

MODEL BUILDER



OCTOBER 1976

volume 6, number 58

\$1.50



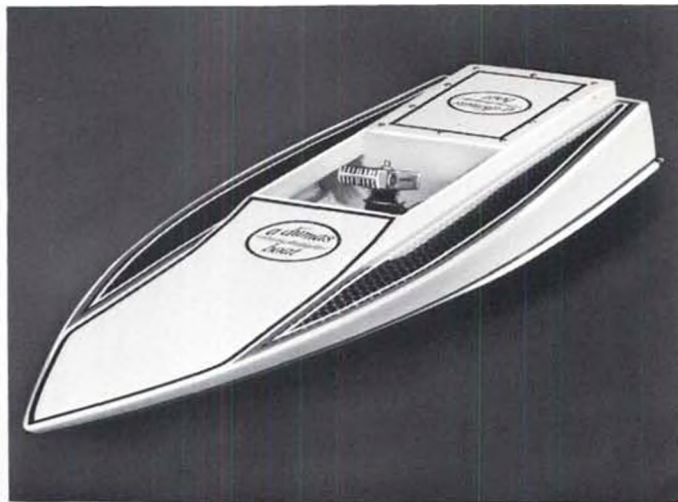
NEW "HALF-PINT" CABIN CRUISER (Kit CC-10)

An 18" model that's easy yet satisfying to build. Makes an ideal "starter" for the beginning R/C boat modeler. Designed for .049 engine.



NEW SKEVEE 10 (Kit SKV-10)

Hours of fun are packed into this 18" wood ski boat model that has a V bottom for competitive racing even in rough water. Looks and performs like the "big boys", uses .049 engine.



HERE'S A NEW RC MODEL BOAT RACING CLASS... AND IT'S EVEN POPULAR WITH YOUR WALLET!

All the fun of R/C model boating is yours at a price anyone can afford with a new Dumas 1/2 A kit, inexpensive to buy, build and run... minimum fuel consumption... and noise! ■ For under \$14.00 you can buy any kit on this page. And because they're just 18" long, they need only an inexpensive .049 engine and hardware. A 2-channel radio and you're ready to go. (Approximate Total Cost: \$160!) ■ Each Dumas model has been pre-tested for ease of building and performance. ■ See your dealer for a pre-packaged hardware kit with everything you need for running. Cool clamps and props available separately. If he can't help, write us.



NEW DEEP VEE 10 (Kit DV-10)

Here's an 18" long Deep Vee that's already proved itself in competitive racing. Built of mahogany plywood and veneer. Great in rough water or calm. Uses .049 engine.



TRIED AND TRUE SK-DADDLE JR. (Kit SK-3)

This hot little boat gets more popular every year. For swimming pool cruising with an electric motor or competitive racing with the 1/2 A's.

See your hobby dealer or send 50¢ for our complete catalog

dumas
boats

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

KRAFT, A GROWING LINE OF QUALITY ACCESSORIES

SERVO TRAYS



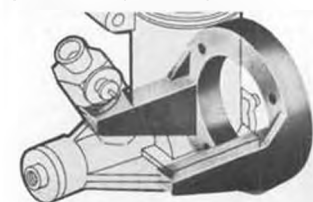
SERVO TRAY PART NUMBERS

SERVO	STYLE 1	STYLE 2	STYLE 3	STYLE 4
KPS-9		200-022	200-021	
KPS-10	200-018	200-019	200-017	
KPS-11				
Kps-11A	200-041	200-042	200-040	
KPS-12	200-045	200-046	200-044	
KPS-14				
KPS-14II	200-089	200-088	200-090	200-101
KPS-15				
KPS-15II	200-093	200-092	200-094	200-102
KPS-15H				
KPS-15HII	200-093	200-092	200-094	200-102

\$3.19 and \$1.69

SERVO ACCESSORY PACKAGES

Mounting hardware, grommets, and output arms for all Kraft servos. \$1.39 to \$1.98.



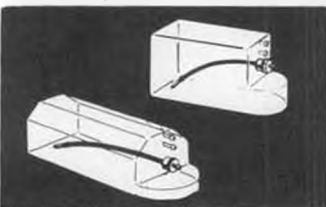
ENGINE MOUNTS

High-strength glass-filled nylon, accurate alignment, low vibration levels and easy installation. Twelve sizes to fit all popular engines. \$2.19 to \$3.49.



ALUMINUM ENGINE MOUNT

For Kraft .61 engine. 200-132...\$7.98.



FUEL TANKS

The finest fuel tanks available for radio control. Two styles in sizes from 4 oz. to 16 oz. From \$2.49.

FUEL FILTER



200-028...\$1.29.



HIDDEN AXLE WHEELS

True running and puncture proof neoprene tires. Bushing to fit three common axle sizes. 1 3/4" to 2 1/4" (Streamline); 1 1/2" to 3" (Scale) \$2.39 to \$3.49.

RACING WHEELS

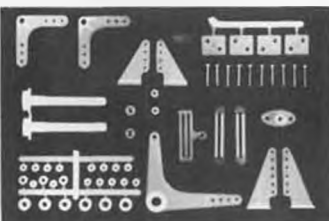
Extra thin solid nylon racing wheels.

1/4 Midget, 200-113... \$1.69 Pr; Formula 1, 200-114... \$2.29 Pr.



HINGES

Polypropylene hinges withstand high vibration and dampen flutter. 200-105...\$1.29 Pkg. of 20.



ASSORTED ACCESSORIES

Control horns, bellcranks, flying stab bellcrank, push rod exits, antenna flag clip, receiver antenna clip, wing hold down nylon bolts, push-on collars. 56 piece assortment, 200-100...\$2.49. Accessories sold separately. \$.59 to \$.98 Ea.



MODELER'S CLAMPS

Both size clamps now feature swivel jaws to permit offset clamping, clamping non-parallel surfaces, and clamping in recessed areas. Molded glass reinforced nylon with tension provided by rubber bands. Large, 200-106...\$1.19 Ea. Small, 200-104...\$1.69 Pr.



MANUAL THROTTLE ACTUATOR

Operate throttle without turning on transmitter. 200-116...\$2.98.



SERVO TRAY SWITCH ACTUATOR

Eliminates need for cutting slots or drilling holes in switch. 200-120 \$.98.



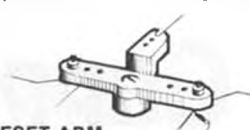
ELEVON LINKAGE KITS

Designed for "V" tails, wings, and powered delta-type aircraft. 200-117 (Universal); 200-087 (For use with 2 KPS-12 servos or all 2/3 channel receiver-servo blocks, except 1976 and later). \$3.98 Ea.



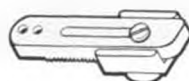
CLEVIS

Nylon clevis with durable snap-lock steel pin. Clevis with 10" steel rod allows for an adjustment of 5/8". 200-128...\$.98. Clevis only. 200-131...\$1.29 Pkg. of 4.



OFFSET ARM

Useful for mechanical landing gear hook-up. For KPS-15II, KPS-15 H II, and KPS-14 II servos. 200-129...\$1.19.



ADJUSTABLE OUTPUT ARM

Adjusts for precise control travel. For KPS-14 II, KPS-15 II, and KPS-15 H II servos. 200-141 \$1.49.



GLOW PLUG ANALYZER

Indicates open or shorted glow plug, and engine flooding. Attaches to dry-cell battery. For square battery, 200-119. For round battery, 200-118. \$7.98 Ea.



RETRACTABLE LANDING GEAR

Self-contained for simplicity of installation; furnished completely wired with connectors. No extra servos or batteries required. Specify year model of Kraft radio when ordering. 700-007...\$109.95.



ADJUSTABLE LENGTH CONTROL STICKS

Fits Kraft KPT-7Z, KPT-7C, and KPT-5C transmitters. 200-122 \$5.98 Pr.



TRANSMITTER TRAY

Vacuum molded of rugged Royalite® plastic; features excellent balance, adjustable straps, and Velcro insert for secure transmitter mounting. Trays have long been used by the world's best fliers for the most accurate control possible. 200-142 \$19.95.



LONG TRANSMITTER STICKS

Increase the degree of control when using a transmitter tray. 200-145...\$5.98



CARBURETOR AIR FILTER

Custom developed for Kraft .61 engine. 200-135...\$2.98.

Write for free accessory catalog and convenient order forms.



450 WEST CALIFORNIA AVENUE
P.O. BOX 1268 • VISTA, CALIFORNIA 92083

World's Largest Manufacturer of Proportional R/C Equipment

pulse commander

☆ IMPROVED!

☆ NOW ON 72 MHZ!

☆ LIGHTER WEIGHTS!

Ace R/C is proud to announce the improved version of the Pulse Commander pulse proportional rudder only system. —Available on 72 mHz! —New double tuned front end receiver! —New powerful RF deck! —New lighter flite pack weights! These units are wired, tested, and guaranteed.

Rudder only flying still offers the ideal way to start in R/C and also is the perfect system for relaxed sport flying due to its small size, light weight, simple operation, and low cost. Four different systems are available for all needs.

All systems are \$75 complete. Available on 72.080, 72.160, 72.240, 72.320, 72.400, 72.960, 75.640, 53.1, 53.2, 53.3, 53.4, 53.5 MHz.



BABY TWIN SHOWN

BABY (10G75)

—Airborne weight=2.5 oz. (70.9g)
—For .010 and Pee Wee .020 planes
up to 36" span.

STANDARD (10G76)

—Airborne weight=3.1 oz. (88 g)
—For Babe Bee and slow flying Tee
Dee .049 planes up to 42" span.

BABY TWIN (10G76T)

—Airborne weight=2.7 oz. (76.5g)
—For .020 and slow flying .049 planes
up to 40" span.

STOMPER (10G77)

—Airborne weight=3.5 oz. (99.2 g)
—For hot .049 to slow flying .15 ships

NOTE: 27 MHz systems are still available: Baby, 10G15 (\$69.95);
Baby Twin, 10G15T (\$72.95); Standard, 10G16 (\$71.95);
Stomper, 10G17 (\$74.95).

ACE R/C, Inc.

Guppy

designed by TOM RUNGE



Span: 34"

Area: 160 sq. in.

Weight: 8 oz. all up

Engine: Pee Wee .020

Radio: Pulse Commander

Baby or Baby Twin

13L113 Guppy \$8.95

A Pee Wee .020 power assist rudder only glider designed expressly for the beginner and the Pulse Commander Baby or Baby Twin radio system.

The 34" span foam wing and simple, yet attractive balsa fuselage make for quick and easy construction. Gentle flight characteristics are ideal for making the first R/C attempt successful.

Please send me your complete catalog.
Enclosed is \$1.00 which is refunded on my
first order. (Add \$.50 for 1st class mail
return; add \$1.00 handling on all other
orders.)

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ACE R/C, Inc.

BOX 511D, HIGGINSVILLE, MO. 64037

LATE NEWS!

Conquest .15 FF won Open A Gas Event
at Ohio NATS
and set new national record!

CONQUEST!

Built to win. By Cox.

Of all the competition engines in the world, through the years none has won as often as Cox model engines. And of all the fine engines now available to you, we believe the very best are our Conquest engines.

We guarantee that each one fully upholds the Cox 25-year tradition of top quality and performance. See them and other Cox engines at your hobby dealer.

Coming Soon! Our prototype Conquest .40 recently won the Class C Free Flight Championship at Taft, California, setting a new AMA Class C record. Watch for this great new winner, and the new Cox .40 R/C, soon at your dealer.



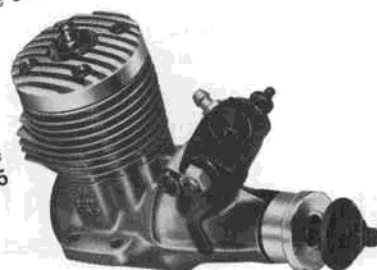
Conquest .15 Free Flight & Control Line.
Designed especially for A.M.A. and F.A.I. free flight competition; F.A.I. combat, scale racing and speed events. **\$55.95**



Makers of Cox Engines — Cox/Sanwa R/C Systems — Airtronics Kits.

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A division of Leisure Dynamics, Inc.
Phone: (714) 540-8200.
Canada: Leisure Dynamics of Canada, 1315 Lawrence Ave. East, Don Mills, Ontario, Canada
Also a complete line of Cox Tee Dee, Medallion Sport, Throttle-equipped R/C & Muffler-Equipped Engines & Accessories.

Conquest .15 R/C.
For quarter midget pylon racing and radio controlled sport flying. Perry carburetor. Exhaust extractors and mufflers available as accessories. **\$59.95**



Send 25¢ for complete
Cox Hobbies catalog.

SIG QUALITY BUILDING MATERIALS

THE LARGEST SELECTION OF AAA AIRCRAFT BALSA AVAILABLE ANYWHERE

STICKS 36" Lengths		STICKS 48" Lengths		SHEETS 18" Lengths		BLOCKS 3" Lengths		BLOCKS 18" Lengths		PLANKS 36" Lengths	
1/16 x 1/16	08	1/8 x 1/8	14	1/32 x 2	22	1 x 1	12	1 x 1	59	1 x 1	1.16
1/16 x 1/8	09	1/8 x 1/4	20	1/16 x 2	25	1 x 2	22	1 x 2	1.23	1/2 x 2	1.60
1/16 x 3/16	11	1/8 x 1/2	29	3/32 x 2	28	2 x 2	30	2 x 2	1.51	3/4 x 2	2.05
1/16 x 1/4	14	3/16 x 3/16	19	1/8 x 2	31	1 x 3	30	1 x 3	1.51	1 x 2	2.38
1/16 x 3/8	16	3/16 x 1/2	37	3/16 x 2	40	2 x 3	40	2 x 3	2.31	1-1/2 x 2	2.72
1/16 x 1/2	19	3/16 x 3/4	44	1/4 x 2	51	3 x 3	59	3 x 3	3.47	2 x 2	3.05
1/16 x 3/4	26	1/4 x 1/4	30	3/8 x 2	55			1 x 4	1.97	1/2 x 3	1.92
1/16 x 1	31	1/4 x 1/2	39	1/32 x 3	30			2 x 4	3.13	3/4 x 3	2.49
3/32 x 3/32	09	1/4 x 3/4	51	1/20 x 3	32			3 x 4	4.62	1 x 3	3.07
3/32 x 1/8	10	5/16 x 5/16	39	1/16 x 3	33			1 x 6	3.10	1-1/2 x 3	3.77
3/32 x 3/16	11	3/8 x 3/8	49	3/32 x 3	40	1 x 1	23	2 x 6	4.50	2 x 3	4.51
3/32 x 1/4	13	3/8 x 1/2	55	1/8 x 3	46	1/2 x 2	29	3 x 6	6.77	3 x 3	6.82
3/32 x 3/8	17	3/8 x 3/4	72	5/32 x 3	52	3/4 x 2	36			1/2 x 4	3.18
3/32 x 1/2	21	1/2 x 1/2	64	3/16 x 3	58	1 x 2	41			3/4 x 4	3.63
3/32 x 3/4	27	1/2 x 3/4	88	1/4 x 3	64	1-1/2 x 2	48			1 x 4	3.93
3/32 x 1	35			5/16 x 3	74	2 x 2	55			1-1/2 x 4	5.10
1/8 x 1/8	11			3/8 x 3	83	1/2 x 3	38			2 x 4	6.14
1/8 x 3/16	13			1/32 x 4	49	3/4 x 3	47	1 x 1	81	3 x 4	9.20
1/8 x 1/4	17			1/16 x 4	53	1 x 3	56	1 x 2	1.62	1/2 x 6	4.35
1/8 x 5/16	18			3/32 x 4	61	1-1/2 x 3	65	1-1/2 x 3	1.30	3/4 x 6	5.10
1/8 x 3/8	20			1/8 x 4	71	2 x 3	75	1 x 3	2.13	1 x 6	6.10
1/8 x 1/2	24			3/16 x 4	79	3 x 3	116	2 x 3	3.06	1-1/2 x 6	7.65
1/8 x 3/4	34			1/4 x 4	93	1/2 x 4	55	3 x 3	4.62	2 x 6	8.97
1/8 x 1	39			3/8 x 4	1.18	3/4 x 4	63	1 x 4	2.66	3 x 6	13.60
3/16 x 3/16	16					1 x 4	70	2 x 4	4.16		
3/16 x 1/4	19					1-1/2 x 4	88	3 x 4	6.10		
3/16 x 3/8	22					2 x 4	107	1 x 6	4.10		
3/16 x 1/2	27					3 x 4	154	2 x 6	6.10		
3/16 x 3/4	36					1/2 x 6	79	3 x 6	9.00		
3/16 x 1	42					3/4 x 6	92				
1/4 x 1/4	23					1 x 6	107				
1/4 x 3/8	28					1-1/2 x 6	133				
1/4 x 1/2	31					2 x 6	150				
1/4 x 3/4	44					3 x 6	232				
1/4 x 1	55										
5/16 x 5/16	27										
5/16 x 3/8	36										
5/16 x 1/2	41										
5/16 x 5/8	51										
5/16 x 1	60										
3/8 x 3/8	41										
3/8 x 1/2	47										
3/8 x 3/4	54										
3/8 x 1	65										
1/2 x 1/2	52										
1/2 x 3/4	70										
1/2 x 1	87										
5/8 x 5/8	64										
5/8 x 1	94										
3/4 x 3/4	88										
3/4 x 1	1.00										

48" AAA SHEETS		SHEETS 36" Lengths		BLOCKS 6" Lengths		BLOCKS 24" Lengths		AIRFOILED SHAPED SHEETS		C-GRAIN AAA 8 - 12 LBS.	
1/32 x 3	84	1/32 x 2	44	1 x 1	23	1 x 1	81	3/16 x 3 x 36	1.24	1/32 x 2	50
1/16 x 3	89	1/16 x 2	51	1/2 x 2	29	1 x 2	162	1/4 x 3 x 36	1.40	1/16 x 2	56
3/32 x 3	1.06	3/32 x 2	56	3/4 x 2	36	2 x 2	2.13	1/4 x 4 x 36	1.90	3/32 x 2	62
1/8 x 3	1.21	1/8 x 2	63	1-1/2 x 2	48	1-1/2 x 3	1.30			1/8 x 2	68
3/16 x 3	1.48	3/16 x 2	80	1 x 3	56	1 x 3	2.13			3/16 x 2	85
1/4 x 3	1.74	1/4 x 2	102	1-1/2 x 3	65	2 x 3	3.06			1/4 x 2	1.07
3/8 x 3	2.20	3/8 x 2	110	1/2 x 4	55	3 x 3	4.62			3/8 x 2	1.16
1/16 x 4	1.32	1/32 x 3	61	3/4 x 4	63	1 x 6	4.10			1/32 x 3	65
3/32 x 4	1.49	1/16 x 3	66	1 x 4	70	2 x 6	6.10			1/16 x 3	72
1/8 x 4	1.70	3/32 x 3	79			3 x 6	9.00			3/32 x 3	85
3/16 x 4	1.96	1/8 x 3	93							1/8 x 3	98
3/8 x 4	2.98	5/32 x 3	1.05							3/16 x 3	1.21
1/16 x 6	2.45	3/16 x 3	1.16							1/4 x 3	1.32
3/32 x 6	2.60	1/4 x 3	1.28							3/8 x 3	1.71
1/8 x 6	2.84	5/16 x 3	1.49								
3/16 x 6	3.20	3/8 x 3	1.65								
1/4 x 6	3.82	1/32 x 4	98								
3/8 x 6	4.40	1/16 x 4	1.16								
		3/32 x 4	1.21								
		1/8 x 4	1.40								
		3/16 x 4	1.57								
		1/4 x 4	1.84								
		3/8 x 4	2.37								
		1/16 x 6	1.94								
		3/32 x 6	2.15								
		1/8 x 6	2.37								
		3/16 x 6	2.50								
		1/4 x 6	3.15								
		3/8 x 6	3.70								

ROUNDED EDGE AILERON & ELEVATOR STOCK		SHEETS 12" Lengths		BLOCKS 12" Lengths		36" TAPERED TRAILING EDGE		18" BALSA ASSORTMENT		BULK BALSA - 3" x 36"		VH - VERY HARD	
1/4 x 1	70	1/32 x 2	44	1 x 1	42	1/8 x 1/2	.31	Box	8.50	Not Stamped or Sorted		1/16 x 3	72
3/8 x 1	82	1/16 x 2	51	1/2 x 2	55	3/16 x 3/4	.40	Sold Only in Standard Packs		Standard Packs in ()		3/32 x 3	85
1/4 x 2	95	3/32 x 2	56	3/4 x 2	70	1/4 x 1	.51	Price Shown List Per Sheet				1/8 x 3	98
3/8 x 2	1.08	1/8 x 2	63	1 x 2	82	5/16 x 1-1/4	.63					3/16 x 3	1.21
		3/16 x 2	80	1-1/2 x 2	92	3/8 x 1-1/2	.72					1/4 x 3	1.32
		1/4 x 2	102	2 x 2	107							3/8 x 3	1.71
		3/8 x 2	110	1/2 x 3	68								
		1/32 x 3	61	3/4 x 3	86								
		1/16 x 3	66	1 x 3	107								
		3/32 x 3	79	1-1/2 x 3	128								
		1/8 x 3	93	2 x 3	153								
		5/32 x 3	1.05	3 x 3	2.31								
		3/16 x 3	1.16	1/2 x 4	107								
		1/4 x 3	1.28	3/4 x 4	1.23								
		5/16 x 3	1.49	1 x 4	1.45								
		3/8 x 3	1.65	1-1/2 x 4	1.72								
		1/32 x 4	98	2 x 4	2.07								
		1/16 x 4	1.16	3 x 4	3.06								
		3/32 x 4	1.21	1/2 x 6	1.48								
		1/8 x 4	1.40	3/4 x 6	1.72								
		3/16 x 4	1.57	1 x 6	2.03								
		1/4 x 4	1.84	1-1/2 x 6	2.61								
		3/8 x 4	2.37	2 x 6	3.05								
		1/16 x 6	1.94	3 x 6	4.52								
		3/32 x 6	2.15										
		1/8 x 6	2.37										
		3/16 x 6	2.50										
		1/4 x 6	3.15										
		3/8 x 6	3.70										

LEADING EDGE 36" Lengths		TAPERED CUT 36" Lengths		ODDS & ENDS PACKAGE OF BALSA		BAGS OF BALSA		CONTEST BALSA 4 - 6 Lb. Stock Very Light	
1/2 x 3/8	54	Tapered to 1/16" Edge		Package	1.39	Bags of Balsa	1.89	1/32 x 3	72
3/4 x 5/8	82							1/16 x 3	77
1 x 3/4	1.10							3/32 x 3	90
								1/8 x 3	1.03
								3/16 x 3	1.27
								1/4 x 3	1.39
								3/8 x 3	1.76



SIG
KIT RC-37
\$18.95

For .09 to .15 Engines
Built-Up Balsa Fuselage 45" Wing Span
Sheet Balsa Tail Surfaces For 2 or 3 Channels
Flat-Bottomed Ready-To-Use Foam Wing
Room Enough For Standard Size Radios



SIG
KIT RC-36
\$19.95

KLIPPER

Designed by CLAUDE McCULLOUGH

KLIPPER & SUPER SPORT KIT FEATURES

Handy Printed Fuselage Sides -
Build Internal Structure Directly On The Wood
Aluminum Landing Gear
Plus: Coil Spring Nose Gear, Nylon Bearing
And Steering Arm On Klipper,
Tail Wheel Included On Super Sport
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Molded Foam Wing
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Aluminum Motor Mounts
Tuf-Steel RC Links
Nylon Control Horns
Molded Plastic Control Hinges
Illustrated Instruction Book

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MODEL BUILDER

OCTOBER

1976

volume 6, number 58

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Cover: Perhaps this picture tells all of us that we should reflect back to the early days of our modeling, when "stick and tissue" was a fact, not an expression; when dope was only something you brushed on that water-tightened tissue; and if you sniffed a little too much of it, you just took a walk and breathed in some cool night air, or tried to test glide that just-completed model under a street light. 35mm transparency by Bill Noonan (see page 42).



from Bill Northrop's workbench

VISITING FIREMAN

• An expression becomes a reality! Based on an initial suggestion by NFFS Executive Director Hardy Broderson, *Model Builder* magazine spearheaded an effort to sponsor a trip to the Nationals for the three reigning World Champions in free flight . . . FAI Power, Wakefield, and Nordic A/2. The only non-Iron Curtain world champion is Lars-G. Olofsson, the FAI Power champ from Sweden. He was also the only champion who was willing and/or able to accept our invitation. The aero clubs of North Korea and Russia declined for their champions . . . Perhaps they were concerned that the modelers would take their "free flight" too seriously!

With the help of contributions from Hardy Broderson, Satellite City, Top-Flite Models, Carl Goldberg Models, Sig Mfg. Co., World Engines, Midwest Products, and of course, *Model Builder*, Lars flew to Dayton, Ohio by way of Stockholm and New York, complete with model box and field kit.

A more delightful and easy-to-please guest could not have been selected. Lars blended so well into the modeling scene that it was at times difficult to locate him after bringing him to an area of competition activity . . . no matter what the category. After a bit of searching, you would find him amongst a group of modelers . . . discussing airfoils, or fuel mixtures, or trimming experiences . . . deeply involved with people he had only met moments before. His English, picked up in school, and with



Brought to the United States to compete in the 50th Nats, as a guest of members of the modeling industry and MB (see text), Lars Olofsson, current FAI Power Champion from Sweden. He is launching his Rossi powered model during the FAI event at Springfield, Ohio.



Lars, a barrel-chested ex weight lifter, scowls upwind in search of some lift. He found it.

very little opportunity to practice it, was more than adequate . . . made easier by the fact that about every third word was a universal modeling term!

Even away from the field, Lars was entirely self-sufficient. He left one morning from the motel where we stayed until the dorms opened, to "take a walk." An hour or two later, we were driving along a busy street about 3 or 4 miles from the motel . . . and there was Lars . . . walking.

"Hi, need a lift?"

"Oh, no thank you. There is a fire station about 3 kilometers from here. I am going to visit."

Like we said, Lars is a fireman in his home town of Vastra Frolunda, Sweden, and he had to take a look. When he

returned to the motel late that night, we learned that the men at the fire company greeted him like a long-lost brother. He spent the afternoon at the firehouse, and they all went to a fireman's club for dinner that evening, where Lars was the star attraction!

In competition, Lars did quite well. Flying one of his back-up FAI models in Class A gas (his World Champ model is in semi-retirement and somewhat out of trim) he and Rol Anderson left all others far behind as they maxed flight after flight. Finally, on his 9th round, Lars dropped 77 seconds short of a max, and Rol went on to complete 10 perfect rounds.

In FAI Power, Lars was plagued with a problem caused by the left leading edge of the stabilizer on his model . . . twice it hit the back of his head as he launched, causing instant DT and a tight loop into the ground! If nothing else, it had to be kind of embarrassing. Still he placed 4th, only 25 seconds off the pace.

One thing sure, Lars Olofsson took home 19 rolls of exposed film, lots of notes, and many names and addresses of new-found modeling friends. The sponsors' money couldn't have been better spent.

Incidentally, AMA was a great help in this venture, especially in making arrangements, and advancing the money for Olofsson's air fare. Negotiations were not concluded until the last minute, and without AMA's help (John Worth's, to be exact) Lars wouldn't have made it. **INDOOR FLASH!**

England's Jim Mosely just phoned to give us some results on the Indoor World Championships held in Cardington, England. Bud Romack, who Jim timed, is the new World Champion, with flights of 39:22 and 39:36, for a total of

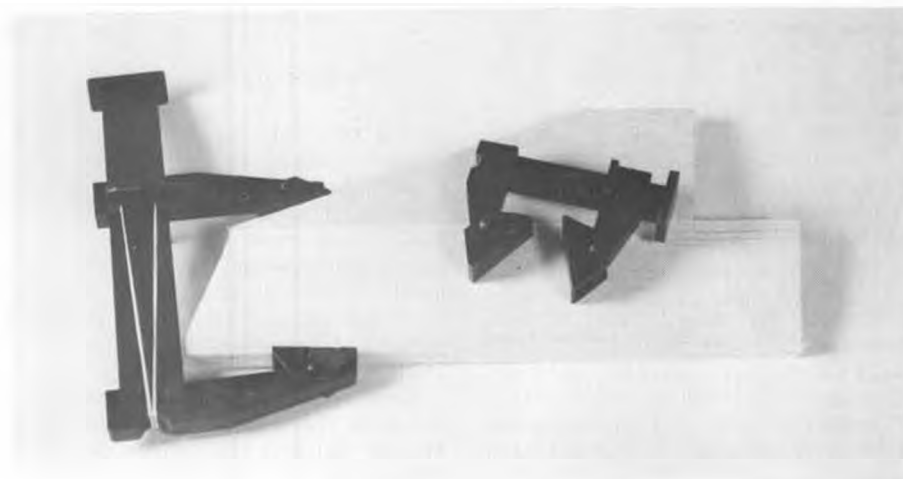
Continued on page 103

OVER THE COUNTER

● Have you tried it the European way? The gang at Kraft Systems did... and liked it. And as is usual for them, improved upon it. As is also usual, they will share with you, with full instructions on how to hold things together with Velcro, or straps, as necessary. They even provide longer Kraft sticks, for those who require them.

The recently introduced vacuum molded transmitter tray is just the thing for the European manner of flying, the way that it has been done for years by the world's best flyers for the most accurate control possible. The Kraft tray fits all Kraft two-stick transmitters from the current models back to the Gold Medal Series, and a number of other brands as well.

The transmitter cavity will accept a transmitter up to 7-1/4 inches wide, 6-3/4 inches high, and 2-1/8 inches thick. A simple but effective method of firmly holding the transmitter is used, and the straps are fully adjustable for the best and most comfortable fit. A companion item is slightly longer sticks that



New swivel-jawed modeling clamps from Kraft Systems.

are also of value for this type of flying. The tray, Part No. 200-142 is priced at \$19.95, the sticks, P/N 200-145 are \$5.98 a pair.

A why-didn't-I-think-of-that idea is the new addition to the already popular

modeler's clamps also available from Kraft Systems. They now feature swivel jaws to permit offset clamping, clamping non-parallel surfaces, or clamping in recessed areas. The larger clamp, Part No. 200-106, with a 4 inch capacity, is



European-style transmitter tray by Kraft Systems.



R/C Buyer's Guide, by Boynton & Associates.



The Pup II, by R/N Models.



The Patriot, for .020 power, by R/N Models.

priced at \$1.19 each. The smaller 1-3/8 inch capacity clamp, P/N 200-104 is \$1.69 per pair.

For further information on this and all the other fine products from Kraft Systems, write to PO Box 1268, Vista, CA 92083. Tell them you read about it in MB.

* * *

A completely new type of product, different from anything else currently on the market, is 'Balsarite', from the manufacturers of well-known 'Coverite'.

This is a crystal clear liquid that will make balsa watertight, the object being to eliminate sag in iron-on coverings due to temperature changes. A side effect claimed is that it makes balsa stronger. Balsarite is available only in half-pint cans, and can be applied with a brush or sprayer.

Try your hobby shop first, or contact Coverite at 2779 Philmont Ave, Huntingdon Valley, PA 19006.

* * *

Ideal for small field flying, the recently announced 'Patriot' from R/N Models should be just the ticket. This 30 inch (760mm) wing span simple free flight or .020 competition model is priced at only \$5.95. The kit is complete with pre-cut and printed parts, and full size plans.

We don't have much information on the Pup II, a redesign of the original Pup, by Peterson Products, but we find it so appealing that we couldn't resist bringing you this sneak preview. It is

for .020 sport flying, and suitable for small R/C.

Not pictured, but also new and of interest to flyers of Coupe d'Hiver and unlimited free flight rubber, is the Mark II Jabberwock, also available from R/N. Using new tailfeathers, and a redesigned fuselage, the complete kit includes printed balsa, prop, rubber, hardware and full size plans. This is a rework of one of Wally Simmers' famous competition airplanes.

When you write for more information, tell them you read about it in MB. R/N Models, PO Box 2527, Lancaster, CA 93534.

* * *

We modelers find many things to disagree with each other about: the best engine, the best prop, best design, the best materials, the rules, and on and on and on. Years ago we disagreed about the best direction for U-control flight; now we disagree about what stick we should pull to go 'up' with our R/C airplanes. One thing we do not disagree on is that a bad paint application can ruin an otherwise excellent airplane, and that the best way to apply paints of all types is with a sprayer.

In an effort to clear the air of some of the airborne debris down at the flying field, Model Builder Products brings you The Ultimate Airbrush, manufactured by Bammco, Inc.

This is a new concept in air brushes resulting in one of the best quality,

most reliable and durable products of this type available. Precision craftsmanship has produced an airbrush free from any of the problems normally found and expected with this type of spray equipment. It is simple to operate, yet the results obtainable are limited only by the skill and experience of the operator.

The molded body is comfortably contoured to fit the hand, all metal parts are machined brass for smooth, trouble-free operation and freedom from corrosion or the effects of the varied thinners and reducers in common use. The heart of this, or any air brush, is the needle valve; available in three different sizes for small, medium or large spray patterns. The needle valve is precisely machined and will permit exact adjustment to the setting necessary for the job at hand.

Introductory priced at \$36.00 post-paid; complete with 2 ounce bottle assembly, 15 ounce air can, medium needle valve, flexible hose, and on/off valve. Accessories and replacement parts are all readily available. Dealer inquiries are welcome. Model Builder Products, 621 West Nineteenth St, Costa Mesa, CA 92627.

* * *

In this day of rising costs, we consider it news when a new version of some product maintains the same price as the original one. But when a model becomes available that has definite and obvious improvements, and the price drops,



Fuel tube fittings set, by Fourmost Racing Products.



Coverite's "Balsarite".



"Strobe" flasher, from International Marine Exchange.



Bammco's "Ultimate Airbrush", as marketed by MODEL BUILDER Products.

this is really news!

Such is the case with the Soling-M Yacht Kit, partially assembled, now available from Vortex Model Engineering at a new reduced price of \$358 with single-paneled sails, \$379 with multi-paneled sails. The price of the unassembled kit was \$377.

It appears that only the assembling that is peculiar to your radio system has been left for you to do, though even some of that has been made almost painless. The servo mounting tray, battery tray, and servo mounting rails have been shaped and drilled.

The deck and hull are already joined, with the seam line shaped and finished in white gel coat. All deck hardware mounting holes have been drilled. The keel weight and stub have been joined, shaped, and finished in white enamel. All interior structures are already installed.

The design specifications for the yacht remain unchanged; it conforms to the specs of the new AMYA Soling One Design Class.

Vortex also announces that the new SC-3 Sail Servomotor, that has been under development for some time, should be ready for shipping by late August. For a firm price, and more complete information on these and all the fine sailing products, inquire from Vortex at 210 East Ortega St, Santa Barbara, CA 93101.

* * *

It is like being at the Toledo show without the noise, the shoving and the pushing, and the sore feet. The Second Edition of the Radio Control Buyer's Guide, that is.

This just-released book includes listings for more than 1500 radio control products, including pictures, and all the important information and speci-



Cox diesel conversion, by Davis Diesel Development.

cations, including retail prices.

More than 180 manufacturers are represented, including their latest offerings, as displayed at the 1976 trade shows. Fully indexed for easy use, the RC Buyer's Guide is an important addition to any serious modeler's shop or library.

Available for \$4.00 at most any RC hobby shop, or postpaid for \$4.75 directly from the publisher; Boynton & Assoc., Clifton House, Clifton, VA 22024.

* * *

As the name implies, International Marine Exchange has model boats of various types and sizes. However, it also has a number of items that are of interest to builders and operators of all kinds of radio controlled models.

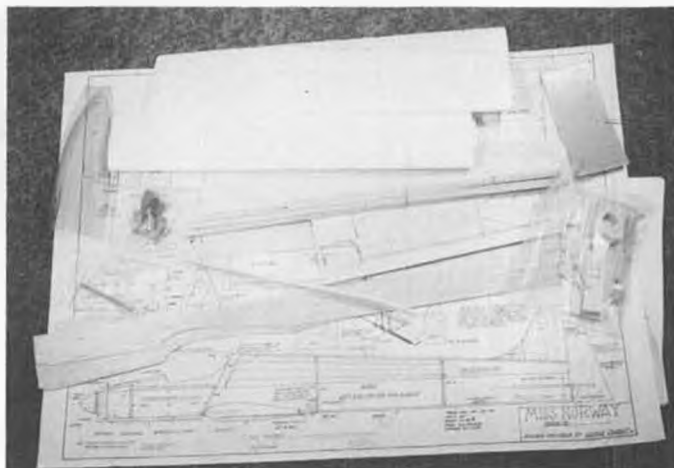
One example is a Strobe Type Flasher, available for 6, 9, or 12-volt operation, and in clear, amber, red, blue, or green lenses. To change voltage, it is necessary only to change the bulb. Further evidence of the excellent design is that the timing is such that the light is on only 5% of the time, resulting in extremely long battery life. The actual drain is less than 20 mils.

The 9-volt system is recommended for aircraft and helicopters, the 6 and 12 volt units should find their greatest use

Continued on page 100



Electronic "Whooper" horn, from International Marine Exchange.



"Miss Norway", 1/2A pattern ship by GMC Models.



Doesn't that look like the world's largest field box, sitting next next to a full size airplane? Even the grass seems close to scale! The Sig Clip Wing J-3 Cub was built by George Dickinson, Somerville, N.J., ST .35, Du-Bro muffler, Permagloss Coverite, Kraft radio. Model flies great.

'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

NSRCA CHAMPS

• It is Monday evening, Labor Day, September 6, 1976, and we have just returned home from the last item on the agenda of the 3 day, 8 round, 3 party (!), NSRCA 1976 Championships for Novice, Advanced, Expert, and Masters pattern fliers. The competition took place at Mile Square Model Air Park, Fountain Valley, California, about 30 air miles southwest of Los Angeles.

The contest was a rousing success from all points except one . . . the almost complete absence of pattern fliers from east of the Mississippi. Only George Hill, from Maryland, and New Jersey's Tony Bonetti kept the event from being an all-southwest regional affair. Seems a shame that the eastern fliers couldn't have reciprocated better for all the long trips made by western fliers in recent years. Hmm . . . probably would have been different if this was the U.S. team selection trials.

We'll go into more detail next month, but for now, here are the category

winners:

Masters: Steve Helms, Vista, California, well out in front of the runner-ups and looking loaded for bear and Austria.

Expert: Howard Danforth, from Long Beach, California, and looking ready to jump into the Masters' scramble.

Advanced: Ralph DePalma, Montebello, California, was pushed hard by Curt Oberg, Litchfield Park, Arizona, and Joe Hildreth, Edwards AFB, only 8 and 15 points back.

Novice: Roy Speights, Santa Rosa, California, who looked extremely smooth in his pattern presentation and will be a tough competitor in Advanced.

We'll talk more about the flying, with Judging pointers, in next month's "Remotely Speaking."

WE'RE NOT ALONE

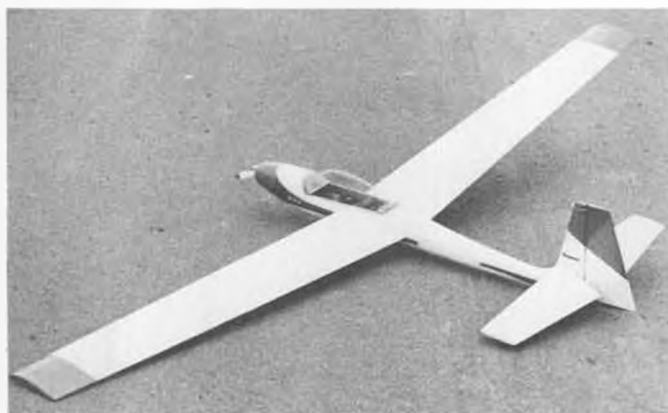
The non-modeling public is getting into the act of rebelling against the CB Monster which has, for many years, been the scourge of safe and sane radio control operation. A recent Associated Press article tells about a report pre-

FLASH! New International RC Boat record set at Whittier Narrows, California, during the NAMBA District IX Championships, September 6th.

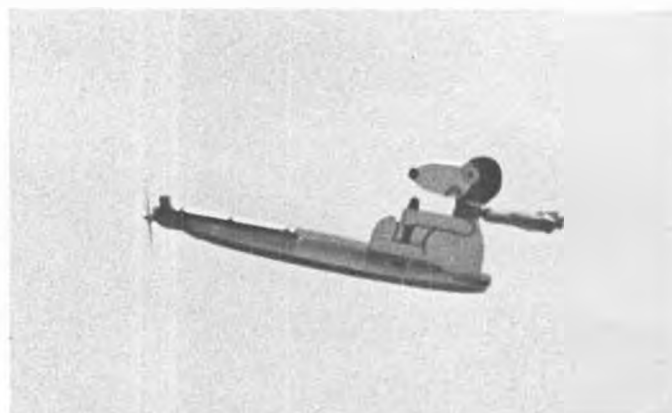
Joe Burzese, a dentist from Las Vegas, Nevada, broke the 1:29.95 record held by Ed Fisher, of Seattle, for C Class Hydroplanes with a new time of 1:28.1. The boat is a Wing Ding, by Octura, OPS-60 powered, with Kraft Systems radio. See November MB for full details of this exciting three day event.

pared by Arthur D. Little, Inc., a private consulting firm, for the White House Office of Telecommunications Policy. The headline is, "STUDY ENVISIONS CITIZEN BAND RADIO CREATING WORLD CHAOS."

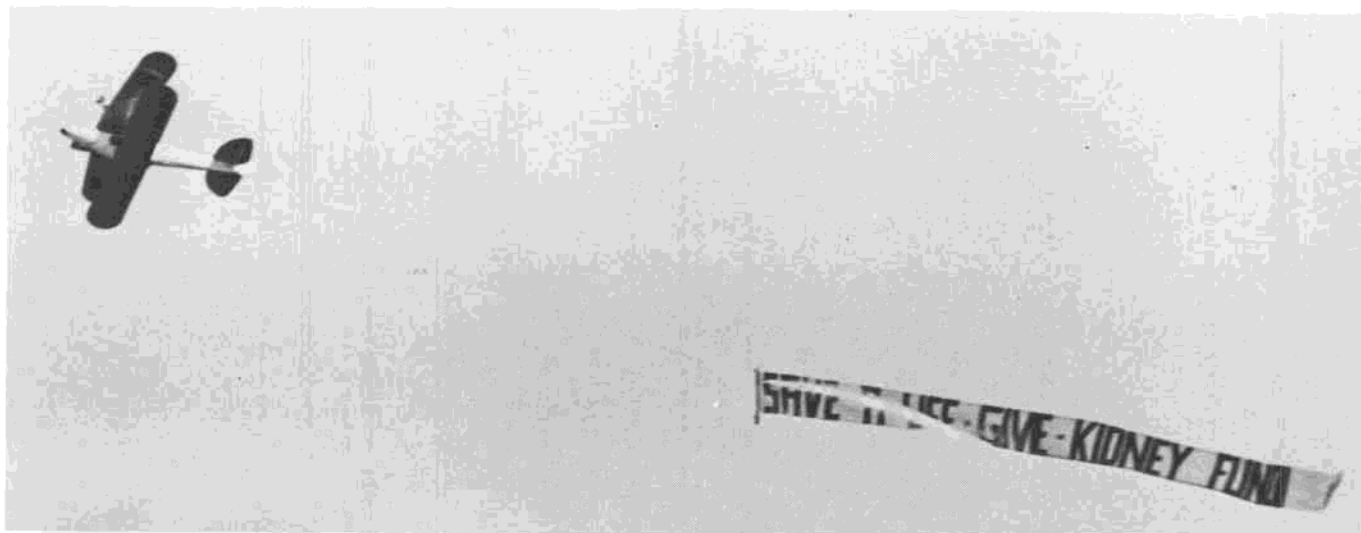
Actually, the report deals with numerous *envisioned* communications problems for the near future, though CB certainly holds the limelight as the star offender. The study forecasts CB radio organized antibusing demonstrations and riots, but by 1977, police will have developed jamming devices to broadcast noise on the channels. Other pre-



Sid Norris, Tennessee, built this AS-K14 from a Graupner kit, K&B SuperPoxy, OS Max, EK radio. Roy Stephens photo. Tri City Aero.



Wayne Duncan flew THIS at the Northwest Kidney Fund Airshow in the Seattle, Washington area. Snoopy got off of the doghouse!



Phil Williams and his Pulsar biplane do their thing for the annual Northwest Kidney Fund Air Show. Photos by Dave Katagiri. Work of this type is not only a contribution to society, it also improves the image of modeling to the public eye. Clubs should strive for this goal.

dictions include using CB for lookouts to warn bandits of approaching police, and prostitutes cruising the streets while broadcasting (hmmm, very appropriate word) their offers. We understand this is already a fact in some cities.

By 1977, it is predicted that scrambling equipment will be available for private conversations, and that special calling equipment will let CBers dial base stations as though they had telephones.

In 1978, and this one has already been confirmed by expert R/C systems designer Doug Spreng, increased sunspot activity will cause American CB conversations to skip thousands of miles, disrupting communications in Europe and South America. This will bring complaints to the United Nations.

By 1979, it is envisioned that the FCC will have virtually abandoned efforts to enforce its rules (Hell's bells! *That* vision is going to be 20 years late!). Faulty CB equipment will interfere with TV and FM radio.

Beyond this, the study envisions problems that seem to come straight out of an H.G. Wells novel . . . to which those of us who have watched the birth and bringing up of the CB monster under the nursing of the FCC, can only



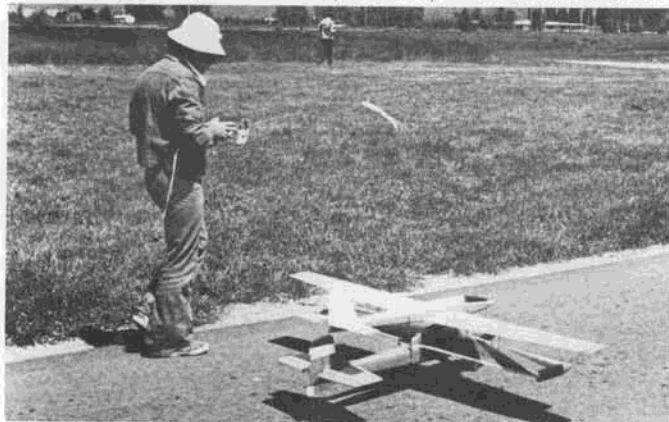
This Jenny, built by Ron Alder, was seen at the 1976 RAMS' Show in Seattle. This, and photos below, were taken by Dave Katagiri.

say, "We told you so!"

By the way, *Model Aviation Canada*, newsletter for Canada's Model Aeronautics Association, published some comments from the Department of Communications (Canada's FCC) which indicates that Canadian officials are showing

much stronger reaction to the CB problem than our FCC. In the words of one official, CB is "a refuse pile for the dregs of the radio community, whose main interest is in hearing themselves talk." Department of Communications

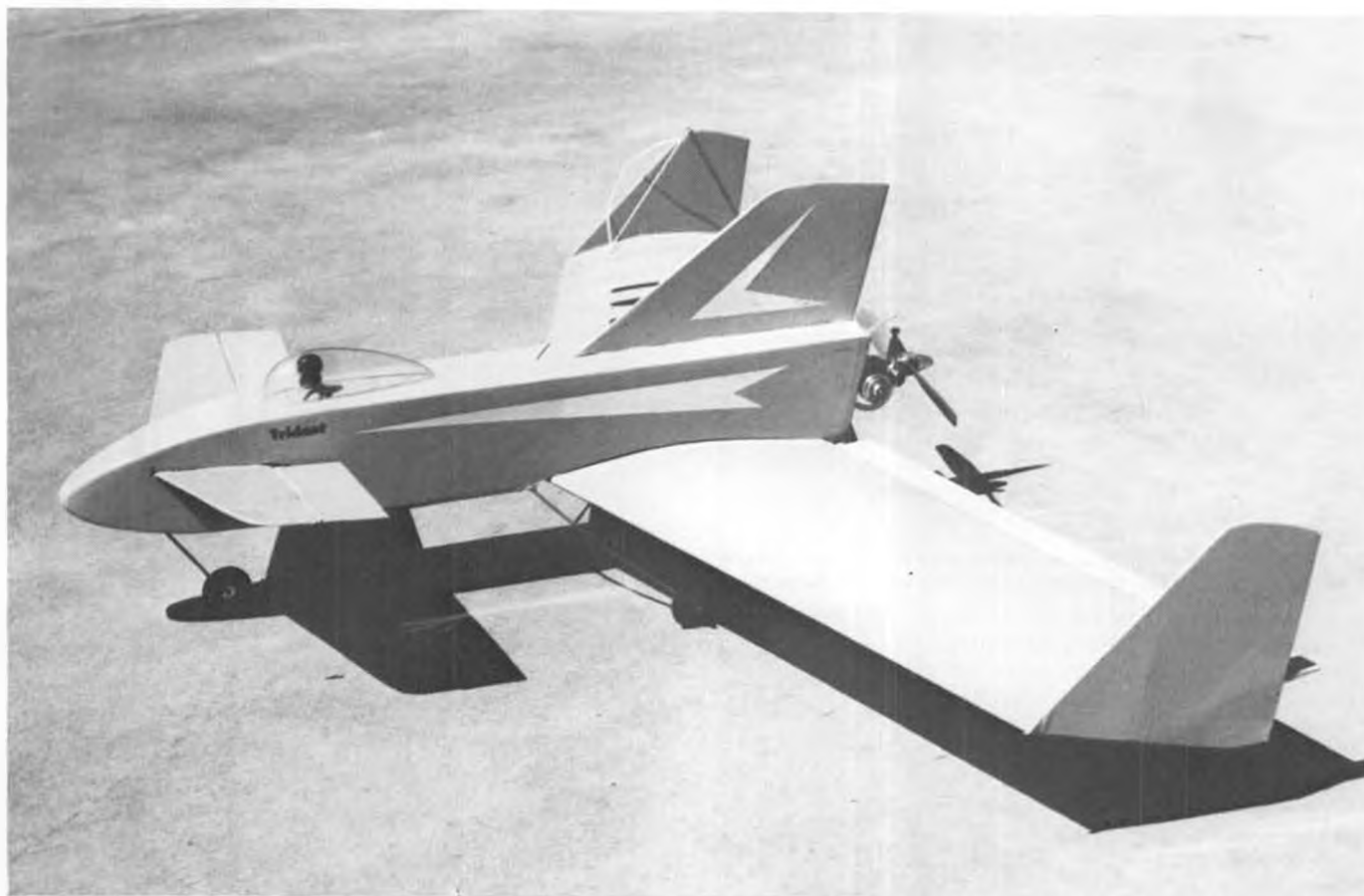
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Ole Recio, of the Boeing Hawks, taxis his aerobatic glider and sport ship combination prior to takeoff. Similar to Walt Good's set-up.



Strap-on wire cradle holds sailplane. Lateral support by outboard wires plugged into carrier wing. Release by auxiliary elevator horn.



THE TRIDENT

By RANDY WRISLEY . . . Wing in back, stab in front, three fins, no ribs, and an engine that pushes. If that ain't out of the rut, we'll change its name to "Tomato Juice". Try *THIS* on your little 2-channel radio!

• Simple, fast, unique. Those were the design goals I set out to achieve when I began work on the Trident, 3 years ago. A good measure of success and some colossal failures made this project one of the most interesting I've undertaken. As presented, it makes a fine sport flyer for those of us who have some stick-time on aerobatic aircraft. If you are a beginner, please build a beginner's model. Trident is dynamically stable. It goes where you point it, until you point it someplace else. Aerobatics are quick and clean. It flies fast, stalls gently, and has no bad habits. In fact, when you build one, you'll be surprised at the ease of construction and ease of flight. Mine have all flown right off the board with only minor trim changes required. Interested? Let's build one!

FUSELAGE

Standard construction is used here. Cut all formers from 3/32 plywood. Make all cut-outs and holes before installation. Cut sides from medium 1/16 sheet. Mark locations of formers, cut nosewing slot, and cement the 1/16 balsa doublers in place. If you use plywood for doublers, make it 1/32. Install formers, taking care to maintain correct alignment. Sheet fuselage top

with 1/16 balsa applied cross-grain. Bend and install landing gear. The gear is shown true length in the front view. You can eyeball the sweep-back or clamp bent gears in a vise and measure it. I chose the former. As long as it sits on all 3 and rolls straight, you're okay. I used a piece of 3/16 square spruce, slotted on one corner, to hold the mains in. FIA and a spacer hold nose gear in. Be sure to epoxy every-

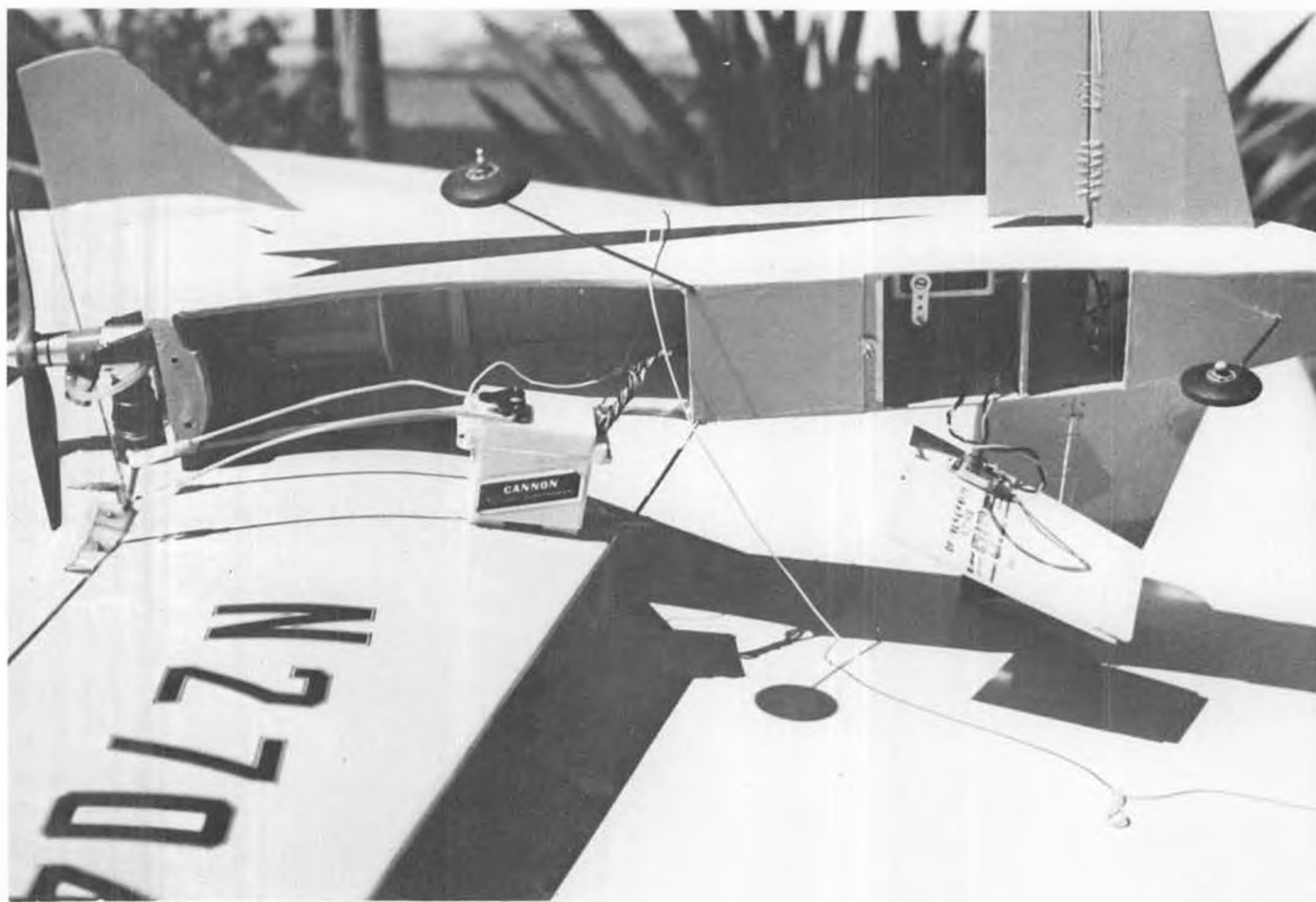
thing well. Now sheet the bottom where shown with 1/16 balsa, cross-grain. Might as well make the hatch now too. Install and shape nose block. Sand it smooth and set it aside until we build the wing.

WING

Spend some time studying the plan to become familiar with construction. Although different, it is simple and



Going away view shows uniqueness of Trident's layout. If you break a prop, it sure will be the hard way! Design is one of several tested.



Any complaints about accessibility? Forward hatch contains switch and covers "elevator" servo. Cannon receiver/servo tapes to top of main wing and drives ailerons. Tank is in top rear of fuselage. One-piece transportation is easy with 30 inch wingspan. Wing is of spar and cap-strip design.

quick. With Hot Stuff, you can build it in about 2 hours.

Begin by installing the 1/8 square spacers on the leading and trailing edges. Use 1/16 scrap balsa as a guide to center the strip. Pin 1/8x7/8 hard balsa spar down on the plan. Follow with L. E. and T. E. Cut all components to required angles and install 3/32 ply spar joiners. Now, raise L. E. and T. E. 1/4 inch off the plan, using 1/4-inch blocks spaced about 2 inches apart. Install 1/16 x 1/4 ribs by bending them over the spar and attaching to L. E. and T. E. Install center section planking with grain running cordwise. Now, flip wing over and repeat the process. Be sure to add 1/16 to your jig blocks to make up for the added height of the ribs. When you finish and the cement dries, sand it to final contour. Install front hold-down dowel by cutting a hole in top planking. Epoxy dowel in place on top of plywood leading edge joiner.

Make ailerons from 3/4-inch shaped trailing edge stock. Bend linkages from 1/16 wire using brass tubing as a bearing. A piece of tubing soldered on top and flattened makes up the horn. Temporarily hinge and install ailerons on wing. The assembly can now be fitted to the fuselage. Shape spruce hold-down block to clear wing and install in the fuselage. **NOSE WING, ELEVATORS AND RUDDERS**

These are simple sheet structures. Don't omit the plywood dihedral brace from nosewing. Cut surfaces out, add dihedral to nosewing, and install 1/32 wire linkages to elevators. Sand everything smooth and you are ready to cover.

COVERING

Use your favorite plastic film here. Cover the entire airplane before assembly.

ASSEMBLY

Start on the fuselage. Install tank, using scrap 1/4-inch sheet wedges. Use Hot Stuff to keep it stuck in. Remember the pickup has to be in the bottom rear of the tank. Route fuel lines through firewall and bolt the engine in place.

Poke elevator linkage through nosewing slot. Slide nosewing in place and cement. Install elevator hinges. I used thread stitching on the prototypes. Install elevator servo upside down on the left side with servo tape. Bend elevator pushrod, slip over 1/16 wire joiner, and solder a washer on either side to keep it centered. Pin elevators in neutral, and solder completed pushrod joiner assembly to elevator linkage.

Install aileron servo on top of wing, ahead of fuel tank, with servo tape. I used a Cannon Tini-Block system. If your single servo rocks around, build a low box to keep it in place. Perma-

nently install ailerons and bend pushrods to shape. A 1/16 plywood plate is cemented to the bottom of the wing for mounting bolts.

Install all 3 rudders. Bolt wing in place and try controls. Remember elevator must move *down* to raise the nose! Now add finishing touches like wheels and trim. A 225 Ma battery pack fits under the nose wing. Raise linkages by pulling them back and wedge batteries in place with foam. Install canopy, and pilot if desired, and you are ready to fly.

FLYING

Well, it's nervous time! Check your balance point and make sure surfaces are aligned. Install a pusher prop or reverse ported crankshaft.

If it rolls straight and isn't warped, you're ready. First flights are best made with 6x3 prop and low nitro fuel. Give yourself a 1/2 tank of fuel and start the engine. Adjust for maximum rpm when model is held nose up about 45°. Take off into any wind. After 30 feet, feed in some up elevator and the Trident will fly! Turns are best made after you get about 50 feet high. Bank with aileron, turn with elevator. Smaller props and more nitro make it go faster. Let experience be your guide. Here's hoping your Trident brings you as much pleasure as mine has brought me!



Rick Pearson cleaned up at the 1976 SOAR NATS, winning 1st overall, 1st in Class C duration, 2nd in Class C Precision, and was a member of the 1st Place team. He did it all with the ship he is shown launching, the SAILAIRE, kitted by Craft-Air. Span is 150 inches.

R/C SOARING

by Dr. LARRY FOGEL.

Impressionistic report of the 1976 SOAR NATS

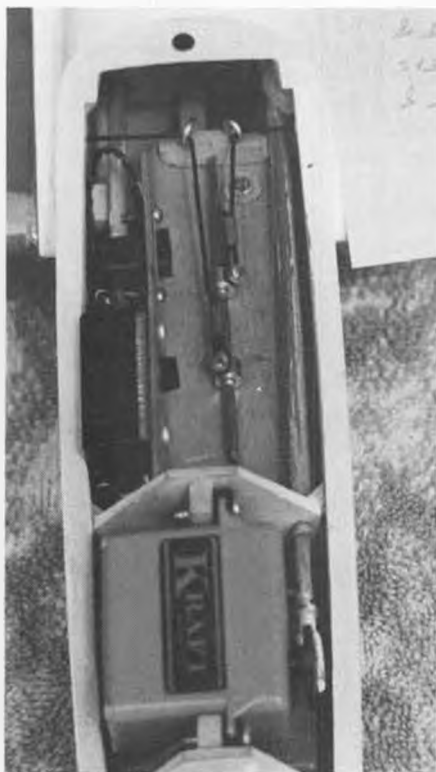
• If you're in this hobby, you probably enjoy participant sports far better than spectator sports. Perhaps you get the same finger itch I get whenever I watch someone else fly.

Then why do so many presumably reasonable people travel great distances and come together to spend 99% of their time waiting around and watching while

others fly . . . as for example at the SOAR NATS? Even the best run contest keeps you on the ground most of the time. There, your anxiety builds up until it's your turn to fly . . . hardly the best set up for producing top notch performance.

This year I attended the SOAR NATS with this question in mind, and began

to learn the answer. Most of the joy of taking part in such an event is meeting the other contestants. They're *real* people from *real* places with *real* sailplanes, each built and flown around some pet notion. There are those who believe that only long wings can win, others who look to gadgetry to make the difference. Some planes are strictly functional, designed only to fit the task. Others mimic scale in varying degrees (if it looks like the real thing, maybe it'll fly like the real thing). Each pilot expresses his own values and judgement. As for me, I do my best, but my chances of winning are so low that I can afford to fly conserv-



Spoiler drive system used by Ed Byrne. Easy to adjust, easy to hook up during assembly.



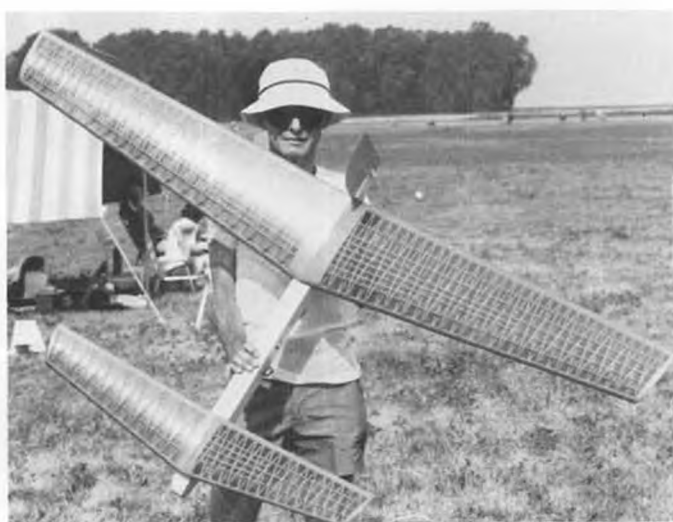
John Remmer, Victoria, Texas, rigged this spoiler/flap system on his "Callisto".



Gary Bussell's "Challenger" featured this compound rudder linkage.



Sid Axelrod, Top Flite, and his Top Sailer, designed by Ken Willard. It's living proof that you can decorate like mad with Monokote!



Bob Miller, Urbana, Illinois, with his canard. Construction shows strong free flight influence.



Unidentified scale glider. Could be Doc Hall's Schugleiter. Wings without dihedral always seem to droop.

atively, and try to avoid those "crash-into-the-spot" landings. I've been told, "If you love your plane, you'll never be able to win with it" . . . Maybe so . . .

I'm still convinced that Torrey Pines is the perfect slope site and that every thermal site has something wrong with it. Arriving at Lockport, Illinois early enough for a practice session, I was

directed to the "sod farm" . . . and that's just what it is, an "unlimited" field of smooth clipped grass. Only problem . . . you're not allowed to drive out onto the field (for obvious reasons).

What would *you* do after your drive to a fine flying field? You're ready to set up your Hi-Start then realize that you have failed to bring along a stake? To make matters worse, there are no

trees or fences and you can't use your car as a tie-down because of the freshly planted sod. Faced with this situation, Roy Hogan, N.S.S. District IX Vice-President, suggested use of the car's tire iron . . . and it works.

It was difficult to get landing practice with so much lift available. Long duration flights were just too tempting. It was nearly sunset and there's nothing more beautiful than guiding that speck from cloud to cloud against a glowing sky.

From my point of view, the next three day's weather was inclement, to say the least. Far too much wind for many wings, and on the last morning there was the remains of a six inch overnight downpour (No points were scored for the amount of splash on landing). At times you could kite your plane to the very top of the line, then dive forward in the hope of releasing the tow hook . . . not an easy task with so much lift under the wings. A number of wing wires were bent during launch, significantly in-

Continued on page 64



DC-3's have been used for just about everything, but probably never before as shelter for R/C glider-nuts!



Dave Kneeland, Huntsville, Alabama, and his FAI maximum area "Leptoplis Dubious". See text for full description.

FOR Ms ONLY

(Mrs.) CHAR ROHRING
 "Ms. ONLY" reports the 1976
 SOAR NATS from the distaff
 point of view.

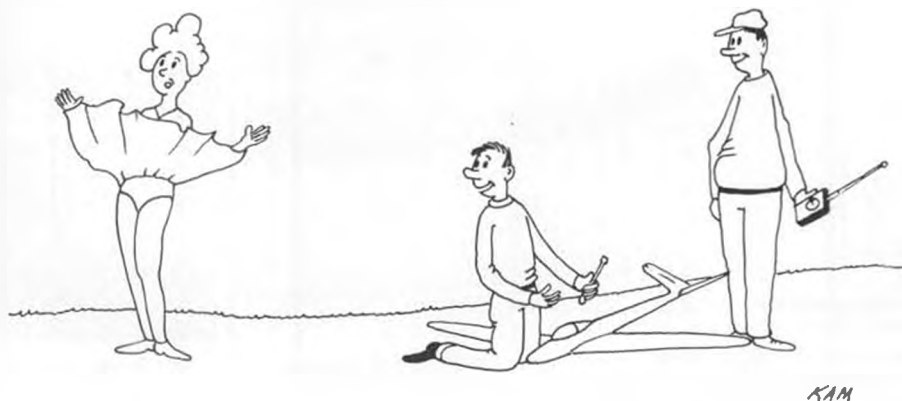
• For your own social security, when girls at the bridge table ask how your vacation was, just answer, "Great!" Don't go into detail. Somehow, to the average woman, a vacation on the contest trail holds very little charm. A few days swatting bugs in Bali has everybody green with envy, but tell them you spent a few days at a national radio control glider contest and they get the same expression they would get if you said Bill, or George, or Harry plays R/C jacks or R/C marbles.

If you go beyond telling your friends where you spent your vacation and tell them what happened on the vacation, you lose more listeners. Finally, after a few sentences, your whole audience is chatting among themselves about Connie's trip to Bali and you find your voice trailing off to nothing . . . no eye contact left with anybody.

A lot of strange things do happen at a big contest, but it hurts when you're trying to explain this to a gathering and your best friend rolls her eyes up into her head and whispers, "Mary Hartman, Mary Hartman!" behind her hand to your second-best friend.

Now do you understand the need that compels me to tell you about my July vacation at the S.O.A.R. Glider Nats in Lockport, Illinois?

I was lured there again this year with the promise of balmy breezes, blue skies, and romance. Bali comes to mind, doesn't it?



"Looks like some strong thermals today, Joe!"



Canadian Mike Broadbent, with swept wing, V-tailed "Algebra", Sean Bannister design.

What I got were winds gusting 12 to 20 mph according to the Lockport Airport. They were gusting 20 to 30 according to a wind speed indicator set up on the flying site, and gusting hurricane to tornado according to the fliers

Continued on page 70



Col. Bob Thacker, with nice looking straight-wing Hobie Hawk. He won scale again.



Bob Hand, president of the Tri-State Soaring Society, built this "glider support case and tool box". Looks handy.



Bob Miller, Dayton, Ohio, and his all-black "Shadow". Span of sheeted, geodetic constructed wing is 158 inches. 1440 squares.



Bob Violett's A-4 "Skyhawk" streaks in for a landing, with shadow close behind. K&B Schneurle 40, Scozzi fan, 60% nitro, 9-1/2 lbs.



Milt Sanders' canard pusher pattern ship, "Zonker 40", also streaks in for a deadstick landing, with shadow close behind. Smooth flier.

50TH NATS R/C Pattern & Scale

Report and photos by BILL NORTHROP

• Thank heaven for Harold Goldklank and Milton Sanders! Harold, the "Court Jester" of Nationals R/C Pattern competition, was on hand in Dayton, Ohio, during the 50th running of the National Model Airplane Championships, to see that no one forgot that this whole affair is still a hobby, and that we are all in it to have FUN.

Milt Sanders saved us from watching an endless parade of 60 powered, retract geared, brightly colored look-alikes. This Novice flier showed up with an O.S. 40 powered pusher-canard that flew so well it brought a round of applause from the normally passive spectator/con-

tants. Even though we saw it on the very first day of competition, the design had already been sold, and will be published in a future issue of "Model Aviation."

It was the largest turnout ever for pattern, with a registration total of 301 contestants, divided as follows: Novice, 122; Advanced, 59; Expert, 44; and Masters, 76. However, by the time the contestants were actually called up to fly, the total had dropped off to less than 250, with the Novice figure still largest, but below 100.

Judging, as usual, continues to catch the brunt of the complaining from

contestants, and to this we can only say, "You get what you pay for." Level 4 and 5 judges, as graded by the USPJA, cannot and should not be expected to judge as well as Level 1 and 2 judges. It's not the people who are at fault, it's the system. If contestants were to get poor judging from top level individuals who have been brought to a contest with expenses paid, they have something legitimate to gripe about.

Enough on that subject for now.

The big news, though to some it seemed anti-climactic, was the unprecedented, fourth-in-a-row Nationals victory by Rhett Miller. No matter how



World R/C Scale Champ, Bob Nelitz (rt), also won at Nats. Beautiful DH "Chipmunk" was one of 4 entered! Bob Karlsson holds.



Roger Brennon and his Northrop P-61 "Black Widow" won Sport Scale and Sport Scale Achievement trophies. Kraft 61's, smooth.



Some of the folks who worked hard for 6 days, and received mostly complaints for thanks, the pattern flight judges.



George Buso's Piper "Navajo" taxis out for takeoff. George chose to use fixed gear, still won 3rd in Sport Scale out of 50 contestants.



Mike Moses, Delaware, flew this Fieseler "Storch" in Sport Scale. Real ship in museum.



The Nelitz Chipmunk in slow, realistic, scale speed flight, flaps down. All yellow trainer.



Another scale speed flier, Don Scull's Sport Scale BE-2E placed 2nd. Working exhaust.



Top Flite's Dan Santich shoots a touch-and-go with F8F Bearcat. See text for finish.



Clayton "Skip" Mast's B-29 has exact scale outline. Two ST 15's, two Enya .15's.



Henry Haffke's Gee Bee was an extremely stable, but lively performer in Sport Scale.



"The Pattern Machine", Rhett Miller, cranks out another winning flight. It's 4 in a row!!



Skip Mast's exact scale B-29 is an extremely smooth flier in spite of being relatively small and weighing 11 pounds. One scale flight judge argued with him about rules, while he was flying!



A pleasant addition to the pattern work crew, Charisse Bickham, age 10, Lima, Ohio LARKS.



"I'm gonna have to put another switch on this box, to control the @%(&)[S]†* weather!"

boring flight after flight of the same pattern maneuvers can get to some who have watched them for years, when Rhett calls "Takeoff", fliers and spectators alike stop whatever they're doing to watch. It is very seldom that an experienced, and thus uninhibited judge, will write down less than an 8 or 9 on Rhett's maneuvers, and if the judge has a 10 up his sleeve, Rhett can pull it out. We have yet to see anyone duplicate his landings, at least not since Doug Spreng discontinued active pattern flying.

Incidentally, we note that Rhett has finally reached that highest pinnacle of fame and recognition in the R/C modeling world . . . numerous faithful duplications of his "Compensator", right down to the engine, prop, radio, wheels, retracts, and paint job . . . only the AMA numbers are different. Rhett, you have arrived!

It's also interesting to note that our whole 1975 FAI Team was right on top of the heap in the finals, including the Team Manager . . . this order of



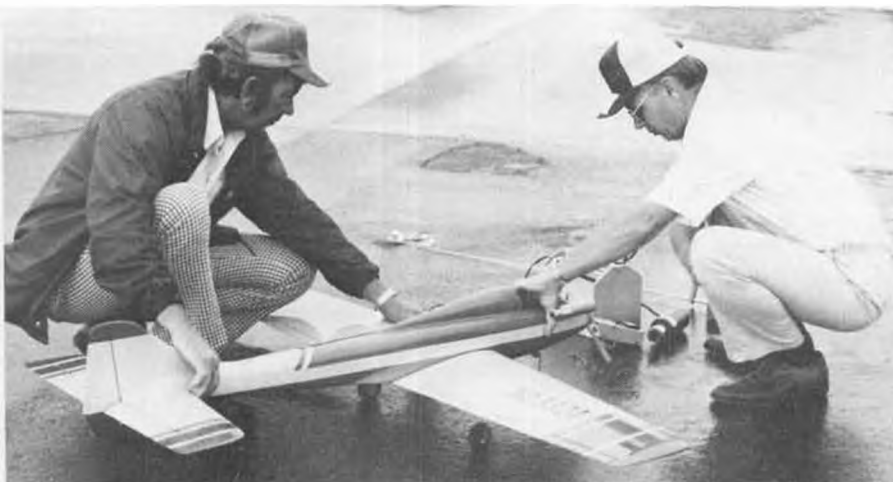
OFB's Bob Karlsson and Graham Lomax had a pair of Sport Scale Chipmunks, fiberglass fuselages, nice fliers. This is Graham's.



Alan Spievack cranks up his MIG-3. Ship flew quite well.



Close-up of engine compartment in Don Srull's WW I BE-2E. Had working exhaust stacks.



Winner in the Expert Pattern Class, Leland Peterson, prepares to start the engine in his "Dirty Birdi", about the most popular pattern ship at the Nats.



Jim Keiger, who finished 10th in the Advanced Class, tries a little rainy weather flying.

finish being Rhett, Dave Brown, Don Lowe, and Mark Radcliff, followed by Mike Mueller, Ivan Kristensen (Canada), Steve Helms, Phil Kraft, Wayne Abernathy, and Jim Whitley. Rhett was nearly 1000 points above the runner-ups, who were all bunched within less than 250 points of each other . . . a clean victory.

This year, the four skill categories were all mixed together on the flight lines; a bit tricky for judging, as some maneuvers had variations in different classes, and the sequence might change, but definitely a moral booster for the Novice, Advanced, and Expert fliers to see and be seen by the Master fliers.

You'll see results in every model publication, but here are the first 10 in each category.

EXPERT: Leland Peterson the winner, followed by Terry Nitsch, Phil Hanscom, Chuck Shade, Allan Johncock, Jim Vanderwalker, Eric Meyer, Bruce Underwood, Allison Tyler, and Howard Danforth.

ADVANCED: James Danley the winner, followed by Larry Ott, Carl Allen, Bob Latham, Karl Ball, Wendell Maakestad, Mike Johncock, Andre Bouchard, Ken Calhoon, and Jim Keiger.

NOVICE: Charles Ramsey was the winner, followed by George Vaughn, Tony Frackowiak, Marty Wittenberg,



Terry Nitsch, who finished second in the Expert Class, keeps his single-stick Pro Line close to his chin. Dick Kefauver calling.



Don Lowe finished in the money, 3rd in Masters. Could be that Jimmy Grier helped by lending Don a little of that "Power"!



Nancy Brown, one of the unsung heroines of pattern tabulating.



Meera Thadani, from India by way of Canada, age 19, flew in the Novice Pattern class.



Julie Woods says she can judge better when she's in close contact with the ground!



A familiar couple at most eastern pattern contests over many of the past years of R/C, Ed and Louise Izzo. AMA VP John Berne judges.



Mike Johncock, age 13, flew to 7th place in Advanced, while his father, Allan, calling for Mike, placed 5th in Expert.

George Miller, Bob Redmon, Phil Sibille, Bob Christopher, Bill Rutledge, and Arlyn Westberg.

R/C Scale at the 50th Nats was sensational, but frustrating. The quantity (50 Sport Scale and 12 AMA Scale actually competed and flew) and quality was tremendous, but it was almost impossible to see every one of them . . . at rest or in action.

First, the only R/C models to appear in the Scale Cage for public viewing were the museum, or AMA Scale types. While it's understandable that considerably more space would have been needed to display all of the Sport Scale models, the reasoning for not displaying them was totally assinine . . . it was to

keep them from being seen up close by two Sport Scale static judges before they performed their official duty! Who can explain the logic of not merely telling two officials to stay away from that end of the hangar where the scale models are displayed, rather than denying several thousand spectators a chance for a close look at these models?

The second problem, was more understandable but not any less frustrating. A single flight line was set up at each of the three pattern sites along the main runway, each 3/8 of a mile from the other. We discussed this with overall R/C CD Kemp Bunting, and the two of us found that there were two

Continued on page 96



Andre Bouchard, from Canada, placed 8th in Advanced pattern.



Larry Smith starts up one of the engines on his F7F Tigercat. A good looking twin engine airplane, two were entered at the Nats.



Jim Bonanno prepares his Vought Corsair F4U-1D for flight.



The latest Schweizer 1-26 is this E model, with all-metal, semi-monocoque fuselage construction, balanced dive brakes on top and bottom wing surfaces, squared off and raked vertical tail, and oval fuselage aft sections.

the Schweizer 1-26

Most popular U.S. glider design . . . By JOHN R. WALKER



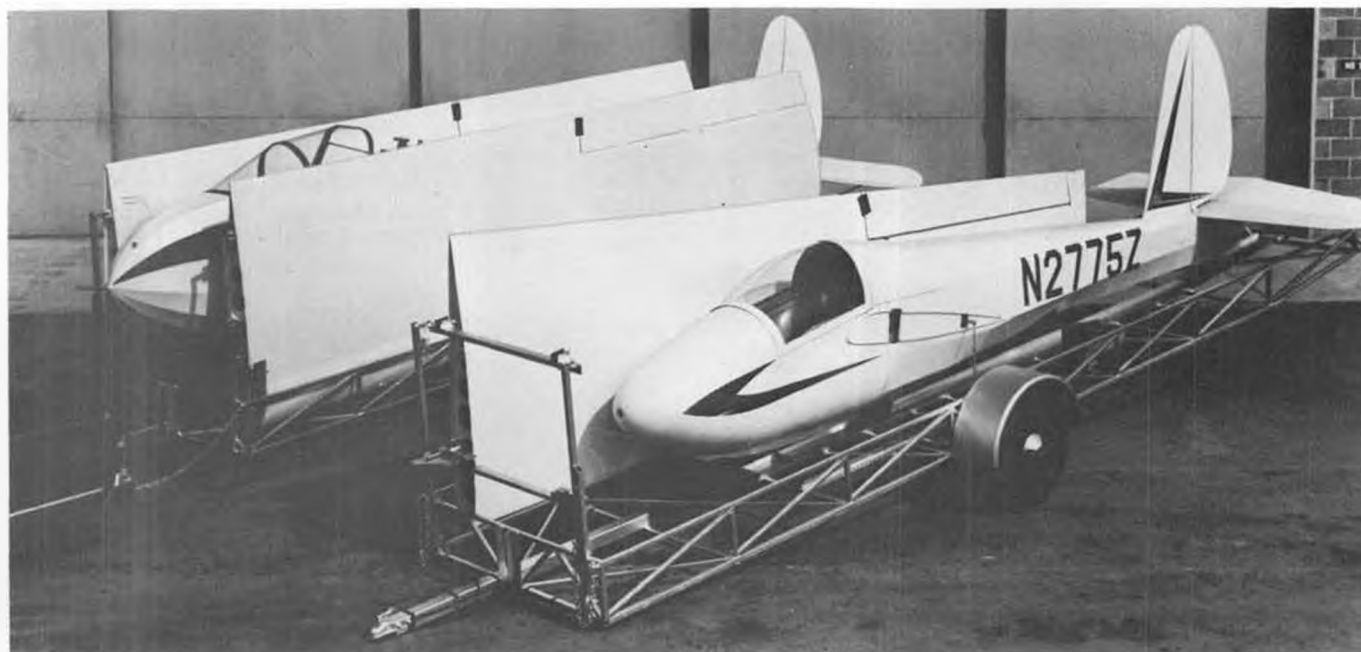
Scale 1-26 by Sterling Models is 70 inch span, or 1-3/4 inches to the foot.

• Schweizer is a well known name in gliding and soaring in America. The Schweizer Metal Aircraft Company was founded in 1935 by Paul and Ernest Schweizer. A third brother, William, joined the firm in the early 50's.

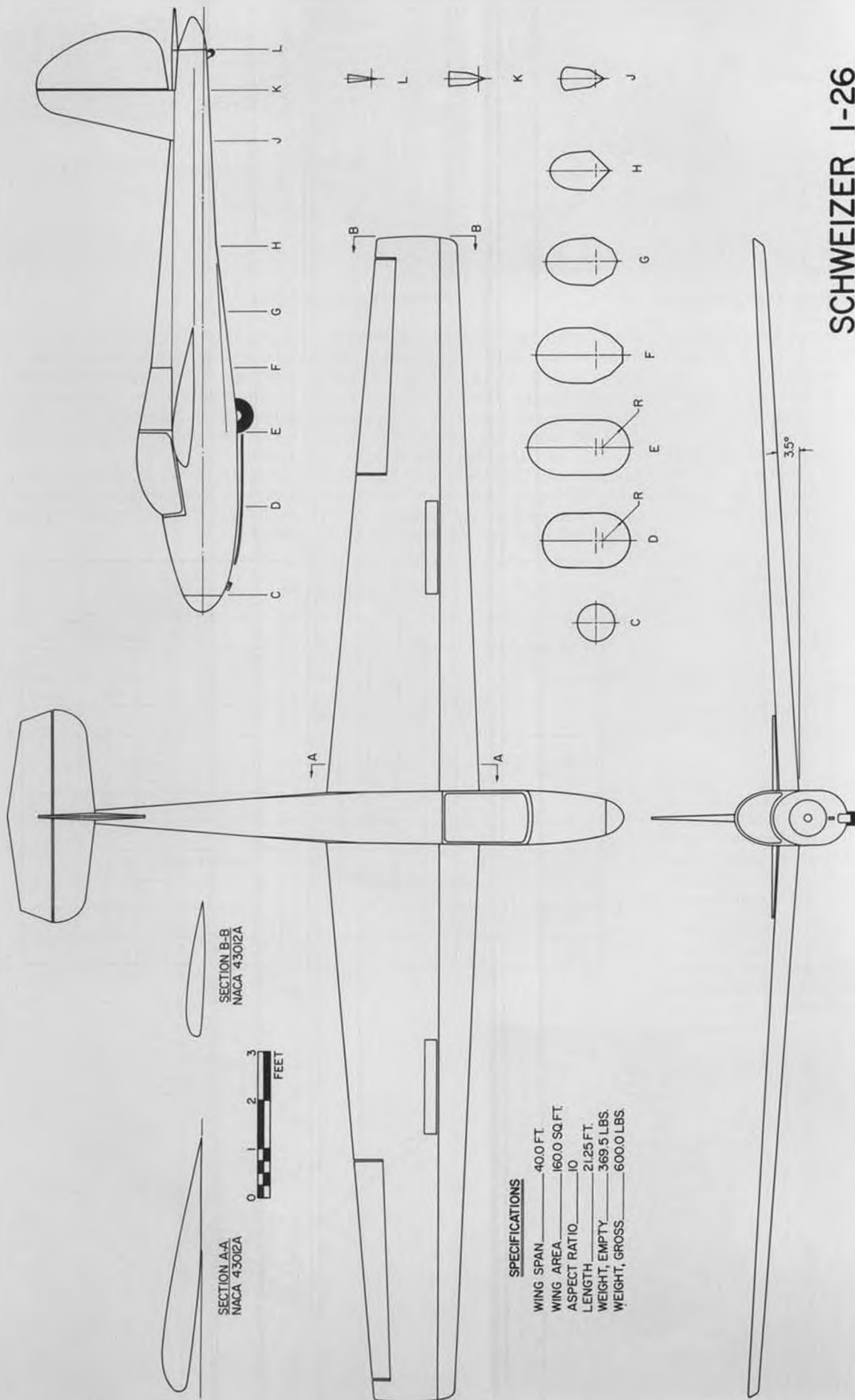
The name was changed to Schweizer Aircraft Corporation when the firm moved to the Chemung County Airport near Elmira Heights, New York in 1939.

All of the firm's aircraft are identified by three letters and two numbers. However, the planes are usually referred to by the two numbers. The first digit indicates the number of persons the craft will carry. The second number specifies the position of the plane in the company's design sequence. Prefix letters S.G.S., only infrequently used in identifying the aircraft, stand for Schweizer Glider Sailplane. An SGS 1-26, then, is a Schweizer sailplane that carries one person and was the twenty-sixth design of the firm.

A prototype 1-26 first flew in 1954 with production beginning in 1955. It was designed to be both factory-built



Two men can assemble and disassemble the 1-26 with little difficulty and mount it on a trailer for transportation. N2775Z is similar to the model shown on the 3-views.



SCHWEIZER 1-26

(GENERAL ARRANGEMENTS)

SCHWEIZER AIRCRAFT CORP.
ELMIRA, NEW YORK



INFORMATION TAKEN FROM DWG 26G952 (9-30-63)



Nose and tail cone of 1-26E under construction.



Fuselage assembly of 1-26E.

and as an FAA approved kit for the home builder. In the 1960's most of the sales were kits. Now the majority of the 1-26's are factory completed sailplanes and the kit has been suspended for the time being.

The 1-26 has proven to be the most popular American sailplane, as the 650th 1-26 was produced last winter (1975-76). Of this number, 200 have been built from kits.

A very active National 1-26 association comprised of the pilots who fly the sailplane, coordinate coast-to-coast activities, including the annual 1-26 North American Championships.

Although designed as an intermediate performance sailplane, many pilots have earned their Gold C's and Diamonds in the 1-26. Some enthusiasts consider the 1-26 the DC-3 of soaring.

The fuselage on the early 1-26's was welded chrome-moly tubing and was fabric covered. Wings and tail surfaces were fabricated from aluminum alloy and, to a large extent, were fabric covered. The third version of the sailplane (1-26B) had metal covered wings.

An E model 1-26 is now in production. Like the earlier 1-26, the latest model is designed to provide maximum service with a minimum of maintenance.

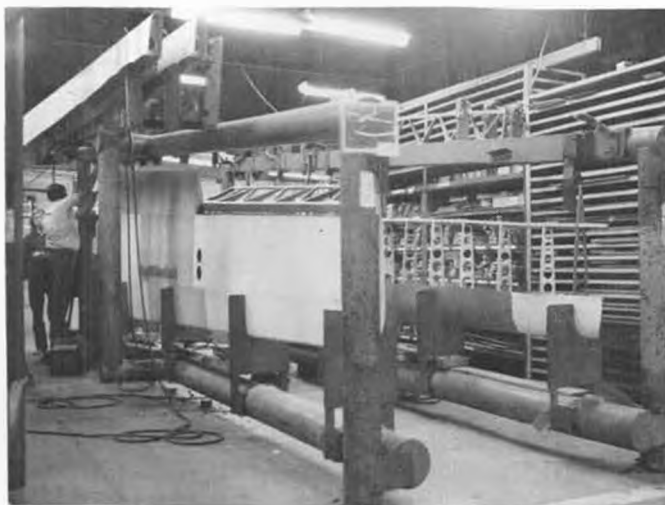
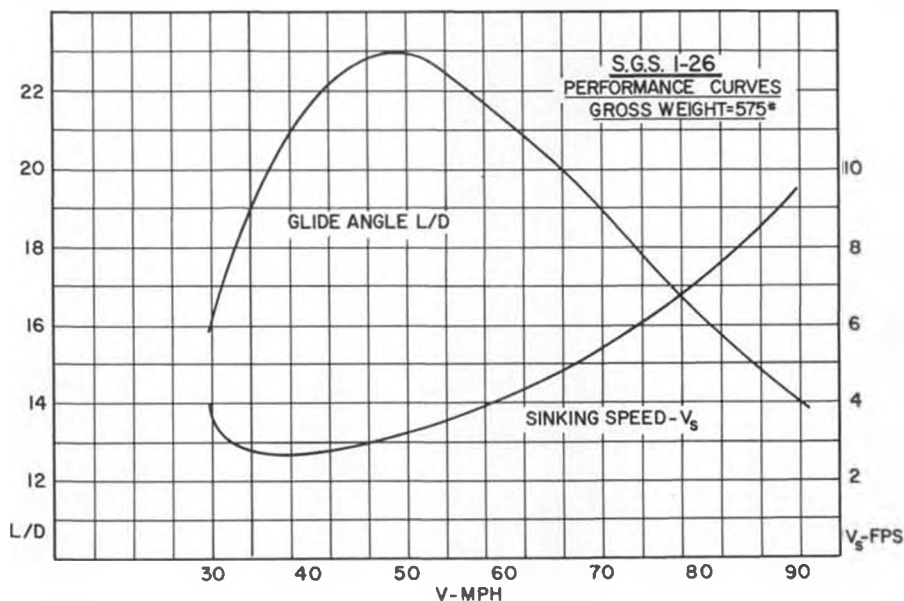
Modifications reflecting the latest

aeronautical and engineering developments are seen in new construction techniques and in the numerous and convenient changes. The fuselage now is of all-metal, semi-monocoupe construction, and the wings are completely metal covered. In addition, the 1-26E is equipped with balanced dive brakes on both the upper and lower wing surfaces. The vertical tail surfaces are no longer rounded but are more rakish in

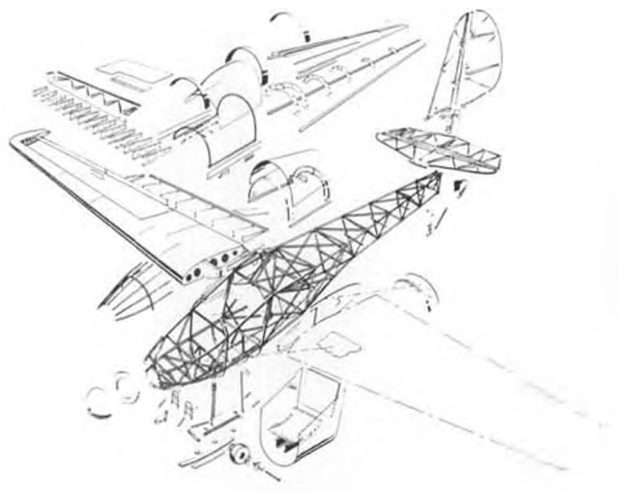
appearance. The fuselage aft section is now oval in section and the nose slants more sharply for improved visibility.

All models of the 1-26 can be easily assembled and disassembled by two persons. The aircraft is also easy to transport.

Should you desire to construct a model of the Schweizer 1-26, an R/C model kit is manufactured by Sterling Models.



Wings for 1-26E in production fixtures.



Exploded view of 1-26C kit assemblies.

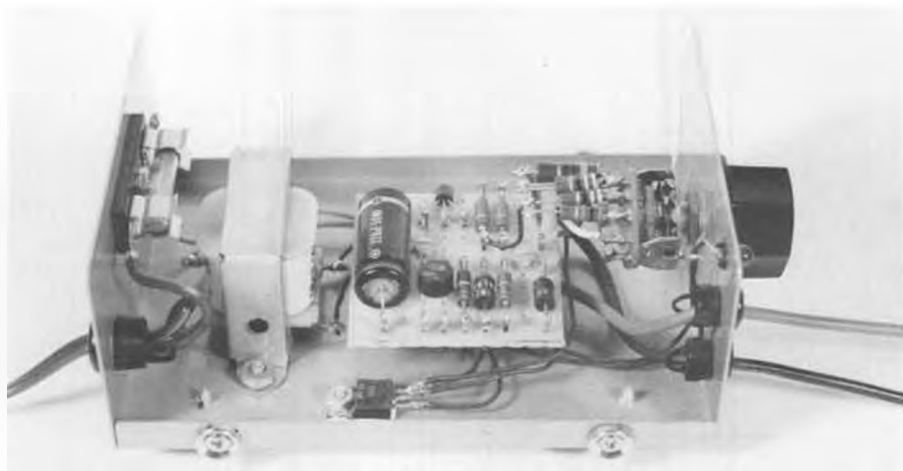


Figure 1. Interior of charger with all components mounted and wired. Perfboard provides the convenience of a printed circuit board, but without the complications of fabrication.



Completed unit with cover on and showing the front panel. Selector for battery size.

* SELECT-A-CHARGE *

By BRIAN ELLIS . . . Here's a charger that will take up to 24 volts worth of the batteries most often used in R/C or any modeling, plus one odd-ball of your own desire. By the designer of our Glow Driver (Jan. '76 MB)

We are presenting this charger because of its modern, safe design, and versatility, and because building it is well within the capabilities of anyone who is able to construct a model that requires rechargeable batteries for its operation.

The fact that it can be used for more than one job makes it especially attrac-

tive. It is certainly cheaper to build one multiple-use charger than to build separate chargers for each different battery.

Keep in mind that the correct charging rate is determined by your particular batteries, at a rate recommended by their manufacturer or by the manu-

facturer of the equipment they are used with. We suggest you determine this rate and adjust the rate of your charger per Mr. Ellis' instructions. The rates as presented are average rates, chosen with the prevention of overcharging in mind. They may not always result in 100% charge with all of the multitude of batteries in use today.

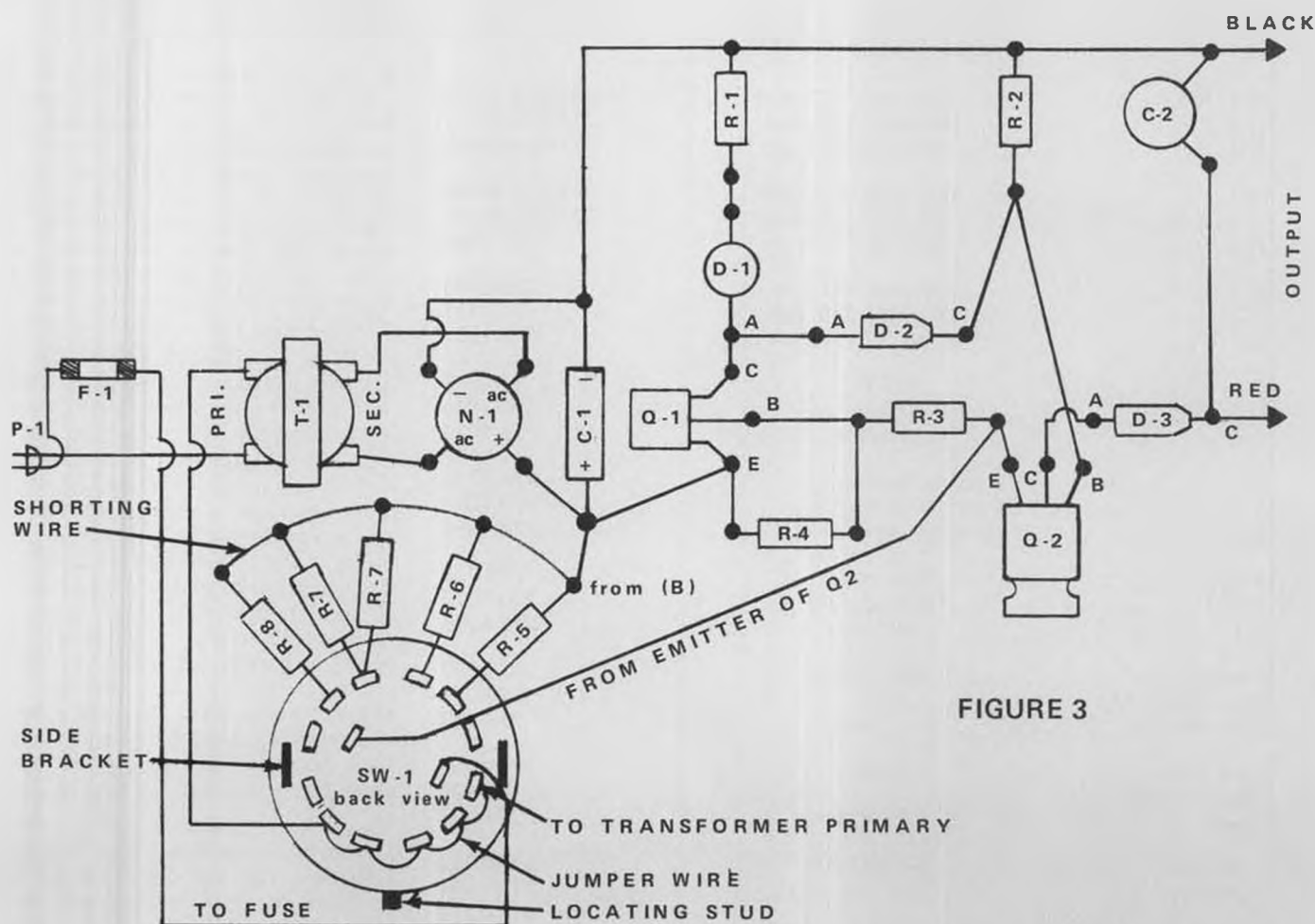
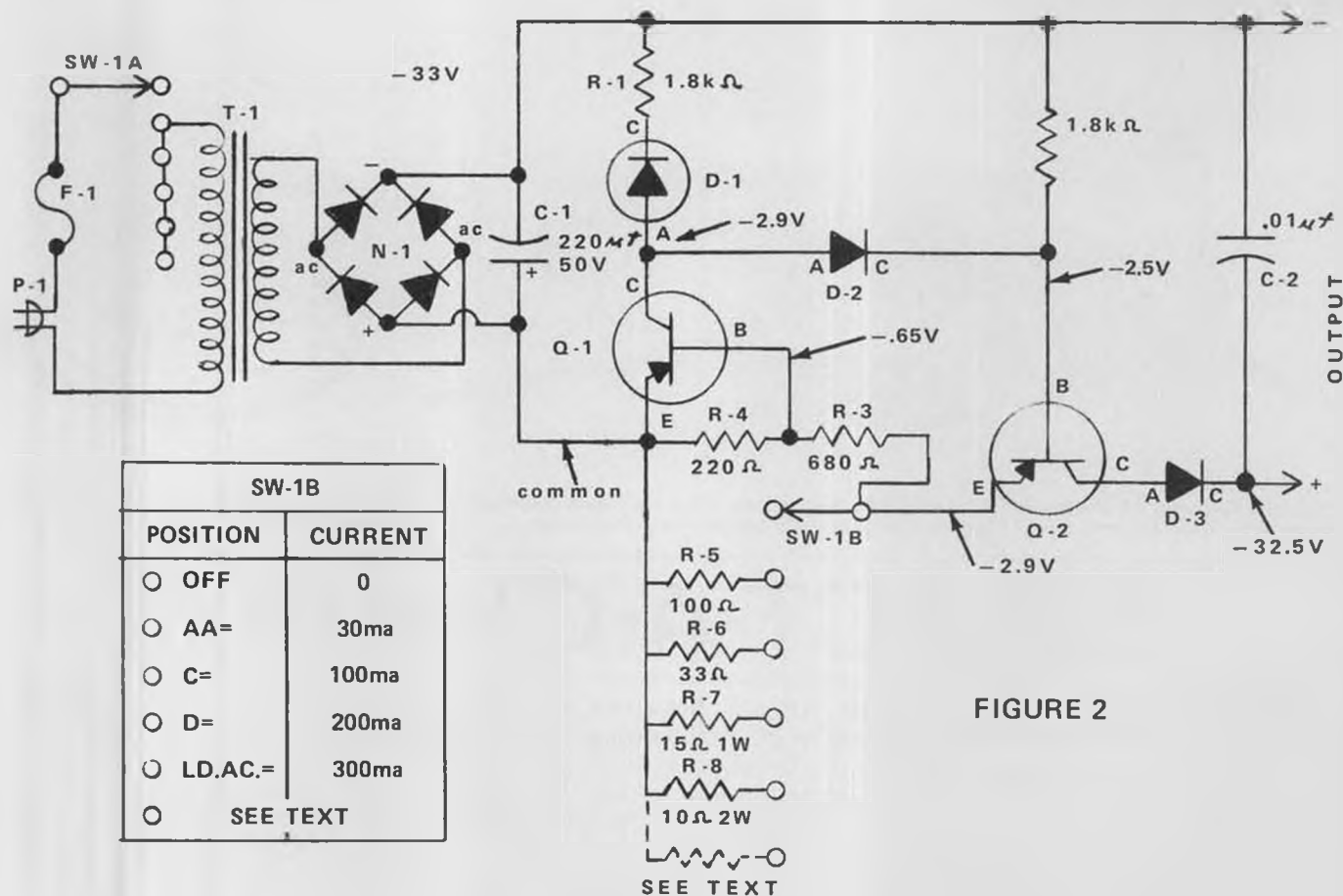
RADIO SHACK PARTS LIST

R-1, R-2	1.8K ohm 1/2 watt	271-000 Series
R-3	680 ohm 1/2 watt	271-000 Series
R-4	220 ohm 1/2 watt	271-000 Series
R-5	100 ohm 1/2 watt	271-000 Series
R-6, R-7A, R-7B	33 ohm 1/2 watt	271-000 Series
R-8	10 ohm 2 watt	271-080
C-1	220 mfd. 50 volt	272-1045
C-2	.01 mfd. 200 volt	272-131
N-1	diode assembly	276-1151
D-1	L.E.D.	276-026
D-2, D-3	diode	276-1135
Q-1	transistor	276-2034
Q-2	power transistor	276-2025
T-1	24 volt transformer	273-1386
SW-1	2-pole 6-position switch	275-1386
F-1A	fuse holder	270-739
F-1B	1/4 amp fuse	270-1270
P-1	line cord	278-1255
Cabinet	4X2-3/8X6"	270-252
Mini Clips		270-378
Test wire	red	278-553
Test wire	black	278-554
Strain Reliefs		278-1636
Knob	1-3/8X5/8"	274-407
Perfboard	4-1/2X5-5/8"	276-1390
Terminals		270-1394
Heat Sink Compound		276-1372

• I'm sure there is no need to tell you about the importance of the batteries for your radio equipment. If you've been looking for a battery charger that will: charge at different currents at the flip of a switch, indicate when charge current is actually flowing, will charge from one to twenty cells at a time, and won't burn up when the output leads are shorted, then this may be the charger you've been looking for.

Most nickel-cadmium rechargeable batteries are recommended to be charged at a rate of one-tenth of their ampere-hour rating. So, if a battery has a three ampere-hour rating, it may be charged at a rate of .3 ampere (300 ma.). To determine how long a charger will take to charge a battery, divide the ampere-hour rating of the battery, by the charge rate. To charge a three ampere-hour battery at a rate of 300 ma., would take ten hours; at 200 ma., it would take fifteen hours; at 100 ma., it would take thirty hours; at 30 ma., it would take one hundred hours. So you see, the charging rate can make a big difference in charging time. Some battery chargers are advertised that will charge all size batteries.

This is true, but what they don't tell you, is how long it will take. To charge all battery sizes with one charge current, they can only use the maximum allowable charge rate of the smallest battery,



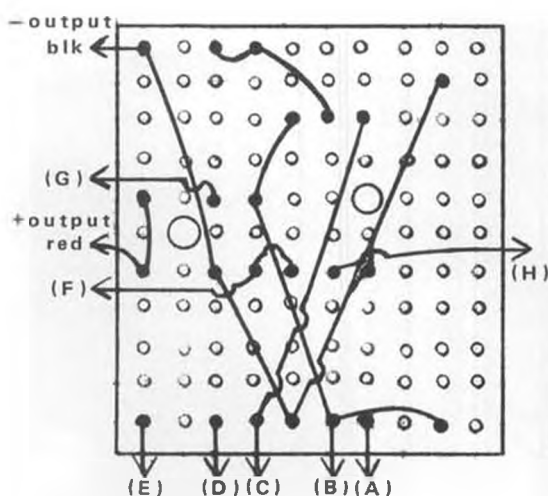


Figure 4. Bottom side of Perfboard.

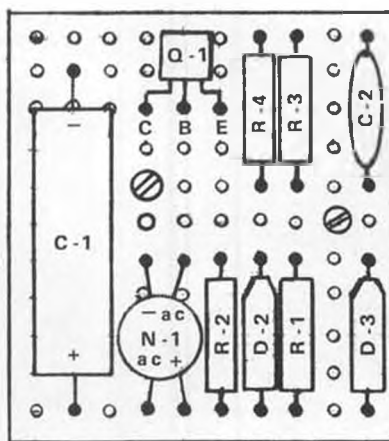


Figure 5. Top side of Perfboard.

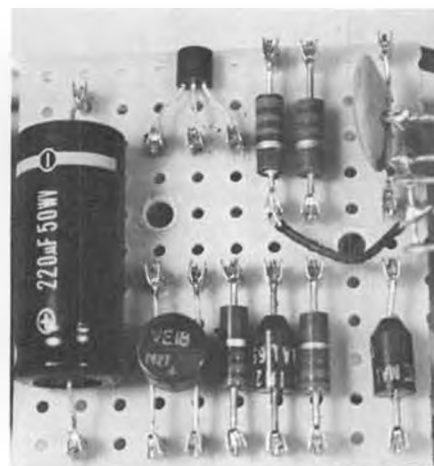


Photo of top side of Perfboard. Corresponds with Figure 5 at left.

which is a pretty small charging rate for a large battery.

The catalog prices for the parts of this charger, comes out to about twenty-four dollars. This is the price, if you have no spare parts around and you are only going to make one charger. If you make two chargers (like one for a friend), each one will cost about eighteen dollars. Sometimes the hardest part of a project is coming up with the parts needed. Radio Shack parts are used and listed because, generally, they are the most available source in the USA. The screws, washers, nuts and spacers can usually be obtained from your local model shop.

One word of caution, about Radio Shack parts. All items inside packages with the same parts number, are electrically the same, but not always physically the same. So stay alert for any hole sizes that may have to be changed.

After obtaining all the parts needed for this project, the first thing we will work on is the box. Take off the cover and put masking tape across the front and back panel. You can put tape on the inside bottom too, if you don't want it to get scratched or marked. Now, mark off the points for the holes, as shown in Fig. 6: The 13/64 diameter hole in the front panel is for the L.E.D. If the L.E.D. that you get is different

in size, this hole will need to be changed to fit your L.E.D. After using a center punch where each hole is to be drilled, drill the holes according to the sizes shown in Fig. 6. Pull the tape off the panels. Deburr all the holes, and check that your L.E.D. fits snugly in its hole.

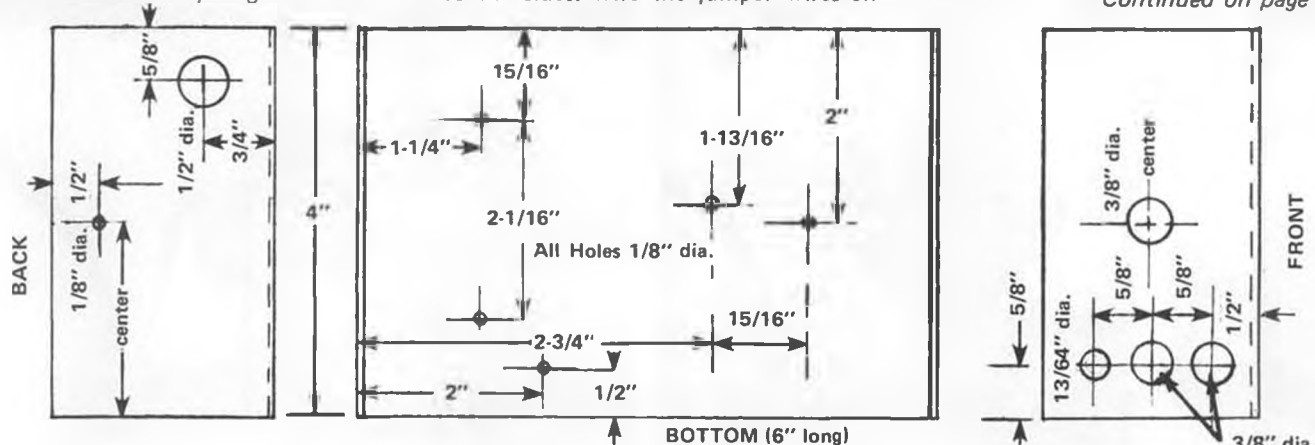
Install the fuse holder on the back panel with a 4/40 x 1/4 inch screw, lock washer and nut. With the primary side of the transformer (T-1) toward the back panel, mount it to the bottom of the box (near the back) with two 6/32 x 1/4 inch screws, lock washers and nuts. The tabs for the electrical connections will have to be bent up at a ninety degree angle, so they won't touch the bottom. Smear heat sink compound on transistor Q-2 and mount it on the bottom left side of the box, as seen in the photo, Fig. 1. An insulator is not required. Next, take the 2-pole, 6-position switch (SW-1) and cut the shaft off, so the shaft is one-half inch long. Put the extra 3/8 nut on the switch, so that it will be behind the panel. The purpose of this, is to keep the threads from protruding too far out front. Leave just enough threads out the front for another 3/8 nut. Mount the switch in the 3/8 hole in the center of the front panel. Mount the switch with the locating stub down, which puts the side brackets to the sides. Wire the jumper wires on

switch (SW-1A), as shown in Fig. 3.

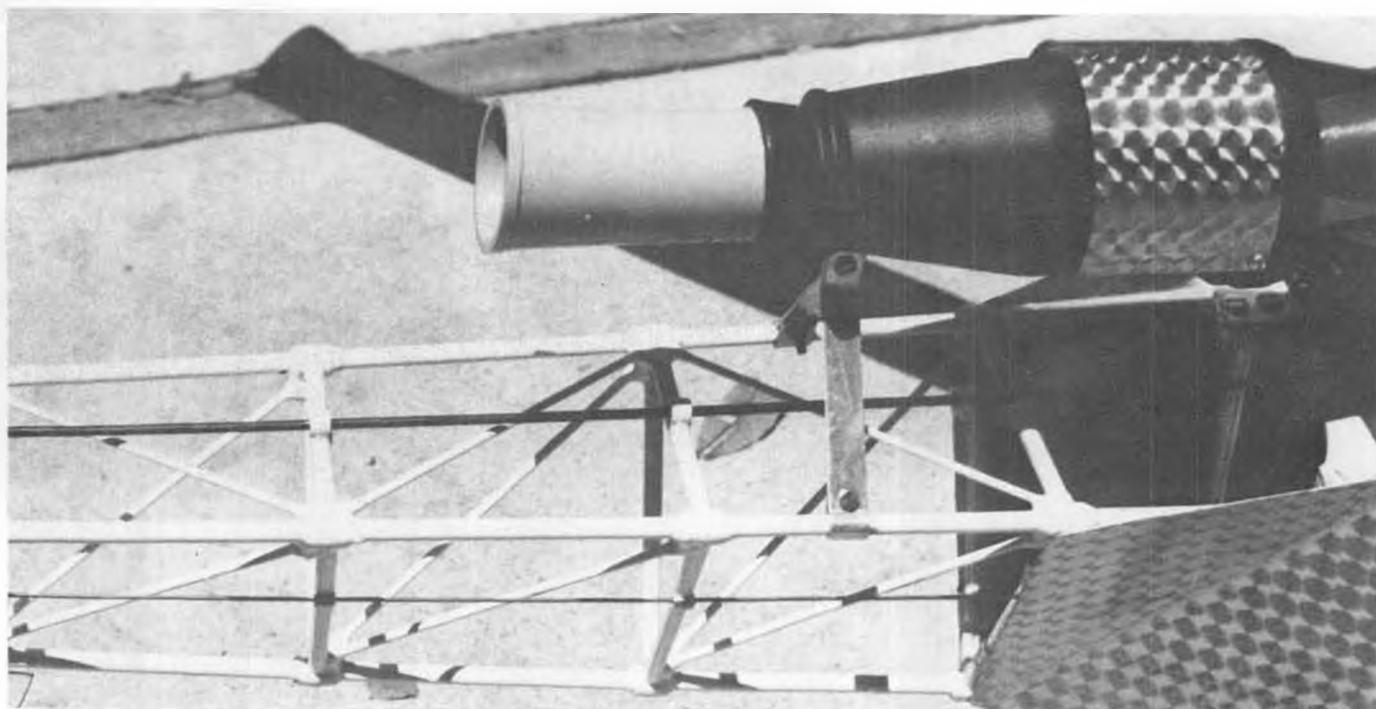
You will notice that R-7 is actually two 33 ohm 1/2 watt resistors tied in parallel. This is done to give 16.5 ohms at a rating of one watt, which is close enough to the 15 ohm one watt resistor we need. At this time, put two 33 ohm 1/2 watt resistors together, and twist the leads together on one side only. Now solder the twisted leads (this is R-7). Take R-5, R-6, R-7 and R-8 and cut off one lead (of each of them), so that one lead is only 3/16 long. Solder these short leads to SW-1B, as shown in Fig. 3. Run a bare wire across the free leads of the resistors (very close) and solder them together. Cut off the excess wire sticking out beyond the bare wire. Take the L.E.D. (D-1) out of its package. Note from the package instructions, which lead is the anode lead. Make a small bend, at the very end, of the anode lead. Put a liberal amount of silicone glue around the base of the L.E.D. casing, and push it in the top hole in the front panel (from the rear). The L.E.D. casing, silicone glue and panel should all make good contact. Set the box assembly aside for now.

Cut the perfboard to a dimension of 2 x 2-1/8 inches. There should be ten holes one way and eleven holes in a perpendicular direction. Drill holes for

Continued on page 86



CASE LAYOUT (FIG. 6)



Close-up of tail boom on "Chopper" editor's Alouette, showing the extra diagonals added to the top surface. This eliminated all tendencies to twist during flight. Diagonal material is ordinary pushrod wire, set into routed holes and epoxied in place.

CHOPPER CHATTER

By JOHN TUCKER

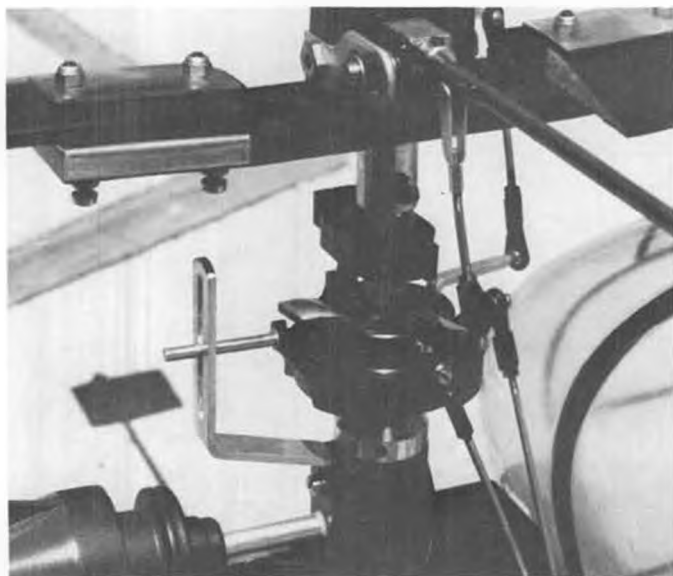


• Right about now, I'm either climbing the pyramids in Cairo, walking through the Casbah in Morocco, or just plain mad at the world 'cause my long awaited vacation didn't come off as planned! (*It did. wcn*) To say the least, I'm writing this column a few weeks in advance so it'll make the deadline while I'm gone. For this reason, I haven't started the Super Heli-Baby project yet, so will fill-in this issue with bits and pieces that have been floating around in

the downwash with no place to land.
**CANNON 530
PROFESSIONAL SYSTEM**

Last month I didn't have room to put in my flight report on the Cannon radio which I installed in the MRC/Kalt Baron helicopter, so will throw in a few words here. During the last MAC show at Anaheim. I was shown a new '76 Cannon Professional R/C system which appeared to be just the ticket for small helicopters. Naturally, the thing

that turned me on was the ultra-small transmitter... single stick and the possibility of 3 different throttle control positions for the experimenter (like myself). After much talk with Bill Cannon about price and availability, and a considerable amount of conversation with Ken Willard about reliability, (Ken, you know, uses the Tini series in several of his small R/C aircraft with great success) I decided to place my order. The 530 Professional system is available in 6



Extra counter-balance was added to the swashplate to compensate for long ball-joint arm which was throwing plate out of balance.



Another view showing added counter-balance, a cut-off piece of metal shelf bracket. Solder was added for adjusting precisely.



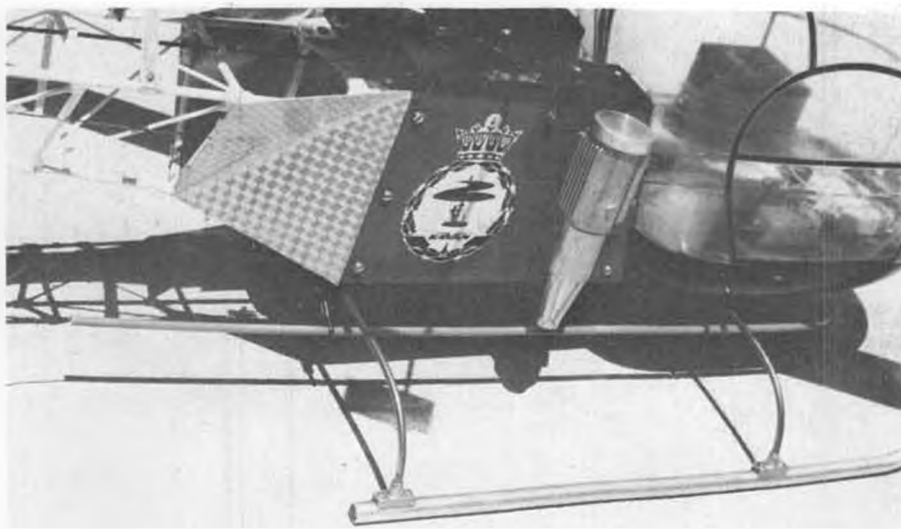
Tail transmission safety collar. See full explanation in text.

channels/4 servos at \$314.95. Single stick option adds another \$15.00. The same system is also available in a two-stick 5 channel/4 servo configuration for \$292.50.

The transmitter is housed in a slim-line 6 inch square vinyl-clad metal case with the new precision Dunham open-gimbal stick. The entire box, complete with antenna and nickel-cadmium batteries, weighs in at 1.8 lbs and features plug-in RF board for easy band change. The receiver weighs 1.2 ounces with metal case, and features a double-tuned, dual FET, voltage regulated front end, with dual AGC and 8-bit shift register decoder. A choice of servos is available; either standard rotary, or the combination rotary-linear style. The 550 mah cube airborne battery pack is standard for the system, and the charger permits charging the transmitter and receiver simultaneously or individually, with separate charging indicator lights.

Without any doubt, the Cannon 530 system is designed for the professional pilot. It contains all those nice goodies mentioned above, plus a lot of other extras found only in the more expensive models; such as externally adjusted servos, optional battery packs, charging/switch harnesses, etc.

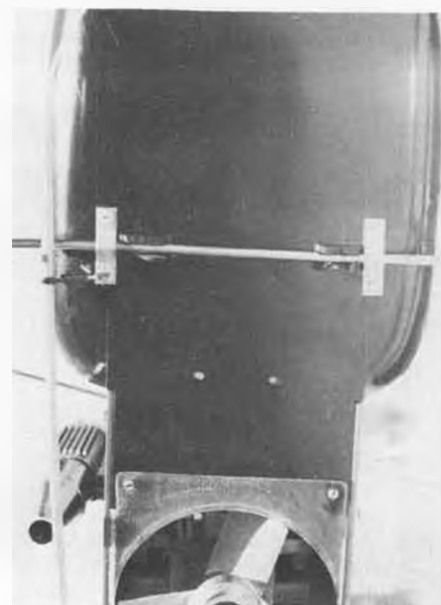
I was especially pleased with the Operating Instructions, which really describe the system completely, gives detailed specifications on all components, and even has a color coded servo wire system which permits instant identification of proper cable-to-servo connections. Some of the many sections are titled: Preparation for Use, Servo Installation, Receiver Installation, Wiring, Battery Installation, Battery Charging, Battery Characteristics, Buddy Box Operation, Maintenance, Schematics, etc. Last but not least, have you ever had a radio system manufacturer tell you how to peak-tune your receiver? Or the proper way to center your servo arms? Or how to reverse the servo direction? Or how



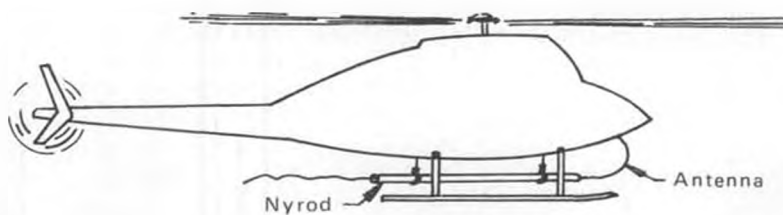
Anti-foot-on-the-antenna-device is a piece of outer Nyrod fixed to bottom of chopper. Prevents unscheduled removal of receiver antenna, also eliminates that unsightly dangling "thing".



Another view of reinforced tail boom truss. Antenna holder can also be seen.



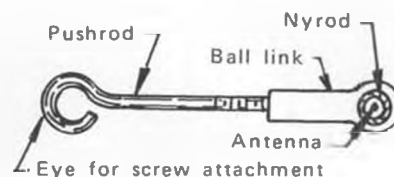
Metal straps repair and/or reinforce landing gear attachment to fuselage. See text.



ANTENNA MOUNT

to change stick modes, etc? Well, it's all here in the instruction manual! Oh, I forgot to mention, this equipment is available in kit form at considerably reduced prices.

After all of that, you'll probably wonder how it works . . . all I can say is I'm very pleased with its looks, functional capabilities, and its performance to date. Everything went together perfectly, and I haven't had the slightest concern for its range or reliability. I'm really looking forward to a good relationship with my Cannon system!



ALOUETTE HINTS AND KINKS

Let's move on now to some of the ideas that have been tried on the Kavan Alouette II R/C helicopter.

Fuselage: Although the triangular

Continued on page 73



Fourteen feet of "flying overcast", Danny Sheelds' monstrous Vernon Boehle (pronounced "Bailey") Giant. Humph! And they accuse "Big John" of creating a balsa shortage! Ship flies at just over a fast walk. Outer panels taped to center section. No, Sid, it's not covered with Monokote.



PLUG SPARKS

By JOHN POND

● Greatest Old Timer Championships yet! Does that title sound monotonous? We didn't mean it that way but after the 1975 Denver Champs, everyone thought that one was the best. Trust Bill Hale, that energetic Contest Manager, with his Central Ohio Free Flight boys, to come up with the best yet. Where we had 108 contestants at Denver, unofficial reports put the number of 1976 contestants at 150!! With Contest Directors Dick Smith (Free Flight) and Woody Woodman (radio) doing such outstanding jobs, the meet was a real pleasure to compete in, watch, or join the general fun bull sessions.

As one contestant put it, "I never

enjoyed a contest so much. The weather was the best I have seen, for Ohio. The winds were excellent. Best of all, when I went to get a flight, there was no waiting for a timer and, get this . . . there was no rushing or crowding me for time to get the model off. It was the best meet ever." I guess we could wrap up the column right now (*Will it snow in Tahiti? wcn*) but let's start at the beginning and tell those who were not there (and those that were) what a great time was had by all.

OPENING SAM CHAMPS BEAN FEED

The opening get-together for the SAM Championships was the product of Bob Laybourne, who was successful

in obtaining the Wittenberg Student Union Hall in Springfield for the free eats. Best part of it all was that one of the local people (preferring to remain anonymous) paid for the whole deal!

The only fly in the ointment was the announcement that there were no beans available. Sitting around Joe Beshar's room in the Holiday Inn in Fairborn, listening to all the moans, finally impelled Beshar to call up one of the local short-order restaurants and get a pot of beans. And what a huge pot of beans it was!! Believe it or not, some of the beans went begging!

With free beer, spaghetti, crackers, etc., etc., the "party" got off to a fast start. Being a cellar type bistro (in the Student Union basement), no heat was necessary down there, as the number of modelers jamming the place made it more than warm!

The only formalities noted were acknowledgments to Laybourne for the excellent setup and some contest announcements; notably, the R/C Texaco Event. Due to its large pre-entry, it



With the Air Force Museum for a background, Vernon Hacker releases his Buzzard Bombshell.



Bob Larsh gives his Arden .19 powered So-Long a nice, legal, no-push launch.



The smile of victory . . . only this was taken before the flight that won Scale for Jim Adams with this Earl Stahl Fokker D-VIII.



Leslie and Bruce Norman did it again! The Fort Worth couple took top honors at the 1976 SAMCHAMPS. Bruce holds a So-Long.



Transistorized ignition system (May '76 MB) on Bob Von Kinsky's Anderson Spitfire powered Powerhouse for R/C Texaco.

would have to run on two days, between 6 and 9 a.m. and 5 to 8 p.m. Talk about an event catching on! This really warmed the writer's heart, as he had been pioneering this type of meet at the Champs for the past two years.

Incidentally, the Student Union Hall at Wittenberg University, Springfield, Ohio, also served as the headquarters for SAM. All contest kits (the AMA Nats have nothing on us!), arrangements for dormitory accommodations, and late entries, were handled here. The more this writer talks about this SAM Champs, the tougher it's going to be to top this act!

With the beer flowing fast and furious, the caretakers of the beer parlor had a little trouble clearing the area as one

group in particular (no names please!) was difficult to dislodge from their comfortable positions. Good time!

THE CONTEST

True to Bill Hale's forecast, the winds at Wright Patterson didn't develop to any great amount until well after lunchtime. With the field limited in size, all timers in the free flight events were set at three minutes. Even at that, in the afternoon breeze, models were seen to disappear over the fence.

Disappear they did, as some unscrupulous people took it upon themselves to appropriate models on the excuse they had "found" them. Although this was held to isolated cases through the strenuous publicity efforts by Bill Hale to inform the public, some of the farmers took a rather dim view of the boys charging through their young (in August!?) corn fields . . . same old deal; modelers should check with the owners of the crops before tromping them down. No wonder some of the farmers were livid.

Fortunately, the foregoing was pretty well in the minority, although would you believe it, two radio jobs got lost!! If you are not prepared to shag them, keep your model upwind of the launching site, regardless of where the thermals are!

Noted about the flying was the fact that everyone came to fly. Most models



Woody Bartelt, from Galesburg, Michigan, launches his Arden .19 powered Cleveland Viking.

were well adjusted and the number of crackups was small in comparison to the number of official flights. Also worth a comment, was the excellent crowd control and parking arrangement in the free flight area. Dick Smith and his group of timers, recorders, and coordinators are to be congratulated on the excellent policing job.

Some of the larger crowds were to be found at the R/C circle, where the Schneurle powered models were putting on spectacular climbs. Conservative estimates would put the average glow powered O/T model at 800 feet in 20 seconds! Of course, the spectacular climb was overshadowed by the graceful soaring against the large, fleecy cumulus



Here's a good idea for scalers. Wayne Cain built this All American Eagle "Eaglet" (Feb. '76 MB). At rest, the wings are like this.



In the air, the wings swivel up to provide stability, limited by strut stops. Pond, at left, points and says, "That's ridiculous." But it ain't!



Tom Acciavatti, Mass., really gets down to work when launching his winning, scaled up Comet Clipper.



It wouldn't be a contest . . . much less an O.T. contest, without Sal Taibi, here with his famous Powerhouse design, Forster 99 powered.



"Please, God, get me into a BIG thermal!" Al Schwankert assumes a prayerful attitude while flying his scaled-up '37 Zipper.

clouds dotting the sky over the field. It was simply great to watch the models soar in the blue.

The Texaco Event ended up in a big scramble for second place, as Cliff Schaible proved his magnetic-induction transistorized ignition system was a real demon for economy. After a poor showing in the wind (only 8 minutes!), the next morning found Cliff, running his

engine for over 20 minutes. That's tough to beat! For those interested in the mechanics of getting the best motor run for the fuel allotted, Tom Bristol and Larry Jones of SAM 21, are working on magnetic induction and photo-electric systems, respectively. Although it was not finished in time (debugged to you), the principles of these systems should appear in *Model Builder* in time for next year's Champs. So be of stout heart men. There is always hope something better will come along in this modeling game of ours.

(MB Editor's comment) We look at these latest fuel economy innovations with mixed emotions. From a progressive point of view, it is just fantastic that a 60 size engine can be made to run nearly a half hour on an ounce to an ounce and-a-half of fuel (gas and oil). A large Old-Timer model should be able to capture the world's power endurance record using one of these systems.

On the other hand, the event for, which this development came along, Fuel Allotment or Texaco, either F/F or R/C, is in danger of extinction. The flying skill (and luck) of finding and staying in thermals would become secondary to the mechanical skill of engine-run duration. Compare the satisfaction of a 33 minute flight with a 5 minute engine run, and a 33 minute flight with a 23 minute engine run.

Without really being too facetious, may we suggest Three Fuel Allotment events? One; Free Flight Texaco, with a 5-minute maximum, timer cut-off engine run. Two; R/C Texaco, with a 5-minute maximum, timer cut-off engine run. Three; all-out engine endurance, in which engine is brought to field on bench stand, given specified amount of fuel (say, 1 ounce for 60's; 3/4 ounce for 40's, etc.) and specified, standard size prop, and simply run and timed 'till it quits. Separate prize for each displacement size. Third event to be run at downwind end of field.

While shooting pictures on the free flight side of things, the writer's attention was attracted by Jim Adams' Fokker D-8 (Stahl design). After fiddling around with his engine (in the early morning) Jim finally turned the Fokker loose. With its slow takeoff and the left wing low, the Fokker gave the crowd a real thrill with its realistic flying and slow climb. Eventually it did reach a respectable altitude, somewhat downwind. The model appeared to be leaving the field but according to Jim Adams, it D-T'd two feet inside the fence, conforming to the special rule in Flying Scale that the model had to land inside the base. That, incidentally, was the winning flight in that event.

Seen on the field were seven Californians; three from SAM 21 (Pond,



Who ever heard of a balsa tire needing air! Actually, Tim Banaszak is pumping up his Hobart model for the Compressed Air event.



Danny Sheelds says this modern rubber isn't much good for old twin pushers. SAM had special event for these.

Von Konsky, and Nicholau), two from SCIFS (Hellman and Boyer), and two from the SCAMPS (Taibi and Adams). The writer thought he was the only nut willing to drive over 2500 miles one way! Hope we get a better showing from the East next year at the West Coast SAM Champs.

ANECDOTE TIME

Time out from the contest description while we relate some fun arising from a bull session including the writer, Chet Lanzo, and Lee Shulman. Leon was recounting the time at Detroit when Chet first brought out his R/C stick gas model. With the Baby Cyclone in it, the model was quite adverse to leaving the ground. It was a real panic to all spectators to watch Chet trying to retrieve his model on the runway. Just as soon as he would get close to it, the motor would pick up and the model would taxi further down the strip. Finally, just as Lanzo was reaching for the model, a little breeze came by and the motor opened up at the same time. Needless to say the model took off. The funniest thing of all was watching Chet racing back to his transmitter as the model was gradually dwindling away to a speck!

SAM BUSINESS MEETING

Right in the middle of all the action, the Annual SAM Business Meeting was held on the second night of the SAM Champs. This was a real hot and heavy meeting. Although a lot of opinions were voiced and some controversy noted, this, to the columnist, is a sign of a healthy organization. None of this sitting on our duffs and saying everything is copesthetic. That's one way for an organization to die on the vine.

For opening announcements, the SAM President, Joe Beshar, noted that the SAM membership was now over 1400. Treasurer Tim Banaszak stated there was over 4000 bucks in the treasury, with no outstanding bills. Thanks to substantial donations from *Model Builder*, *Model Airplane News*, *Flying Models*, and *RCM*, all trophy expenses were prepaid! Even the bean feed was donated!

Results of the recent SAM election was announced, with Beshar being re-elected as President; East V-P, Jack Whittles, Central V-P, Bob Elman, and West Coast V-P, John Pond, being retained, along with the incumbent Secretary-Treasurer, Tim Banaszak. The only new Vice-President elected was Rocky Mountain V-P, Lin Haslan, of the Salt Lake group (U.S.A.).

The results (or conclusions) as submitted by Tim Dannels of the Converted Glow engine controversy was read by Joe Beshar. No real recommendations were stated and Dannels ended up by submitting his resignation from SAM because of the controversy generated and the general abuse he was subjected to as Chairman of the Engine Committee.



Another, and undoubtedly better view of Danny Sheelds, as he assembles his Boehle Giant. Rudder is not as close as it looks. Warped stab seemed to have no effect . . . or did it?

We're gonna miss this boy as he is one of the real pioneers in the old timer movement. Many of the early SAM Championships were staged by Tim, and his Model Museum Club. Say it isn't so Tim! We still want you! All SAM members are enjoined to write Tim in the hopes he will reconsider. Do it now!

To try to settle the matter, once and for all, the President proposed that a resolution be sent to the membership for vote simply asking, "Shall converted Glow engines be allowed in the ignition event?" If a majority of the modelers agree, then Joe Beshar stated he would appoint a new committee to work out an equitable handicap for converted glow engines.

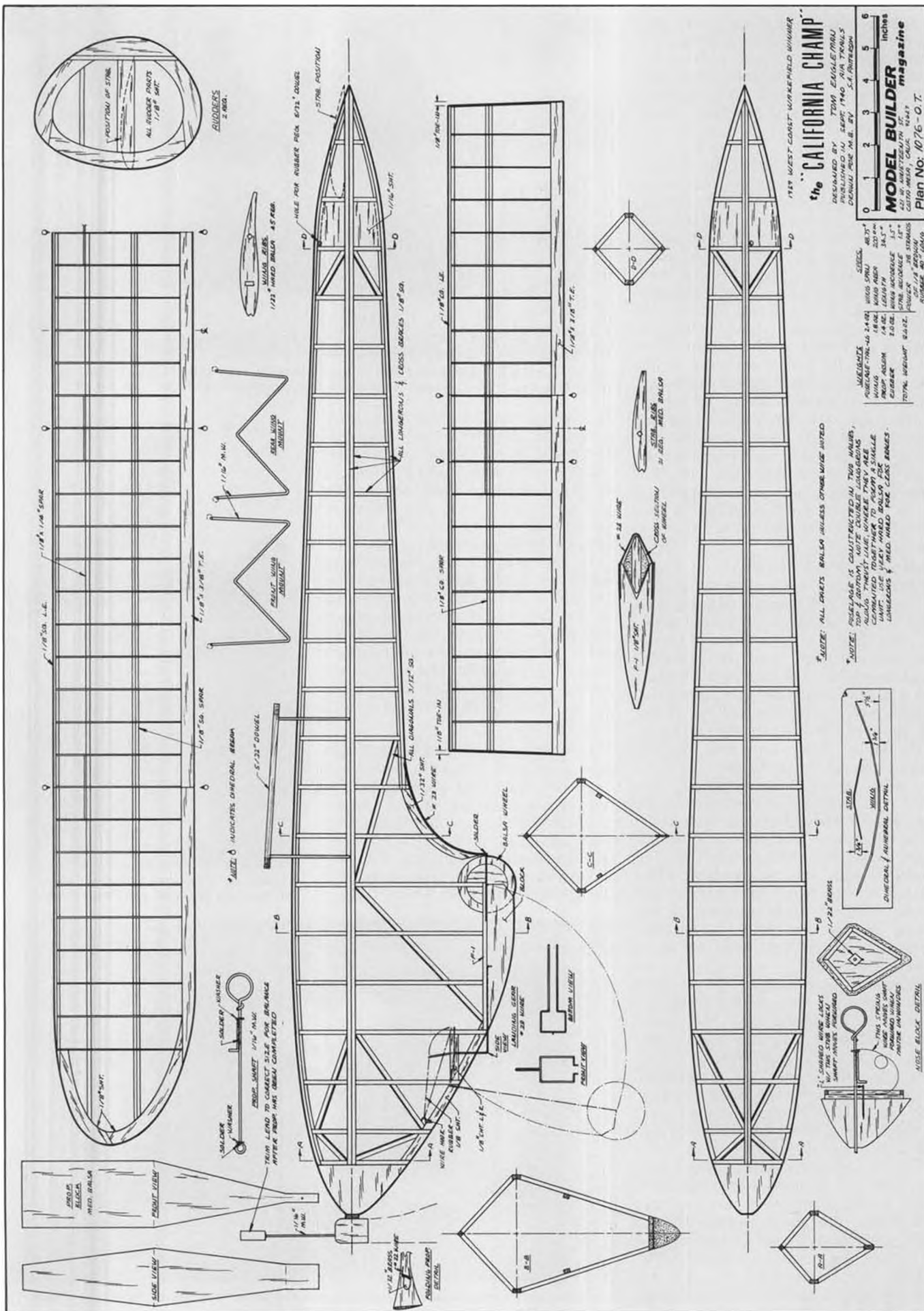
Thereafter, John Pond, Free Flight Rules Coordinator, read a paper outlining the faults and problems of his office, particularly noting that not one proposal had been published for vote. Pond concluded his paper by outlining what duties and responsibilities the office should have with no outside interference possible from any of the SAM officers.



A couple of "Oldies but Goodies." Leon Shulman and Sal Taibi, and Powerhouse.



Tom Schoneau and his scaled up Comet Sailplane. Wotta building project! Scaling up allows maximum utilization of area vs. displacement for R/C Assist.





In the early morning sunlight, R/C CD Woody Woodman gasses up Clarence Andre's classic Custom Cavalier for the Texaco event.



Mike Guarnieri (sp?), New Jersey, and his own M-G design (what else?) from way back. A real pretty airplane, Mike.

Joe Beshar appointed Pond and Hellman to head up a committee to write up the duties of the office. These are to be submitted to the general membership for approval by vote and incorporation into the SAM Constitution.

The West Coast V-P then moved that the 1977 SAM Championships be held on the West Coast. This was passed by the members present despite the fact the meet was scheduled for the "coast" on the automatic site selection rule. Sponsoring clubs are to be SCIFS and SCAMPS Clubs for Free Flight and SAM 21 for R/C. In addition, the VAMPS (Nevada, Las Vegas Club) are to be called on to help in the event Las Vegas is chosen for a site.

Among the other business transacted was the complaint on the combining of the cabin and stick rubber events. As pointed out by Tim Banaszak (interpreting the SAM Rule Book) these are

"Basic Events", i.e., the events that must be run at every SAM Champs. Future SAM Champs are to adhere strictly to the format, unless changed by a vote of the SAM membership.

After noting the excellent job of editorship by Jack Bolton in putting out "SAM SPEAKS", and the lists being compiled by Clarence Andre of old timer supply sources, the meeting broke up around 10:30 p.m.

BACK TO THE CONTEST

Probably the best day of all for weather was the main feature of the third and final day of the SAM Champs. About the only real problem to mar the contest was the radio interference experienced by quite a few of the O/T R/C boys on the first two days. It appeared that the early arrival of the Nationals contestants complicated matters, as some were not aware that R/C competition was going on. Some innocent and

indiscriminate turning on of transmitters cost several contestants their models and their chances to win! Another problem to be carefully looked at in future SAM Championships.

Before we forget it, the other big distraction on the flying field was Pat Krapf, "Miss SAM Championships." As extensively billed by Joe Beshar as a living doll, she lived up to all advance notices. At times it was almost comical to watch the action stop as Pat strolled through the contestant areas. As a show stopper, she was sensational!

Particularly noteworthy on the field were our foreign visitors, Mike Beach, of England (see last month's column) and Lars Olofsson, the 1975 FAI Worlds' F/F Power champion. Revisiting Mike was a real pleasure (having seen him in London last year) as he was also taking in the EAA Annual at Oshkosh. He has

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CALIFORNIA CHAMP

OLD TIMER Model of the Month

Designed by: Tom Engleman

Drawn by: Al Patterson

Text by: Bill Northrop

• One of the slickest looking Wakefields ever developed (back in the days when competition models had character), and a ship that flew as good as it looked, was Tom Engleman's "California Champ."

Built and flown by Ralph Baker, the "Champ" had an excellent performance



record, and in recent years, has proven itself capable of being highly competitive . . . not only in Old Timer events, but also in the contemporary Unlimited category.

Published in the September 1940 issue of Air Trails, the plans did not show a balance point, nor was it mentioned in the text. Start out with the wing in the position shown, and go

from there. Baker suggested moving the wing about 3/8 inch forward on days with abundant thermals. The slight stall induced made the Champ gobble up lift like it was going out of style.

One construction note; the fuselage is built in upper and lower halves, over the plan. When joined, you have a double 1/8 square longeron running down the centerline of each side.



A LOOK AT **MODEL ROCKETRY**

By DOUGLAS PRATT . . .

• Centuri Engineering has been around for a few years, and has established a reputation as a purveyor of innovative and unusual, not to say bizarre, design concepts. They were one of the first to make large-scale flying kits of NASA vehicles, and their Saturn series, including both the Saturn 1-B and the Saturn 5 in 1:100 scale, are the finest we've seen.



FSI Mach 1 vehicle demonstrates rapid liftoff. Difficult to catch in action! CAPCOM photo.



The Centuri team, researching (leaning on) one of the fighter fleet. (l to r): Charles Fox, general manager; Dave Nelson, marketing; Tom Caldwell, USAF guide; Grant Boyd, product developm't.

They were the first to try to recover a booster stage by trimming it into a glide, and they also released a gliding Lifting Body, which relies on the shape of the vehicle to generate lift rather than air surfaces. One of their latest offerings is the Fighter Fleet, at which we are taking a good, close look.

The Fighters are semi-scale (accent on the semi) jet planes. They are, of course, designed for strictly vertical flight, since any launch angle greater than 30 degrees from the vertical, violates the NAR Safety Code. The designs

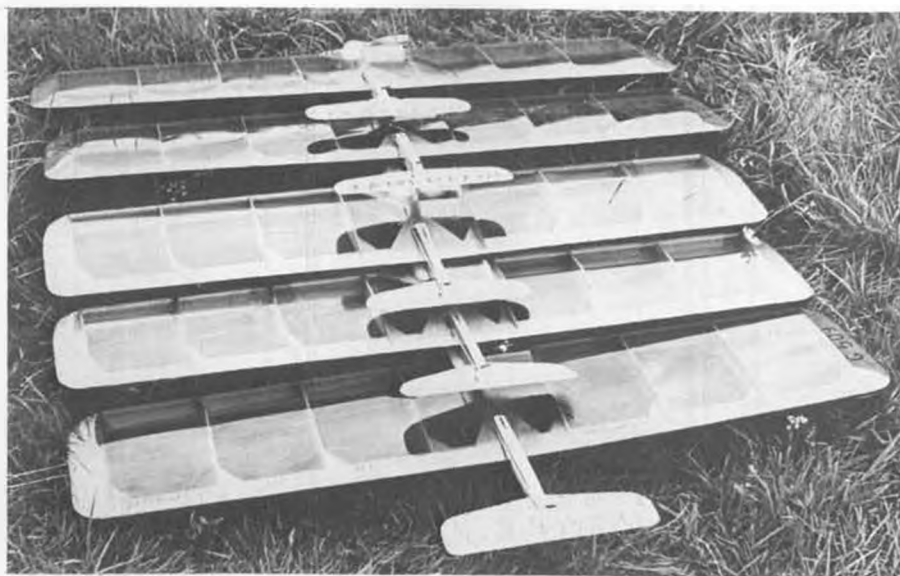
have been modified for simplicity as well, since they are aimed at the younger or less-experienced modeler; still, they bear a strong resemblance to their parent craft.

Presently, there are three Fighters: the F-4 Phantom, the F-15 Eagle, and the F-16 Fighter. All feature plastic nose cones, clear plastic canopies, and large sheets of decals. The wings and fin sections are die-cut fiberboard, which appeared to us at first glance, to be a problem. This stuff isn't cardboard, now;

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The Centuri Fighter Fleet kits (l to r): F-15 Eagle, F-4 Phantom, and F-16 Fighter. Centuri photo.



FAI
COMBAT

TAMERLANE

By DAVE CLARKSON . . . Why not try combat FAI style? Maybe you'll like it! Here's a well-tested weapon for international duels.

• Why fly FAI Combat at all? In Europe, the answer is obvious, since this is the only class of combat we have. But on the U.S. side of the water, AMA 'Fast' and 'Slow' Combat already exist, so why complicate things with yet another class? Well, firstly, FAI Combat is the International class. People all over the world . . . Europe, Asia, Africa, Australia fly it, so if you are doing the "have toy, will travel" bit, like Charlie Johnson and Gary Frost have done from the U.S. side, and Richard Wilkens from England, FAI Combat is the event Combat fliers do. Secondly, in 1978, the first official Combat World Championships will happen, and FAI Combat is the class involved. U.S. fliers aren't going to pass up the chance to be the world champions, are they? Finally, I think the rules make FAI the purest Combat class of the lot.

Few will find much to argue about with my first two reasons, but maybe a bit more convincing is needed for the last one. The key things about FAI are that a spare model is allowed, and there is no "kill". A crash/mid-air/line tangle/kill does *not* terminate the match. So, unless you run out of models, the match goes on for the full 4 minutes allowed. Nearly all of the matches over here in England last the full 4 minutes and, because of the first-round loser's re-draw, every flier gets a minimum of two matches (equals 8 minutes of real combat) per contest. A bit more than in AMA "Fast", I believe! Now that, for 1976 onwards, the FAI has incorporated the British cut definition and the AMA-inspired safety arrangements into the FAI rules, the remaining deficiencies in the rules have been eliminated. For me, Combat is all about skill in piloting, not

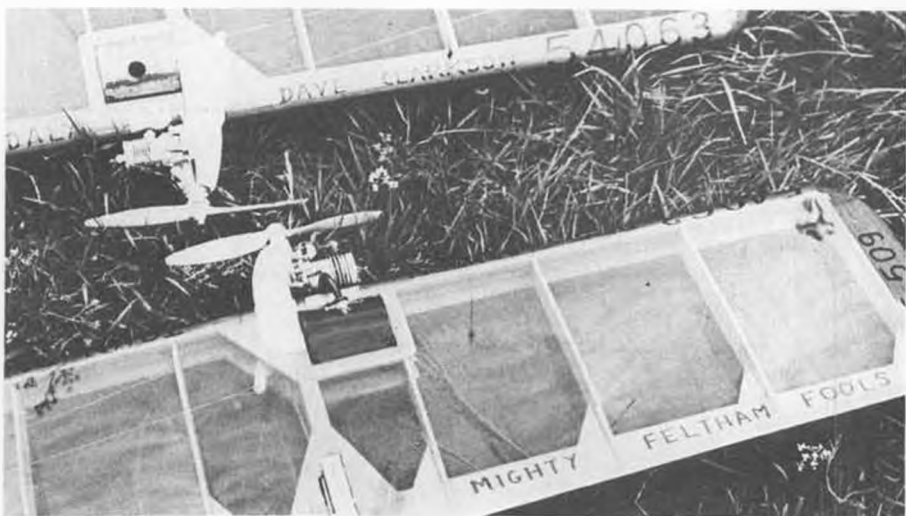
arguing; the FAI rules encourage flying.

TAMERLANE is a typical product of the British evolutionary process. The British have been winning the Big Ones since FAI Combat started 20 years ago, mainly because our FAI Combat scene is the hottest one in the world. Our models have evolved to be tough, easily built and repaired, and yet highly maneuverable. In FAI, you get to do a lot of Combat, so the models have to survive a lot too; they have got to be tough. But no model can survive the ultimate crash or mid-air, so they have to be easily and rapidly built and repairable . . . Don't want to spend all of our time building, do we? The trick is in making such a model highly maneuverable and this is where our British approach has produced the goodies.

A quick study of the plan will show that TAMERLANE has an almost ridi-

culously simple structure . . . a simplicity of structure allowed by the use of, probably to American eyes, a very crude airfoil. This airfoil type is employed just about universally throughout Europe, and there can be only one reason for that . . . it works. Did you see Richard Wilkens' models turn at your '75 Nats? Now tell me that the airfoil doesn't work!

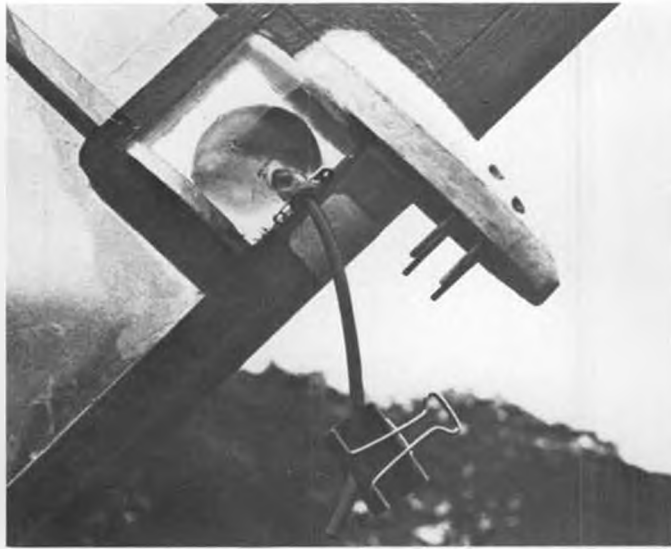
The other thing you will notice is the size . . . almost as big as an AMA Combat model with over 50% of the total flying drag coming from the lines, a bit more wing area hardly touches the speed, but that bit more area sure pays off in the "bends." Some models over here have strayed up to and past the 400 square inch mark, but you need a super motor to lug that lot around (we British didn't have super motors at the '75 European Championships, so our fliers had trouble getting at their opponents). TAMERLANE is sort of medium sized, with 320 square inches . . . enough to give adequately tight maneuvers without requiring a lot of horses to pull it through



Sparless wing has unusual, but well tested airfoil, gets strength from 'C' shaped leading edge. See-through covering allows easy inspection of structure following an "incident".



Would you believe that an instant after this photo, Dave dashed to the center and grabbed the handle before Tamerlane got away? No?



Fuel compartment is enclosed with thick acetate sheet, not only fuel and shatter proof, but also allows quick inspection of pacifier.

them. For those of you wed to 250 square inch 'flying bricks', I reckon a move to 320 square inches is a big enough step to handle.

Need any more convincing? No? So here goes with the building system. I always cut out a kit of parts before starting assembly, this way you can be gluing up one of the units whilst another is setting. Also, I tend to build models in pairs . . . takes hardly any more time than building just one.

Stick to the wood grades given on the plan. I dislike soft wood in stressed locations because it is too brittle, so the design has evolved to give the right balance whilst using mostly medium and hard balsa.

The toy consists of three basic units . . . the wing, the motor pod, and the tail . . . which are assembled separately, and the whole thing comes together just before and during the finishing process. Nice really for those who get urges . . . this week a wing 'urge', the next a pod 'urge', and so on . . . anyone who flies toy planes has got to be a bit strange, so why not be constructive about it.

The wing frame comes first. Drill the lead-out ways through the inboard ribs using a worn-out 1/4 inch drill, assemble the center rib, including the bellcrank platform, and then glue all of the ribs onto the trailing edge. Now assemble the leading edge and glue the ribs into that. Wow! Got the basic frame done in no time flat.

Note that the spruce leading edge reinforcer tapers at its extremities, and only goes on the middle of the wing. Besides requiring only one length of spruce, and therefore saving a few pennies, this short reinforcer ensures that, if the wing breaks, it will break well away from the middle. A wing break towards either tip is usually very easily repaired, helped by the 'U' shaped leading edge, solid trailing edge, and

absence of spars. A wing break in the middle is far from easy to repair on just about any model, so it usually means the trash-can.

With the basic frame done, the controls can be added. Use a 2 inch bellcrank with a bicycle spoke push-rod. The bike spoke has a super-neat no-effort-required end for the bellcrank and is easy to bend for the horn end. Now glue on the rib gussets, tips and pacifier compartment surrounds. Note that the center-rib trailing edge gussets are chamfered where they meet the trailing edge to give a big glue joint area and also preserve the profile here. A bit of work with a razor plane will get the wing trailing edge and tips nicely sharpened.

The pod is of the standard British slide-on variety. After drilling for the mounting bolts and carving to shape, push it onto the wing, using glue as the lubricant, and leave this vital joint to set . . . with the hardwood bearers clamped to the center-rib using a small C-clamp. When the glue has fully set, drill for, and glue generously in place, two dowels to make sure the pod and bellcrank platform stay put. Now the leading edge can be shaped. It is important to get the leading edge profile right; too blunt and the model will turn out nose-heavy and slow . . . a real dog. Too sharp and you get stalling troubles in the turns. I have found the profile on the plan to be about right . . . maybe it could be a bit sharper, but I hate shuddering around the turns.

The last act before covering is to give the whole model a gentle sanding to eliminate bumps and then to fabric cover the pod, locally overlapping the wing. I use 1 oz. glass cloth, doped on, because glass cloth follows compound curves better than any other fabric, however, the favorite pod covering here is wide gauze bandage applied with balsa cement.

TAMERLANE is designed for cover-

ing with one of the iron-on plastic films, not only because of all the advertised (and generally true) reasons, but also because it allows quick and easy de-warping, and seems to give a faster model. I have one weapon covered in "Fascal", and whilst decidedly trickier to apply, a much stronger model resulted.

If you were bright when framing up the wing, you didn't glue in place the pacifier compartment sides. This allows the whole wing, including what will be the pacifier compartment, to be covered (no tricky trimming round the compartment, see?) So now cut away the covering over the compartment and finish this item, not forgetting to fuel-proof the walls. I like to make the compartment top and bottom from thick acetate sheet. Not only is this

Continued on page 77



What do you do when raw fuel runs into the cut on your finger? Smile, you're on camera!



Spectator, pointing, "See that mean looking character with the beard? He's a ukie freak. Somebody told him that R/C gliders have a whole bunch of wire in 'em, so he's out here trying to get a combat match!" Yes, folks, Dirty Dan flies this "Maestro", built from a Dodgson kit.

Control line

By "DIRTY DAN" RUTHERFORD
PHOTOS BY AUTHOR UNLESS NOTED

• I keep trying to get to the point where we can talk about actually flying the Project Goodyear. Everytime I think we're finally ready to go, another little detail crops up.

This time it's props and lines. I guess we need both items before going flying, so let's get into it.

Lines are a problem, as the .012 solids are quite often difficult to come by in your local hobby shop. I would suggest contacting either Aldrich Products, Inc., P.O. Box 1426, Mission, Texas 78572,

or Kustom Kraftsmanship, P.O. Box 2699, Laguna Hills, CA. 92653, for the lines, as well as a bunch of other racing and speed related accessories. When ordering lines, get several sets. They are cheap enough to be disposable and fragile enough to demand constant inspection and trash-canning when kinks appear. Do *not* take chances with your lines. Take care of 'em and toss 'em when they look in the least bit questionable.

The solids present a bit of problem

when it comes to tying the ends off. I've tried several ways of doing it and have settled on the following as the easiest way to go about it. A piece of 1/16 O.D. brass tubing is heated over about 6 inches of its length in a torch. Get the tubing cherry red and let it air-cool. This anneals the tubing, making it easy to bend. Cut the annealed tubing into four 3/4-inch long pieces. Slip one piece of tubing onto one of the lines. Leave a little extra line sticking out for final wrapping. Using a pair of round



Hey, watch it, guys! Col. Howard Rush on the left, Ron Scoones, Chairman of Combat Advisory Committee on right. Cute couple, no?



Would you buy a used car from this man? How about a used Rev-Up prop. It's Rev-Up's J. T. "Jim" Finley.



Dirty's Sig P-51 Stunter. White Monkote on wing and stab. Orange K&B Super Pox on fuse. OS .35 on muffler pressure.

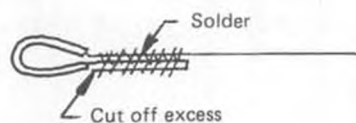
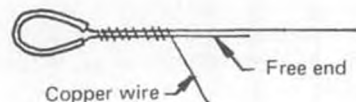
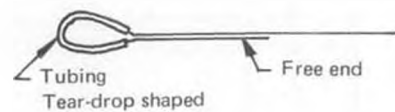
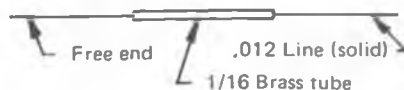


Phil Granderson with latest stunt ship, the Diplomat. Small and light, Fox 35. Was black, crashed, now white. New name . . . P.O.S. Hmm.

nose pliers (X-Acto makes a couple of pliers that work well; snipe nose No. 1507-C and combination nose No. 1508-C) bend the 1/16 tubing into a loop large enough to accept the line clips you'll be using. If done right, the ends of the tubing will come together nicely with the line laying against itself and ready to be wrapped. When wrap-



Finished leadout eyes on Project Goodyear. See sketches and text for 'How to'.



ping, I use copper wire (the Pylon Serving Wire Kit, No. SWC, is a good source for the right type of wire) and start at the ends of the tubing, wrapping the two ends of the line as tightly as possible and with the wraps being tight against each other. I wrap this way for about 3/8 of an inch. The free end of the line is then folded back over the wrapping and the copper wire is then wrapped back up to the brass tubing. The free end of the copper wire can then be simply cut off or wedged in between the ends of the tubing and then cut off.

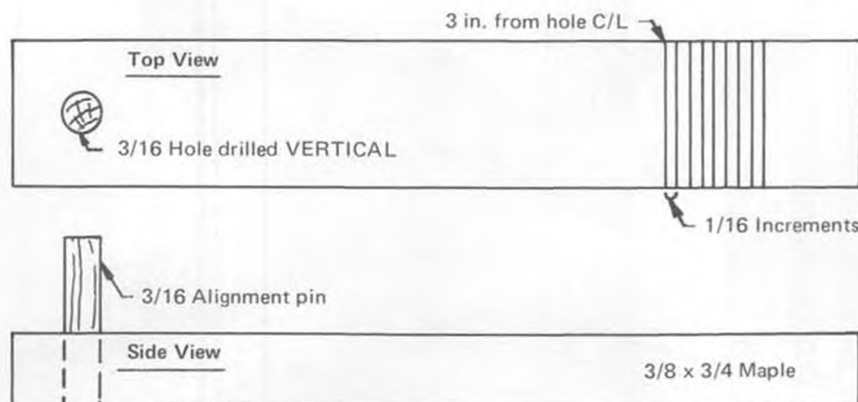
The other line is now done in the same way. Now the wrapping should be soldered to prevent it's coming undone. Do this *very* carefully to avoid overheating the line itself. If the line is accidentally heated too much, it will lose some of it's temper and become soft, just like the tubing did when you heated it. I use a propane torch for this job, but it's a little touchy. A good soldering iron is probably the best.

There is quite a large tolerance concerning line length. In any racing event, you want to take the short way 'round, so I suggest that you hook the tied ends of the lines to the plane's leadouts and run the lines out perfectly straight. Get a steel tape measure and measure off *exactly* 52 feet. Lay the center-line of the grip of your handle on the 52-foot

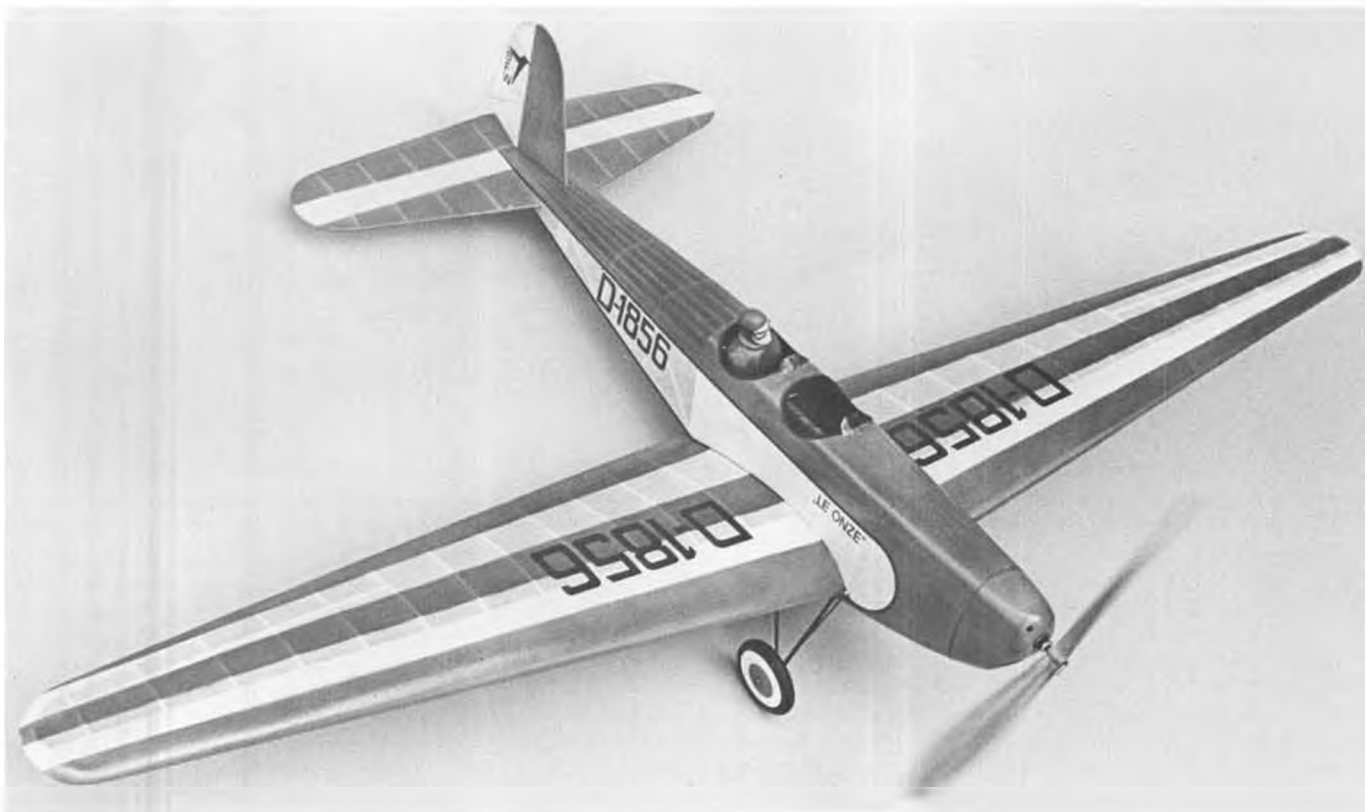
mark. You're just about ready to tie off the handle end of the lines, but check everything first, especially if you're going to tie the lines as short as possible. Be sure the center-line of the model is on the zero foot mark, that the line clips on the plane are the ones you'll be using when racing (Pylon clips are recommended . . . they're the only ones that are safe) and that the handle is the one you'll be racing with. And also check the clips on the handle. Now tie off the free ends of the lines as previously described, double-checking your measurements. Make a mistake here and you'll be searching for a set of lines to borrow come the next contest, assuming you get 'em too short.

Although I've described how to get the lines tied off at the bare minimum, I always try to allow for a margin of error, either on my part, or that of the usual unsympathetic CD. I do this by tying the lines without connectors at the handle end. I prefer to use the large Pylon connectors on the handle and when they are added, my line length comes out about an inch over the minimum. If, for some reason, I still am too short at a contest, I can put large Pylon connectors on at the plane, as I generally use the small ones here. This will add almost a 1/4 inch to the lines, which,

Continued on page 80



PROP. TRIMMING JIG



+ Messerschmitt M23b +

By BILL NOONAN . . . A perfect model for the new 36" minimum wingspan Jumbo scale rules, this ship embodies all the characteristics of our historic rubber scale era that is making such a tremendous comeback.

● The Messerschmitt M23 series was introduced with the model "a" in 1929, to satisfy an appeal issued by The German Aero Club for lightplane designs to compete in the *Ostpreussenflug*, or Circuit of East Prussia touring contest. The early "a" model sported the popular ABC Scorpion two-cylinder (38 hp) engine, or the 45 hp Salmson AD9. The acceptance of the clean, graceful low-wing two-seater encouraged Messerschmitt to make improvements in the form of the M23b, with modified airframe and power plant choices giving

pilots no less than eight different engines to choose from. It is interesting to note variations in fuselage length on production models in the "b" series which varied from 20 feet, 10 inches to 21 feet, 9-3/4 inches. One can assume this had to do with power and weight characteristics.

Our model reproduces the acrobatic mode which served champion Willi Stor so well, registered D-1856. It was powered with an 110 hp inverted Argus engine.

No record seems to have been kept

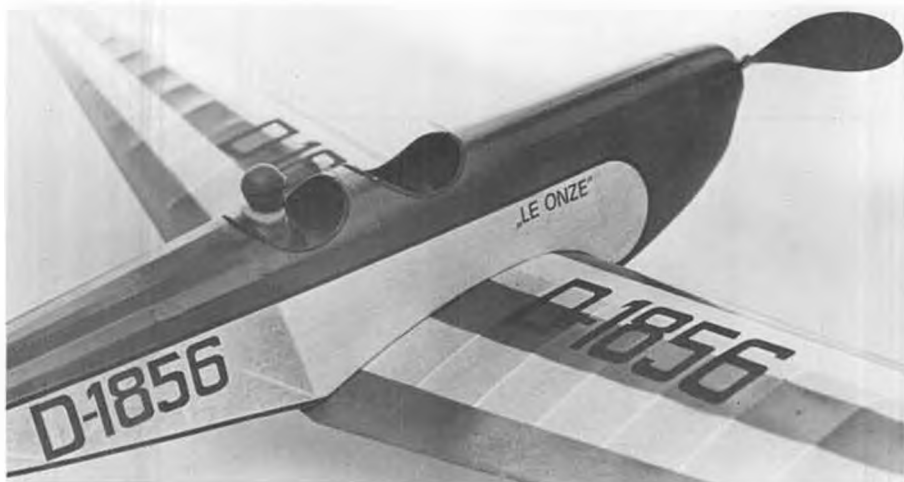
of the exact color of the aircraft, but contemporary black and white photographs, probably taken with orthochromatic film, suggest the plane might have been red and white, which seems appropriate to the somewhat flamboyant scheme chosen by Stor to embellish wings, fuselage and tail surfaces. It must have been popular at air shows.

History records some M23b's with squared-off tail surfaces. Our model follows Stor's configuration, which had rounded tips on both stabilizer and vertical fin, harmonizing nicely with the wing plan. This model seems to depart from others also in the aileron design, which, rather than being contained between rib stations, went to the tip radius.

The M23 series, particularly the "c" model, excite a note of familiarity, much as might be elicited by looking through an old family photo album. *Deja vu?* No, it's a reflection of the most famous Messerschmitt of all, the Me109. Subtle qualities in the shape of the wing, fuselage contour, etc. tie these two generations together, revealing the lineage, much the way the photo album might have.

WING

As was the prevailing practice of many German designers of the twenties (Fokker, Junkers, et al.), the M23b fea-



Neat workmanship shows in this close-up photo. The original airplane had right and left folding wing panels. On the model, a one-piece wing was used for simplicity.



Left: Generous flying surfaces make the M23b an excellent choice for flying scale. Hmmm, would be interesting R/C Sport Scale ship.

tured a strongly tapered, deep-sectioned, undercambered wing. We have deviated from the original, not in plan, but mechanically, in the interest of strength. The original had right and left folding wing panels. Our model incorporates a full-span wing, which passes under the fuselage.

Spar is cut from straight-grained 1/8 x 1/2 medium hard balsa, tapered per drawing. Ribs are cut from light 1/16 sheet, omitting spar, leading and trailing edge provisions.

Cut tapered leading edge and roughly sectioned trailing edge. Pin both over respective positions on Saran Wrap-protected plans. The leading edge will need scrap balsa "shims" to elevate it above the plan to anticipate coinciding with rib contour. Take each rib and hold it in position at its correct station. Confirm proper chord and make mark with sharp cutting tool on each rib at l.e. and t.e. contact points. Cut off surplus and again confirm fit by wedging dry ribs between l.e. and t.e. At this time lay spar across ribs and repeat marking procedure on the top of each rib, indicating spar notch. Withdraw ribs, cut notches to correct depth. Spar sits 1/32 below top of ribs. The excess in front of the spar is removed after assembly, with a fine sanding block, maintaining airfoil contour to the leading edge. This step-down from spar forward allows later placement of 1/32 balsa leading airfoil edge covering. Cut tips from 1/8 medium balsa, cement in place, trim and sand to proper contour.

Your wings should appear as finished,

except for the center section and addition of 1/32 sheet. It might be pointed out at this time that the ailerons were incorporated to enhance the scale effect, as well as to provide for wash-out or to correct incorrigible warps. On the original model, they remain in a fixed position.

Remove wings from plan. Cut dihedral spar brace (part SB) from 1/32 plywood. Cement this part to front of spars, making sure spars accurately parallel brace angle, which automatically gives proper dihedral. Use clothes pins or spring clips available at stationery supply stores, to hold the whole ball of wax together while it dries. The center section immediately under the fuselage is flat as viewed from the front. This allows the wing to "cradle" into the bottom of the fuselage.

Add center section ribs as shown, as well as leading and trailing edges. Sand to proper airfoil. The center section will be covered with 1/32 sheet full chord, so no step-down is called for on center section ribs (two). Rather, these two ribs are 1/32 less in depth than adjacent root ribs. False "stringer ribs" are cemented inside root ribs to form shelf to glue 1/32 sheet to.

The 1/32 sheet can now be fitted. Start by running bead of cement (we used Titebond) along top of spar, taking care not to slop any aft on top of ribs. Pin the sheet along spar top from root rib to tip. When dry, bend to conform to airfoil, and cement to leading edge. When this is dry, cut and sand, feathering to airfoil shape along leading

edge.

Before covering the center section with 1/32 sheet, bend right and left wing anchor hooks and epoxy to back of spar. These will protrude about 3/8 above the 1/32 sheet center section covering which forms the cockpit floor. Mating hooks will later be epoxied inside fuselage sides approximately at top longeron. Stretched rubber bands or tensions springs between the hook sets form the method of holding the wing in place.

A lot of trouble you say?

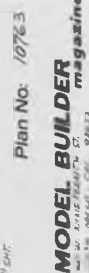
I have had too many occurrences where dynamic contact with a foreign object (the ground?) transmitted stress to longerons and transverse members, usually necessitating major repairs. This method of attachment is further justified by the fact that the landing gear is integral with the wing.

TAIL SURFACES

The primary framework of both vertical fin and horizontal stabilizer is 3/32 square balsa. The stabilizer has a 3/32 x 1/4 trailing edge, tips are laminated from two pieces of basswood, 1/32 x 3/32, to make a 1/16 x 3/32 combination. The entire vertical fin outline is laminated.

To make the laminated parts, cut stabilizer tip and vertical fin forms from 1/8 balsa, and wax edges with candle or paraffin to act as a release in case surplus glue gets between lamination and form.

Prepare the basswood strips for bending by soaking in hot (not boiling) water for about 30 minutes. Wipe excess water from the strips and apply either white



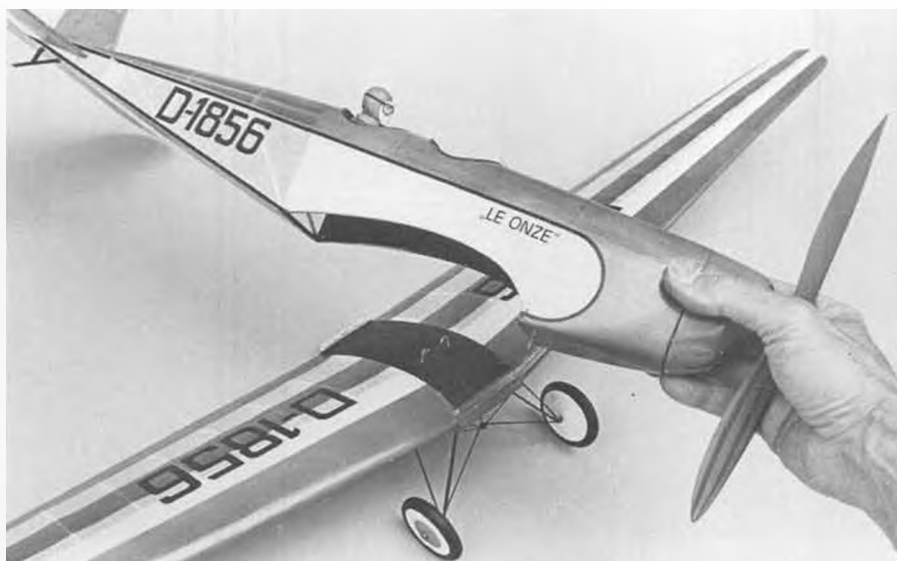
glue or Titebond between strips. Pin down forms and pin lamination strips around the forms, making sure strips conform to the desired shapes. Check to see laminated parts are in contact with one another. Allow to dry overnight.

Trim basswood and cement to primary frame of spar and "ribs." The vertical fin is flat in cross-section, the leading and trailing edges sanded to round shape. The stabilizer airfoil is modified to a symmetrical cross-section by adding 1/16 square "cap strips" on all 3/32 square "ribs," both top and bottom, sanding to streamline section when dry. This enhances the stabilizer contours, and improves the structural integrity aft of the spar. In the construction of the original model, the two center ribs were cemented in place after the fuselage was completed, allowing absolute accurate fit where stabilizer contacted the fuselage sides.

FUSELAGE

The main fuselage longerons are of medium grade 1/8 square balsa. You could substitute 3/32 square in the interest of weight saving, and not appreciably affect structural strength. Lay main longerons over plans, using Saran wrap between to prevent structure from adhering to plans from excess glue. Cement square uprights and 1/16 x 1/8 diagonals in place. Cut 1/8 sheet portion which forms fuselage sides in cockpit area, and is contoured on bottom to receive wing. When dry, repeat procedure for second side, again separating the two with Saran wrap. We used Vintage Aero's plastic "Pins Downs," handy little gizmos that hold balsa parts to plans without having to penetrate balsa with pins, a no-no.

Remove completed sides from plans and position inverted over top view, the top longeron being flat allows this to be easily accomplished. Cement in cross pieces, noting that what would be the top longeron (which is now on the bottom) cross pieces actually bridge the fuselage about a 1/2 inch down, to anticipate the formers being inserted later. This detail allows for eventual



Hooks on top of wing engage rubber bands which wrap around hooks inside fuselage, holding wing in place. Alignment piece on trailing edge should be lightly glued to break away in crash.

passage of rubber motor, approximately paralleling the top longeron. Remove from plans when dry.

Cut formers from 1/16 sheet balsa. *Do not* notch at time of cutting. Cement each in place in main framework. When dry, establish center stringer position by holding piece of 1/16 x 1/8 balsa along center line (looking from above). Mark each former with sharp instrument or sharp pencil. This becomes reference mark for filing notches with modeler's file. Each notch is calculated to receive a 1/16 x 1/8 stringer. Follow same procedure with all stringers. When cementing stringers in place, note that they all wind up in a nice gang at the horizontal "stabilizer post." All stringers about this post with the exception of the center one, which is 3/32 short, allowing vertical fin spar to penetrate the fuselage and form the tail skid support.

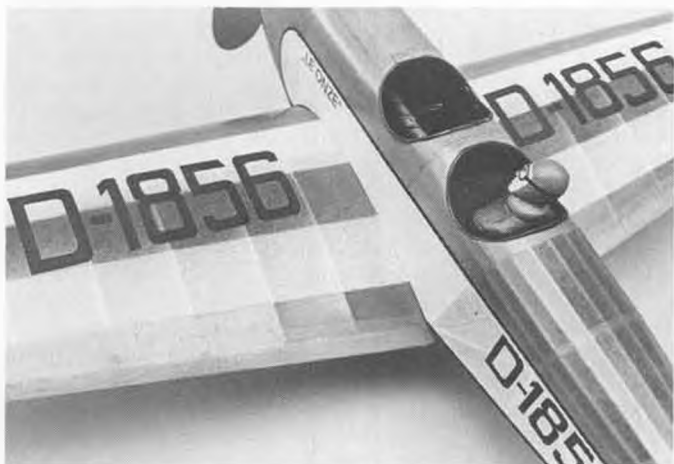
Fill in between stringers with soft 1/16 sheet between Former B and Former F. When cement has set, sand with progressively fine grades of garnet paper, taking care to maintain smooth and accurate contour. Cockpits are cut after covering has been applied, but we

will describe the procedure: Position bond paper pattern in correct position atop the fuselage, determining accurate cockpit locations between formers. Scribe outlines. Cut with sharp, pointed blade. Sand cockpit edges to remove minor imperfections. Cockpit coamings, applied after final color finish, are of either 1/16 diameter black tubing, or insulation stripped from unstranded copper hook-up wire. These hide most minor discrepancies.

Cement the 1/32 plywood former (A) in place. Fill in cowl sides with 1/4-inch soft balsa and cement cowl bottom block in place. When dry, carve and sand to correct shape. Cowl is flat on bottom where it meets the wing leading edge, changing to the void shape of former A at the front. It is not necessary to hollow out the bottom cowl block, as some weight is needed in the nose, and it might as well contribute to structural strength.

The removable nose "block" is really a series of 1/4-inch balsa sheet laminations, cemented with alternating grain. This nose could be carved from a hard

Continued on page 75



Close-up photo reveals neat covering job by author/designer/builder. Rubber motor can be seen in front cockpit.



Needle-nose pliers are used to install rubber bands that hold wing in place . . . Okay, if you insist, needle-nose!



Another great looking model by the author of this month's Messerschmitt M23b, Bill Noonan. This is a Fokker S-IX/2, from the 1938 era.

FREE FLIGHT SCALE

By FERNANDO RAMOS

● For the longest time I have been wanting to cover diesel engines for scale work. Some of you may have heard that diesels are usually preferred for F/F scale, but never knew why. I want to say right off that the following information will not be the least bit technical. I'm far from being mechanically inclined, and I like to have things of this nature explained simply. So, I plan to make it easy on you, too.

Surprisingly, there are many people who are totally unfamiliar with diesel engines for model work. To some extent, this is understandable, since we do not presently manufacture diesels in this country. At one time McCoy and Herkimer Tool and Model Works (makers of the OK line of engines) made a few different models of diesel engines. In fact, my first diesel was a McCoy .049, which I still have. In the U.S., there has apparently never been wide acceptance of the diesel engine for any kind of modeling use. Yet, in England, they are probably more commonly used than the glow engines, particularly in the .049 to .09 displacement. Elsewhere in the world they are also highly regarded. For example, the Rossi and Super Tigre diesels (to mention two of the better known engines) are used in team racing world wide, not only for their power, but also for the fuel economy which is characteristic of the diesel engine.

Now, let's look into some basic differences between the glowplug engine and the diesel engine. The glow engine has a special ignition plug that glows brightly when a 1.5 volt battery is hooked up to it. Once the engine has

started, the battery leads are disconnected and the engine continues to fire by the heat that has been retained in the element. The diesel, on the other hand, does not use or have a glow plug or special ignition system. Instead, the diesel has a very high compression cylinder which automatically ignites the fuel when it is compressed by the rising piston. The compression of a diesel engine is about twice as high as a glow engine, and it is adjustable by means of a lever on top of the cylinder head which lowers a contra-piston, (the contra-piston is located just above the regular piston, providing a combustion chamber between them), in the top of the cylinder. In other words, a diesel does not need a starting battery to get it running.

The function of the compression lever is to adjust the timing of the ignition of the fuel charge. The advantage to this set-up is that different diameter propellers can be used. This is unlike glow engines, which normally use a certain diameter propeller for the most efficiency, and usually only the pitch of the propeller is changed. Again, I'm talking primarily about 1/2A engines, and for F/F scale work only. Adjustable compression allows you to compensate for pre-ignition due to rising engine temperature, and also to ease starting when using a smaller diameter propeller, lower the compression to start and then increase when engine is running.

The only other device you have to worry about with a diesel is the needle-valve, and this of course, is the same as on a glow engine. This is used to control the amount of fuel to the engine and

provides for the correct air/fuel mixture.

Diesel fuel is certainly unlike glow fuel in every respect. It has three basic ingredients, all used in more or less equal parts. That is 1/3 ether, 1/3 kerosene, and 1/3 castor oil. Ether is used because it has a low ignition temperature and insures easy starting. Kerosene also has a good ignition point, and contains more B.T.U.'s than many hydrocarbons. Other substances are often used, such as amyl nitrate to facilitate starting. Later I'll tell you where you can buy commercially prepared diesel fuel, but if you hanker to "blend" your own, get a hold of someone who team races, and they can tell you where to get all of the ingredients necessary. Many use artificial oils (synthetic) rather than castor oil.

Now, let's talk briefly about starting these little jewels. Diesels have a reputation of being tough to start, and at one time I was a firm believer of this notion. However, now that I better understand them, I find that they are no more difficult to contend with than a glow engine. First, a diesel engine should be run on the bench, and broken in adequately. If you don't, you will only discover grief at the flying site. Take it from someone who knows. All the successes I've had with diesels have come from engines which have had proper break-in. This is where the bad reputation comes from; someone at the flying site cranking and cranking away at a new diesel that has never been run. Manufacturers have very complete instructions with each of their engines, and these should be followed closely.

Use whatever diameter propeller recommended for break-in. I usually use a 7x4 on .036 to .047 size diesels. Place the propeller on the shaft in such a way that the prop rests approximately in a horizontal position when a prop blade is brought gently up against compression. The reason for this is two-fold. One is that when the engine stops during a flight, the prop should stop in this same horizontal position, and therefore possibly save the prop in the event of an "unusual" landing. Secondly, it provides a good position to aid starting, since it allows for a good strong flick of the prop, which is a must for starting diesel engines.

You will find when flicking the prop that it is best to hold your finger closer to the hub than the tip. At the tip the prop is rotated at a much slower speed, which may not be enough speed to start the engine. Should it start with your fingers out near the tip, you could get zonked by the next blade coming up. So again, hold your finger closer to the hub, where you can get more power, and get your finger out of the way.

The next step is to check that the controls (needle-valve and compression lever) are set according to the manufacturer's recommendations. If you have an engine without these directions . . . and with all the horse-trading going on these days, this is certainly understandable . . . do the following: Before adding any fuel to the tank, open the needle-valve about 3/4 turns from the full close position. Now start flicking the prop, and notice how it feels. As you continue to flick, screw in the compression lever a little at a time. You will notice that it becomes increasingly difficult to flick the prop. Back off the compression, and fill the tank. Fortunately, many diesel engines have a compression stop pin on the top of the cylinder that gives you only one full revolution of the compression lever. In other words, the proper compression operating range has already been established by the manufacturer, and this truly makes starting and running these engines much easier.

Now place your finger over the

intake and turn the prop until the fuel reaches the carburetor. This is the same as for a glow engine. The engine will feel freer now that there is some lubrication from the fuel. The engine should now start, with a few hardy flicks of the prop. If after about twenty flicks or so it doesn't start, choke the engine again. Be very careful not to over choke, because flooding the engine will occur, and with a diesel, you will not be able to turn the prop over. Should this happen, close the needle-valve completely and blow through the exhaust as you would handle a glow engine. Continue flicking the prop until you are certain that the engine is no longer flooded. Again, open the needle-valve and carefully choke the engine. If the engine still doesn't fire, increase the compression *gradually* until it does. When the engine does continue to run, reduce the compression slowly. It isn't possible, in the starting process, to find the right compression. Too much fuel has been drawn into the crankcase, which in turn, is being thrown into the combustion chamber each time the engine fires. When this excess fuel has been used up, you can slowly increase the compression until the engine is running fast and smooth.

You will find that the best performance is obtained by a combination of relatively weak mixture and high compression . . . so you then close the needle-valve to accomplish this. Should the engine begin to slow up, it could be that it is over-compressed. Back off on the compression until a misfire takes place. You can't miss this, since it sounds just like a real rotary engine. Then increase the compression gradually until the miss disappears. With a diesel, the needle-valve setting is not very critical, but the compression is. Also, to get the engine to run slowly on any prop, all you have to do is back off the compression.

Briefly, the most common errors regarding diesels can be summarized as follows:

1. Engine starts but quits after a brief run. Probable cause . . . mixture

Continued on page 68



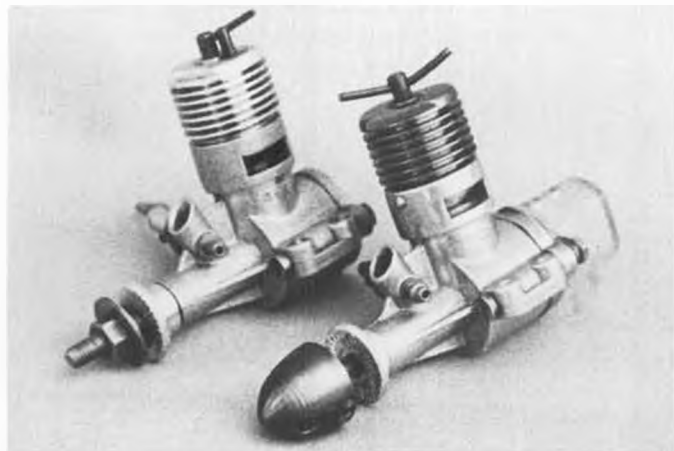
Davis-Charlton .036 Dart. This engine is recommended for your first diesel.



Cox .020 Pee Wee converted to diesel.



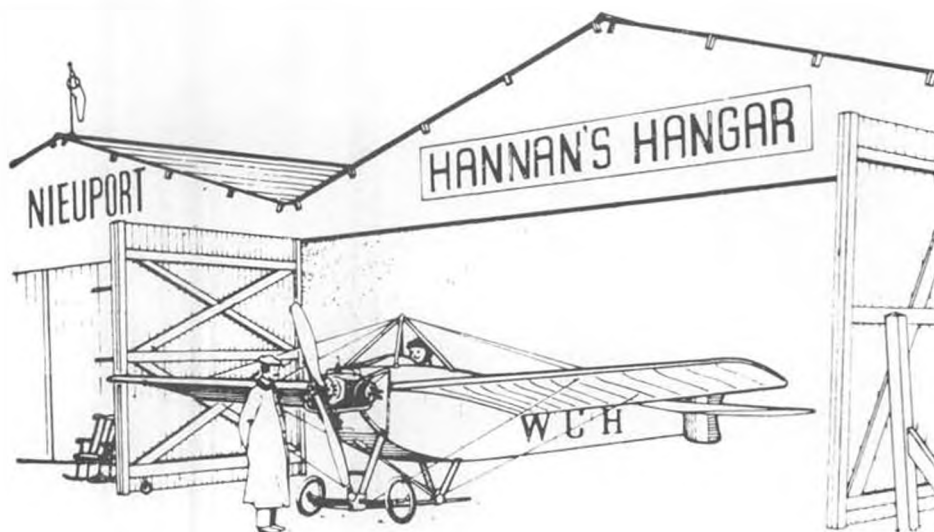
Mills 0.75cc, one of the best, if not the best diesel engine ever made.



Merlin .047 (left) and Super Merlin .047 (right).



Webra Piccolo, an .8cc diesel.



"Model building takes more time than you have available."

● We're sure the above will not represent startling news to most of our audience . . . merely reassurance that nearly everyone would agree.

FOR SALE

This is the title of an article by Chuck Thompson, President of the San Valeers Model Airplane Club, printed in "The Satellite" newsletter, from which we've abstracted these thought-provoking passages:

"What is for sale? The answer is nothing. It has occurred to me, that what we have created in our club, is the largest factory in the world for championship high-flying model airplanes. I have to say that there is a great deal of pride in being a member of the San Valeers, because as a member, you are part of that great factory. I know there are no actual statistics available, but I am reasonably sure that our club is the largest factory of its type. Of course none of the products are for sale; none of the products are mass-produced; as a matter of fact, no two are exactly alike. Each product is a custom-made, semi-experimental expression of the modeler. Usually, before the project is finished, ideas have already been formed to improve the next one. After trimming the planes, only a short time passes to decide if they are competitive and thereby useful. As soon as it is decided they are not, they are discarded, and a whole new building program starts again.

"Actually, the product is sold; it is sold and it is a 100% sale of merchandise. Every modeler who builds exchanges his building skills and talents for things other than money. Some gain only the association of other members; some gain more things, such as the honors of winning, and some gain what is more important . . . some long-lasting friendships with people who love to see a great long wing screaming into the sky."

THE MAGAZINE

Ray Malmstrom, the "Walt Mooney

of England", received an old issue of "FLYING ACES" magazine, uncovered in an obscure corner of the Hangar, and his reaction was so warm and enthusiastic that we felt it ought to be shared:

"What a wonderful surprise . . . to open that envelope and have in my hands, before my very eyes, FLYING ACES!! For a long moment, I could not believe my old peepers. But there it was, a precious magnificent copy of that much-beloved publication. Honestly, I had a most curious, really nerve-tingling feeling . . . I felt I was back nearly 40 years, and as I turned over those exciting pages, my dearest mother would suddenly be calling me to 'Hurry up, Ray, dinner's getting cold.'

OK, so the old man's getting a bit sentimental, but perhaps that's not so bad a thing is it? All my copies of FLYING ACES were lost when my home was bombed in World War II. Mercifully my parents were not there at the time, but Hitler and his barbarians successfully robbed me of those precious copies. Now I have one to keep for all time . . . those yellowed pages, to re-live times that have passed into the warm and kindly light of memory."

What higher compliment could a publication be paid? Think 40 years



Jim Leuken and his Train Mono, at Flightmasters' R.O.W. meet, Lake Elsinore. Cox .049. Scaled up from Peanut plans.

from now someone may feel that way about any present-day magazines? (Sure. Model Builder! wcn).

AMERICAN AIR RACING SOCIETY

We know from our mail that the Golden Age air racers are favorite subjects for many model builders, and the AARS aims to help keep interest alive in those fabulous old pylon-polishers. Their newsletter, edited by Joe Baechle, features tid-bits of information concerning the machines . . . what they were like, and what happened to them. For example, from the July issue, we learn that the Brown B-1 Bushey Special is being restored to its original condition, and that Charles Mandrake, author of "The Gee Bee Story", is about to release a new book devoted to air racing. Anyone interested in joining this organization may contact: American Air Racing Society, P.O. Box 121, South Euclid, Ohio 44121.

AND SPEAKING OF RACERS

Everyone has seen flying models of Gee Bees, but few have seen *successful* Gee Bee models flying! We mean faithful reproductions, that have not been radically altered with "stability aids." One of our photos this month shows a rare exception, proving it CAN be done. The builder of this (and other) performing Gee Bee models is Royall Moore, who actively participates in the Connecticut Flying Aces club free flight events.

According to "on the scene reporter",



Royall Moore and one of his flying Gee Bees. This one features 6 skeins of rubber in its geared drive! See text. Photo by Dave Stott.



The Kiceniuk man-powered aircraft, being piloted by Dave Saks. Here it is under tow, at about 20 mph. Ship is constructed of aluminum tubing and foam, covered with Solarfilm. Photo by Joel Rieman.

Robert Neulin, "Royall Moore employs a geared 'contraption' (no sarcasm intended) really still in the experimental stages. He never seems to tire of trying to make it better. His Gee Bee "Z" (not the R-1 in our photo) weighs only around an ounce, and is amazingly stable in flight. Another thing he is to be commended for, is his ability to get rubber motors wound quickly enough to participate. As you know, there is a (club) time limit on winding up motors for races. Moore has converted a Wilson type winder to feature two hooks, and he winds from the rear of the motor stick."

Hats off to these patient experimenters, who resist the tendency to settle for "ho-hum high-wingers", and show what can be done with some courage and persistence!

NEW STICKUM?

Dave Gibson, of Cedarburg, Wisconsin, suggests that Elmer's Professional Carpenter's Wood Glue is a fine product for model building. He prefers diluting it slightly with water, for what he describes as "happy glue joints."

UKIE SCALERS ARISE

In a recent letter to the Hangar, Lonnie Cope decried the shortage of control-line scale events. He mentions a few hard-core enthusiasts, but thinks there would be greater interest with a



Tarus Kiceniuk, Bill Watson, and Dave Saks preparing the ship for a test run. Foam between Bill's legs is fairing which fits in front of prop. Solarfilm covering donated by distributors.

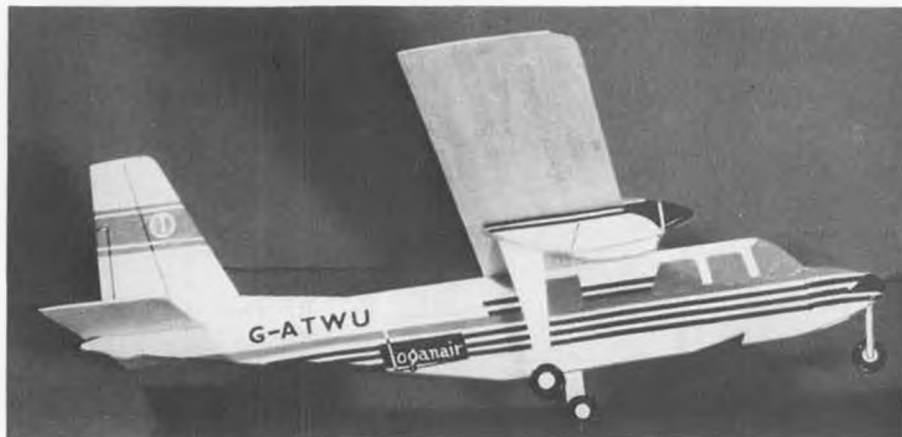
little promotion. Part of the problem seems to be indifference on the part of contest directors, who apparently favor combat and stunt events. From their point of view, scalers are too few in number to justify the trophy expense.

We know that there are quite a few advantages to flying scale models via the control-line system, especially in the case of machines which might be unstable in free flight form. Also, it would seem that there might be less risk in damaging a Ukie scale model, as com-

pared to either free flight or R/C. At any rate, Cope is open for suggestions, and even offers to assist with trophies and help run such events. How about it, readers? Anyone caring to join "Cope's Crusade" may contact him at: 20409 Tomlee Ave., Torrance, CA 90503.

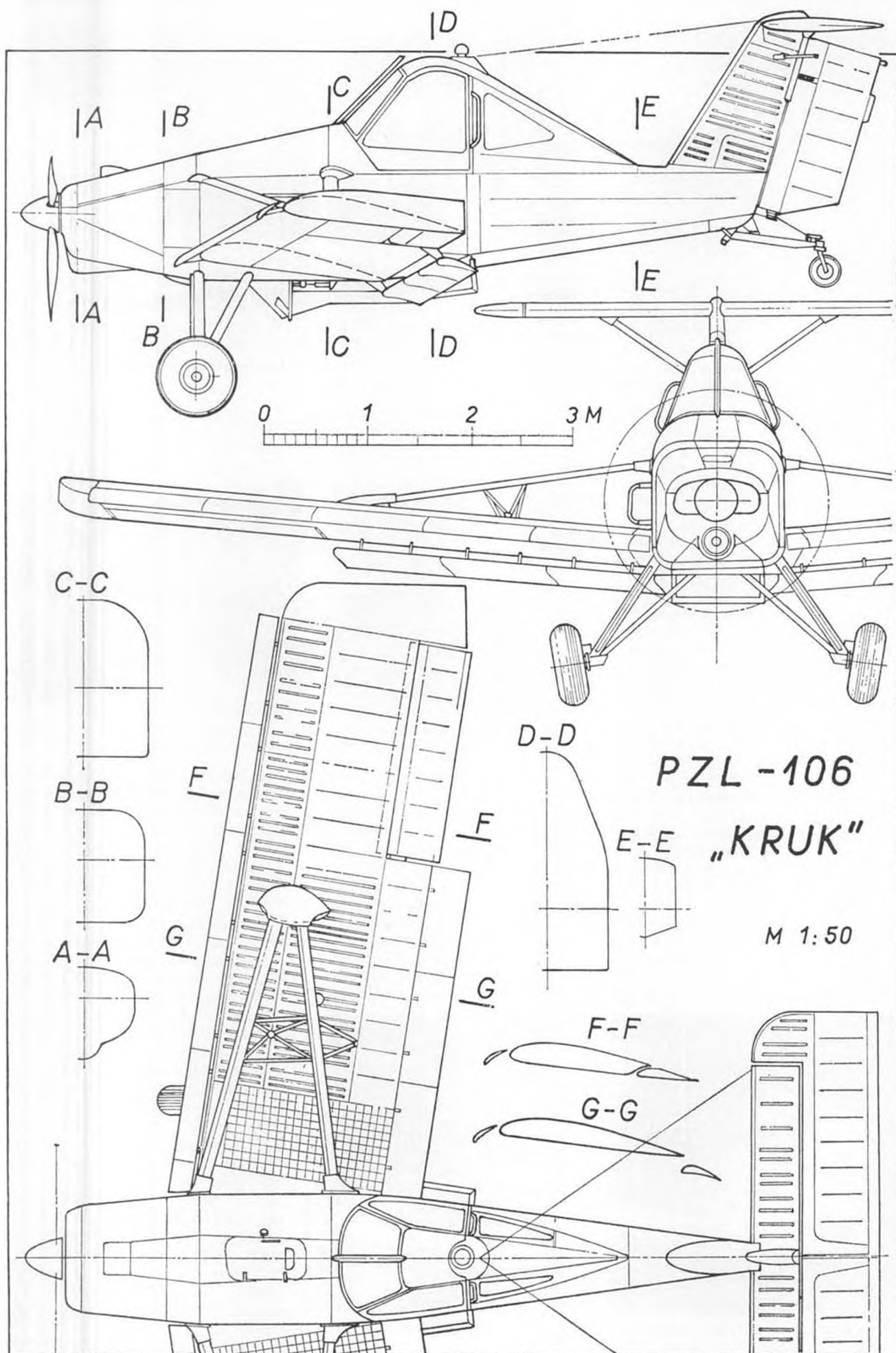
PAPER AIRPLANES

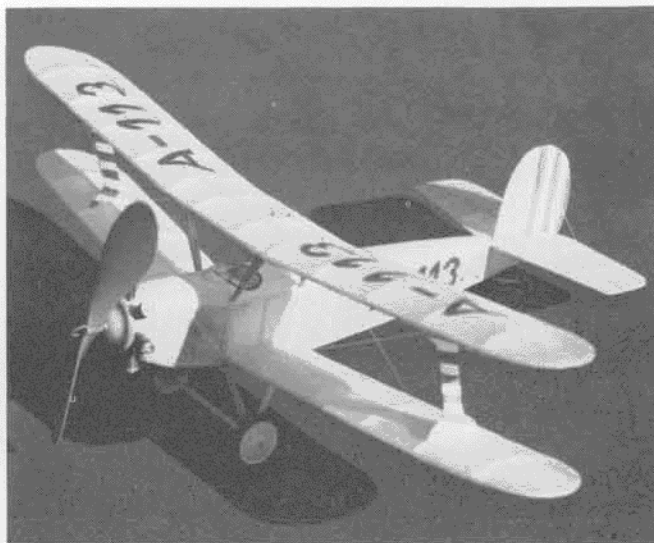
Every so often, the humble paper aircraft, perhaps the beginnings of it all, receives some recognition. Doubtless the high point was the SCIENTIFIC AMERICAN magazine contest of some years ago, but we were pleased to see quite a sizeable article devoted to the subject in a recent California newspaper. Seems that Bob MacKay, recreation director at the Glendale Maple Park Community Center, has been conducting paper airplane classes for youngsters. Assisted by design draftsman Steve Sarley, MacKay has developed an enthusiastic following. He quotes a 1931 essay by H.G.G. Herklots, of England, who felt paper plane flyers were seldom taken seriously: "Nobody laughs at golf or at rugby football. Few laugh at ping-pong, and whereas men snigger at chess, they respect it too. But when my friends discover me trimming the wings of paper



Profile Loganair Liner profile catapult glider, constructed by Ray Malmstrom, of England.

Continued on page 94





Peanut **UDET U-12a 'FLAMINGO'**

By WALT MOONEY . . . One of the prettiest, yet least known biplanes, the Flamingo was a choice of famed acrobatic pilot, Ernst Udet. It makes into a pleasing model, no matter in what scale.

• On page 112 of Aircraft Profile 257 is a view of the U-12a that this Peanut is meant to depict. A-113 was a BFW produced aircraft belonging to the OLAG Flying School in 1932. This profile gives a lot of detail on the many variants of the Flamingo, and I picked A-113 for its yellow covering, black numbers, and red and white candy striped struts.

The original model flies quite well, but being a biplane with struts and wires, will probably do less than thirty seconds unless built very lightly. The model in the photograph weighs three-quarters of an ounce, complete with a fourteen inch loop of one-eighth flat rubber. It has plastic wheels, propeller, thrust bearing, and cylinders. It uses dress snaps for the cylinder heads. As a consequence it is slightly nose heavy and could be a little lighter. Replacing all the plastic with wooden items would save the weight,

but of course, would increase the amount of effort required to complete the model.

Structurally, the model is a classic biplane. Balsa is used almost everywhere, with the exception of the struts. The cabane struts supporting the upper wing center section, and the interplane struts between the wing tips, are from 1/64 plywood. The landing gear struts are model railroad basswood.

The plans show sheet balsa wing and tail tips, which are easy to make, however, on the model in the photos, laminated basswood tips are used on the wings and the vertical tail.

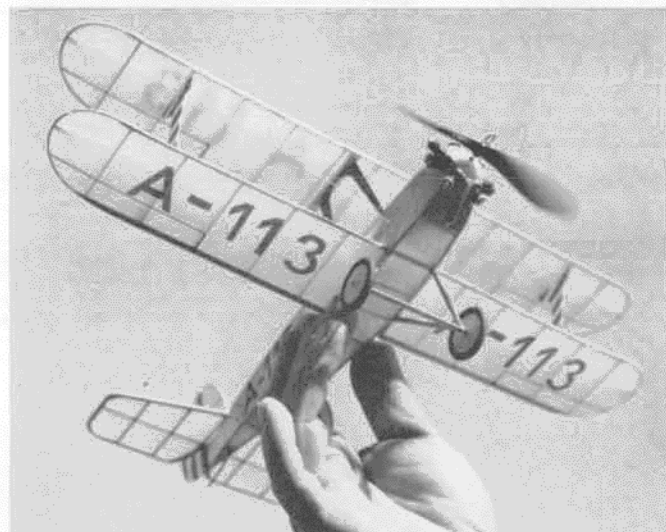
The top of the fuselage is covered with 1/64 sheet balsa. Bond paper can be used if you prefer.

Because the structure uses standard techniques, and the model is covered with tissue in the standard fashion, the rest of this article will concern itself

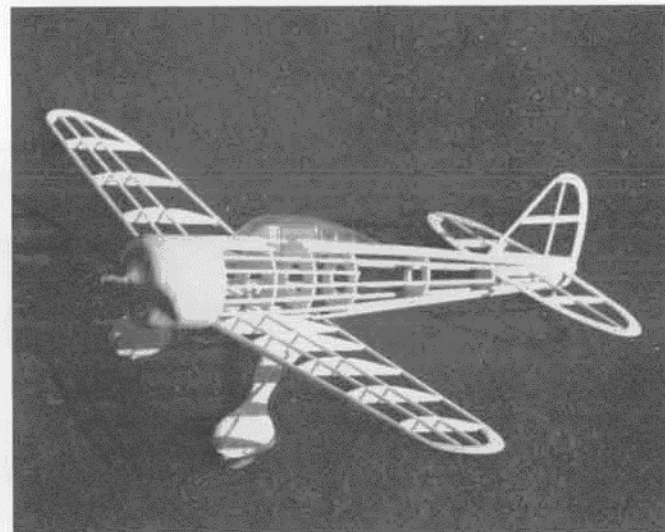
with details. The model shown has enough detail to look reasonable without taking an inordinate amount of skill to obtain.

The engine uses Williams Bros. cylinders. For cylinder heads, we used dress snaps. They are not exact scale, but they do give a nice appearance. I won't take credit for this idea, since I stole it from John Oldencamp. I was impressed by how good they looked on one of his models. The exhaust from the engine modeled was collected into a ring on the front side of the engine, and then exhausted through a pipe that ran aft between the bottom two cylinders. This was simulated by means of about one-eighth inch diameter plastic insulation stripped from some automotive wire. A single strand of the thin copper wire was used to tie the loop and extends

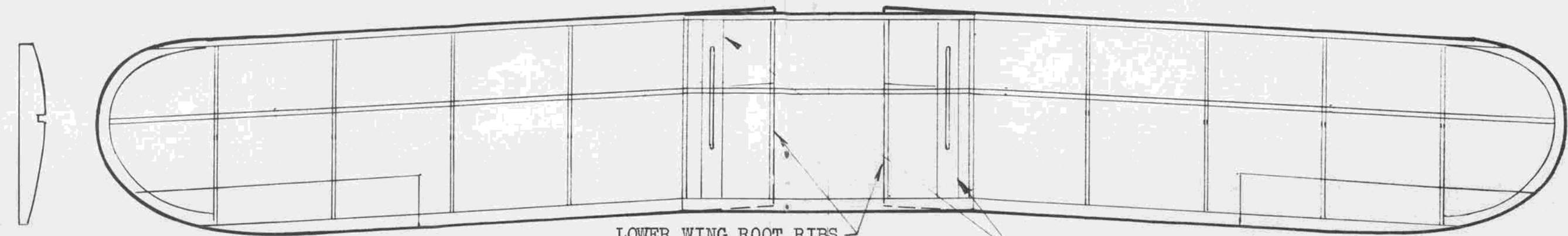
Continued on page 73



A long-time favorite of MB's editor, this one would have become an R/C project, if publishing a magazine had not interfered.



Next project from Mooney's Peanut factory, a Nakajima KI-27.

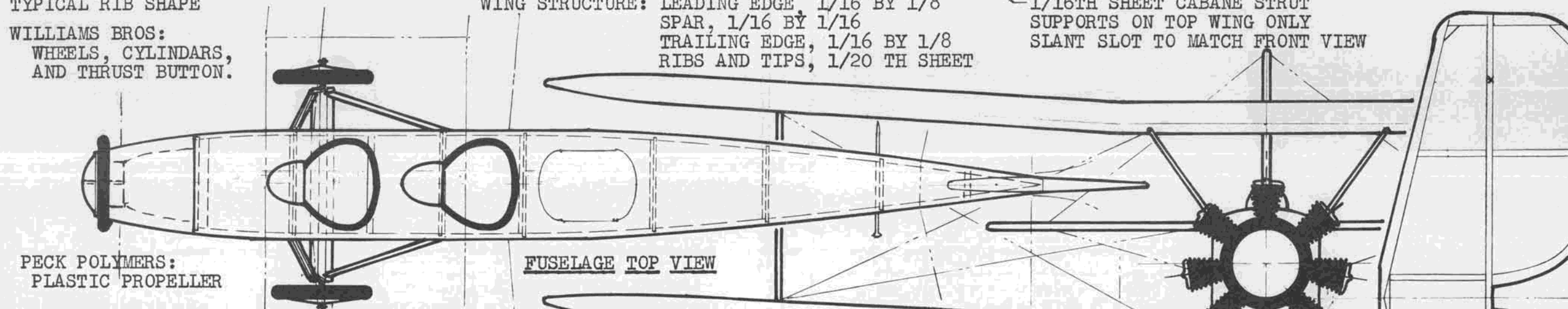


TYPICAL RIB SHAPE

WILLIAMS BROS:
WHEELS, CYLINDARS,
AND THRUST BUTTON.

WING STRUCTURE: LEADING EDGE, 1/16 BY 1/8
SPAR, 1/16 BY 1/16
TRAILING EDGE, 1/16 BY 1/8
RIBS AND TIPS, 1/20 TH SHEET

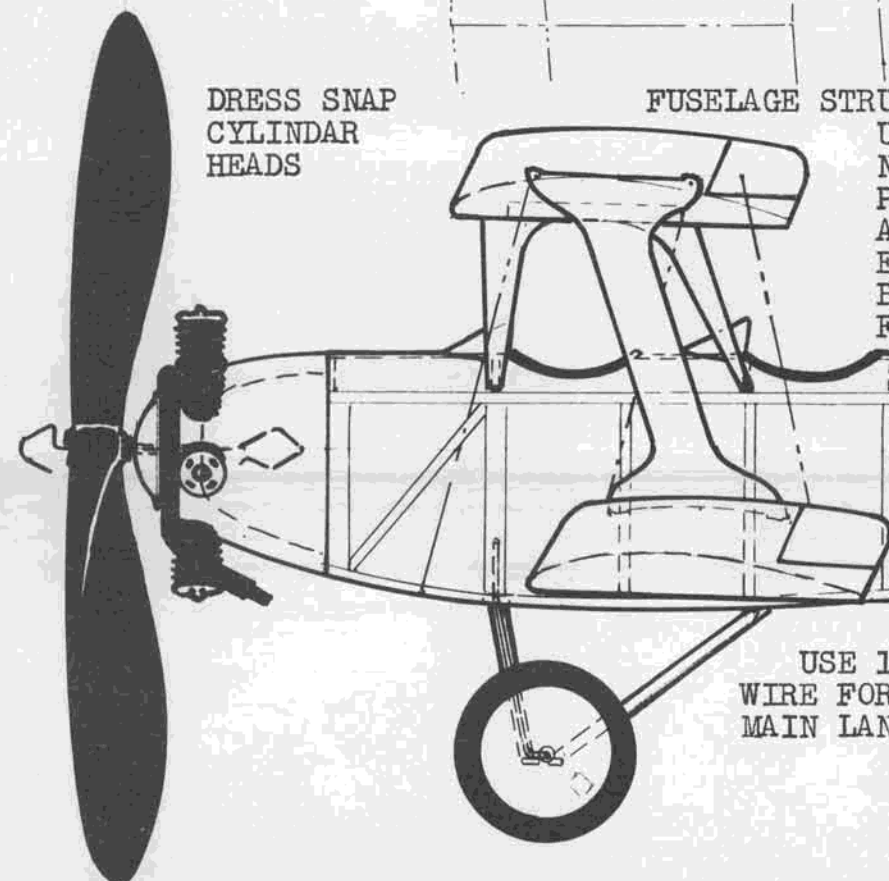
1/16TH SHEET CABANE STRUT
SUPPORTS ON TOP WING ONLY
SLANT SLOT TO MATCH FRONT VIEW



PECK POLYMERS:
PLASTIC PROPELLER

FUSELAGE TOP VIEW

DIHEDRAL

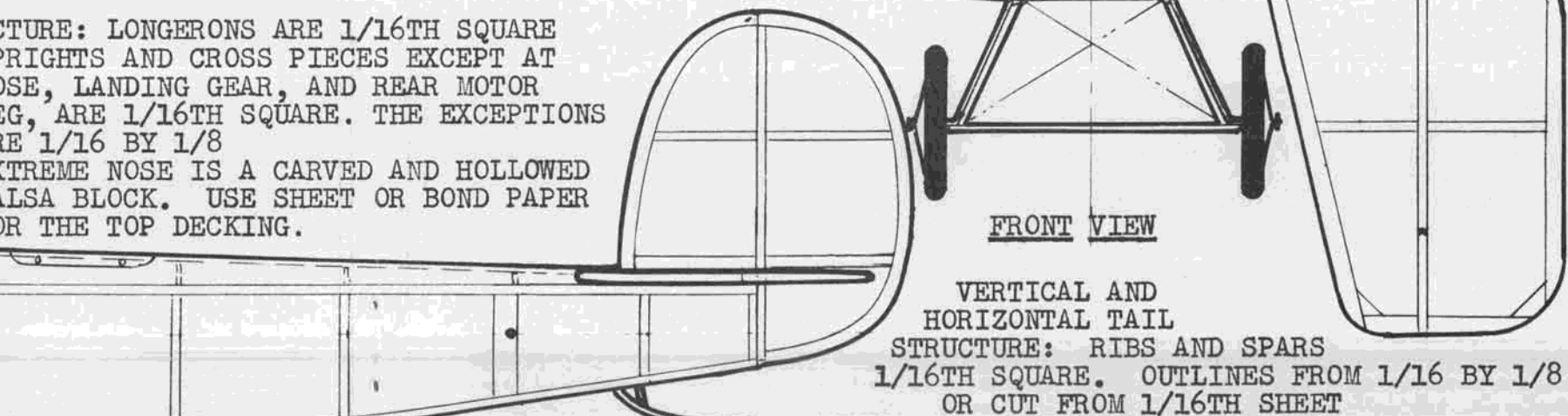


DRESS SNAP
CYLINDAR
HEADS

FUSELAGE STRUCTURE: LONGERONS ARE 1/16TH SQUARE
UPRIGHTS AND CROSS PIECES EXCEPT AT
NOSE, LANDING GEAR, AND REAR MOTOR
PEG, ARE 1/16TH SQUARE. THE EXCEPTIONS
ARE 1/16 BY 1/8
EXTREME NOSE IS A CARVED AND HOLLOWED
BALSA BLOCK. USE SHEET OR BOND PAPER
FOR THE TOP DECKING.

SIDE VIEW

USE 1/32ND OR THINNER MUSIC
WIRE FOR THE PROP SHAFT AND
MAIN LANDING GEAR STRUCTURE



FRONT VIEW

VERTICAL AND
HORIZONTAL TAIL
STRUCTURE: RIBS AND SPARS
1/16TH SQUARE. OUTLINES FROM 1/16 BY 1/8
OR CUT FROM 1/16TH SHEET

MAKE FORMERS FROM 1/32ND SHEET

CABANE STRUT TRUE SHAPE AND SIZE

MAKE ALL STRUTS FROM
THIN PLYWOOD

Udet U-12a
PEANUT SCALE
BY *Walt Mooney*

08-05-76



Sweden's Lars-G. Olofsson, current FAI Power Champion, attracted lots of attention each time he flew at the 50th Nats. A guest of MODEL BUILDER and other members of the modeling industry (see "Workbench"). Unfortunately, his head bumped the stab into DT on this launch.

FREE FLIGHT By BOB STALICK

• There is something almost perverse about completing this column late. Just yesterday, I returned from the 1976 AMA Nationals at Springfield, Ohio, and now I am talking about something other than that Nats. You will, however, find very complete coverage of the Free Flight events at the Nats in the next issue of *Model Builder*. In order to give you a few clues along the way, however, I've decided to spice up this issue with a few hints. Hope you like them.

MYSTERY MODEL FOR OCTOBER

A cabin model that competes with the pylon ships. This design, made to fly with ignition 19s or 23s is a dandy. Designed by a well-known (for the time) modeler who wanted a realistic look for his competition models, this one looks like it could do the trick. If you know the name of the model, drop it in

the mail to Bill Northrop and he will give you a choice of a neat one year subscription to MB or an Uber Skiver knife set. The only hitch is that your answer has to be the first one in the MB office (*No, Bob . . . earliest postmark! wcn*).

THREE-VIEW FOR OCTOBER: SUPER CHICK HLG

Jim Walters is perhaps best known in the N.W. as an excellent A/2 flier, but he also flies several other events. Among them are CGas, 1/2A and indoor and outdoor hand launch glider. This month's 3-view is of Jim's going Outdoor Hand Launch, the Super Chick. Using the d.t. flap principal, this model is designed to be retrieved and used again and again. The flap is bent from very thin aluminum and pinned through the top and bottom of the fuselage right

in front of the wing. The fuse is then inserted in the snuffer tube, which is underslung at the nose of the fuselage. A rubber band is wrapped around the fuse and the flap. When the fuse goes, the flap opens 90 degrees, held to that angle by a cutaway in the back of the flap itself. The model descends in a rapid spiral, and out of most thermals. Trim instructions include slight left rudder, some left stab tilt and 1/16 washin on the left main panel.

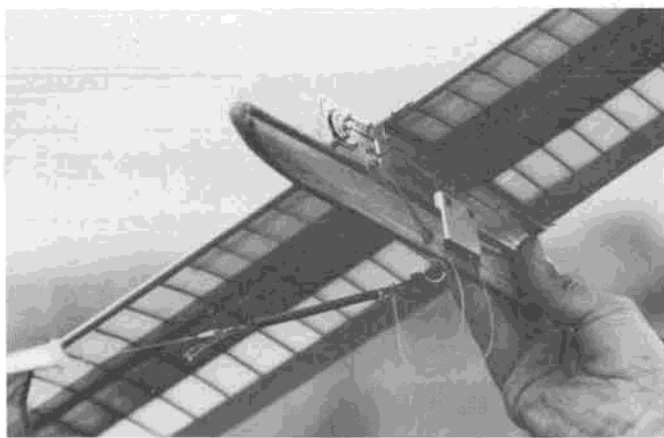
This is a good spirally stable model that is worth considering for outdoor use. The glide is excellent, with the 20 inch long wing span. Worth building.

Nats Note: The new Cox Conquest .15 is very competitive with the Rossi. More next month!

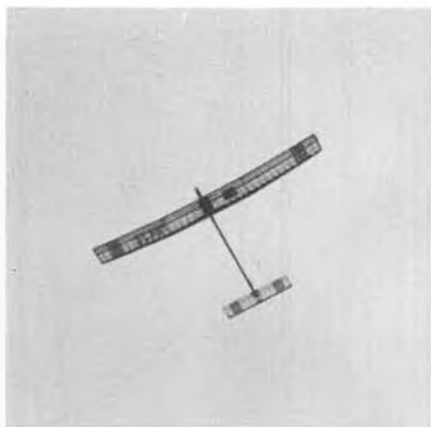
DARNED GOOD AIRFOIL--
The Lindner Wing Section



Marc Nagasawa, 1st place winner in Boeing Scholarship meet. Here he's waiting for some lift to help his Unlimited rubber ship.



Max-Aid circle tow assembly, as marketed by NFFS, mounted on Shigeru Kanegawa's A/2. Shigeru on visa from Japan.



Simplex A/2 (May '76 MB) overhead, in a thermal at Boeing Management Scholarship meet.

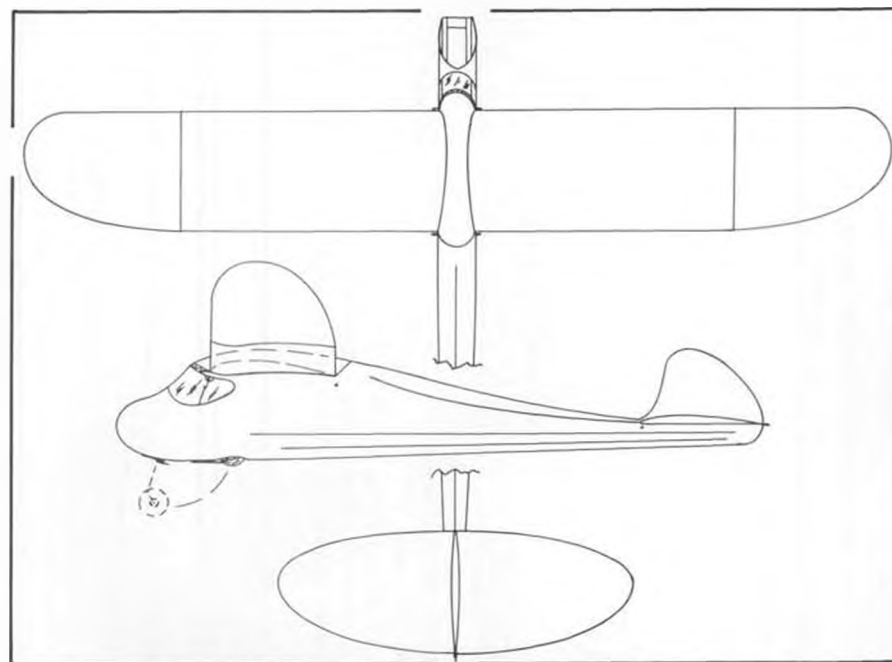
Several months ago, this column featured the Lindner stabilizer section. Finally, I have located the coordinates for the Lindner wing. This was the first of the really thin, high performance A/2 glider sections developed. As a still air airfoil, it has few peers. In fact, along with the GF6 and the B6356B, you would probably have the three best gliding airfoils currently in use. The main drawback to the Lindner would be construction of the very thin trailing edge. Best system would be to use a very wide laminated i.e. of around 1-1/4 inch width, and either a "D" box leading edge or an I-beam spar structure with 1/16 soft sheet webbing between the spars. The underside should be kept very smooth and slick, as with all Nordics, so 1/32 sheet would be worth consideration for the undercamber.

This is an excellent airfoil for your next A/2 glider . . . in fact, it might be worth experimenting with in Wakefield.

Nats Note: What engine was powering the B gas models which were ripping up the sky and passing even the best modified S.T. 23s? One hint: try to buy the new K&B 3.5 cc (.21) for your new small B ship. Out of the box, it's more competitive than any other.

1977 SYMPOSIUM

You haven't even bought the 1976 version of the NFFS Symposium yet? You can do so by dropping a 6 dollar bill, along with 50¢ in postage, to Lawrence Jordan, c/o NFFS Publications, 641 Diamond Hts. Blvd., San Francisco, CA. 94131. Inside the new report, you will not only find the top ten models of the year, but also a series



OCTOBER'S MYSTERY MODEL

of learned and comprehensive articles about our favorite activity.

At any rate, the 1977 NFFS Symposium is now seeking submissions, so if you have some information that covers some aspect of the science or art of free-flight models, including technical studies, practical design and engineering as applied to models, new or unusual model aircraft developments, or historical items, drop a line to: Robert P. Dodds, editor, Box 436, Rancho Santa Fe, CA. 92067.

Send a title of your proposed paper together with an abstract of 200 words or more, or a complete paper if it is available. Abstracts should be submitted as soon as possible and hopefully before October 15. The editor this year would like to have a complete list of the material to be published by December 15, 1976.

If you have a nomination for the Ten Models of the Year, contact Clarence Mather, editor, 3860 Ecochee Ave., San Diego, CA. 92117. Why sit on the sidelines and wait when you can get in and participate?

Nats Note: What famous old time Nationals participant (who hasn't missed a Nats in over 35 years) showed up with a new 1/2A power design? Try the



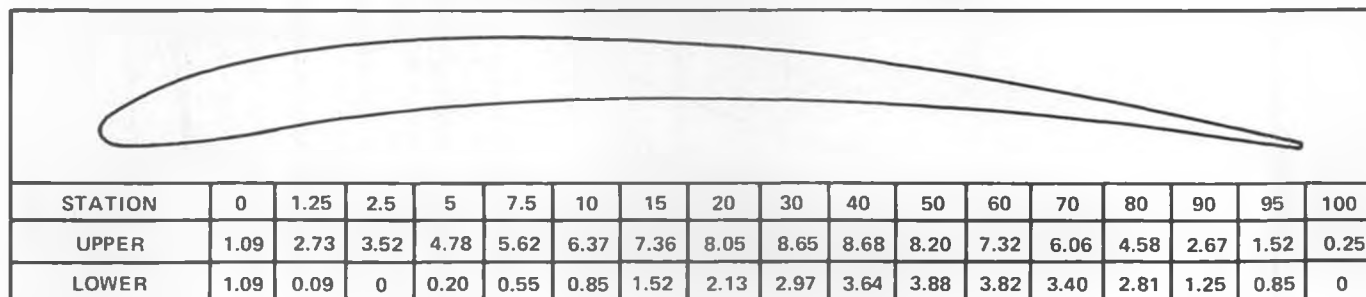
Marty Phillips, last year's 1st place Scholarship winner, with Unlimited Dragmaster A/2.

initials C.G. on for size. (No, it's not Casper Greenspoon. Try again! wcn).

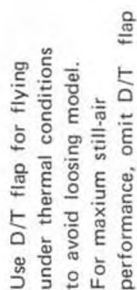
BOEING MANAGEMENT ASSOCIATION SCHOLARSHIP CONTEST RESULTS

Held on July 10 and 11 this year at the Kent Space Center grounds, this year's meet drew 64 contestants from the 18 years old and under crowd. This represents a 2 contestant increase from

DARNED GOOD AIRFOIL — LINDNER



20 in. OUTDOOR HAND LAUNCHED GLIDER



last year, but still less than the nearly 100 who participated four or five years ago. Nonetheless, the weather cooperated by keeping the winds down to moderate speed and the temperature in the high 60s and low 70s. Lift was light and difficult to find, but it was there. In all, a perfect two days for competition.

The indoor events were held in a building that had a reasonably clean ceiling with a height of around 80 feet, but the sides of the building were very cluttered and there just wasn't much floor area. Consequently, many models were suffering intense hangar rash before the indoor events ended. However, eventual scholarship winner Marc Nagasawa had little trouble in either hand launch glider or EZB, winning both with apparent ease.

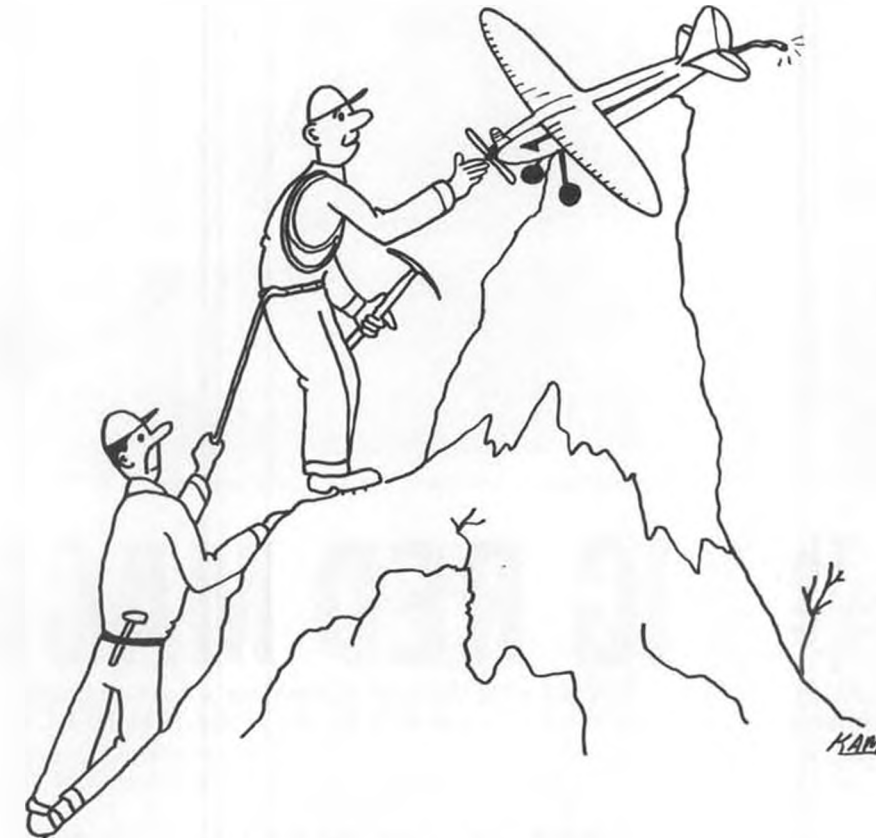
Last year's winner, Marty Phillips, ended up in second place this year. The winners:

1. Marc Nagasawa, \$1500 scholarship.
 2. Marty Phillips, \$1000 scholarship.
 3. Kevin Delaney, \$500 scholarship.
 4. Mike Cameron, \$250 scholarship.
- Plan to attend next year. The meet is excellently run and has good trophies in addition to the fine scholarship awards.

Nats Note: Which famous model club swept all three first places in the FAI events at the Nats? Hint, they fly at Bong Field, Wisconsin.

K&W PROP BRAKE SERVICING

After knocking off the cork brake liner from my K&W prop brake, I fiddled and fretted about how best to re-attach it so that it would be as servicable as new. Without instructions on the package, it was kind of a hit-and-miss, by-guess and by-golly, operation. Well, finally I decided to drop Tom Kerr a line to find out the real scoop. After a few days had passed, my impatience caught up with me and I went ahead and cleaned the surfaces down with alcohol and lightly sanded



"You really should cut your DT fuses a bit shorter!"

the delrin brake face. Then, using Hot Stuff, I glued the brake shoe material into place. Several days later, this note appeared from Tom:

1. Cut off the old shoe material.
2. Clean with alcohol until all the lubricant is gone.
3. Clean with degreasing solvent such as freon.
4. Apply brake shoe material using Hot Stuff.

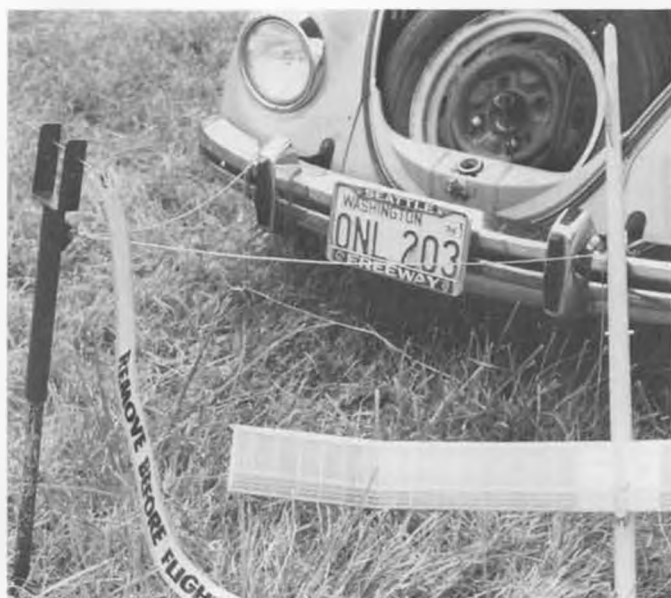
Nothing to it. If your brake shoe material has worn out, Tom sells it, too. Drop

him a line with some bucks at K&W Enterprises, P.O. Box 18895, Philadelphia, PA. 19119.

Nats Note: Even though the Cox 40 is a going engine, don't expect to see them on your local hobby dealer's shelf for several months. Cox is still working out the final details, but if Doug Galbreath's is any indication, the wait will be well worth it.

DESIGN YOUR OWN
AMA GAS MODEL - Part IV

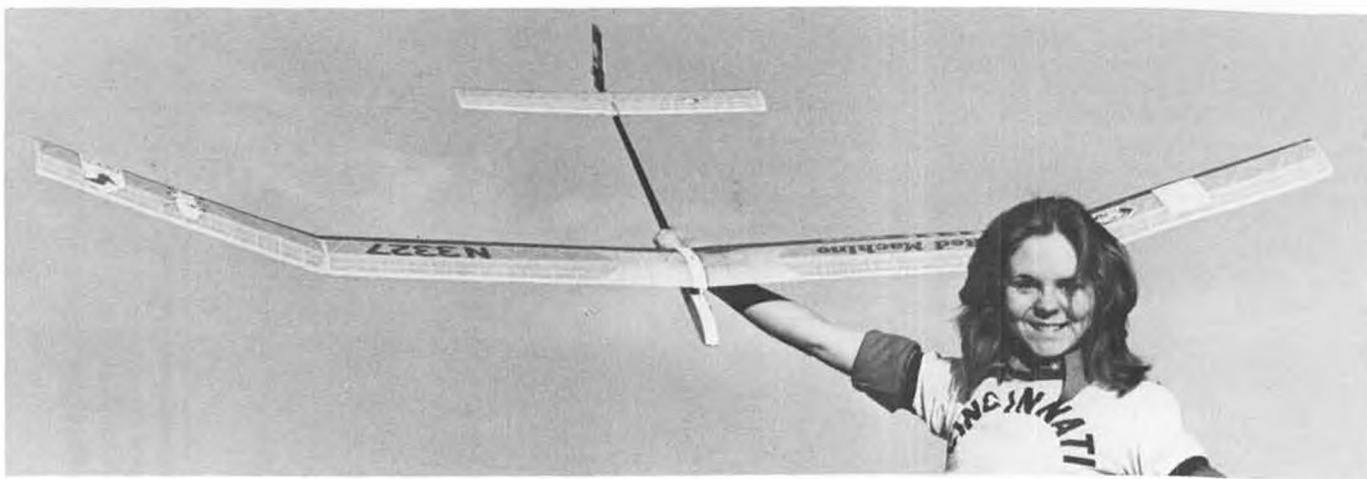
Continued on page 92



Dick Stark flew Unlimited rubber at the Boeing contest. His winding pin has warning ribbon with pertinent message.



Twice we shot pictures of Lars Olofsson and caught him hitting the back of his head with the stab when launching. No damage done.



Two of Jim Haught's favorites; his fiancée, Lisa Heath, and his trophy winning A/2, the "Big Red Machine".

The **BIG RED MACHINE**

By JIM HAUGHT . . . Named after the author/designer's favorite baseball team, the model and the team were champions last year. BRM took first in A/2 Nordic at the 1975 NFFC in Taft, California.

• This model was designed as my concept of an intermediate step between an "easy" type of Nordic, such as the "Dove," designed by Bill Schieman and the world championship class Nordic, such as those flown by my friend Don Chancey.

I felt that I was ready to advance beyond the basic Nordic types, but was not quite prepared for an all-out effort such as one of Don's models. So, I aimed for a fairly high performance model, using simplified methods of the latest Nordic technology.

The result of this effort is the model presented here, named in honor of my favorite baseball team. It might be said that both Big Red Machines did well in 1975, the model maxed-out at Taft in

May to help me win the Grand Championship, and the baseball team won the World Championship!

I do not claim that this is the world's greatest model, but I feel that at least the reader can glean a few hints and tips from my model to further his own Nordic efforts. If this model helps others to gain some of the enjoyment I have from Nordic flying, then it has been an unqualified success.

CONSTRUCTION

The wings, of course, are the heart of any Nordic, and therefore must have considerable time lavished upon them. Spare no effort to make them as strong and evenly matched as possible.

The ribs are cut from very hard C-grain sheet. A few of the lightest ribs

should be saved for use in the wingtips, where strength is not critical and weight saving is important. Be sure all ribs are beveled carefully and fit exactly. With the type of construction shown, no force-fitting or looseness of parts is tolerable, as warps will inevitably follow.

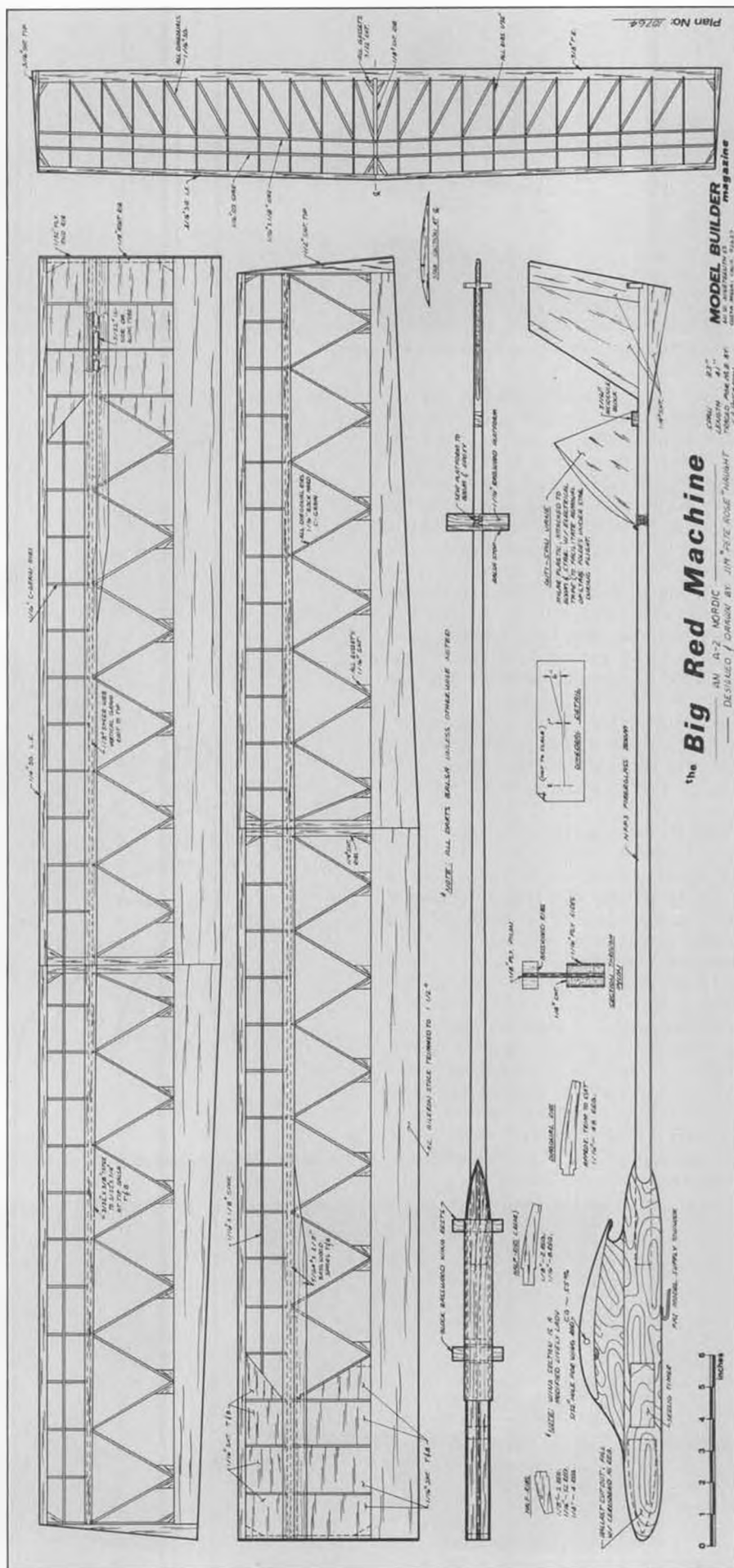
The I-beam spars are assembled before being placed on the plans, using 5-minute epoxy for assembly. After the wing framework is assembled, the spars are sanded flush with the ribs.

Titebond or other aliphatic resin glues are recommended for all basic structural joints. It gives the joints a very slight degree of flexibility. By the way, all joints should receive an extra coat of glue just prior to final sanding.



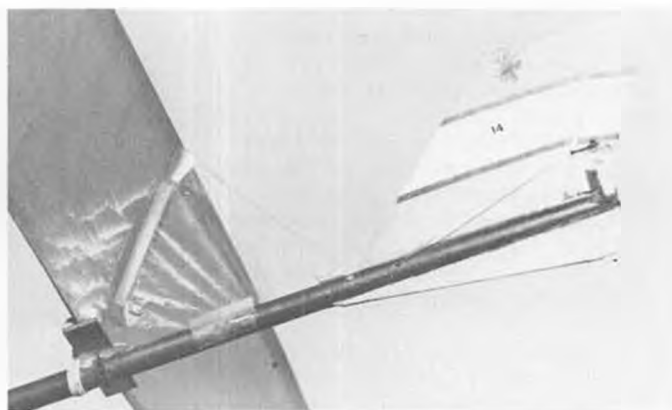
Another of Jim's favorites is the 1975 World Champion Cincinnati baseball team. At the moment, they're not doing too bad this year either, being 8 games ahead of the 2nd place Dodgers at the time of this caption (Sept. 8). Obviously, the plane is covered in red and white tissue!

Fuselage: NFFS sells excellent fiberglass booms, which make fuselage construction a snap. Simply attach the boom to the plywood keel with 5-minute epoxy, add the front pod pieces and fair the boom to the front of the fuselage with Epoxolite fillet material. Finish the front end with several coats of lacquer sealer, topped with a coat of colored epoxy.





C'mon, Jim, you can't get any flying done that way!



Mylar anti-spin vane is attached with electrical tape after stab is rubber banded in place. Photo also shows auto-rudder hook-up.

point, using Cerrobend for ballast material. Check all warps and incidence settings to be sure they are as indicated.

Flying: It's rather a difficult proposition to trim a Nordic by hand gliding, but there really is no other way to establish initial trim, aside from taking a rather large gamble and towing the model without any glide tests.

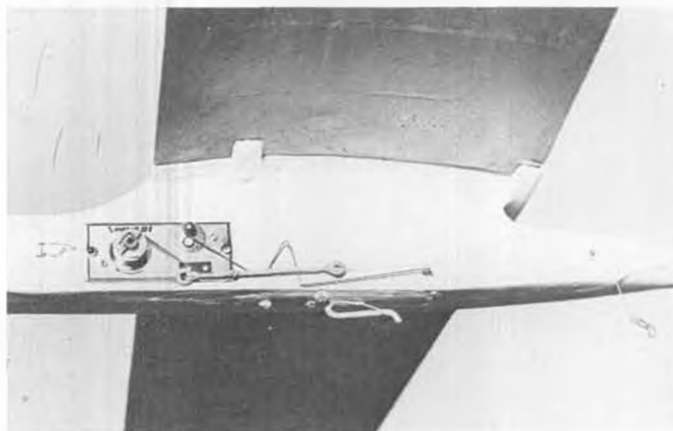
About all one can expect to accomplish in glide tests is to assure sufficient incidence and ascertain that the glide circle is in the proper direction and not too small in diameter. What we desire to avoid is too little incidence, causing a dive, and/or too small a glide circle, causing a spin. If the model is a little stally to begin with, that's fine . . . If not, it may destroy itself on the first tow trial.

After hand gliding has been completed, set the model's timer for about 15 seconds, and place the autorudder in a neutral position for tow. If all goes as it should, only minor incidence and rudder adjustments will be needed to complete flight trim.

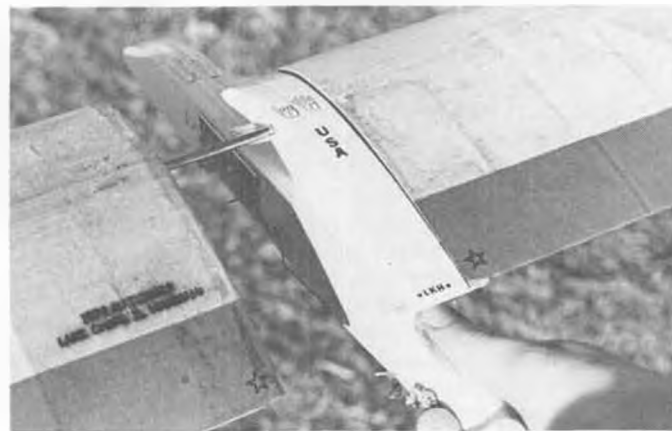
Once basic trim has been accomplished, practice as much as possible with the model to learn its habits and performance potential. Again, I do not claim the model is a world beater but I think it will perform well for you in all conditions. If it performs as well as its namesake, then it will DEFINITELY be a world beater, and I hope a source of many hours of enjoyable flying. ●



"I've never needed a motorcycle . . . my models never go far enough to chase by motorcycle."



Single-wire wing mounting system. Taps protruding from under center section control incidence angle.



Timer installation and self-start wire. Also FAI Model Supply hook and keeper wire. Hand points to timer, reminds pilot to set it up.



Newport 12 Meter, sailing in Newport Beach Harbor. LOA 72". For info, write to 440 East 17th St., Costa Mesa, California 92627.

STRICTLY SAIL

By ROD CARR

and get soaked to the skin, but it's the only way. Those who have the most to gain are the skippers of the full-keeled one-designs such as the 12-meter boats. The relatively shallow keel depths coupled with low ballast ratios make the EC/12's and the Newports quite tender, as well as the big J's. The immediate heel they experience makes the effectiveness of the rudder decrease drastically. This reduces the ease with which the boats can be tacked, which was already difficult. All-in-all, heavy air will take its toll of these hulls first, unless preparation and practice are brought to bear. The large sail areas put a severe strain on the rigging. But isn't it better to watch a shroud pull out of the deck during a practice start than in the middle of a 10-boat Divisional Championship? I try to get my boats out as early as the weather permits (meaning no ice), and that is often late January here in northern Virginia.

What does consistent survival mean? In my book it means that I can tack the boat at will, and that I choose a moment of relative calm, with good boat speed, to insure a successful tack. Too many skippers kill all their way with continual hard rudder applications and then are blown into irons. In the last regatta of this type I watched, two EC/12's were going to weather side by side. The windward one tacked just before a gust hit, the other waited 'till the gust arrived and then tried to tack in the middle of it, lost way, was blown back, and didn't have the sense to shift his helm so that his backwards drift would have carried the boat through the tack. By the time he got underway again and tacked, the distance between the boats was far in excess of 20 boat lengths. I think he would have done better if he had just postponed his tack until after the gust passed (it was easily predictable by its darkening of the water, and the pro-

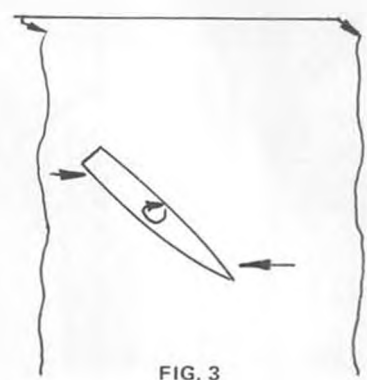
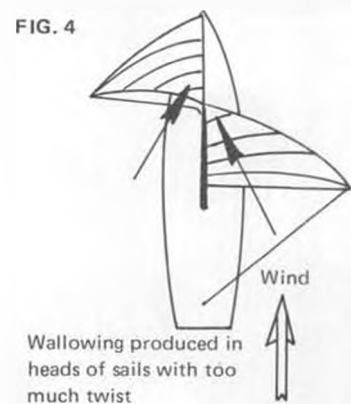
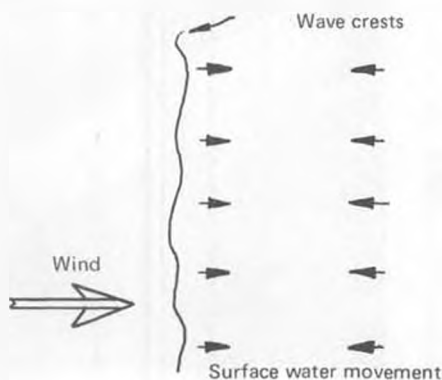
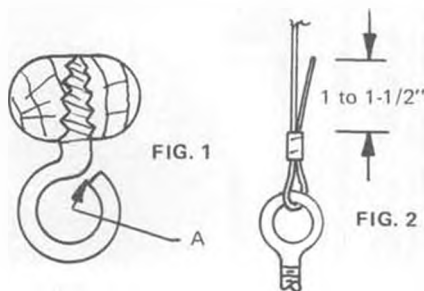
nounced knockdown that the first tacker encountered). He might have luffed up some in the gust, (while the other fellow wallowed) then tacked and been nearer the mark, ending up only a little, if any, behind.

The point remains, sail in the heaviest air you can find. If you find that something breaks, it's better now than later. A prime candidate for failure is the simple-minded approach many people take of winding screw eyes into booms and clubs. See Figure 1. This makes for a real weak spot in the member. Options are to make the beam bigger, drill a pilot hole for the fastener and epoxy it in place to reinforce the area, or redesign the attachment method to avoid piercing the boom. One tip, if you are using such eyes for sheet leads, solder the eye shut at "A" to avoid throwing the sheet off in the thrashing of heavy air sailing. A second problem that occurs often is at the stay terminations. (Figure 2.) Con-

trive to leave an inch or so of extra stay-wire above the swaging sleeve. One finds that the plastic coating can give up the ghost and allow the wire to pull out without the extra to jam up in the sleeve. Tape the "pigtail" if you don't think that it looks shipshape.

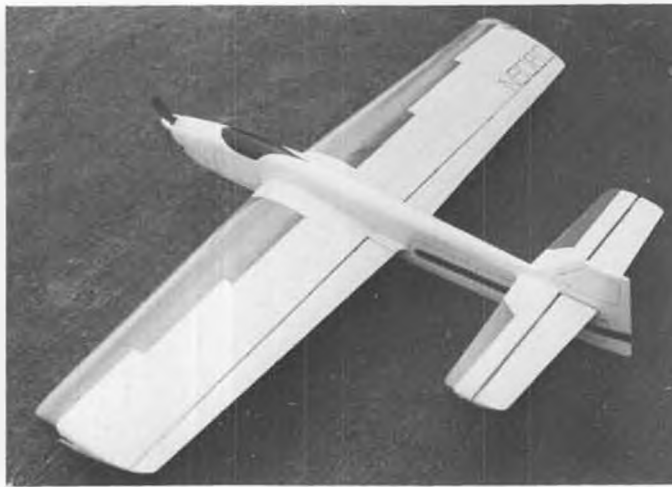
● Heavy air sailing can be fun. Success in dealing with wind and waves can produce trophies just as big as the sunny day regattas, and in this case, concentration on the construction of your boat and its preparation is more important than a finely honed appreciation of racing tactics. Most of these blustery events are won by somebody who merely survived the heats that he sailed. He always finished the heats, and was usually in the top few. As the day blew on he emerged the winner through a policy of *consistent survival*. Where does this kind of ability come from? More important, how can you take advantage of it?

First and foremost in preparation for such regattas is the familiarity which comes from practice in heavy air conditions. Let's face it, it is not pleasant to go out on a stormy Sunday afternoon





The Number 1 1/2A stunter for 1976 is Bob Whitely's "Lil Miss Kell". See text for details.



Frank McMillan flew this "Impulse 2" at the 50th Nats. Features foam wings by Bob Hunt. Weight 12 oz., wing area 220 sq. in.

The 1/2-A SCENE

By LARRY RINGER

Thursday, August 5, 1976.

● I'm sitting in O'Hare Airport waiting for the connecting flight to Dayton. Destination: The Nat's. Purpose: Observe, learn and record. Equipment: Paper, pen, and Pentax Camera.

Three days ago, this trip was a faint hope and wistful wish, but the Gods of finance and budgeting at Cox relented and I'm on my way. Fortunately Cox likes to stay abreast of the latest developments in the competition world, so even though my job involves ready-to-fly/run products, I am off to do a bit of "research."

Prime events I want to observe are the 1/2A Free-Flight and 1/2A Control-Line aerobatics events. This month I'll deal with what's new in 1/2A Stunt. If this column is a bit ragged, forgive me . . . it is due in at *Model Builder* the morning after I return, with no time for thorough proof reading, re-write, or going back for more detail.

Half-A Stunt has been around for a very long time. The first kits of which I am aware were the Guillow's Baby Barnstormer, Southwestern Models 1/2A Snapper, and two "Zilch" series models by Berkeley. These models were good trainers, but none capable of, say a Square Eight, let alone an Hourglass. The more recent kits have been several each by Carl Goldberg, Top Flite, and

Dumas. Generally, the more recent kits have been profile models of about 110 to 130 sq. in. in wing area.

Jim Walker Models was way ahead of its time with the Aerofoam wing series: Firebird, Firebrand and Firebat. These had a 175 sq. in. wings with a really good airfoil, and all weighed under 7 ounces. The company has been sold twice, and I don't know if the kits are still made. Their performance was outstanding!

WAM Club, in Northern California, has held 1/2A Stunt contests for years, but some of their rules were rather restrictive, I'm told. This could be a vicious rumor, so how about some one up there sending me the rules in order to set the record straight. Anyway, as I hear tell, they tended to be limited to



Richard Porter and his amazing "Voo Doo". Did inverted triangles under 20° in practice!



Dave Fitzgerald topped all Juniors with his "Lis Tom Tom" from Dumas kit.



John Davis and his own "Mini Star" design. Very fast, with 34" span, 205 sq. in. area.

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Semi-Stunt scale models.

Starting in 1974, L.M. Cox began sponsoring 1/2A Precision Control-Line Aerobatics as an unofficial event at the Nationals. To kick it off, we gave away 60 brand new Super Stunters to anyone entered in Stunt who wanted to fly our event. Everyone enjoyed the flying and was astounded that, first, a 1/2A model really could fly the pattern, and second, that a 1/2A Ready-to-Fly could fly the pattern.

By 1975, the Super Stunter was obsolete as a competitive model, Keith Trostle's TERCEL won the day.

I can't wait to see what they are up to this year! More later . . . Sunday, August 9, 1976.

Back again, pen in hand, the big silver bird polluting our way back to Smogtown. Half-A Stunt was flown yesterday. Weather conditions were awful, with a cold wind blowing a minimum of 10 mph, and up to 25 mph. Despite this, there were about 25 fliers who showed up from the 35 who pre-entered.

Since my intent with this column is to help push up the general level of competence and improve the state of the art, I'll not get into a full contest report. The following will cover the planes, and the directions of progress.

Junior and Senior entrants almost exclusively flew Super Stunters. The exceptions were a variety of 1/2A kit models. Their models will do the pattern, but only with difficulty. The important thing with this group is that the young fliers were there to compete. Only one or two had competed in the regular stunt event. Reduced cost and complexity, plus the more relaxed atmosphere of 1/2A flying, brought them out in bunches. Also, Cox donated 20 Super Stunters for Juniors and Seniors to use. Due to the wind conditions, the young fliers were having a rough time, so few of their models went home undamaged.

The Open event was a completely different story. These fliers have really begun to get serious about 1/2A Precision Aerobatics. The airplanes were decidedly competitive aerobatic machines, not just slap-dash sport

models. In general, they used uniflo fuel tanks and adjustable lead-outs. Keith Trostle even had a fully adjustable control system which allowed tuning flap-to-elevator ratio and position.

Top flight score in this two-round contest was flown by Bob Whitely using his "Lil Miss Kell." At 165 sq. in. wing area and 10-1/2 ounce weight, Bob cranked his engine up to full r.p.m. and smoked through a fast pattern. He normally flies much slower, but the wind made that impossible at this contest. Bob had removed his muffler, the tail weight it required, and all his tip weight, just before bringing his model to the Nats. (His wings are different length by 1 inch.) He said that the 1-1/2 ounce weight reduction made all the difference in how his model flew. "Lil Miss Kell" features a built-up wing with 1/32 sheeting used over the leading edge. The model was tissueed and then a minimum dope finish used. Bob did his usual good looking decor scheme, so he had one of the two best looking 1/2A models flown.

Second place honors went to Rich Porter. Here, we saw a totally different approach to the problem of stunt performance, as his airplane was a full-size, 350 sq. in. Voo Doo! Construction was 1/32 wood and thin Mylar covering, for an all-up weight of 10-1/2 ounces. The engine was offset 20° and ran on

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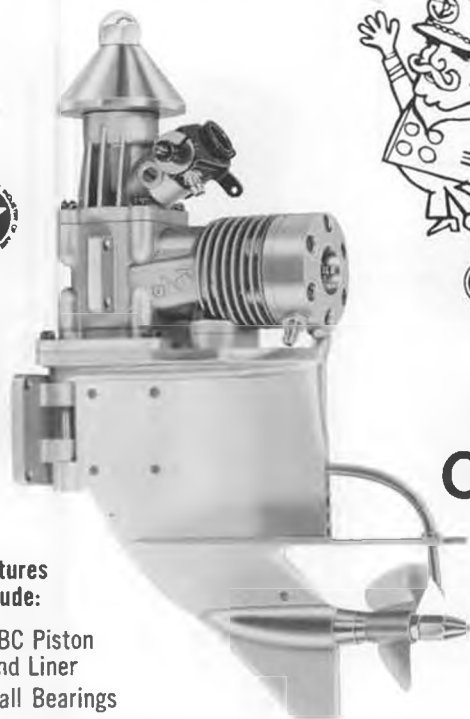
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pen bladder pressure, and in addition, he flew clockwise. Due to the very low wing loading and extreme engine offset, the model flew on 52 ft. of .012 control line. Despite the consensus that a stunt model should look like an airplane and be pretty. I am happy to report that the judges gave a fair flight scoring of this most unusual model.

Third place airplane was Keith Trostle's "TERCEL." This model was published in September 1976 "Model Aviation." Last year, this same model took first place when flown by Bart Klapinski. Keith's model is still in good flying condition despite its age. Keith suffered a "flame-out" in the middle of

his Four Leaf Clover in the second round, so his two-flight total was not quite as high as it could have been. The Tercel weighs 10-1/2 ounces and has a 210 sq. in. wing of 20% thickness including flaps.

There were several other interesting airplanes as shown in the photographs.

So what did we learn? First, 1/2A contests can be held successfully in the wind. Small models are only slightly harder to fly than the "Monsters." Second, everyone feels that the power available from the Tee Dee .049 warrants use of larger models than were used this year. The estimates for what to try range from 230 up to as high as 275 sq.

in. Third, weights are felt to be correct at around 11 to 12 ounces. Fourth, most fliers feel that a longer tail moment is required. Scale down from the big stunters seems to produce too sensitive a model.

Areas of great unknown are: prop and fuel, combined with state of engine tune, control sensitivity, and ideal line length. All we can do is keep on developing and see where we are next year. In the meantime, send pictures and keep me posted on your progress.

Soaring Continued from page 16

creasing the dihedral for the remainder of that flight. From time to time the loud crack of spars was followed by the separate descent of parts that had gone up as a single aircraft.

Mike Broadbent, of the "Canadian Contingent," brought out a new plane with swept wing and V-tail, designed by Sean Bannister. Two channels drive this 2-1/2 pound undercambered, swept-wing configuration. It shows interesting possibilities. Without explanation, Mike calls this plane "Algebra."

Bob Miller, of Urbana, Illinois, also produced an interesting original design, this one based on a canard configuration. This six foot wingspan bird clearly shows its free flight heritage. Bob has experimented with canards of different area. This particular one is 1/3 the wing area. Unfortunately, the high winds prevented this beauty from fully demonstrating its specialty.

Don Vanderplow carries his sailplanes in his specially rigged station wagon. Rubber covered rods are mounted cross-wise high in the body of his car. He tapes the wings and inverted fuselages to these rods in a neat and secure fashion. Here's a good way to save space on the way to any contest or fun fly.

Sid Axelrod entered the Top Sailer designed by Ken Willard. After a guided tour of this plane, Sid went on to provide some hints on how to use his product, Monokote. For large decorations, cut to the desired shapes then separate the Monokote from its backing and use some detergent to wash the surface. Place the Monokote on the surface and squeegee out any air bubbles. It dries smooth and stays fixed. I'll remember that tip.

It's difficult to see planes when they're high and far into the haze and fog. Larry D'Attilio noted that you can see them much better by looking through a deep red filter (No. 25 or 29). He suggests the use of red sun glasses to cut the scatter of blue light under fog conditions. He claims that this generally increases the visibility of your sailplane. Larry failed to comment on the pilot's appearance when wearing such sun glasses. If you try this trick you'd better be prepared for some cute comments.

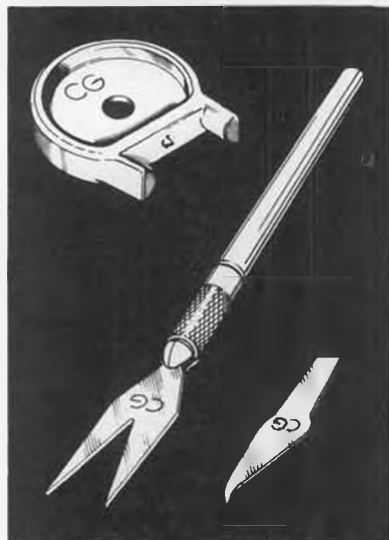
Bob Miller, of Dayton, Ohio, Con-



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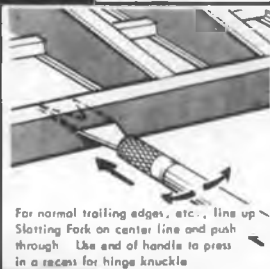
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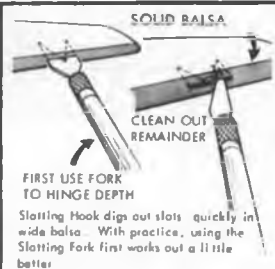
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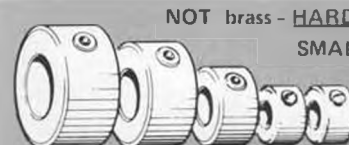


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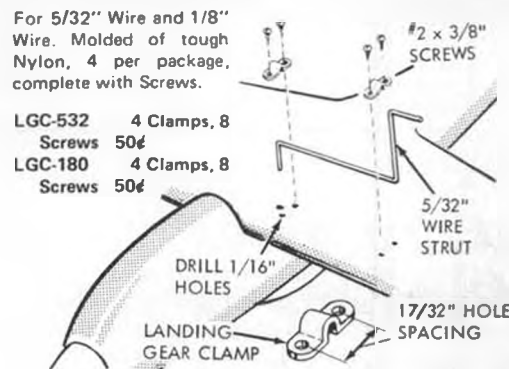
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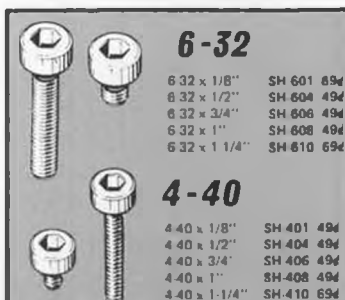
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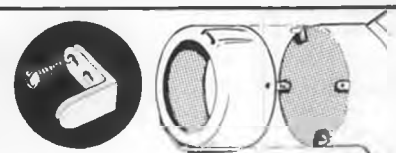
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test Director for the A.M.A. SOARING NATS, also took part in this contest. His sailplane is covered in black . . . all black. I asked whether this was to indicate a state of mourning. His answer was that at the time he covered it, no other planes were solid black . . . "and that's sufficient justification." He calls this plane Shadow. It's of 158 inch span, 1440 square inch wing area, weighs six pounds and is of fully sheeted geodetic construction.

Dave Kneeland (*Does this name ring a bell with any free fliers from a few years ago? wcn*) of Huntsville, Alabama introduced me to his Leptoplis Dubious (but refused to translate the name).

Here is an F.A.I. maximum area sailplane with 14-1/2 foot polyhedral wings (Gottengen 795 airfoil) having a 12-1/2 inch chord. It has inboard flaperons and a vortex shield which serves to cut down the turbulence generated at the outboard end of the flaps when they are in their down position. He uses five channels to operate this ten pounds of aircraft. With full ballast it weighs 14 pounds. The wings are constructed of foam-filled wood over an aluminum spar, all this being covered with two millimeter ply. Dave intends this bird for cross-country flight. Let's watch this new challenger.

Stan Pfost entered his original design,

the Buzzard, and scored well (as expected). Here's a man who had open heart surgery (a double by-pass) last December. You can tell the operation was a success with his new lease on life. Stan was Contest Director at the Tangerine Model Air Races, Orlando, Florida, and is Secretary of the National Soaring Society. In real life he's a dentist, but he doesn't let that interfere with his flying activities.

Stan showed me some clever tricks. He drives his spoilers through Dubro Rivet Ball Links. These fittings make it easy to set up for flight, they ensure slop-free control, and ease of disassembly when it's time to go home. He also uses the Dumas R-4 Rudder Arm with an 1/8 inch shaft with a wire extension soldered in place to couple his flaps to their servo. He won't miss the chance to tell you that he's enthusiastic about using the Bard Parker No. 6 knife, with carbon rib back blade No. 25. You see, Stan uses this knife in his dental laboratory . . . so why not at home as well. (*Been using one for years. They're great! wcn*).

Fred Zoller, of Mexico, introduced an original design entitled "The Tiburon". This flat fiberglass fuselage sailplane weighed in at 34 ounces. The wings are of 100 inch span (700 square inch area) and have separate flaps and ailerons . . . overall, a very modernistic design.

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Weather conditions being what they were, the Suds City Team established their hangar under the fuselage of a DC-3. Can't think of a more appropriate setting.

The scale competition was of particular interest, with specialized antique designs looking very real in flight.

At the end of the day, Lee Renaud demonstrated the electric flight of his Olympic II, using a folding prop. A slight whirr was the only sound as this craft climbed steadily to altitude. A radio signal shut off the electric motor, and the Olympic went on to soar with the propeller offering no air resistance. The pilot can reinitiate lift any time. Here's a way to launch in a restricted area and still get the most out of soaring.

The Callisto, by John Remmer, of Victoria, Texas, displayed a three inch wide spoiler flap (see a recent issue of "Model Aviation"). This aircraft, of 122 inch span, 13 inch chord, weighs 54 ounces, and is covered in inexpensive mylar film produced by the Darby Corporation. This material accepts decorations and looks good. A torque rod actuates the flap spoilers, which effectively bring the craft down to the landing site.

Some ingenious mechanisms were demonstrated. For example, Gary Bussel demonstrated a compound rudder on his Challenger. Ed Byrne and Jerry Mrlik offered convenient means for driving

their spoilers. Ed's technique used movable set screws on a longitudinal sliding rod. Jerry Mrlik's device requires no separate hook-up of the spoilers. Mount the wings to the fuselage and the push rods actuate the spoilers automatically. Bob Hand, President of the Tri-State Soaring Society, came equipped with his "glider support case and tool box." It was suitably decorated in red, white and blue for the Bicentennial occasion. Bob Gill won the Technical Achievement Award with a releasable tow-hook that can be easily added to most sailplanes. It's simple, reliable and most effective. Although there were many new, interesting devices, no one demonstrated an

antigravity machine.

Frank Deis took part in much of the activity, including some post mortems on flights that ended prematurely. He also gave a demonstration of night flight using a Cyalume tube under each wing, with one attached to the parachute of the tow line. When it came time to land, I was glad his hand was on the stick rather than mine.

Before the contest, there was the Great Bicentennial R/C Sailplane Race . . . a competition between teams with red, white and blue sailplanes attempting to complete a cross-country closed course over "hill and dale" . . . really more like "forest and high tension



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lines." The Milwaukee team headed by Ron Kopp, won an award for the most patriotic sailplane. The longest single flight of 17.6 miles was logged by Jeff Mrlik, and the winning team was headed by Warren Tiahart of the Greater Detroit Soaring and Hiking Society (with a time of four hours and twelve minutes achieved with 14 launches). Only four of the original 12 teams finished the race. From what I hear, it took a tremendous amount of effort to stay on course and make headway. Nevertheless, there was marked enthusiasm for a repeat of this event and, in fact, for other cross-country sailplane races to be sponsored by different clubs.

Grand Champion for this year was Rick Pearson, with Dwight Holley, Don Edberg, Ray Hayes and Lemon Payne runners up, in that order. Colonel Bob Thacker won the scale event and also flew his straight-winged (that is constant dihedral) Hobie Hawk. He believes that the elliptical plan form is sufficient to achieve the desired distribution of lift.

It takes a sense of security to be active in R/C Soaring (and model activities in general). It's bad enough when the neighbors give you that "he's going out to play with his toy" look, but what do you say when they ask, "You mean you're going to travel all the way to Chicago just to fly a model sailplane?"

You must be kidding!" Their comment would be even more cutting if they knew the kind of weather we faced for the SOAR NATS this year.

But our dedication and understanding of what takes place in such an event overcomes their jibes. Here is a sport wherein keen competition is coupled with cooperation at every step. You find friends and acquaintances . . . fellow competitors, helping you find that thermal and land at the proper time. Almost 200 contestants met for this year's SOAR NATS and despite the weather difficulties, ended with a new feeling of friendship and good will. It felt especially good to welcome teams from Canada and Mexico.

Good thing I went on this trip. This way I couldn't take part in the local Torrey Pines Gulls Pro-Am Contest. You see, my son, David, placed third among the Pros and ninth overall. I'm not sure I could do as well. In any case, no more flying advice from the "old man." •

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F/F Scale . . . Continued from page 47

too weak. Open needle-valve about another 1/4 turn, choke engine and re-start.

2. Engine slows down and runs back and forth or stops. Probable cause . . . mixture too rich and/or compression too high. Close needle-valve and reduce compression. Flick the prop to get rid

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of excess fuel, then open the needle-valve to a lower setting and re-start.

3. Engine runs but misfires. Probable cause . . . under-compressed. Increase compression.

4. Engine runs but with smoky and oily exhaust, and with loss of power. Probable cause . . . mixture too rich. Close needle-valve slowly until running improves.

Well, almost in a nutshell you have the ABC's of dieseling. Okay, now why should one use diesels for scale F/F modeling? First, and not necessarily in the order of importance is that you do not have to fuel-proof your models. That in itself is a big plus. In reality, there is no real fuel-proof paint, though some tend to resist it better than others. Since I use nothing but nitrate dope and Floquil paints, I have nothing to fear from diesel fuels. Secondly, diesels can handle much larger diameter propellers, which in turn provide a slower, realistic flight pattern for your scale model. Third, you can use a smaller displacement diesel than comparable glow engine. For example, if you wanted to use a .15 glow engine, you could use an .09 diesel; for an .049 glow engine, you could use a .036 diesel. It is not uncommon to see forty-inch plus wing-span scale models powered by an .036 diesel. Fourth, diesels are much more economical in their fuel consumption than their glow counterparts.

The next question; what is available and from where? There are all kinds of different diesels available, and from a variety of countries, but our consideration should be easy availability for both engine and parts. I highly recommend the English diesels, both for their availability and reliability. There are three well-known English manufacturers. One is M.E. Engines (Moore Engineering Ltd.), another is Davies-Charlton Ltd. . . . perhaps this is the best known . . . and P.A.W. (Progress Aero Works). M.E. offers the Heron which has a .059 cu. in. displacement, and the Snipe, which is an .09 cu. in. engine. M.E. also has the Snipe in an R/C version that has

a throttle. Davies-Charlton Ltd. offers the following: Merlin .047 cu. in., Super Merlin .047 cu. in., the Dart, which is perhaps one of the absolute favorites of the serious scale F/F modeler . . . this has a .036 cu. in. displacement. They also have a Spitfire at .059 cu. in., and the Sabre at .09 cu. in. displacement. P.A.W. engines are all bigger, with their smallest being the 149 which has a .09 cu. in. displacement. Others in their line are a .15 and .19 which are usually too big for the usual scale work done in F/F.

Naturally, any article regarding diesels would not be complete if it did not include something about the inveterate

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Mills .75cc engine. This is considered to be the ultimate diesel, especially for scale work. It has a very long stroke and will swing the largest of propellers, and is easier to start than any glow engine. Unfortunately, these are collector's items, and if you happen to run across one, grab it quick! Another diesel that I am particularly fond of is the Webra .8cc Piccolo. As you can see from the photograph, it resembles the old Holland Hornet of yester-year. This little engine

is a virtual powerhouse. At one time I ran one with a 10x3 propeller, and it purred just as pretty as you please. I'm not sure what the status is of the Webra Piccolo. I do not know whether it is still being manufactured or not. They also have an .09 with the same basic shape, but just larger in size.

I have taken pictures of the Dart, the Merlin and the Super Merlin, as well as the Mills. I've also included one of a converted Cox .020. This latter item is a story in itself, and without going into a lot of detail, it is possible to convert a Cox .020 or .049 to a diesel with fixed compression. The real problem is that the rods of the glow engines aren't stout enough to take the punishment given by the conversion. I would love to see a company such as Cox, manufacture a .020 cu. in. diesel to compliment their already outstanding line of fine engines. However, if you do not presently own a diesel and would like to try one, I would recommend buying the Dart. You will not believe the performance of this little engine. If you wanted another good diesel to go along with the Dart, then I would get the Merlin. I have a Merlin in my B.E. 2E, and all I have to do is fuel up, choke and flip the prop a couple of times, and it is off and running. I do not have to touch either the compression lever or the needle-valve; it's simply another super engine. I have all the others that I have mentioned and they are all good runners, but like everyone else, you usually end up with a few that you prefer above all others.

Unless you are near a hobby shop that has a proprietor who loves diesels like I do, chances are you will never see one. Now if you check in the back of MB you will see that Hobby Hideaway RR 2, Box 68, Delavan, Ill., 61734, handles all these diesels of the three companies that I mentioned. They even have spare parts and super diesel fuel

available. You will have to write and get a price list. Believe me, you won't regret it when you see that next scale model flying lazily overhead, leaving a smell of castor oil in the wind!

At this point, if Bob Davis, of Bridgeport, Connecticut, is reading this column, he must be having a fit! Unknown to Fernando at the time he wrote this article, Bob was developing a diesel conversion for the Cox engine. He completed his work, and was demonstrating his Cox diesels, to anyone who was interested, at the Dayton Nationals . . . and there was PLENTY of interest! See "Over the Counter" for a complete description of the Davis diesel conversion for Cox .049 engines. wcn

On December 5th, the Flightmasters sponsor the combined Peanut/Jumbo Scale contest. This year there will be a separate class for biplanes or multi-wing aircraft. Their minimum span is 30 inches. The monoplanes have a minimum span of 36 inches. Hope to see you at these contests.

Ms Only Continued from page 17

who had wind-related accidents.

In place of blue skies I got an honest-to-goodness flash flood that overnight dumped four to six inches around the Lockport area.

As far as romance is concerned, the nearest I got to that was a baby shower for Barb Robinson. Barb is president of Women in Inter-National Glider Soaring (WINGS) and she's an active and respected competitor on the glider contest trail. Barb, plus Barbara Henon of Pacific Palisades, California, and Joan Nolte of Carmichael, California, made up this year's WINGS team at the S.O.A.R. Nats. Barb Robinson and her husband Bob, are from Lansing, Michigan. Bob won first place this year in the Class C two-minute precision. That fact didn't escape the quick wit of the master of

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ceremonies at the banquet when he gave Barb one of the light hearted "Rattle Awards" during the presentation of the trophies.

The elements cooperated on the day of Barb's shower, and the rain that had threatened since morning held off. The party took place in the afternoon of the second day of flying, right on the site of the Nats, and under the canopy of the hosts, Ruth and Ken Bates. Ruth is a WINGS member who is active with her support but doesn't fly. Ruth and her husband are good friends of the Robinsons and pulled a coup in keeping the shower plans from them. When Barb left for her second flight, hostess Ruth went into action and the fixings were

hastily pulled from hiding places and piles of gifts and food replaced repair kits and glider trappings. In the meantime, Barb had finished her flight. Unhappy with it, she returned with her head down to the sanctuary of her canopy which was attached to the Bates' canopy. And then this unparalleled party started.

To prove the open hearted give and take between the sexes, men were invited to the shower, too, and came bearing gifts. They hung around only long enough to make witty shower comments that certainly added to the fun, but that I'm unable to repeat here because of the family nature of this magazine.

If friends couldn't find something for

a baby with an airplane on it they sewed one on, or stamped one on, or embroidered one on. Salespeople all over the country are still questioning why anybody would want a pacifier with an airplane handle. If this child grows up and likes model trains, a lot of people will be flat out mad. To show Barb's enthusiasm for glidering, the ETA of her little fledgling is just after her job as CD on September 11, at the WINGS-sponsored glider meet in Ann Arbor, Michigan.

The flood started after the shower. That evening, about 60 people from the contest braved the risk of stalled cars and made it to the White Fence Farms for family-style chicken. Bill and I kept waiting for the downpour to stop so we could go outside and unhook the electric plug that was anchoring our camper. Finally, we shared an 8 oz. tin of tuna heated in a can of mushroom soup. When the electricity went out, we cleaned up the supper mess with the help of matches. That was as close as I got to the promised candle-light dinner.

You know what happens the day after a flood? Mud happens! That last day of flying was a dirty delight to the little kids, and a filthy nightmare to the mothers of the young men who rode the bikes and retrieved the lines. Good natured pilots rolled their pants up mid-calf and mushed on over for their turn at flying. Through these adversities the R/C families remained friendly, enthusiastic, and dedicated. Even the Lewis University dining hall cashier, Ethyl Johnson, mentioned it. She said complimentary things about how happy and friendly everyone was... even children! She is a retired worker and was called back into action at 4 A.M. to woman her post. Ethyl said she would do it again next year because the people were so great. Bill is right again. Since he first started to fly R/C he has always come home and described the men he flew with that day as "the nicest guys in the world." Stands to reason they would marry the nicest women and have the nicest children.

So I guess I'll let myself be talked into going to the S.O.A.R. Nats again next year. So what if the drink in "some secluded spot" turned out to be a free beer at the Suds City Saloon, casually set under the wing of an abandoned DC3! What the heck! It was really lots of fun even if they won't listen at the bridge table. Didn't I get to stand outside after the farewell banquet and watch cerie and esoteric night glidering? Didn't I win \$23.00 worth of balsa at the drawing? Enroute home didn't I get to skid to a stop in Michigan City, Indiana, and watch the movie "Midway" because Bill said I would just love the authentic B-25's and the ancient "Buffalo." All this and Sensurround, too! If you can think of yourself sitting on the deck of an aircraft carrier with planes taking off dangerously close over your head, and if

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you can imagine the vibrations from a hundred base drums pounding in your chest, you'll have no problem picturing my ending to the robust and rollicking S.O.A.R. Nats!

Flamingo Continued from page 51

back along the single exhaust pipe.

All flying wires are two-pound test monofilament fishing leader. Make a hole in the struts at appropriate places before assembly to make installing the wire easier. In the case of the tail brace wires, they just pass through each surface and are tied at the bottom of the fuselage. A small drop of cement at each intersection of wire and surface makes the installation permanent. Painting the dried cement silver makes it resemble a metal end fitting.

The ailerons, movable tail surfaces, and baggage hatch, are simulated with india ink. This can only be done after doping the model, otherwise it will run in the tissue.

The windshields are thin transparent plastic, and my pilot was from a slot car. The pilot was just cemented in place at the back of the cockpit. Put in two pilots if you like.

The struts were painted red and white, as was the rudder. Otherwise, the color trim was black tissue doped over the yellow tissue after the covering had been shrunk and doped once.

The wing numbers are 7/8 of an inch tall, and the fuselage numbers are 9/16 tall. Cut them out of black Japanese tissue by laying them out on graph paper. Place this over several (four) layers of black tissue. Tape it to the work board so it won't move, and carefully cut through all layers with a sharp pointed blade.

These letters can be doped in place with very thin dope.

The tail skid of the model was made of several layers of model railroad basswood laminated into the proper curve.

Note where the CG of the model should be. The model in the photo requires about a 1/32 of an inch of down thrust, and flies in left circles under

power.

Have fun with your Udet U-12a. Fly it in real Ernst, oops! I mean Earnest! •

Choppers Continued from page 29

fuselage is very strong, we have noticed a tendency for the entire truss assembly to twist at a regular frequency in flight. This has caused no failures of any nature, but it just looks funny while it's doing its thing. The twisting movement was eliminated completely by adding additional diagonal struts across the top of the fuselage so that all three sides are now braced. Strut material used was ordinary push rod wire, cut to appropriate lengths and then cemented in place with Stablit Express. Before cutting the diagonals, I used a very small ball cutter on my Moto-Tool and made small cup-like depressions in the plastic triangles to accept the added trusses. My first try with epoxy glue wasn't too successful, but the Stablit is holding like it was welded.

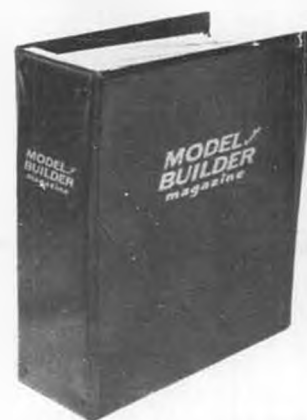
While we're on the fuselage subject, the factory advises that the lower longeron should *not* be trimmed in order to make the tail boom attach to the main body "Parallel" to the ground. The plans showing the tail boom parallel will be changed to reflect the desired uphill slant of the boom in conformance with the real chopper. I might add that a small increase in stability was noted when I installed a new, uncut tail boom!

Swashplate: While building my second Alouette, I noticed that the main rotor shaft assembly had a rather severe vibration while being spun by an air blast on the main gear. Closer investigation revealed that the swashplate was not in balance, as a result of the long ball-joint arms installed in the upper race. One of the arms is counter-balanced by the plastic swashplate driver which rides directly above the swashplate, however, the other arm at 90 degrees doesn't have anything to counter-balance its weight.

The obvious solution was to install an additional arm (unused) and thus bring it back into balance. Not having an

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additional arm, I cut one out of a right-angle shelf bracket, making it shorter but wider to have an equal weight.

Well, I soon discovered that the shorter counterweight needed more weight than the opposite arm because it was closer to the hub. To make a long story short, I added solder to the short counterweight until the assembly ran smoothly when spun by the air jet-blast on the gear. Now my Alouette is as smooth as glass in flight, and I get none of that typical landing gear bounce!

Who would have ever thought that such a small weight, located so close to the hub, and spinning at relatively slow rpm, would have such an effect on the

helicopter? Guess maybe we'd better check our other choppers for the same thing, huh?

Landing Gear Brackets: Hard landings have been known to snap off the landing gear attach brackets on the bottom of the fuselage, and my Alouette is no exception. Again, the fix is simple . . . just install a pair of metal straps across the gear strut just outboard of the original brackets. Be careful when drilling the holes for the screws so that you don't drill a hole in your fuel tank or radio! And be sure the holes are large enough to accept the PK (sheet metal) screws without over-stressing the plastic, otherwise you'll have radial cracks

develop at each drilled hole. Ready-made landing gear straps are available at most hobby shops . . . I used the extra motor mount spacers which came in the kit and didn't need for my engine installation.

Tail Transmission Safety Collar: Before we started to add the extra diagonals to the fuselage top, the twisting motion of the tail apparently loosened the rear transmission and gradually worked it rearward. It never came all the way out, but the rearward slippage caused a change in the tail rotor push-rod control . . . as the transmission went back, more and more rudder had to be applied to keep the chopper going straight. The perfect answer was to machine a small aluminum collar to fit around the transmission body, in front of the rearmost former. It is held in place with a machine screw which extends down into the already drilled oil-hole in the transmission. Now, even if the clamp breaks, the collar will prevent loss of the rear transmission.

Main Transmission Base Plate: To prevent cracking of the plastic lugs which attach the main transmission base plate to the plywood engine compartment, we strongly recommend that the 4 machine screws be installed with a rather loose fit and held in place with Locktite, rather than snugging them up tightly against a lock washer. Too snug a fit means the "pronged" nuts on the

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☐ **Micro-Mold Lark**
Engine: .19-40
Fuselage Lgth.:
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Aluminum
Rotor Span: 42"
Flying Wt.: 4-7 lbs.
Radio: 4 Channel
Collect. Pitch: No

☐ **Graupner Bell 47G**
Engine: .23
Fuselage Lgth.:
39" Plastic & Metal
Rotor Span: 38"
Flying Wt.: 6 lbs.
Radio: 4 Channel
Collect. Pitch: No

☐ **Schluter Gazell**
Engine: .61
Fuselage Lgth.:
55" Fiberglass
Rotor Span: 63 1/2"
Flying Wt.: 8 1/2-10 lbs.
Radio: 4-7 Channel
Collect. Pitch: Yes

☐ **KAVAN Allouette II**
Engine: .40
Fuselage Lgth.:
43" Plastic & Wood
Rotor Span: 42"
Flying Wt.: 6-7 lbs.
Radio: 4 Channel
Collect. Pitch: No

☐ **KAVAN Jet Ranger**
Engine: .61
Fuselage Lgth.:
56" Fiberglass
Rotor Span: 63 1/2"
Flying Wt.: 9-14 lbs.
Radio: 4-7 Channel
Collect. Pitch: Yes



plastic lugs dig into the plastic and snap them off. A tight fit is not necessary because the machine screws hold the base plate in "shear" only.
FINAL APPROACH

A good idea occurred to me the other day, after I stepped on my antenna and lifted my helicopter for the tenth "antenna pull-out". Along the belly (or landing gear) I placed a short length of Nyrod outer tubing to hold the antenna up and off the ground. The Nyrod was simply attached by slipping it through the eyes of a couple of used ball links and then attaching the ball links to the body with a short length of push rod. Works fine and keeps the antenna clean. BCNU next month with a Super Heli-Baby report!

M23b Continued from page 45

block, but this is the method we used, and it provides a highly resilient and durable part.

When nose contouring is completed, using progressively finer grades of garnet paper to achieve proper shape, drill hole on thrust line to accommodate .045 I.D. brass or aluminum tubing, which acts as bushing for rubber hook. The tubing is cut short to accept insertion of wood or teflon thrust button, this backing up roller ball thrust bearing on which the 9-inch Peck-Polymer prop rides. Epoxy the tubing in place, making sure no glue

gets inside the tube. The shaft on the original model had 0 degrees thrust, in other words, no compensation was built into the shaft alignment. Side and/or down thrust is achieved by insertion of scrap balsa between nose block and plywood former, using trial and error method to find correct amount of thrust line alteration needed. The generous "positioning block" cemented on the back of the nose block should fit snugly in the square aperture in the plywood former.

With the entire framework completed, position the wing under the fuselage, securing with appropriately small rubber bands (we used the kind orthodontists provide the kids for their

\$1200 braces). Fit soft balsa blocks under wing which pick up fuselage contours in that area. This is a bit tricky, as they have to accommodate the landing gear wire. The front landing gear wire is epoxied to wing leading edge, the rear wire to the 1/32 sheet balsa underwing covering, which is backed up with a piece of hard balsa running parallel with the spar.

Cover the model with white Japanese tissue. We used white glue (Wilhold) applied with brush, diluted 50-50 with water as an adhesive and found it to give us a little more time to adjust tissue and pull out unwanted wrinkles. When covering the wing, be sure to apply glue to the undercambered section on

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SPAN 134.5 in.
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LENGTH 49.5 in.
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WING LOADING 8.5 oz./sq. ft. to 10 oz./sq. ft.

each rib, otherwise you will wind up with a fat version of a German Clark Y airfoil.

Fuselage is easy. Cover the sides and bottom in conventional manner, making sure tissue grain is running parallel with longerons. Turtleback was covered with individual strips between formers, tissue laid athwartwise, shingle fashion, from longeron to longeron. Cover all sheet surfaces. Nose block and underwing filler are not covered, but receive three coats of Aerogloss sanding sealer or equivalent. Tail surfaces are covered in conventional manner and need no special description.

Spray covered model lightly with water, using atomizer. When dry, apply three coats of nitrate dope, diluted with thinner specified by manufacturer, to a 40-60 ratio, 60% dope. We used plasticizer in our mix, to minimize warp.

The red trim on the model is "Spray Mark" cadmium red no. 310, an aerosol product used by commercial artists, and available at better stocked art supply stores. It is transparent and has excellent color intensity. Carefully mask areas which are to remain white with

draftsman's tape, which has weaker adhesive than regular masking tape, making removal easier. Wing and fuselage undersides are solid red, stabilizer underside repeats striped motif which appears on top. Both wing and stabilizer topside have distinct red and white strips, the wing stripes narrowing toward the tip, as shown in the photos. White fuselage sides are separated from red top deck and nose by black stripe which follows longerons and forms a 180 degree arc on cowlings sides. One note of caution: the Spray Mark is water-soluble, and has to be fixed with artist's fixative, commonly used to "set" charcoal or pastel drawings. We used Grumbacher Myston non-glossy artist's fixative. It is a very light-weight spray. Don't try clear dope over the Spray Mark, the two are not compatible.

Cut registration letter and numbers from tissue, white for wing underside, all the rest, black. We used 3M Sprayment as an adhesive, laying cut figures upside down on newspaper and holding can far enough away so as not to blow the delicate numbers around. Carefully pick up numbers with pointed knife and

position accurately in respective places. Give these a shot or two of fixative to help seal the edges and prevent the airstream from lifting them.

The BFW bird on the rudder is cut from black tissue. Both BFW letters and "LE ONZE" that appears on the fuselage forward of the front cockpit, are 30 point pressure applied transfer type. The type face is "Antique Olive" manufactured by Geotype. Practically all manufacturers of transfer type, and there are a lot of them, have "Helvetica" which may be substituted. "Le Onze" translates to "The Eleven." Its significance is unknown.

MISCELLANEOUS

The 1/32 landing gear wire is sheathed with 1 ply plate finish (smooth) Strathmore artist's paper. This is a durable, hard paper with distinctive grain characteristics which should parallel the wire. Cut sheaths to strut length, leaving about twice as much chord as needed. Wrap wire with paper, forming symmetrical airfoil. Cement and pinch trailing edge, using spring clips from stationery store to hold until dry. Trim to proper chord, and paint flat black with Floquil railroad color, which has excellent texture and covering qualities.

Wheels on the original model were turned from laminated balsa. You may want to substitute Williams Brothers 1-7/8 inch diameter vintage wheels, which would work fine. Tires are flat black, wheel white with red center.

Willi Stor, whose likeness you see in the rear cockpit, was cut from light balsa, sanded and coated with four coats of sanding sealer before receiving artist's acrylic cosmetic. Goggle frames were bent from brass wire. "Lenses" were made by dipping into clear dope spread on water as you might cover a microfilm job. Cement them to Willi with epoxy dab.

The Peck prop was sprayed kind of a

Stearman C3B



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maple color, and when dry, carefully masked to simulate laminations. It was resprayed with a darker value spray which might approximate mahogany and the masking was removed. *Voila!* Instant lamination.
FLYING

Six strands (3 loops) of 3/16 lubed rubber are used for power. The loops should be 24 inches long, which means that about 8 inches of rubber hangs out the nose when limp. Fellow modeler, John Oldenkamp, gave us one of those neat little cast aluminum "unions" which gather the rubber at the nose hook and make it a cinch to transfer to the hook after packing in the winds. We strongly recommend its use (*it's made by Jim Crocket. See ads. wcn*). The other end of the rubber bundle is secured at the tail by 3/16 O.D. aluminum tube, running transversely through fuselage, held by friction in hard balsa.

Test model over tall grass, starting with about 1000 winds. Torque may take it to the left, if all surfaces are unwarped and neutral. That's the way ours went, in large circles. Model should balance when supported at wing tip extremities. We had to add a piece of printer's type weighing about 7 grams to the nose, inside the cowl bottom, to achieve this.

The model flies slowly and exhibits no stability peculiarities. We always try to get about two to three degrees uniform wash-out built into the wing tips, and this model is no exception. What is two to three degrees? It should be about an 1/8 inch at the trailing edge at the wing tips. If it can't be built in, you may want to experiment with aileron angle change.

The Messerschmitt M23b is a neat, well proportioned model that seems to satisfy a number of requirements; it's easy to build, it's pretty and it's strong.

Tamerlane Continued from page 39
fuel and shatter-proof, but in a match, your pit crew can see if the pacifier is OK instantly.

An all-balsa boom and tail is used because it seems the easiest way to do it. Use pretty hard wood and it won't fall apart, especially if the boom is covered in one ounce glass cloth before adding the wing and tail. My procedure here is first to dope the glass cloth onto the boom; then locally remove the film covering from the boom glue area on the wing; then epoxy on the boom; then line-up and epoxy in place the tail; then sew on the elevator and install the horn; finally, only now, bend the push-rod end for the horn. Doing it this way means you have a good chance of getting equal up and down on the elevator.

Model is just about finished now, so slap a coat of epoxy paint over the pod, boom and tail. Again, if you were bright, you wrote your AMA number on the

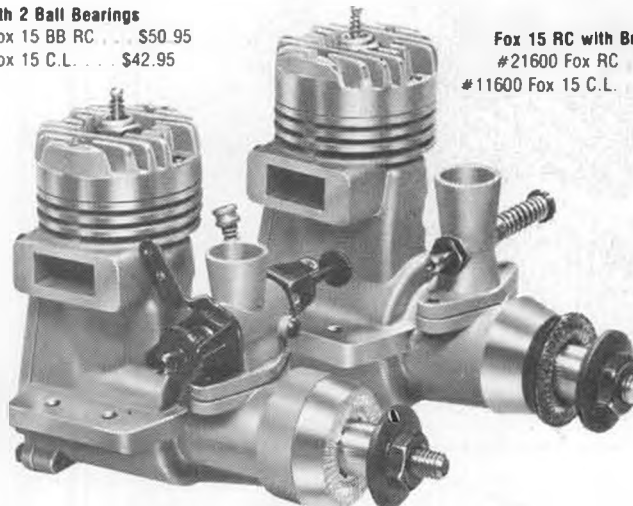
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structure before you covered the model (plus any endearments that seemed appropriate at the time). Make up the lead-out connections, bolt in the motor and get flying. Before you do, maybe a few words on motors, props, fuel, lines etc. will be appreciated. (*Do we have a choice, Dave? wcn*)

TAMERLANE is designed for a 2.5 cc (.15 cu. in.) glow motor . . . the hotter the better. Only one diesel is competitive nowadays, the Rossi, and you need a rich daddy to mess about with those. (*Please, let's not bring THAT up again. Some QMers may be reading! wcn*).

There are only a few really good front-induction, 2.5cc glows available, so the

choice is limited. None of the ones I have handled have been perfect out of the box, all requiring some attention . . . usually a new head and needle valve assembly. Maybe the new Cox 15 will prove useable out of the box, shall have to see (*It's available now. wcn*).

I strongly recommend a nylon 7 x 4 size prop as being the only choice, and the Tornado 7 x 4 at that. Wood and glass-nylon props break too easy. A 4-1/2, 5 or 6 inch pitch kills most motors stone dead in continuous maneuvers . . . and you do spend most of a match doing this . . . you don't? Hmm! Of the nylon 7 x 4 props, the Tornado seems to work the best by quite a bit.

I use fuels with 15-25% nitro because

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such medium nitro grogs seem to give the least setting problems in all weather. Because FAI is a 4 minute, plus warm-up, event, and usually turns out this way, you have to fuel up for a full match. Around 2-1/2-3 oz. of fuel does the trick for me. I have flown matches using your (U.S.A.) 0.012 inch braided lines and found them more than a bit prone to being cut by evil-minded opponents. We use soldered 0.014 braided piano-wire lines here, and these seem to resist such tactics better. Maybe using your 0.015 inch braided wire would be the wise thing to do. I hate fly-aways, after all, the model might get dented on someone's head, and you are bound to lose a lot of ground time whilst your pit crew retrieves the streamer... nothing more annoying than treeing your model with streamer attached during a match.

I am not going to tell you how to fly this weapon. If you can trim out and fly an AMA 'Fast' toy, you will find TAMERLANE a doddle. Be careful to avoid warps though; the big wing means that any warp has a powerful effect. TAMERLANE is fast and tight, yet

very amiable for precision cutting. When trimmed out, mine do full elevator inside or outside loops of around 10 foot diameter, each loop taking about 1 second, consecutively dropping a foot or two per revolution until it clips the daisies; so should yours.

A few words on match tactics. The vital thing to remember is DO NOT KILL. In FAI, a 'kill' is now just a cut... OK, a nice 100 points, but you cannot get any more in the match and your opponent has the rest of the match to nibble little bits off your streamer while all you can do is play 'dodge 'em'. If you 'kill' early in the match, you are sure to lose.

The best way of avoiding killing is to follow. Following is a skill to be learned on the club field. Practice following a friend through consecutive horizontal eights until you can do it whilst telling jokes (or what ever turns you on). Only when you have ingrained the necessary reflexes, (or run out of jokes. wcn) move on to practice following in random maneuvers and then on to actual Combat. If you can stay right behind your opponent, no matter what he tries to do

to shake you off, you get the cuts and he doesn't and you hit paper before you hit string. Our best fliers over here for many years now have been real artists at the following game... it is a tough tactic to beat. I believe the Burch/Wilkins match at your '75 Nats in FAI was a following classic... Those who saw it will know what I mean.

The other important thing to learn is organization in the pits. FAI allows a spare model, so use it. If your man's... er... woman's... er... person's (we have got it too you know) toy gets planted, don't mess about trying to clear the motor, or lines, or whatever caused it to come down. Dispatch a runner to go get the streamer and clip off the pacifier whilst your starting pair get the spare going. A quick streamer transfer and you are off again... in less than 15 seconds if you are organized and without panic. Whilst your pilot is working out how to get your pit crew to work again, you can keep busy by sorting out the downed model to be ready for the inevitable.

The following art has done things for our models here. You can follow a fast 'brick' simply by turning inside it, but you cannot follow a super-maneuverable model with a brick... all he needs to do is some tricky stuff near mother earth and you plant yet again. In the ultimate at FAI Combat, the more maneuverable model will always win. A big speed advantage may make things difficult, but will not reverse the situation, as the '75 European Champs proved. Whilst the 'kill' remains unrecognized by the FAI rules, the 'followers' will always come out on top, and to follow successfully you need more maneuverability. Thus, the slow and tricky 400 square inch 'Giants' are popular over here.

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any way extreme. It suits me, maybe it will suit you.

Huh! Why the name? TAMERLANE, otherwise known as 'Timur The Lame' or 'S-S-S-S' to his followers, was a particularly nasty Mongolian chieftain who, in the late 14th/early 15th century, with the aid of his horse-mounted hoards, devastated and de-populated large areas of Asia and the Near East. They have not recovered from his exploits yet. Now I am not suggesting that this model will be quite so spectacular, but you can always dream . . .

C/L Continued from page 41
coupled with the connectors at the handle that weren't in place when tying the lines, gives me about 1-1/2 inches to play with.

If you think tying the lines as short as possible isn't worth the trouble, think again. In this area, races are won or lost by only seconds and every little bit helps. In the first outing for Project Goodyear, we got beat by two seconds and finished ahead of third place by only four seconds, so I regard little details like line length as quite important!

The small line reels are generally hard on solid lines, as the lines themselves must be bent some in order to get them on the reel. A home-made, large diameter line reel can be made, or

just get the big reel that Pylon markets. It's the 5-inch diameter reel you want, and it is CLR-5 in the Pylon catalog. Selling for \$1.25, it's a worthwhile investment.

Before getting off the subject of lines, I want to mention that stranded .015 lines are allowed in Goodyear, and are an acceptable alternative to the .012 solids. The larger diameter cuts into the top end, but this loss in speed is small, no doubt, and the durability of the stranded lines may be more important to you than that last mph or so.

If nothing else, you can use the .015 stranded lines for practicing. I don't, I make it a point to practice with everything set up exactly the way it will be come Race day.

PROPS

Or, compellers, as P.T. Granderson calls them. Unfortunately, I don't have a very good background in reworking props, and can't let you in on many tricks. Although I have worked on many props in the last few years, and have been able to get good performance gains this way, all my work has been of the "cut 'n try" variety. As I don't even have a prop pitch gauge yet (a pitch gauge is a must for consistent results from prop rework), I can't even tell you the specs on the props that have worked fairly well so far. All I can say for sure is that, after you get to a certain point,

the only way to go faster is through prop rework. For instance, Project Goodyear is turning 16.2 to 16.0 and the only way we'll be able to break into the 15's is through better props, as everything else is working pretty well.

Kilsdonk says to use Bartels props pitched as per his Zipper article in the Sept. '75 Model Aviation. As the Bartels props are so hard to come by, we've elected to not use them, as it is doubtful that we could locate enough of them to be worthwhile. Even if we got a dozen of them, by the time we experimented with different pitches and diameters, broke a couple, beat another few to death on the pavement, we'd only have a couple left for Racing. Then, if we couldn't find more Bartels, all the time spent making them work would go down the drain. Better to spend our time working with the Kelly props, which seem to be fairly easy to come by.

Regarding Kelly props, Aldrich says to cut them to 6-1/2 to 6-5/8 diameter by 6-1/2 true pitch washed out at the tip to 5-3/4 pitch.

Without a pitch gauge, I have yet to try Aldrich's advice, but there it is for you to try. If using Kelly carbon fibre props, you may find that you can use a slightly larger diameter than is possible with the glass props.

So far, we are using Kelly glass props that have been cleaned up and balanced. Here is how I have gone about it. The flashing is removed from the prop with a small file. The hub is cleaned of flashing and filed to give a flat face front and rear. The hole is checked to be sure it is perpendicular to the hub faces. Once in awhile, you'll find one that is not perpendicular, which causes the blades to have different pitches. The only fix for this is usually to toss the prop . . . or sell it to a competitor!

If the props checks out OK, so far, I just start filing away, sharpening the leading and trailing edges of the prop and thinning it some at the same time. By working slowly and checking yourself as you go, the prop should come out smooth and almost balanced. If you do

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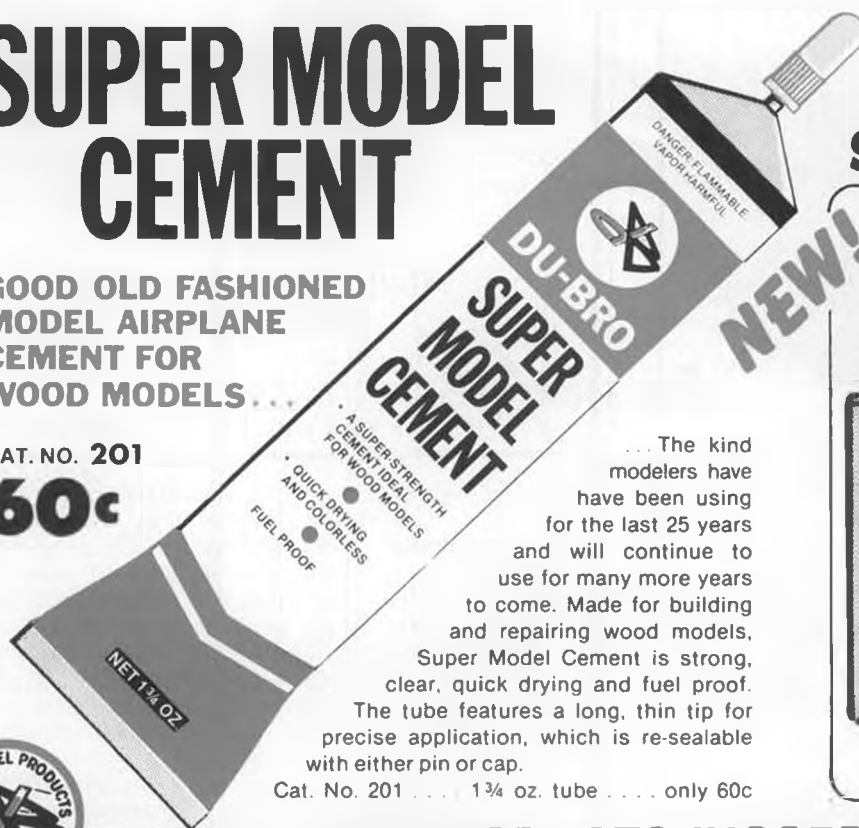
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any thinning of the prop, it is advised that you check yourself with a dial indicator to keep both blades the same.

All filing is done on the forward (as installed on the plane) side of the prop. Any filing, other than a very light clean up, on the back side of the prop blades will probably result in a change of pitch. This is OK, if you know what you're doing, and have a pitch gauge. Otherwise...

With the prop shaped nicely, I start getting it balanced, still working with the file. Again, the dial indicator is handy here, as the heavy blade can be checked for thick spots and these removed to give symmetrical blades and balance, to boot.

For those without a dial indicator, or access to one, the good ol' fingers will do in a pinch. You may be surprised to find that you can detect quite a small difference in blade thickness by simply feeling the blades between your fingers.

Rats... we haven't got this thing to the proper diameter, yet. Do this *before* balancing! To get the prop cut to the diameter you want, just forget doing it with the prop hand-held. I made a very simple jig for this purpose by drilling a 3/16 hole in a piece of 3/8 x 3/4 maple motor mount stock. Measuring from the center of the hole, I marked off 3 to 3-1/2 inches, in 1/16 increments, on one side of the hole only. A

square helps here to get the lines at 90° to the edge of the maple.

With the jig made, it is a simple enough thing to insert a piece of 3/16 piano wire (actually, I used a 3/16 pin out of my Austin Teeter-Prop) into the hole in the jig and then to slip the prop over the wire. Using the marks as a guide, one tip is marked to the diameter desired. By turning the prop one half revolution, the other tip is marked. Now trim the tips and double-check this by replacing the prop on the jig.

Although this jig is very simple, I think you'll find it to be quite accurate, if used carefully. I also use this type of jig to cut down Stunt, Combat and F/F

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props. It works.

With that done, we have the prop just about finished. All that is left to do is some final sanding and the prop will be very smooth. I start sanding with 400 wet-or-dry paper, used wet. When the prop is sanded to my satisfaction, I wipe it dry and check the balance again. If the prop has gone slightly out of

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balance, from the sanding, just sand the heavy blade until the balance is right again. Final sanding is done with 600 wet-or-dry, again used wet. If you take a few minutes to do it right, these two sessions of sanding will get you a prop that is as slick as a baby's empennage. Do one more check on the balance, just to be sure.

Kilsdonk suggests that the prop used should allow the GMA Rossi to turn at 20,500 to 21,500 on the ground, using the 55% fuel formulated a few issues back. Using a Kelly prop worked to above suggestions and cut to 6-3/4, we are getting 21,000 flat on 60% Nitro-

tane, so at least we're getting the right kind of ground rpm.

Again, I want to emphasize that prop rework is where it's at; once everything else is pretty well sorted out. Get a hand-full of props, a pitch gauge, some decent files and go to work finding out what works for your plane/engine/fuel combination.

READY TO FLY... FINALLY

Jeez, I guess we have finally gotten to the point where we can go flying. Rather than try to cover every possible thing that might happen to you, I'll go through what happened to us and what we were trying to achieve each time we went out.

First time out, all we wanted to do was to see how well the plane handled at take-off, level flight, simulated passing and landing. Also we were making mental notes as to what kind of needle setting the engine required on the ground, to make it honk in the air, plus seeing if we got consistent runs and how many laps we got per tank.

Notice that we weren't checking for top speed this first time out. First things first, folks.

We had previously decided that Gary would pit and I would fly, so I left Gary alone to do his thing with the motor. As Gary has the primary responsibility for getting the engine started and tuned properly, I have made it a point to let him have a free hand in this department, even though I have a lot of experience as a pit-man and Gary had little experience, prior to this season. I mention this as I have seen too many Racing team partners trying to tell the other what to do... sometimes right in the middle of a race!

If problems crop up, and the pilot thinks he sees the pit-man doing something wrong, or vice versa, there will be time to hash it out later and with no doubt more positive results than if each is yelling at the other over the scream of an engine.

Gary got the motor started fairly quickly and set it just a touch on the fat side. Before taking the plane off, we

tried the shut-off, just to be sure it worked OK. It did, Gary fired it up again and released. The plane got very light on the lines on take-off, but straightened out OK and flew just right. Easy to lay it on the deck and groove around. Seemed to be willing to go high, as in passing. The setting stayed fat, so we knew that fat ground settings weren't necessary to avoid an over-lean condition in the air.

Let the plane run about 50 laps and shut it down. After shut-off, and with neutral elevator, the thing took 1-1/2 laps to get down to catching speed, which didn't thrill me a whole lot, as we weren't going much over 100.

At this point, we weren't interested in practicing pits, so Gary just caught the plane and set it aside. I came in and checked everything over (never know what might come loose on a first flight). Plane looked OK. We talked about needle settings and the way the plane went loose at takeoff. This had me a little worried, so we talked about launching more carefully and me doing better at whipping the plane into the air.

A second flight seemed in order, so Gary got it started, leaned it out a bit and launched. SPLAT!!!!!! Damn thing immediately went slack at release, torqued to the left and hit inverted on the pavement. Now I was really worried! Either I was doing an extremely poor job of getting the plane up (not likely, I've got plenty of Racing under my belt), Gary was doing a terrible job of launching the plane (again, not likely), or the plane was built crooked (maybe).

With a scarred-up plane on our hands, we sat down to try to figure out the problem. Couldn't come up with anything. The plane is straight, tracks straight, no left-thrust, etc. I was convinced I was handling the flying properly and Gary was equally convinced his technique was right.

Nothing to do but try again. Went home and fixed the plane up a little and double-checked everything.

The second time out, both Gary and I resolved to be very careful on takeoffs,

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with me leading the plane into the air and stepping back toward the center of the circle at the same time and Gary making every effort at having the nose of the plane to the outside of the circle, prior to release. We put the plane up several times without problems; Gary working the needle down to a right-on setting and me trying to figure out how to get the thing down without excessive bouncing.

When the setting seemed right, we decided to see what kind of speed and laps we were getting. Flying with the handle in tight, but not whipping, we were going 16.2 to 16.0 (a little over 110 mph) and getting 85 laps before any indication of an over-lean condition. This was pretty good, and Gary was getting his starts and pits down fairly well, so we decided to try a simulated heat race of 80 laps and 1 pit.

It doesn't make much difference how the pilot flies when practicing, as long as he can fly the same way lap after lap, practice session after practice session. Consistent flying eliminates one more potential variable when comparing practice times. I found that the easiest way for me to fly consistently was to walk the pilot's circle, fly with my arm straight out and not whip the plane.

Flying in this manner, our first practice heat was a 3:13, which ain't bad. Oh, yeh, we were using 50% Nitrotane that night.

Although the time was pretty good for a new plane and team, there was room for improvement. Gary was a little slow on the start and pit. And I was shutting off 1-1/8 laps out from the pit.

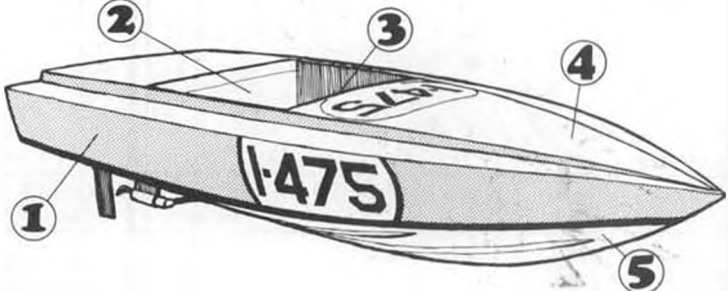
Ron Scoones was with us, trying to sort out his Badyear, and didn't think we turned in the low 3's. So we offered to let him time us as it was kind of a hassle for us to do it anyway.

Had a good heat going, looked as if we would run faster than before. Gary had a good pit, launched the plane . . . it went loose for a second and then straight up into a big loop. Goodyears don't pull out of loops so good. Plane hit at a slight angle and very hard. A big scar at the nose of the fuse, but that was nothing compared to the outboard wing panel, which was almost completely broken off. Man, now that put a real damper on Team spirit!

Pulled the motor (it wasn't hurt, luckily enough) and put it on my old Goodyear, for a little more practicing, rather than waste a trip to the pavement. No takeoff problems with the old plane, so the Falcon obviously had something wrong with it.

After some work with the GMA Rossi, we changed motors, this time to see if the new Cox 15 would cut it against a custom Rossi. The Cox was pulling a top-end equal to the Rossi, on the same fuel and prop, so the hp is there. Bruce Tunberg, designer of the Cox 15, (and an ex-Speed and Racing

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flier from the N.W.) says the Cox will pull a slightly larger prop than the Rossi, plus live on 70% nitro, so it looks as if Cox may have a honker.

However, Gary had inconsistent results in starting and restarting the Cox, so we quit for the night. Bruce says that some castor oil in the fuel, plus hitting the prop real hard, rather than just flipping it, will result in good starts, so try this, if you haven't already. About 10% castor is the recommendation I got from Bruce.

A call to Kilsdonk didn't shed much light on our problems. He said that he has seen dozens of Falcons, and they all worked fine, even one he had that was *very* warped!

Being a stubborn type and not having time to build another Badyear, I decided to fix the Project plane and give it one more try. Fixing the plane was a real problem. With the outboard wing broken off almost completely, and fairly close to the root of the wing, it took a little thought as to how I was going to fix it and still have an adequately strong wing.

Here is how I did what looked like an impossible job. All odd, loose pieces of balsa were pulled from the split in the wing sheeting, and I managed to get everything pushed back to a fairly tight joint. With the plane blocked up and holding the wing straight, Hot Stuff was applied. This glued every-



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thing back together fairly well, but the joint was obviously not strong enough.

An application of fiberglass cloth was in order, but how to do it was a problem. Once again, Hot Stuff to the rescue! I sanded the area I wanted glassed and laid a big chunk of K&B 3/4 oz. fiberglass cloth in place. Starting at the center of the cloth, I just liberally poured on the Hot Stuff. And it worked! The Hot Stuff would wet the cloth, making it lay flat, and then dry almost instantly. By wrapping a plastic sandwich bag around my fingers, I was able to squeeze the cloth down in stubborn spots and spread excess Hot Stuff around a little without becoming a permanent part of the plane.

When the area to be glassed was covered, I cut off the excess cloth with a razor blade and stuck down the loose ends with more Hot Stuff.

A coat of K&B sanding resin and the plane was as good as new, although not as pretty as it once was. If you ever have a tough repair job, try the above fix. It really works.

I decided we didn't need any more loops and such out of the plane, so dug into the outboard tip and epoxied in a bunch of lead, even though tip weight is normally not required in a Goodyear, especially a Falcon. The Lee titanium gear was also twisted to the right, to force the plane to track to the

outside of the circle in a very positive manner. Again, this should not be necessary.

The only thing we have found that *may* be causing problems is that we are using Lee gear with a 15° forward sweep, where as Kilsdonk uses gear with a 35° sweep. His wheels are just below the glow plug, so they're way out front! John says this gear makes the plane crab to the outside, which certainly would help line tension. Also, when his plane touches down, coming in for a pit, it immediately crabs to the outside of the circle. Instant brakes, as John says. Must look kinda strange, especially to those promoting rear set gear as the way to go for good ground handling. Think I'll go with Kilsdonk on this and try another set of gear.

The third time out, Gary made even more effort at launching the plane cocked to the outside of the circle and I tried to do better at getting the plane off. This, combined with the tip weight and twisted gear, eliminated our problem. Too bad we can't find the cause of the problem, though.

With the take-offs solid and dependable, we settled into some serious practicing. Did a couple of 3:20 heats, but got down to a best of 3:10.

Had several fast-fill plugs go bad on us, which is very aggravating. Carl Goldberg gave me a couple of Taylor plugs from England to try and we blew both of them. Neither plug lasted more than one run, so they don't seem much good to me, although I have heard differently from others that have tried 'em. Had a few GloBee's along, so tried them. Seem to be OK, but nothing fantastic. They would go bad about as fast as the K&B plugs we normally use, at least on our set-up. Had a couple of the new Cox plugs around, but I sent one to Kilsdonk and lost the other, so wasn't able to try one. Keep hearing good things about them, though. If I find the one I lost, I'll try it and let you know next month how it works.

As Gary and I have had real good luck with the K&B plugs in our Combat motors, that is the plug we decided to use in the Goodyear, and we get good results out of them. They are a little sensitive to over-lean runs, but this type of run is to be avoided anyway. In this practice session, we had a K&B last for about 100 tuning laps, plus 5 practice heats. Over 500 laps and about 20 starts on that plug before it went away. I consider that to be pretty good.

One strange thing about the GloBee plugs is that they will look OK (other than a small amount of element distortion), glow bright and yet not run, when they go bad. The engine will start and act as if it is running out the prime, then die out. This had us fooled the first time it happened!

At the end of the third session, we

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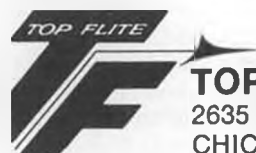
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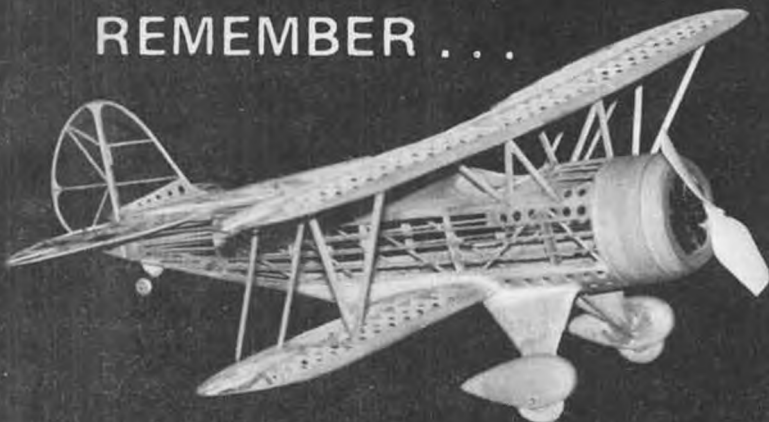
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felt we were coming along OK, but Gary wasn't getting the Rossi to fire off as quickly as we wanted. I was getting the plane shut down at slightly less than a lap in front of the pit, but needed to do better. Kilsdonk shuts down a half lap before the pit, but I'm not sure I'll ever get to the point where I can cut it that close!

Our fourth practice session was great, everything started coming together. Had a talk about pitting and we decided that by setting the prop so that it is straight up and down when against compression, Gary could hit it with a straight, fast swing, rather than flipping it. This one thing changed the pits from a "maybe" situation to a very consistent 1 or 2 flip proposition.

Of course, this position for the prop means we screw up a prop tip every once in awhile, but the fast pits are worth it.

Gave the new Magnum fuel a try, and it works great. We used 40% and still were getting 16.4, even though 40% is a little low for Badyear fuel. Plug life seemed to get better with the Magnum fuel, but that may have been due to the fact we weren't running as fast as before.

Did several heats in 3:10 with the Magnum fuel, so it was obvious that we were cleaning up the pitting a little . . . plus doing the whole act a lot more consistently.

Switched back to 60% Nitrotane and did 16.0 just slightly rich, so we were ready to beat our previous best of 3:10. But started having setting problems. Gary would have a lot of trouble getting the needle just like he wanted on the ground and then the motor would go over-lean in the air. The fast-fill was OK, but then we found the riser tube in the Rat tank was coming loose, so we packed it up for the day.

At the end of 4 practice sessions, Gary and I have: (1) Burned over two gallons of fuel; (2) Settled on Kelly glass props, cut to 6-3/4 and cleaned-up only, as competitive; (3) Decided to use K&B plugs; (4) Decided to use 60% Nitrotane; (5) Started getting consistent 1 and 2-flip starts and re-starts; (6) Started to get the plane shut down at 3/4 lap in front of the pit; (7) Found that George Aldrich really does have the fine touch with the Rossi 15.

One thing not covered is the trick to getting a 110 plus mph Badyear slowed to catching speed in less than a lap. Nothing secret to it, but it does require practice. Immediately after hitting the shut-off, the plane is wiggled up and down by quick applications of full up and down. When the plane is slowed some, it is set down as quickly and as smoothly as possible. The wiggles kill off most of the speed and the ground roll does the rest. Sounds easy enough, but plan on lots of practice before being able to do it consistently with anything less than a lap lead on the pit.

Your pit-man will really dig it if you can shut down with a 3/4 to 1/2 lap lead on the pit . . . it makes him look good when the pits are timed by the opposition. But miss just once and smoke that 1-1/2 lb. plane into him at about 60 mph . . .

Charger Continued from page 27

the two 4/40 screws, 1/8 inch in diameter, where shown. Exact locations can be found by counting holes. Install the perfboard terminals as shown in Fig. 5. Mount the parts as shown. Note the collector (C), base (B), and emitter (E) markings for transistor Q-1. Note the anode (A) and cathode (C) markings for D-2 and D-3. Capacitor C-1 and diodes N-1 have their markings too. If you

can't see, or figure out, the plus marking for N-1, you can find it with an ohmmeter. Put the black lead of the ohmmeter (minus) on one lead of N-1. When you touch the red lead (plus) on all the other leads and get a low ohms reading, the black lead is on the plus lead. Change the black lead around, until you find the plus lead. Kitty-corner across from the plus lead is the minus lead. The other two leads are the A.C. leads. Check the diode and transistor packages for proper lead identification.

Turn the board over, match up the terminals with Fig. 4, and wire it up as shown. The wires hanging loose (wires A through H), should be about six inches long. Use a piece of tape, and mark these wires with their letter designation as shown. The red and black test probe wires (output leads) should be cut twelve inches long. When you are sure you have this board wired right, *check it at least one more time.*

Using two 4/40 x 1/4 screws, mount the two 1/2 inch spacers in the bottom of the box, beneath where the two screws in the board, in Fig. 1, can be seen. Do not tighten these spacers down yet. Use two lock washers between the spacers and the bottom of the box. When installing the board, be careful not to pinch any of the wires between the board and spacers. Install the board as shown in Fig. 1, using two 4/40 x 1/4 screws. Now, tighten the two screws into the bottom of the spacers.

How you dress the wiring isn't too critical. One thing to watch, is to keep the wire insulation away from anything that might get hot. Connect wire (A) to one of the secondary terminals of transformer T-1. Connect wire (B) to the wire that connects R-5, R-6, R-7 and R-8 together. Connect wire (C) to anode side (bent lead) of L.E.D. diode D-1. Connect wire (D) to the cathode side of D-1. Connect wire (E) to the Collector lead of transistor Q-2. Look at the package, to see where the Collector, Base and Emitter leads are. Connect wire (F) to the Base lead of Q-2. Connect wire (G) to the Emitter lead of Q-2. Connect a wire from the Emitter lead of Q-2, to the inner terminal of switch (SW-1B), as shown in Fig. 3. Connect wire (H) to the other secondary terminal of transformer, T-1. Run the test probe wire out the center left 3/8 hole in the front panel. Run the black test probe wire out the bottom left 3/8 hole in the front panel. Pull the wires tight, and install two small bushings where they go through the hole. Pull these leads out full length and cut the longest one off to the same length as the shortest one. Push the black alligator clip boot over the black lead. Push the red boot over the red lead. Strip these two leads enough to install the two alligator clips, and tin the wire ends.

Crimp and solder the alligator clips on.

After the alligator clips have cooled, slip the boots over them. Strip back and tin the ends of the power cord. Push this cord through the hole in the back panel. Connect one lead to the closest fuse terminal. Connect the other lead to the closest primary winding terminal, on transformer T-1. Connect a wire from the other fuse terminal to the inner terminal of switch (SW-1A), as shown in Fig. 3. Connect another wire from the other primary terminal of T-1, and the outer terminals that are shorted together on switch (SW-1A), as shown in Fig. 3. Install the larger bushing on the power cord, where it goes through the hole. Install the 1/4 ampere fuse. The wiring is now complete. Very carefully recheck the wiring, and all the solder connections. Recheck the Collector, Base and Emitter leads against the packages and drawings. Be sure that no bare wires are touching the box.

Turn the knob all the way counter-clockwise. The dial is now in the off position. By slightly loosening the dial screw, adjust the dial pointer so that when you go through the six positions, they fall symmetrically on the right half of the panel. When you have it adjusted properly, tighten the dial screw down tightly. Using a marker, or any other method, mark the panel. The first position (all the way counter-clockwise), is marked "OFF". Each position after that is marked in this order; "AA", "C", "D" and "LD.AC." The LD.AC. stands for Lead Acid. The sixth position is left for the charge current of your choice, between ten and three hundred milliamperes. Mark the current you have chosen, or you can do it later. How to adjust the charger for your charge current selection will be covered later in this article. Mark the panel, where the red lead comes out, as "plus", and where the black lead comes out, as "minus". If what you've marked the panel with will rub off, cover it with clear tape, or some other means.

Before going into check-out procedures, I will explain how it works, so you will know what's happening and why. When the selector switch is turned to the AA battery setting, power is applied to the transformer (T-1), through the switch (SW-1A). At the same time, switch (SW-1B) selects resistor R-5. Transformer (T-1), applies twenty-four volts A.C. to the diode network (N-1). N-1 changes the A.C. voltage to a pulsating D.C. voltage. Capacitor C-1 filters this pulsating D.C. voltage, and changes it to a constant D.C. voltage. Resistor R-2 supplies enough drive current to transistor Q-2, to turn it fully on. When Q-2 turns on, charge current begins to flow into the battery connected to the outputs. This charge current also flows through the selected resistor, R-5. When thirty milliamperes flows through R-5, three volts is developed across it. The voltage divider (R-3 and

R-4), applies .7 volts to Q-1, when three volts is developed across R-5. Transistor Q-1 now turns on, and shorts out just enough current from the base of Q-2, so that Q-2 will now *only allow thirty milliamperes* to flow through it. Q-1 also turns the L.E.D. on, indicating that the prescribed charge current is now flowing. Only the prescribed current will flow, whether the output leads are shorted together, or there is up to twenty-four volts worth of batteries connected to the output. Resistor R-1 limits the amount of current that can flow through the L.E.D. Diode D-2, blocks the current from flowing through the base-emitter junction of Q-2 and through the L.E.D. If D-2 were replaced

with a wire, D-1 would always be lit, when the power was on. If diode D-3 wasn't in the collector lead of Q-2, the charger would discharge any batteries connected to the output leads, when the charger was turned off. Some chargers may have a tendency to oscillate, so capacitor C-2 was put in, to keep this from happening. The selected resistors R-5, R-6, R-7, and R-8, were computed to give three volts drop across them, when the desired charge current flows through them. If you are familiar with electronics, you may wonder why I used a voltage divider across the selected resistors. Why not use .7 volts, instead of three volts? To use .7 volts, all but one of the selected resistors would have



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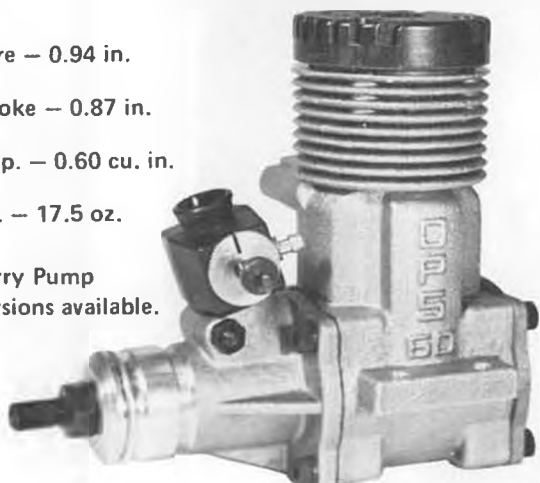
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to be less than ten ohms. Radio Shack carries only one resistor value less than ten ohms, and that's a one ohm ten watt resistor. To get the values needed, resistors would have to be paralleled. So, using three volts, as the sensing voltage, we can use resistors of ten ohms and higher. You can say that this charger has been engineered with **Model Builder** readers in mind. This charger will run pretty warm, but keeps well within limits.

One more thing left to do, before checking your charger out, is computing the resistor value needed for your chosen charging current. The formula for finding resistance is: Resistance

equals Voltage divided by Current. To find the resistance value you need, divide three volts by whatever current value you selected. For example, if you need a fifty milliamper (0.05 ampere) charging current, divide three volts by .05 ampere, which equals sixty ohms. A standard value resistor doesn't come as a sixty ohm resistor. You can use a fifty-six ohm or a sixty-eight ohm resistor, which will be close enough. Radio Shack resistors have a ten percent tolerance, which means a fifty-six ohm resistor could go as high as sixty-one and six tenths ohms. Now that we have the resistance value, we need the wattage rating. By the formula, watts is equal to

current times volts. For a current of .05 amperes and a voltage drop of three volts across the sixty ohm resistor, we have .05 amperes times three volts, which equals .15 watt. A fifty-six ohm, one-half watt resistor should do fine. So, plug your numbers in, and see what resistance and wattage value you need. When you have your resistor, solder it on the switch terminal, next to the ten ohm two watt resistor R-8. Remember, both ends have to be soldered in.

Okay, you are now ready to check your charger out. Before plugging it in, be sure the one-hundred and twenty volt wiring that is on the switch, is only on the bottom half of the selector switch. If you feel you might be putting your hands inside the charger, with it plugged in (even when it's turned off), cover the fuse and fuse holder assembly with tape. The only positive way to check this charger out, is with a current meter. A V.O.M. meter will measure current. If you are going to be using equipment that requires batteries, or participating in electronic construction projects, you should have a V.O.M. meter. Position the selector switch in the "off" position. Plug the charger in. Nothing should happen, or it is wired wrong. Short the output leads together. If the L.E.D. comes on, the power switch (SW-1A), is wired wrong. Disconnect the two output leads from each other. Turn the selector switch to the AA position. If there is no smoke, continue on. At this time, the L.E.D. should not be on. Short the two output leads together, the L.E.D. should now light up. Go through all the switch settings, connecting and disconnecting the output leads, and observing that the L.E.D. lights and extinguishes as it should. If all works properly so far, you are ready to check the charge currents. With a current meter connected to the output leads, go through each switch setting, and check the output currents. The diagram in Fig. 2 will show you what current readings to expect. With these selected resistors, the current readings should be close enough. However, if you want the readings to be closer, this can be done. For battery charging, it isn't real fussy. If the current is too high, the selected resistor value is too small. If the current is too low, the selected resistor value is too high. To decrease a resistor value by ten percent, solder a resistor that is ten times higher in value, across the resistor (in parallel), that you want to decrease in value. To increase the value of a resistor, add a resistor of the value you want to increase it by, in series with the original resistor. If all checks okay, install the cover. You are now ready to charge batteries.

You may charge as many batteries, in series, as will not extinguish the L.E.D. This charger should charge up to twenty-four volts worth of batteries,

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When Matty Sullivan decides to tackle a problem, he's never satisfied until he solves it plus all other problems in sight. And that's exactly what happened when the Willow Grove Wizard went after the problem of vibration.

The final result is the new Sullivan motor mount, a product that will shake up the industry — but never your airplane. This rugged, tough, solid cast aluminum motor mount uses steel clamps to hold your engine in place the way bolts never could. Sullivan's mount uses the same time-tested method as professional metalworkers in holding their work in a milling machine.

After five years of testing in a racing car (no failures) and four years of testing by a local model airplane club, the Sullivan mount was declared a big winner. The 10-32 Allen screws took more torque and did not stretch. The mount even did its job well when one inch was cut off the prop and one clamp was removed. That's hanging in there.

Sullivan purposely chose cast aluminum for the material because ordinary nylon mounts just don't have the strength. Some of the best known producers of nylon mounts are now switching over to aluminum for their larger models.

That points out another problem the new Sullivan motor mount solves — the need for a different model mount every time you put in a new engine. The new Sullivan mount fits any engine within its class. The MM-1 will take all engines from .29 to .44 while the MM-2 will take all engines from .45 to .60. And, with a little filing, each of the two rugged mounts can even handle larger engines.

The new Sullivan mount is longer and has extra holes so the position of the engine can be adjusted to suit your needs. It can be a full inch forward or backward and can be turned as much as five degrees left or right. With this mount, you can make that final adjustment for push rod or spinner clearance. Also, because it's so sturdy, you can

even file it to allow clearance for a Perry pump.

The problem of adding weight to the nose of the airplane is also eliminated by the new Sullivan mount. It has the weight you need and the way you position the engine can give you the balance you want.

You can also forget about the problems of drilling and tapping — they aren't required with the Sullivan motor mount.

Breakage is yet another problem that has been licked. Matter of fact, if your new Sullivan motor mount ever bends or breaks or its threads become stripped, just send it back with \$2 to cover handling and Sullivan will send you a brand new one.

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connected in series. When charging batteries in series, they should all be of the same ampere-hour rating. When charging batteries in series, don't add all the ampere-hour ratings together, to figure the charging time. If all the batteries are of the same size, only one battery is used to calculate the charging time. It is not recommended to charge batteries connected in parallel. This charger is *not* for zinc-carbon batteries.

If, after putting this charger together, it doesn't work, very carefully recheck all the wiring and solder connections. Using the packages the diodes came in, recheck the polarities of the diodes and insure they are wired properly. Check the transistors against the packages and drawings to insure they are wired up properly. Go back and read the instructions on what each part does, and if it is doing its job. Voltage readings are given in Fig. 2 to help you trouble shoot. I will go over a few possible problems, and what might cause it.

Symptom: No output current, L.E.D. lit.

Possible causes: C-2 shorted, D-3 in backwards, Q-2 open circuited or wired wrong, R-2 open, Q-1 shorted.

Symptom: No output current, L.E.D. not lit.

Possible causes: C-2 shorted, D-3 in backwards, Q-2 open or wired wrong, R-2 open, C-1 shorted, N-1 wired wrong or defective, T-1 wired wrong or de-

fective, SW-1A wired wrong, F-1 blown, power cord wired wrong.

Symptom: High output current, L.E.D. lit.

Possible causes: Q-2 defective or wired wrong, D-2 in backwards, SW-1B wired wrong.

Symptom: High output current, L.E.D. not lit.

Possible causes: Q-1 defective or wired wrong, voltage divider R-3, R-4 wired wrong or wrong value resistors.

Symptom: Blows fuses.

Possible causes: SW-1A wired wrong, transformer T-1 wired wrong, bare wires from the power cord touching the case, short circuit in the secondary circuit of T-1, T-1 defective.

If you wire this charger together properly, and all the parts you put in it are good, this charger should work the first time you turn it on. It should give you many hours of trouble-free service.

A word for those who read my previous article and put the glow plug driver together. About the water test: If the driver maintains enough heat to keep water from getting into the glow plug cavity, it's working properly. Three modelers wrote and told me, that sometimes their glow plug driver's short-detecting circuit would kick out too soon. If you have this problem too, change R-6 from 12K ohm to 27K ohm, and R-7 from 1.5K ohm to 2.2K ohm.

I hope you have found this driver as useful as I and my friends have. ●

Plug Sparks . . . Continued from page 35
an SE5 in his garage, nearly complete!

Lars Olofsson was a real pleasure to talk with, as he was quite interested in Old Timer activities. As reported in this column previously, there is a large club (about 40-50 members) devoted to old timer flying. Even Lars has become infected! Haw! We'll gettun all yet!

While rambling around the parked cars in the free flight area, the columnist ran into Caldwell Johnson, with a "Slick Stick", a design published in Air Trails in 1940. Watching him crank up and fly the model again was like seeing that portion of the movie you saw as you first walked in. Incidentally, the Slick Stick performed excellently.

While on the subject of "Cadwell" (as he is called by the old Brainbusters), he lost a model with a stuck timer in plain view of the writer and the group he was "gassing" with. About a half hour later, here comes Caldwell with the errant model. Caldwell explained how the timer stuck from lack of use. Winding the timer several times, it worked fine. The author recommended oil, at least 3-in-1, or at worst some glow fuel, the oil of which would lubricate the timer.

Nope, it's okay. Caldwell promptly launches the gassie again, and just as

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promptly, the timer sticks. This time the model loses itself but good. As Caldwell notes, you just get older, not smarter.

The Indiana trio showed up; Larsh, Burgess, and Murphy. Larsh had the oldest models, one by estimate, about ten years old. The old Strato Streak flew great for the first two flights, but old age finally got it when it looped over into the hard, hard ground. Oh well, Bob, should have retired it a long time ago!

Jumping over to the other side of the field, the R/C entries showed a tremendous variety of models. For those models with wing areas that did not meet the size motors available (i.e., 900 sq. in.

for a .40 cid engine) a considerable number of scaled-up models were seen. Best flying of the bunch was Tom Acciavatti's large Comet Clipper. Sure did float!

Best design on the field was on original rescued from his attic . . . Mike Granieri's M-G (appropriately named).

This model, with a stringered turtle deck fuselage and wing on wire cabin struts, not only looked good but flew good. Quite a few others agreed, as more than several were seen on the field, including one scaled down version. We're gonna hafta make this available to all members one of these days!

No meet would be complete unless "El Goofy", Meredith Chamberlain, showed up. Recently married, Chamberlain appears to be a bit more restrained. We're gonna miss him throwing his Gas Bag fuselage the length of the runway! However, Meredith was up to his usual tricks, building and finishing (one way or another!) models on the field. That's a neat trick, building out of the car. Especially with the wife in it!

MISCELLANEOUS

While on the field, met Art Suhr selling his excellent publication, "Antique Gas Model Engines." This book features pictures of most of the old time engines from 1934 to 1950. This long-awaited book, well printed with illustrations used in advertising copy in the various magazines of that day, is well worth the asking price of \$5.00 postpaid. Art also has a publication called "Index and Guide to Major Model Magazines." This book gives a short history and a graph indicating the length of publication and numbers of issues. Well worth the \$2.00 tag. For further information on these books, write Arthur Suhr, W218 N. 5866 McLynn Court, Menomonee Falls, Wisc. 53051. Delivery is super!

Not to be outdone, Bert Pond has finally issued his commemorative Book '76 which gives a tremendous amount of history of the early days of model flying. Included also, are a series of plan inserts which will enable any modeler to



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reproduce a model of that era. Eight blueprints in all are included. Well worth the \$4.25. Get your copy from Bertram Pond, 128 Warren Terrace, Longmeadow, Mass. 06606. I even had mine autographed, "To my 'son' from Bert Pond" - Haw!

SAM VICTORY BANQUET

Wotta blowout! Would you believe 320 paying guests? This was the Victory Banquet to end all victory banquets. Again, kudos should be given to Bill Hale and especially Bob Laybourne for the excellent facility (the Student Union dining room) and the even better meal. Nobody went hungry that night.

Trophy awards seemed to go on forever, as beautiful trophies were available to fifth place in each event. The most outstanding M-C work was done by C-D Dick Smith in awarding the free flight trophies and conducting the merchandise drawing. Man! There was enough that about every fourth person present got a prize!

The raffle for the Kraft Radio set was won by a lady (name escapes me) who, when asked if she would prefer cash (\$200) promptly said she wanted the radio as she had just lost her R/C glider with all the accompanying R/C equipment. A nicer person couldn't have won it!

Noted among the celebrities present were John Clemens, AMA President and Editor Bill Northrop, Model Builder.

Fortunately speeches (including Joe Beshar's; haw!) were short. As it was, the banquet was long but never particularly boring.

Some of the fun included Carl Spielmaker awarding cash prizes to the winners of the Compressed Air Event: Tim Banaszak, 1st place, \$50; Karl Spielmaker (!) \$25, and the two then pooled their money to give Fred Collins \$10 for a nice try with his compressed air entry.

When the dough was being passed out (a pun!), it was almost a mutual admiration society with Karl handing Tim money and Tim handing his money back to Karl. Hope we can get more

interest in compressed air models next year! Maybe Karl will sponsor again?

We're not through yet, but maybe a few of you are getting nervous and want to know who won what. Well, here's the results. Note, although trophies were given to fifth, in the interests of keeping this column from overflowing into the December issue, only winners to third are given:

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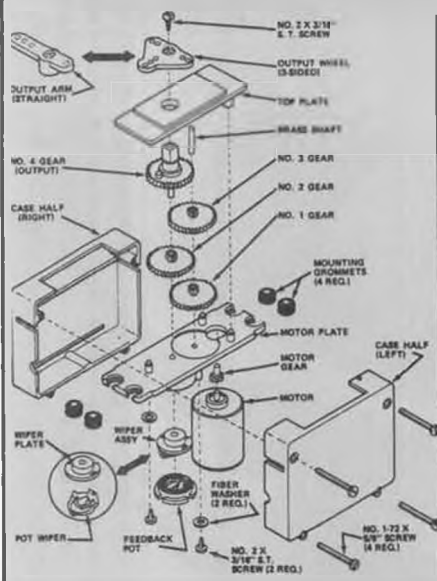


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THE WRAPUP

Several things are in order before wrapping up the column. One is a tremendous idea by Tom Barnes, who says the only way to beat the power rat-race is to have claiming races, similar to horse racing. In case you don't know what we are talking about, in a claiming race, a price is set on the model (or horse) as it is entered. If it fails to win, it can be claimed for the price set on it. How would you like to have your hot jewel claimed? Boggles the mind, doesn't it?

Last but not least, our illustrious SAM President, Joe Beshar, always good copy, to wit: While visiting some of his buddies at the dormitories in Wittenberg College, one of the screens was giving trouble.

Brash Joe, who lets nothing deter him said, "I'll fix it." Sure enough, he knocks the screen out, but he doesn't know the fire alarm is tripped. Of course, when the screen was knocked out, it fell to the ground outside the dormitory. Taking a short cut to retrieve the screen, Joe goes through a security door. All hell breaks loose with more alarms going off. They are still looking for Joe. Haw!

That's it for this month. Next issue, we'll get back to all the news we have had to set aside for the SAM Champs report. We'll have a special report on the New Zealand O/T Nats and a buncha others. Keep tuned!

F/F Continued from page 57

Last month, I detailed some thoughts regarding nose and tail moment arms, pylons and downthrusts. Let's get into wing and stab areas and shapes this month.

Some Areas of Thought for Wings and Stabs: Here is a pungent topic! Assuming you have decided which wing size you are going to use, you now have to decide on the effect you want for a stab. Most designs will have a stab

area from 25 to 40% of the wing area. A rule of thumb to follow is that the longer the TMA (tail moment arm), the smaller the stab can be. With the new multi-function timers now being used in AMA gas classes, smaller stabs can also be used even without long TMA. If you would go back to the sketch of the "lever" you made a couple of months ago, you can see that it takes less force to lift a long "arm" than a small one, and a smaller area stab on a long TMA is just that.

Now, let's look at that wing. Free flight wings always have one characteristic . . . they're large in span compared to their chord. The ratio of span to chord is called Aspect Ratio (A/R). To calculate this figure, simply divide the span by the mean chord. Example: an average 6 inch chord wing divided into a 48 inch span equals an A/R of 8. The higher the A/R, the more efficient the wing (glide); however, F/F power models will vary from a low of about 6.5 to a high of around 9. When airfoils get so narrow (in chord) their efficiency becomes less and they become more critical to adjust to their optimum performance. Generally, a wing chord of less than 4 inches is considered less effective, depending upon the airfoil used, of course. There are successful models with A/R as high as 14, but they are sometimes prone to wing flutter (vibration) under power, due to the difficulty in making the extremities stiff enough structurally to withstand the speed of a fast climb. Low A/R wings are easier to control . . . in rate of roll . . . than are high A/R wings, but the glide suffers. Again, a perusal of successful models will give you some indication of what you might want to use.

Another point to consider when laying out your wing planform is its shape. There are two reasons for tapered or elliptical type planforms:

1. Lighter tips recover from upset better than heavy ones, and 2, elliptical, and to a lesser degree tapered tips, are more efficient drag-wise than are rectangular or square tips, but, rectangular planforms are easier to build.

Stab A/R is less important than wing A/R, since its main purpose is stabilizing rather than lifting. Most stabs will average around A/R 5. I would recommend an A/R between 4 and 6.


Curses! (Air) Foiled Again! Here is a field just ripe for controversy. Some people swear by a particular airfoil, while others swear at it. There are about four basic airfoils used for wing sections on USA Power Models . . . they are the NACA 6409, the Goldberg G-610b, the Clark Y, or the Lucky Lindy, or variations on these. The first two listed are undercambered sections, useful on models with higher wing loadings (6 to 8 oz. per sq. ft.), and the other two are flat-bottomed, useful for lighter wing loadings. Typical variations

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of these foils include: thinning them to 7 or 8 percent thickness, adding turbulators to the tops of the forepart of the section, making them thicker to improve the glide. Flat bottom sections and thinner sections climb faster, undercambered and thicker sections tend to glide better, but climb suffers. It is very unusual for successful AMA class models to have an airfoil thickness much over 10%.

Stabs most generally use thin sections of the wing, i.e., a 10% Lindy section wing might have an 8% Lindy stab. Most builders prefer a flat bottom stab foil, even if they use an undercambered wing foil. Since a thicker foil is more powerful, one way to reduce stab area is to use a thicker stab section or a section with undercamber, but a stab should never have a thicker section than the wing, because it could create a longitudinally unstable model.

My own preference is for a stab airfoil that is flat-bottomed, with a high point at or near 30%, and a thickness of 6 to 7%. The RSG 29 is a good section to use, as is, or thinned down.

How to Finagle the Fin: Did you ever look at the fin on a modern power job? Fin on top of the stab, in front of the stab, below, behind, on the tips . . . or some combination of the above. Egads! Sometimes there are more fins than seems necessary. Egad 2! Some of them



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look like barn doors . . . others, thin. Confusion. Amuzin'? Now what to do?

Fins mounted on the fuselage cannot be knocked out of alignment, but must be aligned very carefully during construction . . . whereas, a fin on the stab can be very easily knocked out of adjustment unless the stab is keyed very securely. The farther back on the fuselage a fin is mounted, the smaller its area can be for any given design. Fins mounted on the fuselage behind the stab tend to handle power more easily than do other types, and are less critical in adjustments; due in part to the blanketing effect of the stab on the



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prop wash striking the fin. Fins on the bottom of the fuselage have much of the good of the rear fin, except that they are more vulnerable to damage upon rough landings, unless they are properly reinforced. What size? Most fins average around five to six percent of the wing area, but there are a number of variables entering into any formula and they are: 1, fins must be larger if there is a short TMA, high dihedral angle and/or fins placed closer to the C.G., and 2, fins may be smaller if there is a long TMA, low dihedral and/or rear mounted.

A fin is more effective if it is more than a flat sheet of 3/32 or 1/8 balsa.

Aerodynamically, a fin should be symmetrically airfoiled to produce a wider range of stability. This is usually accomplished by using a thicker sheet of light wood sanded to shape, or a built up structure. If you've stuck it out for this long, you'll be happy to know that the final installment covering construction tips, trim tips and one-upmanship will conclude in the next two months. See ya' here, hear!

Nats Note: Guess which famous FAI Power flier came out of a ten year retirement to fly FAI power at the 1976 Nationals? Give up? Who was our last World Championships Power winner?

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That's who it was alright!

FREE FLIGHT AND CITIZEN'S BAND

As promised last month, there are some similarities which exist in the separate worlds of C.B. and F.F. It is the purpose of the following paragraphs to draw several keen and hopefully succinct comparisons that you can mull over in your mind. Lest you get your dander up and write poison pen letters to Bill, just remember this is the humor section of this column. Here we go:

How about the following C.B. handles:

"Little Daddy", George Perryman;
"Rubber Duckie", Dave Linstrum.

Or the following definitions:

"Bear in the Air", Free Flight model maxing.

"Pregnant Roller Skate," a free flighter in a V.W.

"Front Door," a model flown as a "goat."

"Rocking Chair," easy thermal picked by the front door flier.

"Back Door," too late for the thermal picked by the front door flier that the rocking chair got into.

"Cab over Pete with a Reefer On," a free flighter named Pete getting a beer from a cooler.

"All the Good Numbers," 180 and 300.

"Pedal to the Metal," 25,000 plus rpm.

"Double Nickels," two maxes.

"Got Your Ears On," wearing ear plugs.

"Good Buddy," any free flighter.

Well, that's probably more than enough for now, I'm sure that with a little imagination, you can come up with your own versions. Try it. In the meantime, this here's the Front Door wishing all of you Good Buddies All the Good Numbers until next month.

PS: Beginning right now, I have moved to a new address. Please send all correspondence to me at 4437 Fox Hollow Road no. 1, Eugene, Or. 97405.

Hannan Continued from page 46 aeroplanes, they laugh me to scorn." MacKay agrees, and feels paper airplanes deserve greater respect, as they play a primary role within "the faculty of mental escape."

RAILWAY MODELER?

What are we doing quoting from a British model railroad magazine? Well, we thought the editorial in the July issue contained philosophy equally applicable to OUR hobby. See if you agree with these "non-denominational" thoughts: "Any new idea has sooner or later to pass the test of exposure, not to a small group of specialist critics, but to the whole broad spectrum of the hobby." "We are at present free to model what we like, when and where we like, providing our wives agree! Nobody, official, or quasi official can say us nay, which is as it should be. Long may this state of

affairs continue." Amen.
THE ONE THAT GOT AWAY

Last month we described the fabulous free flight birds-of-prey show featured at the San Diego Wild Animal Park. One of the chief attractions was a giant (37 feet long) helium balloon used to take two hawks aloft some 500 feet, where they are released via R/C, for their flight demonstrations. Between shows, the balloon is kept tethered at altitude, where it serves as a fine advertisement for the park. During the first week of August, the line broke, allowing the craft to escape. It rose to such an altitude that the envelope failed, and the framework fell to the ground. Thankfully, the birds were not aboard at the time. A replacement bag, of slightly different configuration has been obtained, and the show goes on. We have seen it half a dozen times, and still find it fascinating. Some spectators remain skeptical (perhaps not surprising in an election year) that the act is on the level, suggesting that the trainer is a ventriloquist, in the case of the talking birds, and that the diving hawks are actually R/C Models!

PEDAL POWERED PUSHER

Some time ago, we mentioned the man-powered aircraft then under construction by designer Tarus Kiceniuk Jr., of "Icarus" hang-glider fame, and Bill Watson, of model-building notoriety. Representing a truly fresh philosophy, the craft is of low aspect ratio planform, and is intended to take advantage of ground effect. Unlike high aspect ratio designs, which have a long history of self-destructive tendencies when operated close to the earth, this new machine exhibits a greater degree of practicality with a minimum of controlability problems. Although the craft is actually on tow in our fine flight photo, by Joel Rieman, it has briefly left the ground under the pilotage of Dave Saks, another active model builder.

We congratulate these fellows on their original thinking, and look forward to the establishment of some new records!

BALSA BRIDGE BUILDERS

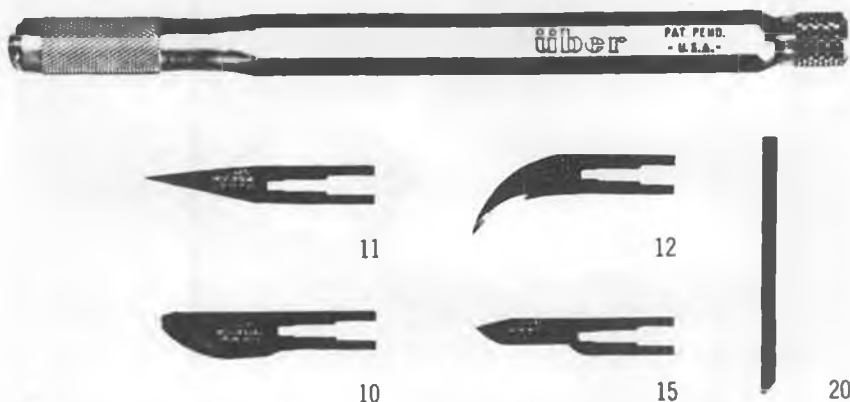
Alex Toth favored us with a clipping from the June, 1976 Los Angeles Times, describing an interesting school assignment. High School Teacher Kent Miller, conducting a class in engineering physics, gave an assignment to approximately 20 students, calling for bridges constructed of 3/32 balsa wood strips and glue. Each bridge was subjected to load application until it ultimately failed. Previously, the bridges would break at about 35 to 40 pounds of pressure, but this year, one student, Doug Gillingham produced a design which withstood 174 pounds! (With that kind of bridge building talent, Doug will no doubt take up dentistry! wcn).

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frightening situation at best. Almost every aviation enthusiast is familiar with the long, drawn-out conflict between the Wright Brothers and Glenn Curtiss regarding wing-warping/aileron invention contentions, but did you know that in 1931 Robert Esnault-Pelterie brought suit against the U.S. Government and Chance-Vought? Apparently, the constructor of the pioneer R.E.P. aircraft held the master patents covering the use of a single control column used for actuating elevators and ailerons. Interestingly, both Nieuport and Bleriot used different systems at the time of the invention, as did the Wrights, Curtiss, and Santos-Dumont. Doubtless a few lawyers profited as a result of the liti-

gation, but does anyone know how the case was resolved?

ANOTHER PEANUT PROPOSITION

According to Bob Haley, of the Union Stadt Zeppelin Works, the West Coast National Antique Association Peanut Scale Championship will continue to be a feature of the Antique Airplane Fly-in at Watsonville, California. This year saw the first such event, which, though limited in participants, was welcomed with great enthusiasm. Designs flown included a Mooney-designed Miles Sparrowhawk, Peck-Polymers Pietenpol and Zero, plus a Curtiss Robin, Cessna AW, Pietenpol and Bellanca Skyrocket from the Zeppelin works. In spite of a few Kamikaze flights into the crowd, a good time was

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had by all. The Peanut event replaced previous extra-curricular events such as streaking and belly dancers . . . Can there be a message here? A similar affair is expected to take place late in May of next year.

PARTING SHOT

Bill Pardoe laid this "bomb" on us . . . you may have to read it aloud to get it. Having got it, you may wish you hadn't.

Q: "Where'd you get your new prop?"

A: "The 'torque' brought it!" ●

R/C Nats Continued from page 21

other circles, closer and equidistant from the center site. This would have permitted better viewing by the spectators and also allowed scale competitors to see other flights besides the ones at their assigned site, but scale officials persisted. Incidentally, we talked to quite a few scale contestants who would have rather flown "back-to-back" from the same site, in order to see more of their favorite types of models in action.

Almost without exception, the quality of scale flying has improved greatly. It was obvious that every model we watched had been flown before appearing at the Nats. Also, the contestants are becoming more aware of the importance of scale speed. Scale speed means lighter wing loading, and this is where the real building skill comes to the

foreground. It's much more difficult to obtain a scale finish and include detail while keeping weight down, than it is to throw caution to the winds and depend on brute power to keep your lead sled airborne.

Bob Nelitz, current R/C Scale World Champion, from Canada, proved this beyond a doubt, by also winning at Dayton. His Chipmunk was a thing of beauty, on the ground or in the air. Charlie Nelson, a winner in 1973 at Oshkosh, was back with another Jenny that lumbered around in proper fashion, to take Second in AMA Scale. Bill Bertram flew his Oshkosh veteran Aeronca LB low-winger to third place, followed by Scale Team member Bob Underwood with his "Boxy Bonzo", and perennial scale competitor Ralph Jackson, with his pretty Piper Comanche.

In Sport Scale, Roger Brennon's masterful flying of his P-61 Northrop "Black Widow", pulled through the air by two Kraft 61's, put him in first place. The ship was beautifully smooth in the air and its flying speed, though fast, did not seem out of scale for that type of aircraft.

Don Snull's BE-2E could have done well in AMA Scale, and when he started the engine, we discovered that the exhaust was actually hooked up to the two vertical stacks that extended above the leading edge of the top wing. Second

place, but gosh, it must have been close!

George Buso flew a large Piper Navajo Twin to 3rd place that again, because of its size and wing loading, flew very realistically. The inside of the fuselage looks like Grand Central Station!

Bob Noll's 4th place Steen Skybolt was equipped with a smoke maker that could be turned on and off by radio. Basically, he pumps liquid up to the muffler by engine pressure, just at the exhaust connection, where it is hottest. As the fluid sprays into the exhaust through a needle valve, it vaporizes, making smoke. Kerosene or brake fluid work well.

Ramon Torres was fifth, flying a Beech T-34.

Incidentally, we learned an interesting "weathering" technique from Sid Axelrod and Dan Santich of Top Flite, as used on Dan's F8F Bearcat. The model is covered with chrome Monokote, painted with polyurethane . . . in this case, typical Navy dark blue . . . and then the paint is rubbed or scraped off in the normal wear spots. Very realistic.

* * *

Next month we will get into more detailed discussion about some interesting pointers and rules problems that were picked up from various contestants and officials during the Nationals. Meanwhile, we had better cut it off to leave space for some pictures! ●

Sailing Continued from page 61

So here we are at a regatta that was 78° and 8 knots last year, but the weather man has sent 45° and 22-25 knots for this edition. Look over at your competition. First of all, there is his boat sitting up on the cradle, waiting for a knockdown with a wind shift, and flogging its sails to beat the band. You have your boat lying down, sails almost horizontal, and have built a wall of toolboxes around your rudder so that nobody will step on it. He picks his boat up and heads for the water, almost getting blown over in the process, while you keep the bow to the wind and get a crew member to carry your transmitter, knowing you'll have your hands full with the boat. If the opponent gets waterborne, you can watch him blowing tack after tack, gyrating wildly downwind and in general moaning about what he could be doing instead if he had stayed at home . . . Consistent survival? Not that turkey!!!

You have had the experience necessary to know what to do to ready the boat for these winds, not only know, but have done them. You are prepared with foul weather gear, boots and warm socks, a plastic rain bag for your transmitter, a wide brimmed hat to keep rain drops off of your glasses, and one of Harris Engineering's waterproof switches so you don't have to take a hatch off

unless you are changing battery packs.

Your check list has included:

- 1) New sheets.
- 2) All fittings checked and oiled, including all staywire.
- 3) All batteries and ballast tied down tight in the boat, 90° heel will not move anything.
- 4) Maximum obtainable watertight integrity, all hatches taped shut no matter how they were built.
- 5) Plenty of spare battery packs, larger receiver packs . . . you'll need more rudder servo power, and the extra weight will be a blessing.
- 6) You may have storm sails up . . . check with your sailmaker. I recommend 3 oz. cloth, maintain the original foot dimensions and reduce the amount of roach and luff heights. My 50/800 sails like a banshee with 650 square inches when it's piping up. I've had her out in 35 knot gusts and she survives quite nicely. One-design classes will benefit from an overall 15% reduction in area, where a real improvement in performance will appear.

Now let's go around the course and see what we can do to make some adjustments to the rig and boat for heavy air. **BEATING**

This is probably the most important leg to tune for. The requirement is for reduced heel and a reduction of weather helm and leeway. Heeling reduces the amount of sail area which is producing drive, and leeway becomes pronounced as the effective area of the keel diminishes. Weather helm will slow you down, and it is speed that will allow you to make sure tacks. Here is a set-up list for going to weather.

1) Ease the traveler . . . will reduce heel.

2) Bend the mast back with backstay tension to release the leech of the mains'l and allow some twist to develop. This will allow the head of the main to start to luff early and reduce heel.

3) Tighten the main luff halyard or downhaul. As the wind increases, the draft in the sail is blown aft. This increases weather helm by cupping the aft half of the sail, a definite no-no. Tightening the luff will pull the draft forward. (Remember to slack it off for storage.)

4) Flatten sail feet with outhauls. This will reduce the heel that the rig will produce.

5) Devise a means of locking shroud turnbuckles so that vibration and tension will not let them loosen. I have used 2-56 nuts on the turnbuckle threads for lock-nuts, or surgical tubing to immobilize the barrels and prevent turning.

6) Adjust your jib traveler or sheet. On an EC/12, snugging it in to backwind the mains'l is good. On some 50/800's, letting it out will reduce heel effectively without interfering with the main. Tuning trials with a partner will help tell you which to do.

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7) Move ballast aft to keep the rudder in the water, and to move the CLR aft, reducing weather helm.

8) Tightening the vang will help bow the mast forward and flatten the mainsail. But this has to be balanced with allowing some twist to develop in the sail, and will be related to the aspect ratio involved, taller sails requiring the softer vang setting.

9) Keep jibstay tight, the increased backstay tension will help, and the jenny's will need to be tuned to produce a smooth curve in the head of the mast.

10) Sailing to weather minimize the number of tacks. This is just good sense, tacking is risky in heavy air, it takes time, and it loses ground if you miss one. Pick your spots and tack with authority.

A good rule to remember with regard to almost all rigging adjustments is: "THE HARDER SHE BLOWS, THE TIGHTER IT GOES." Except for sheets, this seems to hold quite well.

REACHES

1) Adjust sail trim to minimize heel.

2) Keep the jib full to minimize the pressure on the rudder.

3) Luff the main if necessary to balance the boat.

4) Remember, "WHEN IN DOUBT, LET 'EM OUT." A heeling hull with a bone in its teeth only looks fast. The more nearly vertical you can keep the mast, the more sail power is going into

drive and the less into heel.

5) Avoid dragging boom in water as this will reduce speed and make maneuvering difficult.

RUNS

1) Goosewing the sails to balance the boat.

2) Anticipate the broaching tendency of the boat, and be awake to the slewing effect that you experience when you go down the frontside of a wave. The water at the crest is going with you, and the water in the trough is coming in reverse (take my word for it). The result is two forces acting to yaw the boat around if you don't counteract. (Figure 3.)

3) As a general rule, don't let the boom or club go all the way out to hard abeam (90°). The reason is in the twist of the sails that we put there to help in sailing to weather. The twisted sail will allow a force to develop to weather of the main, can cause a broach, or at the very least, will start a wild rolling that will scare the daylights out of anyone near you. Fig. 4. The vectors that you see in the tops of each sail are directed off of the axis of the boat. They will result in more yawing moments which will cause the hull to slew around. If this gets in step with the natural period of oscillation of the boat, or if they happen to push in conjunction with the wave/water couple shown in Fig-

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ure 3, the resulting broach can be incredible.

GENERAL TACTICS

The loss of vessel control that your opponents experience in heavy air can work to your advantage. In any case, give them a wide berth, since collisions in this kind of weather can be fatal. You do have the opportunity to take the benefits of a port tack who cannot yield to you on starboard tack. Make sure that the crossing situation is well understood . . . yell, "STARBOARD," with gusto . . . then when he can't tack, you tack and make sure he gets the two points for failing to give you the right-of-way. Nasty, sure . . . but you were the one who has been standing out in the rain practicing . . . it ought to be worth something tangible. (*Sounds like Dirty Dan has been talking to you, Rod. wcn*)

In stormy starting sequences, I prefer to start late, and to weather of the fleet, in clear air. The interferences of wind

flow in a bunched fleet makes sure control difficult. Also, there is an inevitable crunching of boats in that bunch which I want to avoid. Keep clear of the pack. Arrival at the weather mark requires caution, if anyone has managed to keep up with you. Give the mark a wide berth, and remember that your opponent may not be in full control of his boat. It makes good sense to overstand the mark so that if you happen to get slowed by other boats, the leeway that you make will not carry you below the mark.

It is a good practice to keep a weather eye up the course to see just what kind of wind is coming your way. This allows you to tack in relatively quiet air, it will help you to plan your buoy roundings, and most important, it will give you a good indication of what is going to happen to your hapless opponent who is still muttering about the rotten weather.

As I said before, keep boat speed up. The water velocity flowing past your rudder is what allows you to change

direction. Help all you can with the sails. On the aforementioned keelboat classes, the rudder is easily overpowered by the sailpan in heavy air, so a good strong winch and a quick thumb on the transmitter will serve you well. Let the sails and rudder work together, rather than fighting one with the other.

And after the sun comes out on you as they hand you the trophy . . . just remember all those soggy hours of practice . . . see, heavy air sailing really is fun.

Remember to send your dues into the AMERICAN MODEL YACHTING ASSOCIATION. The new Secretary is Bob Cryslar, 2709 So. Federal Hwy, Del Ray Beach, Fla. 33444.

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Rocketry . . . Continued from page 36

it's heavier, and has a higher bend resistance and shear strength. It also has an occasional slight warp, which can be carefully straightened out. Once this stuff bends, there is no tomorrow; it has to be cut and glued, and really can't be finished properly again.

On the plus side, fiber fins can't shatter like balsa under rocket speeds, although they will flex a bit. And an interview with some of the Centuri folks at the NARAM (our Nats) revealed another fact; the wing sections of the kits are too wide to be fitted onto any commercially available sheet balsa!

Construction of the kits is straightforward, as long as care is taken to read the instructions first and follow them. The main danger is misalignment of the wing or fin sections, and they've written some good tricks into the instructions to help you with that. On the F-4 and F-15, paper shrouds are folded and glued to the body to form the jet intakes; this can be a bit tricky. These shrouds come punched out of a sheet, and pre-creased. On the F-4, the folding wing tips are duplicated by gluing end plates on the wing section; this can give trouble, since white glue is flexible and they can sag if they get warm. I recommend a carefully-applied batch of epoxy to attach these panels. Keep the glue from smearing on the fins; it's next to impossible to sand off once it dries. The kits all feature neat little missiles and external fuel tanks, the nose and tail sections of which are plastic. As to the clear canopies, there is a decal simulating a cockpit interior that goes on the nose cone before the canopy is glued in place. The instructions say to glue it in place before painting the nose cone, but the cones are made from colored plastic, which leaves you with a ring of red or blue between the edges of the decal and the canopy. We gave the cones a couple of coats of spray flat paint first, and then applied decals and glued canopies directly to the paint. It's touchier, but it turns out a slightly

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better looking nose section.

Another slight modification was made with our models, to allow engines from several different companies to be used. Centuri's engine mount consists of a length of ST-7 tube and a cardboard ring which centers the ST-7 tube in the main body. The ST-7 mount is fine for Centuri's A, B, or C engines. In our case, we wished to fly the model with D20 engines, from FSI, which are too wide to fit in the ST-7 engine mount tube. First, we assembled the engine mount, substituting a 3-1/2-inch piece of ST-7 tube and gluing the centering ring 1/2-inch from the forward (ejection) end of the engine mount tube. Then another centering ring was glued 3 inches inside the main tube. When flying the model with the FSI D20 engines, this second centering ring serves as the engine block, and the engine is simply secured in place by friction-fitting with masking tape. To use Centuri engines, slip the engine mount assembly into the main body until the tube slides through the center of the forward centering ring. Put a little tape on the rear centering ring, and push it in place until it makes contact with the forward ring. Make sure this assembly fits tight enough to avoid ejecting it when the parachute ejection charge fires. Now fit the engine in the engine mount tube.

In flight, it's once again important to check the instructions carefully. The model is designed to use a parachute yoke that brings it down belly-first, to minimize damage to those fiber fins. Take extra care to see that it doesn't get snarled. Boost characteristics of all three models are excellent with all engines from A through D, both Centuri and FSI.

On our first flight test, we used a Centuri B6-4 engine, and followed the instructions to the letter. After an excellent boost, the chute ejected and snarled around a wing. A concrete sidewalk leaped from its former position and ran across the field in order to be underneath the model when it smacked into the ground. Expecting to find a pasteboard pretzel, we chugged over to the crash site, to find a disgustingly undamaged model! There were nicks along one wing edge, showing where it had taken the shock of landing; but there was no sign of a bend to the main wing, or anything else, for that matter. Considerably surprised, we flew the three models until the engine box gave out: eighteen flights. Not a one received worse than minor scratches and nicks. Cardboard and fiber are getting a lot more respect around here now!

Our good friend, Bob Del Principe, designer and comic relief at Centuri, tells us that at least three more Fighter models are planned. He has no word on just when the Fighter line will be expanded, but one of the design ideas is said to be a Mirage, and all of the kits may feature international markings. If



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they come up to the quality of the three present Fighters, they'll be excellent additions to your collection. Contact your local hobby shop, or write Centuri Engineering, Box 1988, Phoenix, AZ 85001 for a catalog.

Speaking of catalogs, we've seen quite a few in our experience, but none with quite as much information as the new one from Aerospace Vehicles, Inc. They call it the Encyclopedia of Space Modeling, and they're not that far off. It's printed newspaper-style, with several large sections; lots of technical info as well as items on the NAR activities and a complete listing of all US and FAI model rocket records to date. AVI lists products from every single model rocket manufacturer of any size in the USA, as well as one Canadian company;

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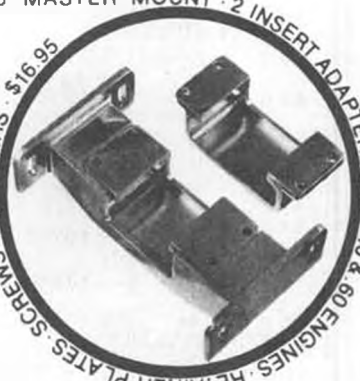
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they also sell hot air balloons (!) and space stamps for philatelists. It's an excellent evening's reading, as well as good resource material; just don't let your wife throw it out with yesterday's paper. Copies are \$2 (mostly for postage; the thing is heavy) from AVI Astroport, Mineral Point, WI 53565.

In this month's Howzat-Grabya department, we have a very interesting communication from Daryl Harris of Monument, Colorado. It seems that Daryl likes to fly FSI F7-6 engines, but encountered difficulties recovering his models after the engine's nine-second thrust duration (the F7 is known to hardened spacemodelers as the "Steam

Machine"). He came up with a most ingenious solution. His models were modified to use a payload section. The nose cone was then sanded until it was a very loose fit in the payload section tube, and then secured with shock cord to the payload tube in the standard manner. Before the flight, the payload section is filled with flour. When the model peaks out and ejects its parachute, inertia forces the loose-fitting nose cone out, and produces a nice, big cloud of white dust. Daryl pointed out that the FSI OSO kit is ideal for this type of flight. We tried it, and it does indeed work very well; although we suggest the use of black tempera powder to make the cloud show up against a cloudy sky (which they evidently don't have in Colorado). Incidentally, Daryl is fifteen, and found his interest in rocketry when he was crippled with an unknown ailment. Fortunately, the condition proved temporary, and the interest in spacemodeling permanent.

Moving right along, we have another picture from the publishers of CAPCOM, the BCMRA club in Florida. They succeeded in doing the impossible; they got a liftoff shot of an FSI Mach 1 rocket. If you haven't seen a catalog lately, the Mach 1 System is a two-stage rocket kit that is capable of breaking the sound barrier; yes, it's done legally, with standard model rocket constructions. I've actually heard one of the things produce a sonic boom (more of a crack, really). In any case, the beast lifts off like a goosed archangel, and it took a quick finger on the shutter to catch that beautiful shot. Thanks guys.

At this point, we'd like to announce that the plans are proceeding well for the holding of the 1977 International Spacemodeling Championships in the good old U S of A. The tentative site for this third Internats is Dayton, Ohio, on or around Wright-Patterson AFB. FAI approval is in the works, and nine countries are scheduled to show up. The U.S. teams have made a good showing in the past, but have been consistently nosed out of first place; with the Internats held here, we can get some real talent

involved, since the team members don't have to come up with a couple of grand apiece to get overseas and back. Sound familiar? The event is to be held in early September, 1977, and it's going to really be a special event. Watch MB for more details as they become available.

Well, the NARAM gave us the opportunity to get some more late word from the manufacturers, so you'll be seeing reviews of some exciting kits coming up. Centuri is releasing a flying model of the Eagle Transport from Space: 1999, whether you like the show or not, you'll like the looks of the model. Estes has released its Space Shuttle, and we're preparing detailed information for publication; partly as a review of the kit (which looks excellent) and partly to pass on some straight data to scratch builders. We're also building one of those fancy Kopter gliders for a review. Keep those cards and letters, and especially pictures, comin' in folks. ●

Counter Continued from page 9

in boats. Imagine a Harbor Patrol Boat with flashing red, amber, and blue law enforcement lights . . .

To complete this particular type of equipment, International Marine Exchange has available electronic sirens, whistles, and, as pictured, an electronic 'Whooper' (Navy "Battle Stations" or "General Quarters"). These are all designed to emit the most realistic sounds, and will operate on from 6 to 12 volts. The greatest volume will be obtained from the higher voltages. As with the Flashers, the design has been optimised to obtain maximum battery life. Actual current drain is only 100 mils at 6 volts, which is not excessive, considering the intermittent use of the device.

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* * *

According to the 'Manual for Diesel Operation of Cox Engines,' by Davis Diesel Development, model diesel engines were first developed in Europe in the 30's. They have always been noted for power, simplicity of operation, and economy. Still popular in Europe today, the world endurance records in both R/C and U-control are held by diesels, and they are extremely popular with team racers in Europe.

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Conversion is simple. READ THE INSTRUCTIONS, which are complete and thorough; remove the Glo Head, install the proper diesel disc, which is a fluorocarbon seal, install the diesel head. Fill up with 'Diesel Power' fuel, also available from DDD, set the needle and contra-piston to the proper number of turns as per the instructions, and crank as any other Cox engine (Did you notice it didn't say "Hook up the battery to the glow plug?").

The instructions cover theory, settings and differences from one engine to the other, even a complete troubleshooting section in the event the engine will not start or operate properly.

For more information, contact Robert Davis, at Davis Diesel Development, 86 Priscilla Circle, Bridgeport, CT 06610.

* * *

We would have named it "Miss Linda", after the very charming Mrs. Chabot, but George Chabot, of GMC

Models, christened his latest creation 'Miss Norway, Mk III'. Described as 'A superb 1/2A Pattern Ship', this is certainly a superb looking airplane and kit. It will probably take most of us a little longer to build this little bird than it would to build the same size machine in a slab-sided box fuselage, but the results should be well worth the effort.

The kit includes profusely illustrated plans, completely detailed instructions, high quality die-cut and machine-cut balsa and plywood pieces. Included also is a hardware package with aileron torque tubes, control horns; even an engine mount and spinner. The only thing required is your favorite R/C system and a hot Tee Dee up front.

Naturally, one of the new super-small radios would be ideal, but the fuselage is still wide enough to accept most systems using mini-servos and separate receivers. A 225 mil battery in place of the usual 500 mil size is probably the only change needed to most airborne systems.

The span is 35 inches, weight is 20 to 25 ounces, with two channels on ailerons and elevator. Price is \$24.95. At your favorite hobby store, or GMC Models, 28062 Glasser St., Canyon Country, CA 91351.

* * *

The latest item from Fourmost Racing Products, 4040 24th Ave, Forest Grove, OR 97116, like their other products, is designed to make life easier for the Half-A builder. A new fuel fitting set, consisting of two elbows, one tee, and one pen bladder tee, should handle problems. The fittings are molded from lightweight fuelproof polyethylene, and while small enough for Half-A use, feature an internal hole of 1/16 inch diameter, large enough for the fuel demands of a .60.

No more having to worry stiff metal tubing to the proper contours, no more kinked fuel lines. See your dealer, or inquire from Fourmost. Tell them both where you read about it.

Remotely . . . Continued from page 11
officials say closing the entire band

might be the only solution if things continue the way they're going.

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Long-time modeler and kit manufacturer, Hal DeBolt (30 years as DeBolt Model Engineering Company, including the last 8 as Orbit Northeast), has reorganized his business activity.

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ized sales and service center for ProLine Electronics and Train Miniature Products (present owner of Orbit), and (4), will offer service to all manufacturers in the form of Product Development.

The kit manufacturing business, DeBolt Model Engineering Company, is being sold, and Hal will no longer be engaged in that activity.

WHY GAMBLE?

The following was lifted from an R/C club newsletter, which claimed to have lifted it from another newsletter. Quite possibly, others have picked it up and passed it on to someone else . . . the end result being that if the idea makes anybody happy at all, it would have to be the R/C engine, kit, and radio manufacturers.

It goes like this, "If you have dead nickel-cadmium cells that refuse to accept a charge, try this method that has been used for years. It *might* work for you. Use two "D" cells, or two dry cells, if available. Connect these in series, then connect a wire from the plus side to the dead cell's plus side. Then connect a wire from the negative terminal (of the two dry cells) to the dead cell's negative terminal, and hold for approximately 10 seconds. The dead cell now becomes polarized at 1.25 volts, and is ready to be charged. Now charge for the required rating of the nickel-cadmium cell and then check it under load. It *should* work in most cases."

The key to this "handy" hint is in

the italicized words *might*, in the second sentence, and *should*, in the last sentence. Let's face it . . . trying this stunt is like passing up the "Last Chance Gas Station" just before hitting that hundred mile stretch of desert road . . . someone is trying to tell you something. This battery that you're trying to revive has already failed once. At most, it is worth less than 3 bucks. How does that compare with the value of your prize R/C bird; complete with engine, radio, accessories, building materials, and your hours of construction time (or dollars of purchase price)? Is it worth the gamble?

Have you heard the story about the middle aged flyer who went to his doctor with a complaint that his left leg hurt? After the examination, the doctor said, "I wouldn't be concerned if I were you, it's just old age coming on." To which the flyer replied, "Then why doesn't my right leg hurt, it's exactly the same age?"

In our humble opinion, this philosophy applies somewhat to batteries. If one cell has failed, it could be an indication of a tired or aged pack of cells, or a pack that has been damaged due to misuse, etc. One bad cell can make the whole pack suspect, moreso if the pack is over a year old.

Save the tired cells that still show some life for your fuel pump, a flashlight, or some of your kid's toys, but get a new pack for that favorite and expensive R/C project.

The above subject was suggested by our resident electronics expert and editorial assistant, Eloy Marez.

A SHORT ONE

In order to leave room for our commentary on R/C Pattern and scale at the Nats, we'll knock this off until next month.

W6 MGK over and out . . .

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BANGKOK. Amour Toy and Hobby Shop offers German and American airplanes helicopters and boats. Model builders supplies and Solarbo balsa. English speaking customers ask for 'Chalan'. Krungthep Amour, 647-89 Phetburi Road, Bangkok, Thailand. Phone 252-5144.

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WHEN IN TOKYO, visit our complete hobby shop for Futaba, Sanwa, Logitec, Kraft, Pilot, kits. Futaba Sangyo Co., Ltd. Chiyodaku, Soto Kanda 1 Chome no. 1 Ship no. 16 Near Akihabara Station.

ENGINES: New and used. Also parts and accessories. Complete listing 25¢. T. Crouse, 100 Smyrna St. West Springfield, MA. 01089.

NUTS and BOLTS for model builders. Send a stamped, addressed envelope for price list. Ray Johnson, Box 169 MB, St. Michael, Minn. 55376.

DON'T WASTE TIME - To find any plan, article, or three-view in Model Builder (prior to January 1976), you must have the new MODEL BUILDER Index and Digest, compiled by Paul Plecan, P.O. Box 1810A, Garden Grove, CA 92642. \$1.50 per copy, postpaid.

MOST COMPLETE STOCK IN THE FAR EAST. Send for free catalog. R/C planes, boats, helicopters, German, Japanese, British, American. Radar Co., Ltd. 3 Observatory Rd. Tsimshatsui, Kowloon, Hong Kong Tel: K680507

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Workbench . . . Continued from page 6
78:58. He also recorded the highest single flight.

Eduard Ciapala, of Poland, was second, with a two flight total of 72:03.

Laurie Barr, England, was third, with 71:24, followed by John Blount, also from England, Mike Thomas, Canada, and Karrol Rybecky of Czechoslovakia, in 6th.

The U.S. Indoor Team was first, with a total of 215.26, which means that Bucky Servaitis (68.18) and Jim Richmond (68.10) must have been in the top ten (we didn't get their exact finishing positions). England was second, with 210.16, and Canada was third, with 202.51.

THERE YOU ARE, GILLIAM!

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Paul "Civvy Boy" Gilliam, has been heard from. He writes:

"Have retired to God's Country near the Oregon border, to write, design, and build models. Have designed a pretty little Half-A sport job, and a zippy Half-A F/F contest ship..."

"Please drop a spot somewhere in your great magazine of my address and whereabouts. I understand quite a few modelers want to know where I am."

Hope their intentions are honorable, Paul, 'cause here goes'. . . It's 3 Broce Camp on the Klamath, Horse Creek, California 96045.

MB MAKES THE TIMES

The Sunday, August 1, New York Times carried a long article, in the Leisure section, about model rocketry. The by-line was Douglas R. Pratt, which is strikingly similar to a contributing editor's name on Model Builder's masthead. Yes, it was our own Model Rocket editor, and he came through in shining colors, mentioning MB twice, and providing the complete address of our establishment.

Model Rocketry continues to grow in popularity, and as you will note in Doug's column this month, can be very closely allied to model airplanes. The smart modeler knows that new ideas, building materials, and construction hints can be found in almost any article on modeling. Batter take a look.

THINGS TO DO

More info on that Southwest Modeler's Show, January 15 and 16, 1977, in

Dallas, Texas. To be a trade show for the consumer, as well as manufacturers, importers, distributors, and dealers, similar to Toledo, the facility has large demonstration areas (including a large lagoon for R/C boats), and unlimited free parking.

For more information, contact Mike Clark or Chuck Holden, co-directors, Southwest Modelers Show, 9427 Meadowknoll, Dallas, Texas 75247.

* * *

The 6th Annual Flying Circus and Auction, sponsored by the Rockland County Radio Control Club will be held on October 10, 1976 at the IBEW Hall, Philips Hill Road, New City, New York. Contact A.G. Hague, 30 Demarest Mill Rd., West Nyack, NY 10994.

* * *

The QMRC Valley Flyers will be holding the West Coast Championship Race at Sepulveda Basin, San Fernando Valley (west of Los Angeles) on November 27 and 28. AMA and QMRC rules, Standard and Expert classes, short course, K&B 500 fuel provided, pre-registration fee, \$10. Pilot's meeting at 9 a.m. both days. Contact Bob Gillespie, 12271 Epsilon, Garden Grove, Ca. 92640. Phone (714) 638-7736.

* * *

SAM Newsletter editor, Jack Bolton, 9521 Scenic Highway, Pensacola, Florida 32504, phone (904) 477-2055, announces the first annual Scotty Murray Memorial Oldtimers Contest. To be held

on October 23 and 24, the site is Spencer Field, near Pace, Florida, which is northeast of Pensacola.

A special feature of this contest, which includes O/T Cabin, Pylon, Open Rubber, Rubber Scale, R/C Texaco, R/C Cabin, R/C Pylon, and .020 Replica, will be "Scotty's Event," which is limited to Scotty Murray designs only. Most old timers remember that Scotty was a Brooklyn, NY modeler who joined the R.C.A.F. early in World War II and was shot down while flying a Spitfire in action. The "Topper" was one of his better-known designs.

Some non-O/T events are also available for competition, including AMA Gas, FAI Power, Open Rubber (Unlim., Coupe, Wake., OT'er), Open Glider (A/1 or A/2), and JHLG. Contact Jack, or CD Tom McLaughlan, 4140 Fern Ct., Pine Glades, Pensacola, Florida 32503, (904) 438-5372.

* * *

"Desert Classic" is the name for the pattern and stand-off scale contest being sponsored by the Antelope Valley Tailwinds R/C Club, on November 6 and 7, California City, California. In the desert resort area northwest of Los Angeles, there are all sorts of recreations for the family while "the modeler" does his thing. Contact Dick Russ, 10650 Applewood Dr., California City, CA. 93505, (714) 373-2262. •

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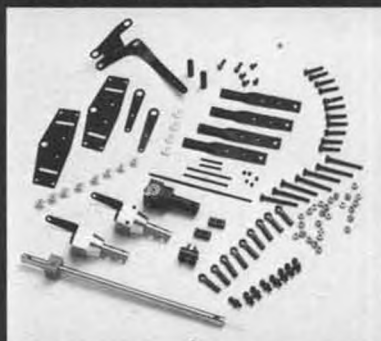
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