MODEL BUILDER

MAY 1984

$2.50

ICD 08545

volume 14, number 148

CONSTRUCTION

- PT-1 On Floats
- R/C Tlush Mite
- Peanut Laird LC-DE

REVIEWS

- Robbe ASW-19
- Jomar SC-1
- Kobe-Kiko Robinson R-22 HP

1984 IMS SHOW COVERAGE INSIDE

SIG BALSA SALE

SEE YOUR DEALER TODAY FOR THE BEST PRICES ON SIG AAA BALSA SINCE 1975!

FORGET THOSE MAILORDER BLUES, WONDERING JUST EXACTLY WHAT YOU ARE GOING TO GET THIS TIME AND WHEN IT MIGHT COME. GO DOWN TO YOUR FRIENDLY SIG DEALER INSTEAD. BROWSE THROUGH HIS SELECTION AND PICK OUT THE WOOD YOU WANT, NOT THE WOOD SOMEBODY ELSE 1000 MILES AWAY THINKS YOU SHOULD HAVE. YOU KNOW THAT YOU CAN ALWAYS TRUST SIG FOR THE VERY BEST IN BALSA.

STICKS - 36" Lengths

B-001	1/16 x 1/16	.07
B-002	1/16 x 1/8	.08
B-003	1/16 x 3/16	.10
B-004	1/16 x 1/4	.13
B-005	1/16 x 3/8	.16
B-006	1/16 x 1/2	.18
B-007	1/16 x 3/4	.24
B-008	1/16 x 1	.30
B-009	3/32 x 3/32	.08
B-010	3/32 x 1/8	.09
B-011	3/32 x 3/16	.10
B-012	3/32 x 1/4	.13
B-013	3/32 x 3/8	.17
B-014	3/32 x 1/2	.21
B-015	3/32 x 3/4	.28
B-016	3/32 x 1	.35
B-017	1/8 x 1/8	.09
B-018	1/8 x 3/16	.13
B-019	1/8 x 1/4	.16
B-020	1/8 x 5/16	.18
B-021	1/8 x 3/8	.20
B-022	1/8 x 1/2	.22
B-023	1/8 x 3/4	.31
B-024	1/8 x 1	.38
B-025	3/16 x 3/16	.16
B-026	3/16 x 1/4	.20
B-027	3/16 x 3/8	.21
B-028	3/16 x 1/2	.28
B-029	3/16 x 3/4	.34
B-030	3/16 x 1	.42
B-031	1/4 x 1/4	.22
B-032	1/4 x 3/8	.26
B-033	1/4 x 1/2	.30
B-034	1/4 x 3/4	.44
B-035	1/4 x 1	.52
B-036	5/16 x 5/16	.28
B-037	5/16 x 3/8	.35
B-038	5/16 x 1/2	.42
B-039	5/16 x 5/8	.51
B-040	5/16 x 1	.59
B-041	3/8 x 3/8	.39
B-042	3/8 x 1/2	.46
B-043	3/8 x 3/4	.55
B-044	3/8 x 1	.66
B-045	1/2 x 1/2	.52
B-046	1/2 x 3/4	.69
B-047	1/2 x 1	.84
B-048	5/8 x 5/8	.62
B-049	5/8 x 1	.92
B-050	3/4 x 3/4	.86
B-051	3/4 x 1	1.00

BAGS OF BALSA

B-524	Bags of Balsa	2.90

ODDS & ENDS OF BALSA

B-534	Packages	1.95

SHEETS - 18" Lengths

B-173	1/32 x 2	.18
B-174	1/16 x 2	.20
B-175	3/32 x 2	.24
B-176	1/8 x 2	.28
B-177	3/16 x 2	.35
B-178	1/4 x 2	.44
B-179	3/8 x 2	.49
B-180	1/32 x 3	.27
B-181	1/20 x 3	.29
B-182	1/16 x 3	.30
B-183	3/32 x 3	.34
B-184	1/8 x 3	.40
B-185	5/32 x 3	.44
B-186	3/16 x 3	.48
B-187	1/4 x 3	.56
B-188	5/16 x 3	.67
B-189	3/8 x 3	.75
B-190	1/32 x 4	.39
B-191	1/16 x 4	.46
B-192	3/32 x 4	.48
B-193	1/8 x 4	.56
B-194	3/16 x 4	.69
B-195	1/4 x 4	.85
B-196	3/8 x 4	1.05

SHEETS - 36" Lengths

B-134	1/32 x 2	.36
B-135	1/16 x 2	.39
B-136	3/32 x 2	.47
B-137	1/8 x 2	.53
B-138	3/16 x 2	.68
B-139	1/4 x 2	.86
B-140	3/8 x 2	.95
B-141	1/32 x 3	.53
B-142	1/20 x 3	.55
B-143	1/16 x 3	.58
B-144	3/32 x 3	.67
B-145	1/8 x 3	.79
B-146	5/32 x 3	.86
B-147	3/16 x 3	.95
B-148	1/4 x 3	1.10
B-149	5/16 x 3	1.30
B-150	3/8 x 3	1.45
B-151	1/32 x 4	.75
B-152	1/16 x 4	.90
B-153	3/32 x 4	.95
B-154	1/8 x 4	1.10
B-155	3/16 x 4	1.35
B-156	1/4 x 4	1.68
B-157	3/8 x 4	2.08
B-158	1/16 x 6	1.50
B-159	3/32 x 6	1.70
B-160	1/8 x 6	1.90
B-161	3/16 x 6	2.20
B-162	1/4 x 6	2.50
B-163	3/8 x 6	3.20

STICKS - 48" Lengths

B-061	1/8 x 1/8	.13
B-062	1/8 x 1/4	.18
B-063	1/8 x 1/2	.28
B-064	3/16 x 3/16	.20
B-065	3/16 x 1/2	.34
B-066	3/16 x 3/4	.44
B-067	1/4 x 1/4	.29
B-068	1/4 x 1/2	.39
B-069	1/4 x 3/4	.56
B-070	5/16 x 5/16	.36
B-071	3/8 x 3/8	.50
B-072	3/8 x 1/2	.58
B-073	3/8 x 3/4	.69
B-074	1/2 x 1/2	.68
B-075	1/2 x 3/4	.91

48" AAA SHEETS

B-388	1/32 x 3	.65
B-389	1/16 x 3	.76
B-390	3/32 x 3	.89
B-391	1/8 x 3	1.04
B-392	3/16 x 3	1.28
B-393	1/4 x 3	1.48
B-394	3/8 x 3	1.17
B-395	1/16 x 4	1.24
B-396	3/32 x 4	1.40
B-397	1/8 x 4	1.58
B-398	3/16 x 4	2.00
B-399	1/4 x 4	2.31
B-400	3/8 x 4	3.28
B-401	1/16 x 6	2.15
B-402	3/32 x 6	2.50
B-403	1/8 x 6	2.75
B-404	3/16 x 6	3.19
B-405	1/4 x 6	3.50
B-406	3/8 x 6	4.50

TRIANGULAR CUT BALSA 36"

B-416	1/4 x 1/4	.33
B-417	3/8 x 3/8	.40
B-418	1/2 x 1/2	.50
B-419	3/4 x 3/4	.63
B-420	1 x 1	.82

LAPPED EDGE BALSA SHEETS

B-610	1/16 x 3-1/4 x 36	.85
B-611	3/32 x 3-1/4 x 36	1.00

BULK BALSA - 3" x 36"

Not Stamped or Sorted

B-508	1/32 x 3	.47
B-509	1/16 x 3	.50
B-510	3/32 x 3	.58
B-511	1/8 x 3	.69
B-512	3/16 x 3	.84
B-513	1/4 x 3	.96
B-514	3/8 x 3	1.25

BLOCKS - 3" Lengths

B-251	1 x 1	.12
B-252	1 x 2	.23
B-253	2 x 2	.32
B-254	1 x 3	.32
B-255	2 x 3	.42
B-256	3 x 3	.66

BLOCKS - 6" Lengths

B-266	1 x 1	.23
B-267	1/2 x 2	.30
B-268	3/4 x 2	.35
B-269	1 x 2	.42
B-270	1-1/2 x 2	.50
B-271	2 x 2	.57
B-272	1/2 x 3	.38
B-273	3/4 x 3	.46
B-274	1 x 3	.58
B-275	1-1/2 x 3	.68
B-276	2 x 3	.78
B-277	3 x 3	1.24
B-278	1/2 x 4	.57
B-279	3/4 x 4	.64
B-280	1 x 4	.70
B-281	1-1/2 x 4	.90
B-282	2 x 4	1.09
B-283	3 x 4	1.70
B-284	1/2 x 6	.81
B-285	3/4 x 6	.96
B-286	1 x 6	1.13
B-287	1-1/2 x 6	1.55
B-288	2 x 6	1.71
B-289	3 x 6	2.40

BLOCKS - 12" Lengths

B-299	1 x 1	.43
B-300	1/2 x 2	.57
B-301	3/4 x 2	.67
B-302	1 x 2	.82
B-303	1-1/2 x 2	.99
B-304	2 x 2	1.13
B-305	1/2 x 3	.73
B-306	3/4 x 3	.90
B-307	1 x 3	1.13
B-308	1-1/2 x 3	1.36
B-309	2 x 3	1.64
B-310	3 x 3	2.50
B-311	1/2 x 4	1.14
B-312	3/4 x 4	1.27
B-313	1 x 4	1.40
B-314	1-1/2 x 4	1.80
B-315	2 x 4	2.18
B-316	3 x 4	3.45
B-317	1/2 x 6	1.58
B-318	3/4 x 6	1.92
B-319	1 x 6	2.30
B-320	1-1/2 x 6	3.15
B-321	2 x 6	3.50
B-322	3 x 6	5.15

BLOCKS - 18" Lengths

B-333	1 x 1	.65
B-334	1 x 2	1.25
B-335	2 x 2	1.70
B-336	1 x 3	1.70
B-337	2 x 3	2.50
B-338	3 x 3	3.75
B-339	1 x 4	2.15
B-340	2 x 4	3.29
B-341	3 x 4	5.25
B-342	1 x 6	3.75
B-343	2 x 6	5.75
B-344	3 x 6	9.25

BLOCKS - 24" Lengths

B-354	1 x 1	.86
B-355	1 x 2	1.65
B-356	2 x 2	2.25
B-357	1/2 x 3	1.48
B-358	1 x 3	2.25
B-359	2 x 3	3.30
B-360	3 x 3	5.00
B-361	1 x 4	2.81
B-362	2 x 4	4.38
B-363	3 x 4	6.95
B-364	1 x 6	4.60
B-365	2 x 6	7.00
B-366	3 x 6	10.30

TAPERED CUT SHEETS - 36"

B-430	1/4 x 3	1.05
B-431	1/4 x 4	1.63

LEADING EDGE - 36" Lengths

B-085	1/2 x 3/8	.52
B-086	3/4 x 5/8	.90
B-087	1 x 3/4	1.17

36" ROUNDED EDGE AILERON & ELEVATOR STOCK

B-441	1/4 x 1	.69
B-442	3/8 x 1	.81
B-443	1/4 x 2	1.08
B-444	3/8 x 2	1.23

AIRFOILED SHAPED SHEETS

B-111	3/16 x 3 x 36	1.07
B-112	1/4 x 3 x 36	1.22
B-113	1/4 x 4 x 36	1.80

TAPERED TRAILING EDGE 36" Lengths

B-097	1/8 x 1/2	.33
B-098	3/16 x 3/4	.42
B-099	1/4 x 1	.55
B-100	5/16 x 1-1/4	.65
B-101	3/8 x 1-1/2	.76

MODEL BUILDER'S ASSORTMENT

B-600	Balsa Wood Assort.	9.50

PLANKS - 36" Lengths

B-206	1 x 1	1.27
B-207	1/2 x 2	1.70
B-208	3/4 x 2	2.00
B-209	1 x 2	2.50
B-210	1-1/2 x 2	2.99
B-211	2 x 2	3.40
B-212	1/2 x 3	2.20
B-213	3/4 x 3	2.70
B-214	1 x 3	3.40
B-215	1-1/2 x 3	4.10
B-216	2 x 3	4.95
B-217	3 x 3	7.50
B-218	1/2 x 4	3.40
B-219	3/4 x 4	3.82
B-220	1 x 4	4.25
B-221	1-1/2 x 4	5.40
B-222	2 x 4	6.55
B-223	3 x 4	10.40
B-224	1/2 x 6	5.25
B-225	3/4 x 6	6.35
B-226	1 x 6	7.45
B-227	1-1/2 x 6	10.45
B-228	2 x 6	11.40
B-229	3 x 6	18.50

36" C-GRAIN AAA 8 - 12 LBS.

B-470	1/32 x 2	.41
B-471	1/16 x 2	.44
B-472	3/32 x 2	.52
B-473	1/8 x 2	.58
B-474	3/16 x 2	.73
B-475	1/4 x 2	.91
B-476	3/8 x 2	1.00
B-477	1/32 x 3	.58
B-478	1/16 x 3	.63
B-479	3/32 x 3	.72
B-480	1/8 x 3	.84
B-481	3/16 x 3	1.00
B-482	1/4 x 3	1.15
B-483	3/8 x 3	1.50

VH - VERY HARD

B-493	1/16 x 3	.63
B-494	3/32 x 3	.72
B-495	1/8 x 3	.84
B-496	3/16 x 3	1.00
B-497	1/4 x 3	1.15
B-498	3/8 x 3	1.50

CONTEST BALSA - 36"

Very Light 4 - 6 Lb. Stock

B-454	1/32 x 3	.62
B-455	1/16 x 3	.67
B-456	3/32 x 3	.76
B-457	1/8 x 3	.88
B-458	3/16 x 3	1.04
B-459	1/4 x 3	1.19
B-460	3/8 x 3	1.54

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PH: 313-477-6266
FARWELL
Lockwood Aero & Hobby Shop
3060 N. County Line Road
FLINT
Rider's Hobby Shop
3012 Corunna Road
KALAMAZOO
Rider's Hobby Shop
3417 So. Westnedge
PONTIAC
RC Hobbies
921 Huron
SAGINAW
Roger's Hobby Center
5658 State at Wieneke
Ray's Shopping Center West
SAGINAW
Tait's Hobby Shop #2
C-326 Fashion Square Mall
SAULT ST. MARIE
Pinnacle Hobby Shop
129 E. Portage Ave.
TRAVERSE CITY
Ray's Radio/Control Shop
517 So. Union
PH: 616-947-4949
UTICA
Henderson's Hobbies
2441 Auburn
WARREN
Prop Shop Hobbies
23044 Van Dyke
1 Block N. of 9 Mile
WYANDOLLE
Stoner Hobby Center
145 Maple St.
PH: 313-283-2355
MINNESOTA
BLOOMINGTON
Jolly's of Southtown
7935 Southtown Center
CRYSTAL
Crystal Schwinn Cyclery
6324 Bass Lake Road
DULUTH
Carrs Hobbies
2014 West Superior Street
RICHFIELD
Hub Hobby Center
16 W. 66th Street
ST. PAUL
Gulliver's
1526 W. Larpenteur
ST. PAUL
Mac's Models, Inc.
1326 N. Rice Street
PH:612-489-6060
MISSISSIPPI
BILOXI
Chuck's Hobbies
502 Edgewater Gulf Dr. C 3
PH: 601-388-6346
OXFORD
Creative Sources
1010 Jackson Ave.
MISSOURI
GRANDVIEW
Flo-Mow Co.
700 Blue Ridge Ext
LEE'S SUMMIT
Blue Hilles Bike & Hike, Inc
229 S. Main
ST. CHARLES
Mark Twain Hobby & Craft
1355 S. 5th
St. Charles Shopping Center
NEVADA
LAS VEGAS
J.J.'s Hobby Den
4972 S. Maryland Parkway#8
RENO
High Sierra Models
953 West Moana Lane
PH: 702-825-9098
NEW HAMPSHIRE
KEENE
Leisure Time Hobbies
322 West Street
LITTLETON
Hobby Land
101 Union Street
NEWINGTON
Eric Fuchs Hobbies
Fox Run Mall
NEW JERSEY
EDISON
Central Jersey R/C Supply
1681 Route 27
PH: (201) 985-8660
MARLTON
Hi Fly Hobbies
Route 70 & Cropwell Road
PH: 609 983-8060
MIDDLESEX
Middlesex Photo & Hobby Center
730 Union Avenue
POMPTON PLAINS
Hobby Hut
567 Route 23
PH: 201-835-2077
RAMSEY
Hi-Way Hobby House
Route 17
RANDOLPH
Carl's Hobby Center
508 Route 10
PH: 201-366-4300
RED BANK
Hobbymasters, Inc
62 White Street
WALLINGTON
Bednarz Servicenter
R/C Hobby Supplies
356 Main Ave.
NEW MEXICO
ALBUQUERQUE
Valley Hobbies
4522 4th St. N.W.
PH: 505-345-9688
CARLSBAD
The Schettlers
1009 N. Eighth St.
NEW YORK
BROOKLYN
Brooklyn's Model Masters
1307 Gravesend Neck Road
PH: 212-339-9250
BROOKLYN
Wall's Hobby Shop
7909 5th Ave.
PH: 212-745-4991
DEPEW
Depew Hobby Center
5866 Transit Road
PH: 684-5555
EAST ISLIP
Hobby World
232 E. Main Street
PH: 516-277-4499
ELMSFORD
Andy's Hobby Shop
36 Main Street
KINGSTON
J & J's Hobbies, Inc.
785 Broadway
ROCHESTER
Dan's Crafts & Things
352 Empire Blvd.
ROCHESTER
G & G Hobbies
1339 Dewey Ave.
ROCHESTER
Panco Hobbies
2676 East Ridge Road
SYRACUSE
Walt's Hobby & Craft
4300 W. Genesee St.
UTICA
American Hobby & Sports
2107 Whitesboro Street
PH: 315-724-4959
NORTH CAROLINA
CHARLOTTE
Respcap Inc. - Science Hobbies
2615 Central Ave.
EDEN
Coke's Fix-it Hobby Shop
Rt. 2 Box 222
PH: 919-627-0166
GREENSBORO
Sports & Hobbies Unlimited
2144 Lawndale Drive
Lawndale Shopping Center
HENDERSONVILLE
The Hobby House
1211 Asheville Hwy.
PH: 692-6683
HIGH POINT
Berne's Craft & Hobbies, Inc.
2291 English Road
KING
King R/C
Old Hwy 52
PH: 983-3969
WINSTON-SALEM
The Hobby Corner
136-D Oakwood Drive
NORTH DAKOTA
MINOT
Aeroplane Factory HobbyShop
Minot Intl. Airport
WILLISTON
Tri-County Hobbies
103 22nd St. West
OHIO
AKRON
Miller's Hobby Shop
1018 Kenmore Blvd.
PH: 216-848-2264
BEAVERDAM
Buckeye Hobby Shop
7940 Lugabill Road
BERLIN HEIGHTS
Daniel's Hobbies
36 Center Street
BUTLER
Pete's Hobby Shop
48 Cleveland Street
CLEVELAND
National Hobby, Inc.
5238 Ridge Road
FINDLAY
Jim's Model Supplies
721 Rockwell Ave.
LAKEWOOD
Wings Hobby Shop Inc.
17112 Detroit Ave.
PH: 221-5383
LANCASTER
Slater's Inc
Plaza Shopping Center
1141 N. Memorial Drive
LIMA
Callahan Hobbies
1229 E. Elm St.
MANSFIELD
John's Hobby Shop
15 N. Main
MIDDLETOWN
G & G Hobby Shop
1720 Central Ave.
PROSPECT
Lighthouse Hobby Supply Co.
507 E. North Street
TOLEDO
The Hobby Stop
4907 Summit Street
WAPAKONETA
Dad's Toy Shop
129 E. Auglaize St.
YOUNGSTOWN
Boardman Hobby Center
6820 Market Street
ZANESVILLE
Thompson Radio Supplies
110 S. 6th Street
OKLAHOMA
OKLAHOMA CITY
Campbell's Hobby House
3500 N. MacArthur
TULSA
House of Hobbies
6914 E. Admiral Place
TULSA
Wings 'N Things
1350 Skelly Drive
OREGON
CORVALLIS
Trump's (DJ's) Hobbies
1875 N.W. 9th St.
PH: 503 753-7540
ONTARIO
Hobby Shack
903 E. Idaho Ave.
PH: 503-889-6115
PORTLAND
Strictly R/C
7958 S.W. Capitol Highway
PENNSYLVANIA
BATH
Valley Crafts & Hobbies
301-303 West Main Street
PH: 215-837-9066
BATH
Dick Wetzel's Hobbies
514 E. Main St.
PH: 215-837-6681
LANCASTER
The Flight Box
Lancaster Shopping Center
LANSDALE
Penn Valley Hobby Ctr.
837 W. Main St.
LEHIGHTON
Carpenter Hobbies
Rt. 5 Box 337
MILTON
Kreb's Newstand
83 Broadway
NAZARETH
Trainland U.S.A.
105 Belvidere Street
PITTSBURGH
Bill & Walt's Hobby Shop
116 Smithfield Street
READING
Iron Horse Hobby House
60 South 6th St.
READING
Ott's Hobbies
536 N. 10th St.
WARMINSTER
J.C. R/C Hobbies
13 York Road
PH: 215-672-5200
RHODE ISLAND
EAST PROVIDENCE
A & R Hobbies
56 Alica St.
PH: 401-438-2754
SOUTH CAROLINA
GREENVILLE
The Great Escape
Pleasantburg Shopping Center
1426 Laurens Road
Ph 803-235-8320 or 242-4229
MYRTLE BEACH
Ed's Hobby Shop
702 Main Street
TENNESSEE
KNOXVILLE
Tennessee Model Hobbies
Rt. 62 Oak Ridge Hwy - Solway
PH 615-482-2900
NASHVILLE
The Toy Mart
113 Graylynn Drive
PH: 615-883-1648
TEXAS
ARLINGTON
The Hobby Hub
903 A Pioneer Parkway West
AUSTIN
J & J Hobbies
610 Kennston Dr.
DENTON
Yellowbird Hobbies
117 W. Hickory
EL PASO
Hal's Hobby Shop
No. 57 Sunrise Center
PH: 915-755-1914
FORT WORTH
Mott's Hobby Shop
7241 Grapevine Highway
PH: 817-281-0921
HARTLEY
Mark's Hobby Hut
804 White Street
PH: 806-365-4408
HOUSTON
Clear Lake Models
117 Camino S. Shopping Ctr.
PH: 713-488-6315
HOUSTON
Larry's Hobbies
2327 FM 1960E
PH: 713-443-7373
HURST
Roy's Hobby Shop
1309 Norwood
SAN ANTONIO
Clayton Hobbies
5707 E. Mobud
UTAH
OREM
Miniature Aircraft Prod
811 W. 400 N.
SALT LAKE CITY
Douglas Models
P.O. Box 9276
2065 E. 33rd South
VERMONT
SWANTON
The Hobby Shop
RFD 1 Rt. 7
PH: 802-524-2715
VIRGINIA
ANNANDALE
Model Masters, Inc.
6920 Braddock Rd.
RICHMOND
The Hobby Center
1709 Willow Lawn Dr.
WASHINGTON
BELLEVUE
R/C Model Shop
14020 N.E. 21st St.
PH: 747-9914
BELLINGHAM
Hobby Hive
111 E. Magnolia
CASTLE ROCK
Aero Motive Products
607 Spirit Lake Highway
KENT
Kent Hobby
1313 W. Meeker
Suite 110, Meeker Mall
PUYALLUP
Fingrove Model Supply
10611 - 136th St. East
PH: 845-7675
SEATTLE
Webster Supply Co
17818 Aurora Ave. N.
TACOMA
Bill's Hobby Town
13923 Pacific Ave.
PH: 206-531-8111
WALLA WALLA
Harley's R/C
Route 1, Box 277A
PH: 509 529-2618
WEST VIRGINIA
CHARLESTON
Fountain Hobby Center
200 W. Washington St.
WISCONSIN
LA CROSSE
Hobby Hub
4336 Mormon Coulee Road
Shelby Mall
MARSHFIELD
Mid Wisconsin Hobby Center
Northway Mall
503 E. Ives St.
MENOMONIE
True Value Hardware
1512 9th Street
L Mart Shopping Ctr.
MILWAUKEE
All In 1 Hobby
South Gate Mall
333 So. 27th Street
PH: 414-645-4555
MILWAUKEE
Casanova's Hobby
1423 S. Muskego Ave.
PH: 414-672-2700
WAUSAU
Pope's Hobby Land
640 South 3rd Ave.
CANADA
BAWLF, ALBERTA
B & P Transport Ltd.
Box 6
PH: 373-3953
CALGARY, ALBERTA
Calgary Hobby Supply, Ltd
Box 3173, Stn. "B"
CALGARY, ALBERTA
P.M.S. Hobby Craft
Calgary North Hill Centre
WINNIPEG, MANITOBA
Cellar Dweller Hobby, Ltd
1354 Main St.
PH: 589-2037
WINNIPEG, MANITOBA
Gooch's Hobbies
646 Portage Ave.
ST. JOHN'S, NFLD.
Capitol Hobby Centre, Ltd.
6 Freshwater Road
DUNDAS, ONTARIO
Skycraft Hobbies Inc
139 York Road
SCARBOROUGH, ONTARIO
Toronto R/C Hobby
1869 Lawrence Ave. E.
PH: 416-755-1766
WILLOWDALE, ONTARIO
Keith's Hobby Shop
5205 Yonge St.
PH: 222-4721
ANCIENNE - LORETTE, QUEBEC
Passe-Temps Phoenix
1459 Notre Dame
PH: 418-872-4113
ARVIDA, QUEBEC
LeModele Reduit Enr.
118 Mathias - CP 341
PH: 418-548-2136
HAUTERIVE, QUEBEC
Le Centre Du Modeliste Allard
1223 Lestrat
PH: 418-589-2248
MONTREAL, QUEBEC
Can-Air Hobbies
5850 Gouin Blvd. Quest
PH: 514 332 3565
SASKATOON, SASKATCH
Collins' Aero-Craft
238 First Ave. North
PH: 652-4775
YORKTON, SASKATCH.
Radio Control Hobbies
39 Betts Ave.
AUSTRALIA
SYDNEY, N.S.W.
Pyrmont 2009
Burimex
137 Pyrmont Street
PH: (02) 692-0694
ENGLAND
NORFOLK, NR17 1DG
Pegasus Models, Ltd
Caston, Attleborough
NEW ZEALAND
INVERCARSILL
Model Shop
55 Arcade Dee St.
PH: 89439
VENEZUELA
CARACAS 1070-A
Hobby World, C.A. (Dist.)
Apartado Postal 75054
PH: (02) 34.33.02

DEALERS: Write For Details On How Your Name Can Appear In This Column

from Bill Northrop's workbench

Jim Barr came down from British Columbia to compete in the static model display at the 1984 Northwest Model Exhibition. He showed us this photo of a Supermarine *Walrus* there at the show, and got us wondering if we could talk him into a *Walrus* construction article . . . more information about the model is in the text.

• Dick Phillips, who somehow manages to squeeze his *BIG is Beautiful* article in amongst all that advertising in another well-known model mag (of course we're jealous!), is one of many who have written to comment on my editorial in the February issue, expressing concern over the lack of young modelers coming along to replace the "old gang", as they fade into oblivion. Over to you, Dick. . .

Just read your editorial in the February issue which arrived today. I'm sure everyone has noted the same thing . . . this lack of young newcomers to the hobby. Our club here is quite small and has a restricted membership but the average age is beyond 50, I would guess. (The restriction is placed on us by the landowner, by the way, and restricts our numbers to a maxium of 40 bodies)

Most of us are business people, most have families who are grown and out on their own, and most have the wherewithal to indulge the 'need' for all that good stuff we buy to satisfy the creative urges that drive us.

We do not have a youth program per se, but the restricted membership has a good deal to do with that.

The other, much larger R/C Club in Edmonton does not have a junior program either, and their chief activity toward encouraging participation is a mall show and come and watch, but no particular encouragement is offered to cause anyone to do so. I suspect that's the norm in most clubs. Sort of a . . . "we're here, but you'll have to find us on your own" attitude.

I would bet that if a club had an active publicity campaign to attract spectators, there would be some who would become part of it all. However, that doesn't really get to the kids, and there's the rub.

Compare your youth or that of most of us, and it'll be in sharp contrast to today's world. When kids of the early thirties would build and fly, the alternatives were not nearly as numerous as they are today. How many kids today participate in a sports activity, either of their own volition or the drive of their parents, or, in some cases, as a convenient sitting service? As a Scoutmaster for several years, I suspect the 'sitting service' is more the norm than we'd like to admit.

In addition, there's the all pervading TV screen, we have foresworn reading to sit in front of the screen and be entertained. I saw some figures recently that indicate the public is spending more and more time with the boob tube and it makes my skin crawl to see that such miserable pap will hold people's attention for the many hours they (and their kids) will sit and stare.

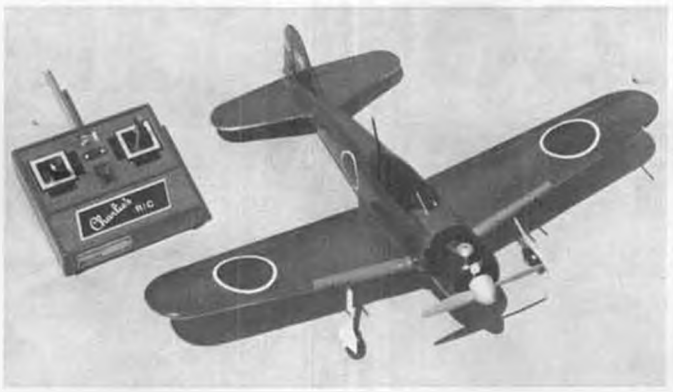
Kids now want to pump their quarters into video games and there are few homes these days that don't have a computer or video arcade hooked up to the second or third TV in the family room. Many parents, judging from what we read in the papers these days, abrogate their position as parents to whoever will take it over, and many have little control over their kids or influence either, for that matter.

I'm sure it's obvious that the choices for the kids of today and those of our youth are a world apart, and that's where we lose so many in the hobby.

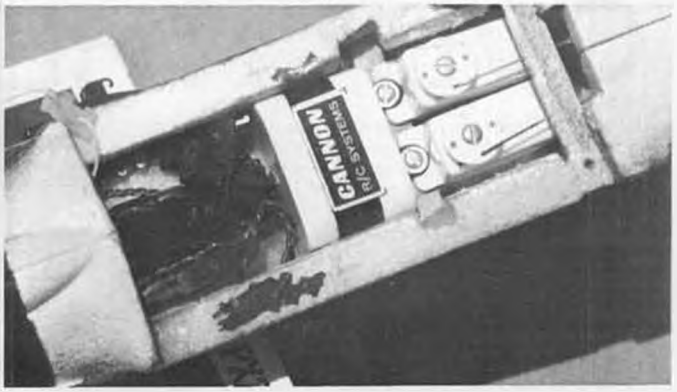
I would guess that one way of getting the kids back, in addition to the simpler, and less costly kits you suggest, is to get to them through the school system (if that's possible) as an extra curricular activity, co-sponsored by HIA and AMA and staffed by the grassroots . . . the local club member who would be will-

Charlie Smith, Colorado Springs, Colo., built this Douglas O-46A. Details in text.

Another Charlie Smith plane, a Curtiss N2C-1 *Fledgling*. See text.



Tony Recht ingeniously converted this Bentom all foam, F/F scale *Zero* to .020 powered R/C. Plane spans a mere 20 inches. See text.



Cannon R/C Systems Super Micro flight pack is a tight, but workable fit into the belly of the *Zero.* Total weight of aircraft is six ounces!

ing to give some time to a class in building techniques with the simpler models . . . subsequently taking the kids out and teaching them the neat little 'tweaks and tricks' you had so much fun with in concert with Bill Hannan and Jack Elem.

I don't know that scholarships or large prizes are necessary, in such a program. I suspect the fun would be enough. If such a program were possible, and I'd bet that it could be done, and if it were to continue for a few years you'd be up to your armpits in young people at the flying field, and that might be a problem . . . too many people to enjoy the flying! Although, with that many more people and that much more interest, parks departments and city governments could be a whole lot more receptive to the setting aside of areas for model sport.

I am currently involved in making some video tapes on the construction of models. These are particularly aimed at the builder who wants to go BIG, but from what my readers tell me, much of what I have used in the column applies to their building, despite the fact they haven't built anything BIG . . . yet! The tapes will be similar to the material in the column, but in a way people have already become addicted to . . . the TV screen. We are currently introducing the initial tape to a select group of the manufacturers in the hobby field in the hopes that one (or more) of them will pick up on it and incorporate the tapes into their own marketing stategy. My personal hope for the video idea is that it will both encourage people to get into the hobby and will provide quality instruction for many who don't have a club near enough to get to every month, or who don't have another modeler with whom they can confer when they need help.

Current plans, depending on acceptance by the manufacturers, call for a series of about ten tapes, covering every aspect of building, from the selection of the model to trimming and flying it. About ten hours in total. Again, depending on acceptance, there are other specific subjects that could be covered, such as pattern, gliders, peanut, indoor . . . the list is pretty extensive as you know. We may go so far as to bring in acknowledged experts in such fields to spread their expertise a lot wider than is currently possible.

The tapes, by the way, are produced professionally by a commercial firm here and are professional quality, not a collection of hand-held amateur material loosely held together. There's already enough of that available, we feel! The equipment being used is professional gear; the camera used to take the shots at our field, which introduce the tape, is worth $30,000, so you can be sure the quality is there!

Anyway, Bill, I'll relinquish the soap box to someone else now that I've had my say.

Like the new highway that bypasses a beautiful country town or the TV with commercials that are somtimes more educational than the program they help sponsor, progress can be both useful and devastating. However, you can get off the highway to see the town (if there's an exit), and the other night, I cut out the printwood for a Peck-Polymers Prairie Bird while watching (but mostly listening to) *Different Strokes!*

THINGS TO DO

TWO BYRON BASHES

Byron Originals' home town of Ida Grove, Iowa, will be the scene of two big

Continued on page 107

"ADVICE FOR THE PROPWORN"

—By Jake

Dear Jake,

How do you know what size tires to put on a model airplane?

—Inquisitive in Indiana

Dear Inquisitive:

A good rule of thumb is:

Tire Diameter =

$2(ab-c)\sin \Theta X^2 + 3Y(\log W)$

Where:

a = Landing gear strut diameter in inches.

b = Propeller diameter in feet.

c = Desired ground clearance in percentage of wing chord.

x = Number of rudder hinges.

y = Diameter of tailwheel strut in microns or diameter of nosewheel steering pushrod in angstroms.

W = Airplane weight in metric tons.

Θ = Arrestor hook engagement angle in degrees.

Another good rule of thumb is: Don't bother me anymore with stupid questions.

—Jake

★ ★ ★

Dear Jake:

I have this great idea for a TV show. It's called 'Hill Avenue Blues.' Its about this R/C club called the HARCS (Hill Avenue

Continued on page 106

OVER THE COUNTER

All material published in "Over the Counter" is quoted or paraphrased from press releases furnished by the manufacturers and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by R/CMB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by R/CMB.

• The Model Rectifier Corporation (MRC) has recently announced the availability of two fabulous R/C cars. The first is in fact a *first* . . . MRC-Tamiya has developed a 1/10-scale R/C car that is comfortable running on either asphalt or dirt just the same as full-size rally cars. It is called the Audi *Quattro Rally* (Kit No. 5836).

The *Quattro Rally* car has a well-detailed Lexan body and durable chassis that can take the pounding expected of any rough race course. A sealed radio box protects the R/C equipment from debris, yet the motor battery is easily accessible for a quick change. A long wheel base and wide tread provide great stability, and with a tough differential gear, you'll get great cornering ability to Boot!

A swing axle front end with coil springs and a trailing link rear suspension with adjustable coil springs keep all four scale-like Michelin TRX rally semi-pneumatic tires firmly on the road while soaking up the shocks. The rally spoke wheels are mounted on one large ball bearing for less friction.

MRC-Tamiya is proud to put into your hands a model of a real rally winner . . . the Audi *Quattro Rally*. You'll win with it too!

The second of MRC-Tamiya's new R/C cars is the 1/10-scale, off-road *Frog*. According to Frank Ritota, MRC's Product Development Director, *The Frog*, when built with the parts that come right in the box, can out-run and out-handle even the hottest, specially "souped up" buggies.

MRC/Tamiya Audi *Quattro Rally*.

MRC/Tamiya O/R buggy, *The Frog*.

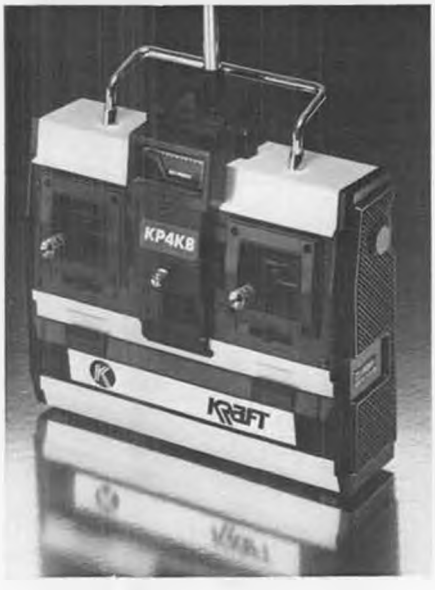
Its polycarbonate body is strong and lightweight, and the RS-540 motor included in the kit gives it powerhouse punch. However, Ritota explains, speed alone is not the only advance *The Frog* brings to off-road running and racing. For instance, the chassis has been specially contoured to hold receiver, battery, and servos in the precise location for optimum center of gravity. Newly engineered, large differential gears offer control for tighter turns; and *The Frog* has been designed with interchangeable gear ratios . . . which can be changed right in the pit area to conform to track contours and changing conditions during a race.

To hold the road, heavy-duty, coil cover, adjustable, oil-filled shocks complement an adjustable trailing arm rear suspension. These innovative shocks provide for progressively increased resistance when the tire is forced up, and less resistance when it drops to the road. This means tighter cornering, better traction, and better road hugging at high speeds.

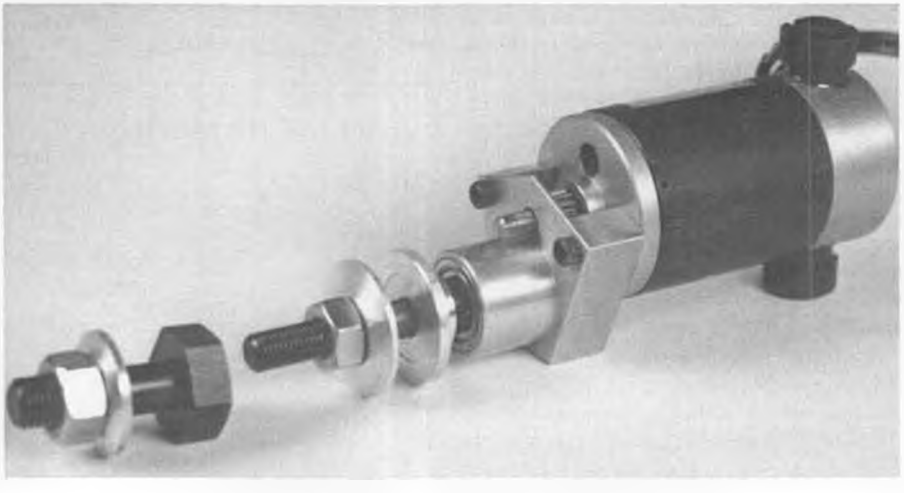
These are just some of the many other features which make *The Frog* the best handling, best performing, and fastest off-road buggy in the MRC-Tamiya stable!

Midwest Products *Fantail Launch II*.

Ikon N'wst Aeronca C-3 *Master*.



Kraft Systems KP4KB: high tech, low price.



Astro Flight all-metal gear boxes for cobalt motors.

Ace R/C .40-sized sport T-34.

Preassembled or partially assembled *Miss America* O/T from Beehive.

For further information on either the Audi *Quattro Rally* or *The Frog* (Part Nos. 5836 and 5841 respectively), contact your local hobby shop or MRC, 2500 Woodbridge Ave., Edison, NJ 08817.

★ ★ ★

Astro Flight, Inc. has been busy developing its latest products: two metal gear boxes for its Challenger cobalt and Super Ferrite motors. The smaller size fits the Challenger 05 and 15 motors as well as the Super Ferrite 10 and 15 motors. The stock number for this gear box is 4033.

The larger gear box is specially designed for Astro's Challenger 25 and 40 motors. The stock number for this gear box is 4041.

These new gear boxes look and run great. Astro has switched to a new stainless steel gear which is precision machined, and prototypes have been run over 100 hours at maximum power with no sign of wear.

With these new gear boxes, the modeler can run props of 11 to 12 inches diameter for sport, scale, and Old Timer models. The Geist 13-7 folding prop can also be used on your favorite sailplane.

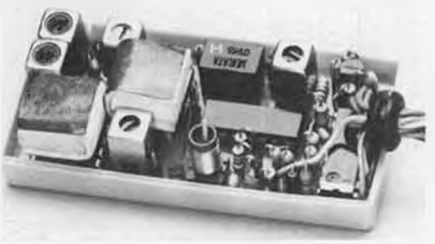
Other announcements include: all cobalt motors are now in stock; Super Ferrite 25 and 40 are now in production as are the Super Ferrite 10 and 15 motors.

Contact Astro Flight, Inc., 13311 Beach Ave., Venice, CA 90291, (213) 821-6242, for more information and catalog/price list.

★ ★ ★

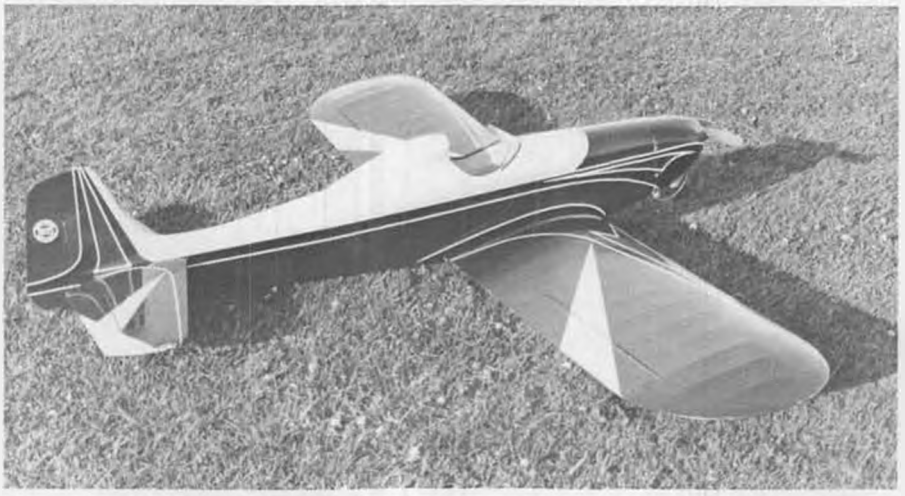
Kraft Systems Company, 450 West California Ave., Vista, CA 92083, (619) 724-7146, introduces its new four-channel radio system with professional features at an affordable price.

The new KP4KB R/C system is priced right for the beginner and equipped for the experts. Behind the front label panel are instant access adjustments for servo travel and servo reversing for all four

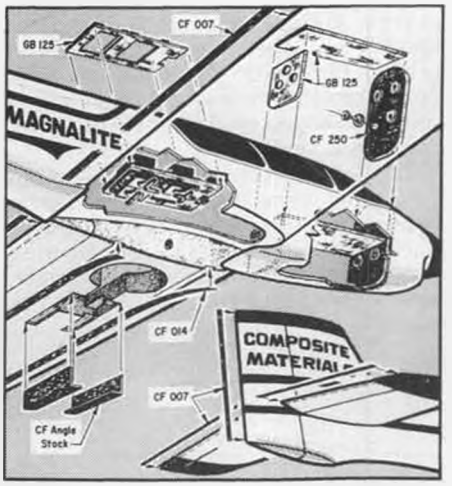


Novak Electronics NER-'91 AM receiver.

channels! The most noticeable aspect of this system is the handsome new "high-tech" black and silver finish of the rugged extruded aluminum transmitter case. This system also features all the solid performance, reliability, and durability Kraft is famous for. The transmitter features a convenient carrying handle, neck strap support, large power level meter, and precision Micro-Touch control sticks. Additionally, an FM update will be available in the fall of 1984 for all

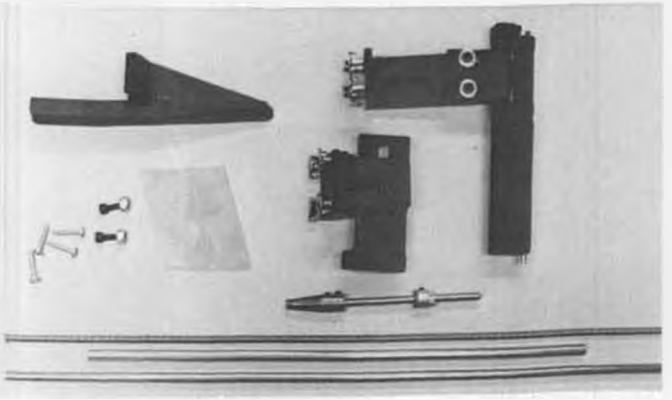


RC Sweitzer Enterprises *Hog and Ahalf,* 150% modified version of the *Astro Hog.*



Bob Violett Models carbon fiber products.

Hunt Models F/F scale, CO_2 *Fly Baby 1B* bipe.



Power Products R/C marine hardware. Space age plastics.

Peck Polymers "Busy People Kits". Citabria *Champion* (left), and Stinson *Sentinel.*

Peck Polymers "Busy People Kits." Zlin 50L (left), and Cessna *Aerobat.*

KP4KB Systems.

To round out the system, the KPR7KB Receiver, which is very selective and compact, is provided as standard equipment. The KP4KB can be ordered with either three or four fast, high torque KPS-26KB servos. The new KP4KB transmitter, like most other Kraft System components, is fully compatible for use with other Kraft K-line and deluxe radio systems. All of these fine features and quality are offered at a very affordable price. Contact Kraft Systems Company at the above address for prices and a dealer near you.

★ ★ ★

Ace R/C Incorporated announces its latest kit airplane, the sport T-34. Patterned from the venerable T-34, this plane really looks like its full-size namesake. The T-34 is designed for solid and predictable flight characteristics with good ground handling and slow landing speed. It is powered nicely with a .40-sized glow motor.

The T-34's structure is lightweight but strong and features a balsa sheeted foam wing with a Lite Ply and balsa fuselage. Balsa tail surfaces, vacuum formed canopy and cowl, formed landing gear, and a complete hardware package round out a very respectable kit.

Specifications for the T-34 read as follows: span, 56 inches; area, 532 square inches; weight, 5-1/2 pounds all up; engine requirements, .35 to .45 cubic inch glow; functions, four channel R/C.

To discover for yourself the myriad of products offered by Ace for your modeling convenience, write to Ace and order the just released 1984 catalog. You will be impressed by the depth and breadth of the product line manufactured by Ace and over 100 other manufacturers. Include $2.00 for all US and APO, and $3.00 for non-US catalog orders.

Ace R/C, Inc., P.O. Box 511, 116 W. 19th St., Higginsville, MO 64037. Phone (816) 584-7121.

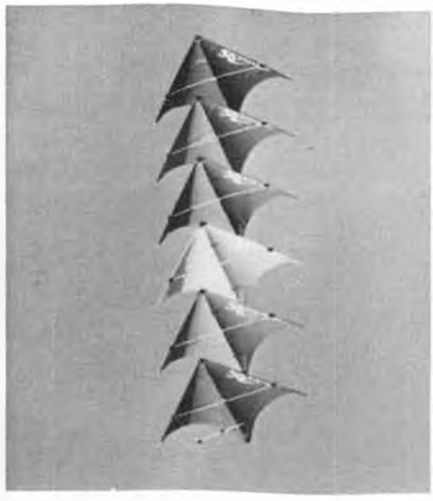
★ ★ ★

Peck-Polymers has come out with a completely new series of easy to build, all balsa profile models. The kits are called "Busy People Kits" as they require very little time to build. All parts are prefabricated and only require glue for assembly.

These deluxe prefab kits include: die-cut balsa, formed wire parts, plans with

Continued on page 103

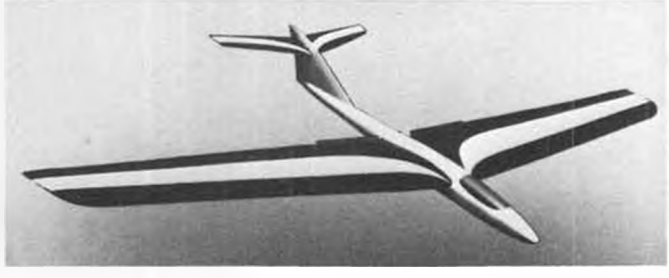
Top Flite Monokote Cleaner Polish.



Skyfox kites from Skynasaur, Inc.

Ace R/C's comprehensive 1984 Catalog.

Great Lakes Model Co. AT-6/SNJ *Harvard.*



Craft-Air *X-cell* advanced slope soarer.

Can you ID this full-scale airplane? It's a Dalotel, of course.

Pattern Flying

By DICK HANSON

• At the time this is written, the first results of our new "1984 Pattern" are showing.

It seems that the vote for a separate FAI Pattern means you will fly *either* FAI Pattern or the AMA multi-class schedule at this year's Nats in Reno.

The reason, apparently, is the possibility of everyone electing to fly the new schedule as well as flying in the Elective Class event. The manpower and the time required for both to be flown could be beyond practical limits.

May I suggest an emergency vote on the proposition that we simply make Masters Class the *only* class for the FAI schedule? This would, I'm certain, eliminate much confusion in the future.

Those fliers who wish to fly the new schedule could simply abandon their present Elective Class and jump directly to Masters.

I really don't know how *every* pattern flier feels about the whole situation, but the feedback I have received is very lopsided in favor of the Turnaround. Surprisingly, very few are concerned about the need for new airframes. After all, we have progressed through other changes in equipment which required money plus the learning of new building skills. If you feel otherwise, simply do what you like best! Remember, it's supposed to be enjoyed.

Let's get back to the flying field for a while. Last month, we outlined a practice schedule for developing proficiency with the rudder. If you haven't tried these exercises, do so. You must become as comfortable with the rudder as you are with the elevator if you really want to do well.

This time, let's look at the spin. The spin required is an inverted spin which is totally unfamiliar to the majority of pattern fliers. The entry into the spin is quite unusual. The model will have just completed a long, vertical climb. Next, having been pushed over to level flight, the model is rolled inverted and assumes the correct entry position for the inverted spin. The sequence is then: climb, push over, half roll, stall.

model, you are very skilled indeed. Most fliers will find that the model easily loses direction either in the climb, *or* as the pushover to level flight occurs, *or* during the one half roll. One of the contributing factors here is the desirability of enacting this sequence in one half of the frame length.

To assist the performance of this maneuver, we strongly recommend a very light, very well powered model having very effective controls. It's easy to see why some fliers may favor flaps, spoilers and reverse pitch props to control the point of *predictable* spin entry. Our approach is to use a simple, light model which will idle at a very low speed, plus have an airfoil which will stall on command.

We worked a lot with the airfoil on our *Tipo 750* and *Tipo 825* to achieve this, and settled on a shape which has a small leading edge radius and a high point approximately 40% back which transitions straight back to the blunt trailing edge. We have found no reason to tape on stall strips or other "patches"
on stall strips or other "patches" to get good reliable "breakaway."

Our present models, which are intended exclusively for Turnaround Pattern use the same basic airfoils . . . just a little thinner. I believe the technical name for these airfoils is "Series 6" type. (I never spent mucn time learning the proper names for airfoils.)

If you read last month's article, you may recall that we recommended learning how to momentarily "hover" the model using power and surface control. If you did this, you probably have aquired a feel for your model's stability characteristics. Remember, you must get a predictable spin entry.

Here is a procedure to try which works for us: Assume you have just completed the two inverted to inverted rolls and then climb *vertically* to the top of the frame. Push over to level flight, then reduce power and roll to inverted and cut power to the lowest possible idle. Feed in down elevator as fast as possible *without gaining altitude*. The idea here is to get the model into a very high drag attitude. If you are a glider pilot, you probably know that this nose high attitude really kills forward speed!

Keep increasing the "down" elevator input until the model either wanders off to one side, or just hangs there and mushes along inverted. If it wanders, correct the wander asrequired,but keep adding the down until the model simply falls into a spin or spiral.

If the model just mushes along, you probably have not provided enough elevator throw, or the model is nose heavy. At any rate, you should learn the limit of your model's ability to assume this very slow, inverted flight attitude. *This is extremely important*! If you don't, you can easily lose your model when attempting to recover from a spin. My CAP 21 went in once because I tried for an abrupt spin recovery and got another spin for my foolishness.

Back to the excercise . . . . Practice the entry sequence until you can fly right up to the frame center and "hit the braces" by using the high drag attitude technique. At this critical point, a shot of full down, plus a touch of rudder and aileron (optional), should cause a perfect spin entry. Here's the tricky part: keep a sharp eye on the pitch attitude, and make certain you see the nose start to drop before adding the rudder (and aileron). The model should now be in a solid spin which will almost surely speed up if you hold full elevator and rudder.

I find that I can control the spin rate by simply varying the rudder input and holding a preset elevator rate. (Preset means about 3/4 stick deflection.) A little practice here will show the amount of rudder required for a very slow, even spin. *This is not a spiral dive* !

The object of all this practice is to develop a spin which takes up the minimum amount of altitude. This allows the maximum amount of space for recovery. The spin, of done as described, recovers from rotation almost instantly. This allows time to make any last roll corrections before pushing gently to horizontal flight.

This is a critical point. Do not attempt to quickly recover from a rapid spin. Always stop the rotation first, *then* ease in the elevator. The more predictable your model is in slow speed flight, the more latitude you will have in making

Continued on page 96

Lucky modeler receives Great Planes CAP 21 at the IMS Giant Raffle.

Susana Seigelkoff of CB Associates shows a partial sampling of CB's product line: Quadra prop adapter, Kawasaki engine, mufflers . . .

International RC Specialties Eddie and Lupe Morgan display 1/3-scale instrument panels, nav lights, rigging wire and clevises, & more.

Peck-Polymers booth (L to R): Marilyn Schwemmer, Sandy and Bob Peck. New Busy People Kits as seen in "Over the Counter."

Jersey Metal Spinning booth (L to R): Laurie Ackley, Eileen Jersey, Fred Jersey, Paul Ackley. Beautiful metal cowls, spinners.

Prism Concepts demonstrated the amazing *Dip-er-Do* flying models. (L to R): Ron Strollo and Gloria Olguin. Have fun!

shows each day. They and the Black Sheep Squadron model club members again demonstrated the feasibility of electric powered control line. Stunt, carrier, and three-plane flights of WW-II scale aircraft flown by Black Sheep members in the tight confines of the central demo area, proved that quiet, clean, easy-to-operate electric control line flying could open up a whole new vista of environmentally compatible modeling that could bring those greatly needed kids into our hobby. Why the industry has not picked up on this still remains a big mystery to me.

As for R/C, scratch-built blimps by Tony Avak and Bill Watson, plus Bob Peck's commercially available blimp, were cruising around the exihibit hall, over the heads of exhibitors and spectators, almost continuously during the show. Tony Naccarato, a veteran of indoor fixed wing, electric powered R/C flying at the IMS, again flew his fantastic quarter-scale(!) Farman *Moustique*, powered by an Astro 035 motor, with Cannon Super-Micro radio, which weighs an unbelievable 23(!) ounces, with over 1200 square inches of wing area!

To top it al off, Larry Jolly flew two electric powered helicopters. The first was the production Ishimasa EH-1 (Electric Helicopter. How much more logical can you get?) Available through Condor Hobbies, Irvine, California. The second was a Circus Hobbies Baron 20 converted to electric. However, the motor was a little different. It is an Astro Flight 110-volt DC motor, weighing only 11 ounces. Through an AC/DC converter, it is provided power from any common AC outlet and an umbilical cord to the helicopter. The complete package is now available from Astro, in Venice, California.

The remaining live demonstrations consisted of a variety of indoor rubber free flight models that probably many new spectators to the model airplane

AMERICAN made motors galore at the RJL booth (sizes .20 to .61). (L to R): Holly Schirm, Randy Linsalato, Jim Arnold.

Darlene Lind and Lee Chandler were plenty busy demonstrating and selling the Eldon J. Lind Co. Extra Hands and Duplicator tools.

Lancaster Model Aircraft Sup. booth showed the Miniature Aircraft Sup. line of choppers incl.: Schluter, and new Heim (Germany).

Midge Johnson and crew show the Hi Johnson Model Products line of foam wing aircraft, hardware, Supertape, $2.50 catalog.

California Slope Designs Mark Rebeck and beautiful Sandy Webber displayed *Savage* and *SOS* gliders and video tape.

Racing Wings corner booth saw plenty of action with flying demos of the *Ultralight Looping Glider* by Erwin Trowbridge.

Master Jig reps Dean Bjorneby and Keith Bjorneby demo the Master Jig 400.

Zinger props and more props! Left to right: Gerry, Joe, and Gerry Zingali.

Another Giant Raffle winner named John picks up an Airtronics radio system.

Williams Brothers Larry (L) and Granger with *Dart Kitten* powered by Gemini Twin engine.

The Flying Machine Model Center booth had kits, fuselage holders. Dan Spinks proprietor.

McDaniels R/C Service booth kept those Ni-Starters and Chargers moving! Mike Yee (R).

hobby had never seen. There were ROGs, Penny Planes, Easy Bs, new "Busy People" profile scale models, and the big thrill for the youngsters were the *Delta Darts*. IMS, through HIA, provided 160 *DD* kits, and the construction was monitered and aided by Black Sheep members. Each youngster (or oldster) who completed and flew his or her *Dart* was given a certificate of accomplishment, and of course, allowed to keep the model. What the heck . . . 160 here, 160 there . . . we need 'em.

This was the second year for the Swap Shop, and it keeps growing. Under the supervision of Red Garlough and Dick Anderson (are those subscriptions straightened out yet?), over 60 swappers rented tables in the Annex area connected to the exhibit hall.

Another major feature of the IMS

Blimp's eye view of the T&A Hobbies booth. Wide selection of F/F, R/C, C/L, indoor kits.

G.L. Conley Engineering (Gary Conley) had working, model V-12 engine, also V-8, V-4.

Radial engines for scale or sport from Technopower II. D. Lohmolder with 1.3 ci, 5-cyl.

Tuned pipes, mufflers, headers for planes or choppers. David McAllister proprietor.

Always a crowd around the John Pond booth! Old Timer plans . . . you name it!

Alberto and Olga Dona of newly formed Condor Trading Co. International. Engines!

J&J Enterprises reps Jean and Jerry Kleinknight sell gliders, radios, engines, & more!

Sid Gates of Tech R/C was kept busy by the modelers who wanted his R/C accessories.

If RTF models interest you, look up Lanier R/C in Oakwood, GA. Bubba Spivey prop.

Great Planes people (L to R) Rick Stephans, Don Anderson, Jim Tier, field questions from interested modelers. Lotsa scale and sport.

West Coast R/C Distributors rep, Erwin Schreiber, with Consolidated Models AT-6. West coast dist. for HB and Quadra engines.

Hobby Products Co., Columbus, OH, is the place to find Unimat 3 lathes & machining systems. Judy Minkos (L), Peggy Miller.

Model Aircraft Design Co. (L to R): Joe Bridi, Jim Certain, and *Krafty "25"*. Power planes for sport and fun!

J.C. Development (L to R): Tufei, Steve, Jesse, and Kai Chao. Kai holds the Skylark starter. Also: Ni-Cds, chargers, etc.

Caltronic Laboratory has all kinds of machinery, tools, instruments. Al Wolff and Carl Tendick guard Simplex Hornet OT engine!

were, 86, not counting our own IMS Info and Raffle Ticket booths. There were 120 booths in all, plus three "street corner" positions that had to be added at the last minute. As there simply isn't enough space to write about every exhibitor present, and it would seem unfair to only mention those who had something really new, we'll just list them alphabetically, as they appeared on the program and let the photos tell you the rest. In this, and subsequent issues, our various contributing editors will tell you about new items being introduced this year. For example, Eloy Marez covers the latest in electronic items in his *Electronics Corner* this month.

List of exhibitors at the 1984 International Modeler Show.

Academy of Model Aeronautics
Airtronics Inc.
American R/C Helicopters
Astro Flight
Blacksheep Squardron
Bob Martin R/C Models
Buzz Waltz R/C Design
Byron Originals
California Model Imports
California Slope Designs
Caltronic Laboratory
Cannon electronics, Inc.
Carl Goldberg Models, Inc.
C.B. Associates, Inc.
Charlie's R/C Goodies
Classics Guild
Condor Hobbies
Condor Trading Co. International
G.L. Conley Engineering
Craft Air
Davey Systems Corp.
E&L Manufacturing
Electronic Model Systems
The Flying Machine
Golden Gate Hobbies
Gorham Model Products
Great Planes Model Mfg.
Hi Johnson Model Products
Hobby Horn
Hobby Products
Hobby Shack
Bob Holman Plans

Tim and Bob Renaud manned the Airtronics booth. If it's radios, gliders, or sport planes you want, Airtronics has 'em. New CS7PS.

Sig introduced its new *Astro-Hog* R/C sport or pattern plane at the IMS. (L to R): Hazel Sig, Maxey Hester, Jeff and Rex Perkins.

Larry Jolly Model Products: too many new products to list! Gliders of all sizes, electric powered planes too! Impressive.

New gliders, 1991 radio systems, and high-tech synthesized frequencies from Kraft. (L to R): R. Forbes, J. Albrecht, G. Boudewyn.

Hobby Shack was present with all of its RTF, ARF, and kit airplanes, radios, and accessories for the R/C modeler.

Condor Hobbies reps (L to R) Cliff Rausin, Taylor Collins, John Bernbrock, and Butch Asher. Tele Tachometer featured up front.

SEAPLANE PRIMER

By GEORGE WILSON . . . If you've ever wondered what makes a good seaplane or float plane design, this primer will teach you the basics. George's follow-on story, the PT-1 (page 23), tells you how to build a scale float plane that does its thing quite well. It should fly well . . . check out all of the history on these pages!

The *Seahorse II* (*Model Builder,* May 1972), designed by the author, was a simplified Harold deBolt design with floats. Floats were pretty and worked well. Step height was increasing then.

The *Seaprentice* (*MAN,* February 1969) was the seaplane version of Bill Northrop's *Apprentice.* Ed McCarty still flies it! Good float design was emerging at this time.

The most asked question this writer receives is, "How do I adapt this or that model for float flying?" This article will address that question, and will review some of the basics required for good seaplane performance.

In general, model seaplanes have to abey all the full-scale design requirements. Typically, floats have to be relatively large with respect to the fuselage. This provides adequate floatation and minimizes rough sea problems. The floats must be designed and mounted to allow adequate lift for takeoff at a reasonable speed (i.e., with reasonable or available power). On the other hand, model floats can have flat bottoms (for ease of construction), whereas full-scale floats/hulls are normally vee bottomed to ease the shocks of landing and plowing through waves.

Model seaplane flying is at its best when the model is properly waterproofed (to allow prolonged flying sessions) and when it steers easily while taxiing. The capability to land and to take off properly is, of course, the core of good water flying fun.

The writer learned to fly R/C with a seaplane. Water flying is not difficult, and it has many subtle advantages over land flying. Most important is the fact that the water is very forgiving of rough landings made many feet from the planned touchdown spot. Note that takeoffs and landings can most often be made directly into the wind. The model can usually be launched and taxied back to a spot on the shore. The presence of mermaids should not be overlooked! Nor should the availability of water flying sites versus land sites be underestimated.

The need for a boat is a detractor, but it is most often surmountable with a little forethought. Good friend Ed McCarty has flown for years without a boat . . . seaplanes can be very reliable.

What follows will first address some of the considerations needed to produce a good seaplane model, and then cover the design of a fun-fly "simulation" of the Consolidated PT-1 Army trainer (circa 1922). This project started with the goal of producing a float design for a flock of *Rumplestadts* being built by the Otis R/C Club (Cape Cod, Mass.). The *Rumplestadt* was published by *RCM* many years ago and is a "humorous simulation" of a WW-I biplane. The plans for the PT-1 floats may also be used for the Rumplestadt.

REVIEW OF THE FUNDAMENTALS: POWER CONSIDERATIONS

Properly designed seaplanes do not require much more power than their land plane equivalents. Often, the added power is primarily required to offset the air drag of the water gear. Sometimes it is required to affect takeoff from smooth water on a warm day when the air is light. If the seaplane is a clean lined flying boat, it can be argued that no added power is needed above that which is used in an equivalently loaded and sized land plane. In this case, you lose the drag from the land gear.

The secret to water takeoffs is to maximize the available lift at relatively slow speed. This can be done by proper float design . . . more about this later.

An important consideration is that full-scale seaplanes were never intended to do stunts or to climb straight up. The fun of seaplaning is scale-like performance. Realistic takeoffs and landings, the ability to taxi to and from the dock and the adrenaline free enjoyment of normal flight maneuvers is the heart of it. All this can be done with a relatively quiet, moderately powered airplane.

Yes, Fred, power is one of the cures for the poorly designed seaplane that is reluctant to takeoff. Most any pattern plane (overpowered for normal maneuvers) will takeoff the water with any set of floats that will adequately float it, *and* will allow a little angle of attack during a high speed takeoff run. If you must, go ahead and put floats on this type of plane and join the water fun. Better still, read on and build a seaplane that will make you a real sea(plane) farer.

FLYING BOATS VS. FLOATPLANES

If you are looking for the best seaplane performance and are starting from scratch, the flying boat is the best choice. If you are inclined to build a scale model of a floatplane, do it! Floatplanes have some disadvantages, but they do look great, and, in spite of problems, most of them will perform very well.

Flying boats have the following advantages:

- Minimum air drag, especially if they

DAWN PATROL. The author (left), John Ross, and friend are all set to make ripples on the glass smooth lake. Planes are the *Seasquare GT* (*American Aircraft Modeler*, Nov. 1974), the *Seastick* (*MAN*, April 1977), *Sealander II* (*MB*, Feb. 1977), Proctor's *Antic* on floats.

Seastick (*MAN*, April 1977) is a very simple float plane that flies well. Rugged, square float bottoms are practical, work just fine.

The *Seasquare* (*MB*, March 1976) is a small flyingboat that is about as simple as they come. The original is still flyable, and the author/designer has built two more just to make sure there is one around when the urge to fly seaplanes arises. Design is a working, .19-powered, 3-ch. model.

The *Seatrainer* (*MAN*, Aug. 1970) was the second derivative of the *Apprentice/Seaprentice* series. It has the advantages of being a flyingboat. Author's wife, Eleanor, with plane.

have nice, clean lines.

- There is a minimum tendency for water to get into the propeller. Wide hulls are recommended. (Multimotored flying boats do not have this advantage. Even the full-scale ones have their problems with water in the propellers.)
- They have a profile which minimizes their tendency to capsize when taxiing broadside to the wind.
- Rigging a water rudder is easy; (On the average, flying boats have the best water handling characteristics.

The rules for hull and float design are the same. These will be discussed later. However, the size and mounting of floats on a floatplane may make or break the plane's performance. Again, more about this later.

High wing floatplanes are particularly difficult to handle on the water if there is any appreciable wind. A puff of wind broadside will easily capsize them. This is especially possible if they are turning and heel over such that the upwind wing rises and catches the wind under it. Turns should be made in th opposite direction (if possible) to avoid this problem.

Bear in mind that water handling is a large part of the seaplane fun. Long taxis on rough water are par for the course unless you want to restrict yourself to near perfect weather conditions and an ideal water flying site.

SUBRUDDERS

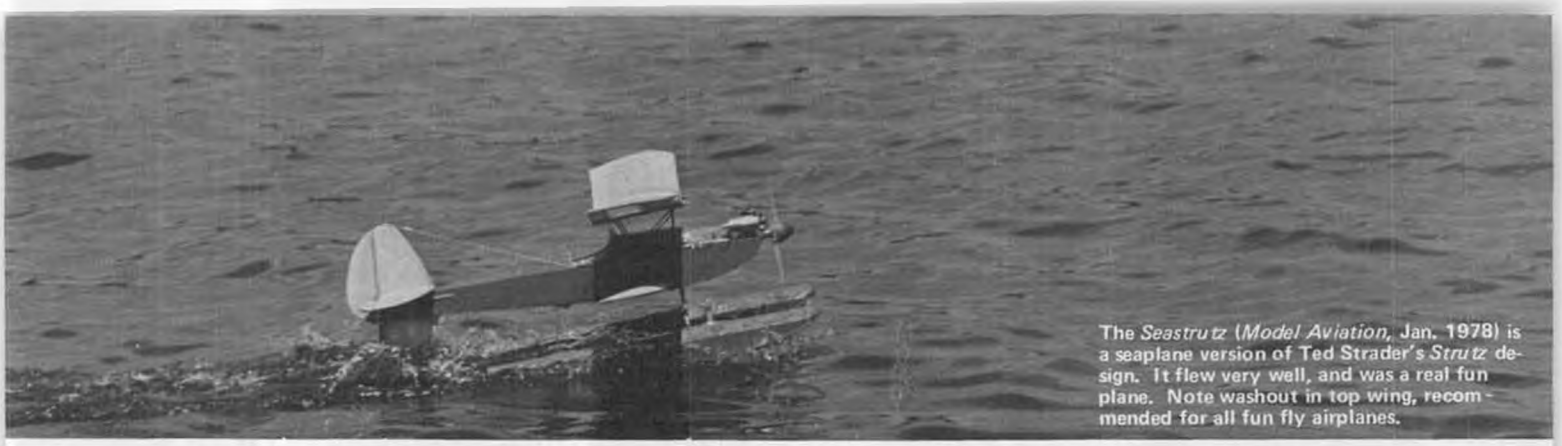
The term "subrudder" actually refers to added vertical fin area that may be necessary when a landplane is converted to a seaplane. If a plane is a to fly straight ahead naturally, it must be "stabilized" in that direction. The most efficient approach to this is to have the vertical area moment behind the CG greater than the moment of the area in front of the CG. Most often, vertical fin/rudder area is added until the tail nicely weather vanes behind the CG. If floats are added with more vertical area in front of the CG than in back, added vertical fin area is needed. If your model does not "groove," or is squirrelly in yaw, then more fin area (a "subrudder") is called for.

Do not be afraid to add a fair amount of fin area. Seaplanes can stand to be somewhat over stabilized as they normally are not called upon to do agile maneuvers. Remember, the farther aft the area is, the more stabilizing effect it will have.

WATER RUDDERS

The most important factor in water handling is an effective water rudder. Like the air rudder, the bigger it is, and the farther aft it is, the more effective it is. The shape of the aft part of the floats or hull will also influence the effectiveness of the water rudder. Typically, flat float sides tend to fight the rudder's effort to turn the aft end.

The well designed water rudder will be under water at taxi speeds and be out of water when the plane is running on-the-step. It may momentarily drop back into the water as the plane rotates for takeoff. In fact, it most often is the last thing out of the water.



The *Seastrutz* (*Model Aviation*, Jan. 1978) is a seaplane version of Ted Strader's *Strutz* design. It flew very well, and was a real fun plane. Note washout in top wing, recommended for all fun fly airplanes.

LEFT: *Flymobile* (*American Aircraft Modeler*, Feb. 1975) was an unusual design that flew very well, proof that almost any plane will fly with floats. Don Foster floats made conversion easy.

BELOW: Scale seaplanes are loads of fun. The J-3 *Cub* on Edo floats (*MB*, Sept. 1981) is a very good flier; very scale-like.

Water rudders are frequently of the "balanced" type. This means that they have area in front of, as well as in back of, their turning axis. About 1/3 of the total area is often in front. This design makes the rudder partially self-powering. The force on the front part tends to increase the rotational force. However, as the aft area is greater, the rudder will be self-righting in case of servo or linkage failure. With the power available from the modern servo, the balanced design may fall into the design overkill region.

If you are adapting a land plane for seaplane use, the "Walt Witkos rudder" is the simplest. Many years ago Walt extended a relatively long 1/16 music wire from the hinge of the air rudder and added a small (about one-inch by two-inch) tin can stock water rudder to the bottom of it. It isn't elegant. It is very springy, but it is effective, and, best of all, it's simple!

A subrudder may be used to support a water rudder. This approach is shown in one of the drawings. The subrudder area may not be necessary from an aerodynamic point of view, but it will only make the model a bit slower to turn left or right.

The most scale-like approach for floatplanes is to add the water rudder at the aft end of the floats. The water rudder can be turned with a linkage or cables to the air rudder, or a separate servo can be used.

Seaplanes can be flown without water rudders. The normal result is a high level of frustration at best and sometimes total inability to steer the plane when it is on the water. This is one place not to cut corners.!

FLOAT/HULL DESIGN

For best performance, floats or hulls should conform to these basic rules:

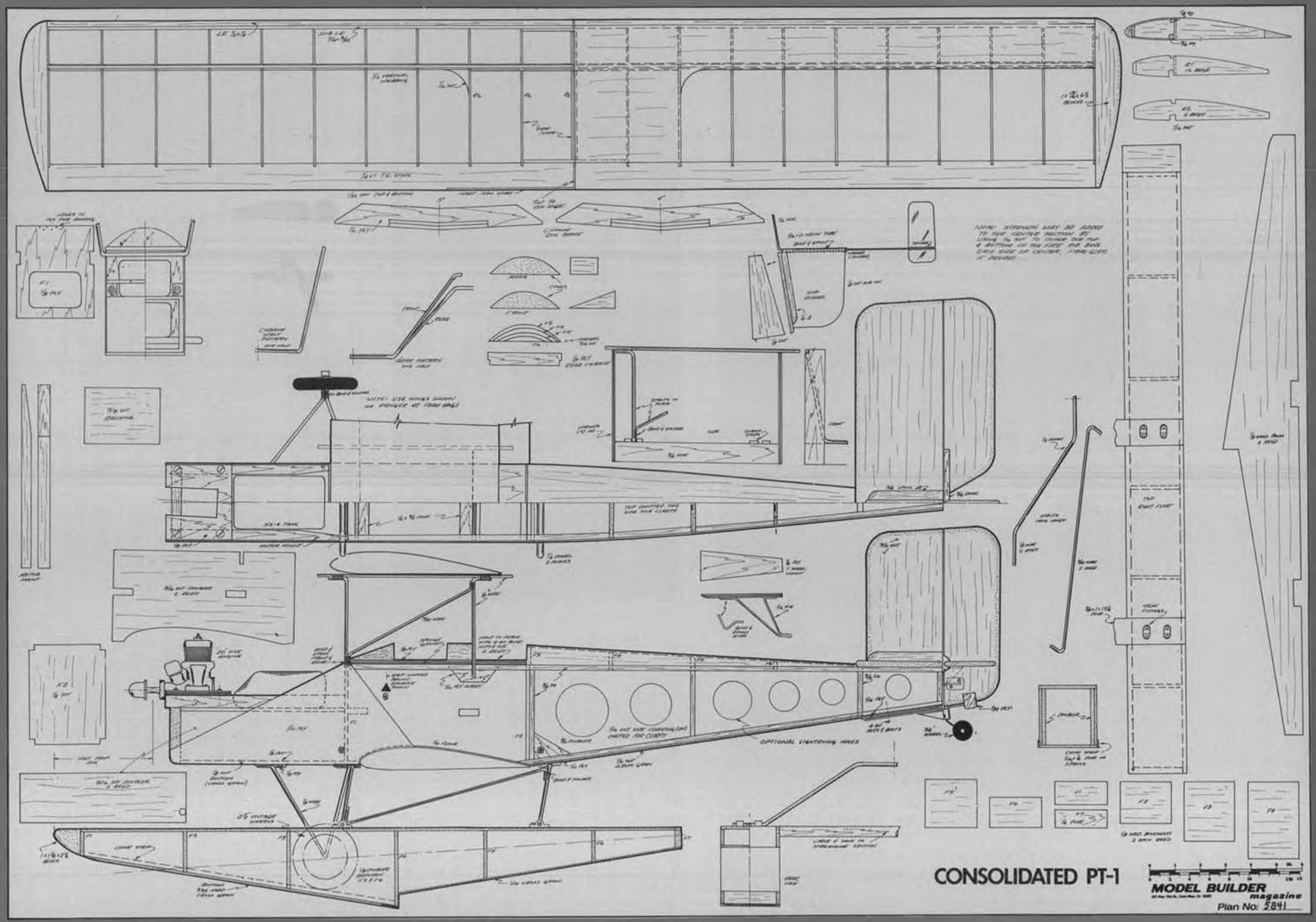
- They must be large enough to handily float the model.
- They must be long enough to have the nose of the floats well in front of the propeller (half the propeller diameter is a good rule.)
- They must float the model at rest with the nose high. The waterline should be *below* the float at least from the propeller forward. (Float length should be in the order of 80% of the fuselage length in the normal case.)
- The height *at the step* (not the height *of the step*) and the taper upward aft of the step must be such that the model can rotate *at least* six degrees for takeoff.

The lakeside environment can be very enjoyable . . . the mermaids were swimming when this photo was taken. Seaplane is the *Seahorse II* (*MB*, May 1972).

The latter rule is most important for the takeoff manuever. If this rule is not observed, the aircraft will have to rotate (if possible) about the aft end of the float(s). This means that the wing lift must actually lift most of the model's weight to attain rotation. Rotation about the step (which should be under the balance point) requires no wing lift. In fact, if you place the model on a hard surface, it will fall (rotate) backward until the rear end of the float stops it. This is the maximum normal rotation angle.

If more rotation is necessary for takeoff, the wing lift must lift the step off the water. With the model sitting in the maximum rotation position, try raising the step off the surface by lifting the model under the balance point. This will show you how much additional lift is required if the model will not take off at less than the maximum normal rotation angle. This lift must be supplied by additional forward speed which requires additional power.

Continued on page 79

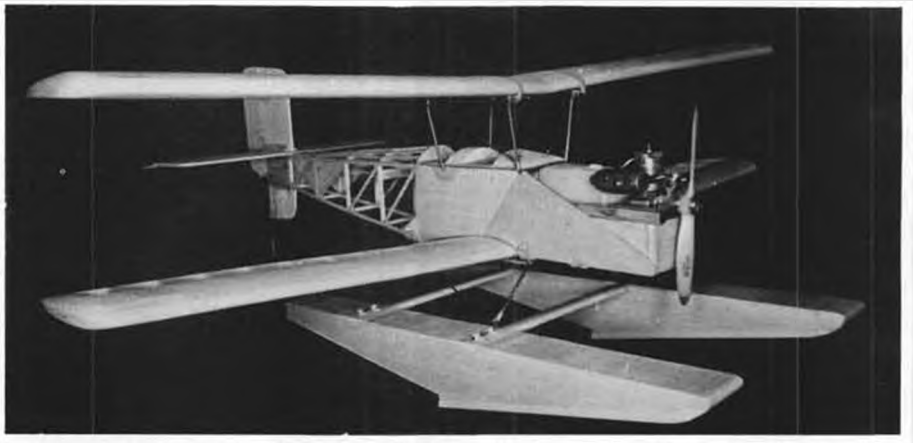


FULL-SIZE PLANS ARE AVAILABLE — SEE PAGE 106

CONSOLIDATED PT-1 FLOAT PLANE

George Wilson and the "sorta-scale" PT-1.

By GEORGE WILSON . . . Here's a "sorta-scale" PT-1 for the guy who likes to fly over the wet stuff on a regular basis. It isn't a difficult biplane to build, and its water manners couldn't be nicer. If wet doesn't drive you wild, skip the floats and build the PT-1 with the landing gear shown on the plans.



The uncovered airframe (and water frame?) of the PT-1 reveals the wide wing spacing and the uncowled motor . . . like the full-size version. Foam wings could also be used.

• The Consolidated PT-1 was selected because of this author's affinity to relatively square aircraft that have their motors completely exposed. (The editor's preference for biplanes came to mind also!) It is not even "eyeball scale" . . . my source documentation is a single sketch by Douglas Rolfe in the book *Airplanes of the World*. He points out in the caption that the engine was fully exposed to facilitate easy maintenance . . . a sterling approach to aircraft design!

The general configuration was inspired by Bob Lovejoy's *Rumplestadt* published many years ago in *RCM*.

About 10 years ago Fred (Fritz) Hess brought a *Rumplestadt* to the Brimfield meet. It had a single main float and wing tip floats for balance. With a .15 motor, it would not get off the water. However, as Fritz puts it, "With a .19 motor in it, it went like a scalded cat!"

The original model differs from the final plans in several relatively unimportant ways. In fact, the plans were redrawn to simplify some of the construction and add some (probably unneeded) strength to the rear end of the fuselage. The wing structure was also simplified and made lighter. The original uses the built-up wings shown in the plans . . . the foam wings used on the *Rumplestadt* (see the plan) should also work well.

FUSELAGE CONSTRUCTION

The fuselage is not difficult, but the following order of assembly will be helpful. Make a left and a right side as follows:

1) Build the 3/16 square frame over the plan.

2) Add the 3/16 gusset behind F2.

3) Install the 3/16 sheet doubler that is above the lower wing. Be sure to leave a slot for F2 to fit into.

4) Carefully laminate the large triangular 1/16 ply front outer sheeting to the rectangular 3/16 sheet doubler that goes under the motor bearers. When cutting out the ply piece, note the notch required for the cabane strut assembly and the hole for the wing elastic band pegs. Note that the doubler is installed 1/8 inch above the bottom to allow for the bottom sheeting.

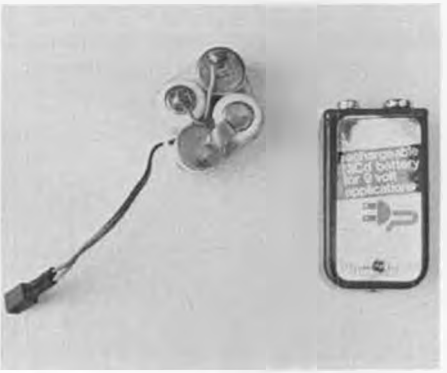
5) Cement the laminated assembly made in Step 4 to the front of the side frame work. Be sure leave a slot for F1. Join the two sides by pinning them over the top view of the fuselage as follows:

6) Loose fit F1, F2, the rear cabane support, and the two servo tray supports to see that everything is square.

7) Cement the items fitted in Step 6. Pin to the board and to each other, check the squareness, pull the tail end

ELECTRIC POWER

By MITCH POLING



ABOVE: The author makes inexpensive 60 mah flight packs from GE 9v rechargable batteries. They weigh less than 1 oz. and allow two flights between charges. Charge at 250 mA for 15 minutes or less (watch voltage peak).

LEFT: Al Tabor (R) and John Zendler fly their electric powered *Brigadiers* (*MB* plan No. 9822) a mile high at Boulder, Colo. See text for setup details.

The Graupner ASW-22 *Elektro*, shown in its unpowered version, is designed for electric power. The scale sailplane is almost ready to fly (ARF) out of the box. Use an Astro cobalt 15.

• In the last column, I mentioned the book that I hope, someday, will come out on electric power from Kalmbach. There are three books on electric power that I know are available right now, *The Silent Revolution* from Astro Flight, *RC-Electroflug* by Hans-Dieter Levin, available from Wilshire Model Center, and *Electric Flight* by Dave Day available from Historic Aviation. *RC-Electroflug* is an excellent book, full of "nuts and bolts" information, but it is in German, and my shaky, shoolboy German is not enough to get me past a lot of the technical explanations. However, the illustrations and diagrams are excellent, and it is worth having as a reference book. I don't know the price, it isn't listed in the Wilshire catalog, but I would guess that it is around $10. The Astro Flight book is more of a review on what is available and what can be done with electronics, and does not emphasize "how to" or "nuts and bolts" information. It is useful as a survey of what is possible, and the price is reasonable . . . about $8.

The book by Dave Day is from England, and it is written in a very English manner! As Dave says, "It is not the writer's intention to promote the development of this type of aircraft, but rather to illustrate the ease and practicability of the modern electric powered model aircraft". True, but at times I'm not sure about Dave's writing, it is almost a "it works, but . . ." style, very nearly apologetic. I would like to see a little more promotion, and less understatement! Also, most of the equipment described is English, which does limit some of the advice for us readers. The "how to" is spotty, there is some, but not enough, and what is there is often not detailed enough, it leaves you guessing as to what comes next. The book is $9.95 plus $2.50 handling fee from Historic Aviation, 3850-F Coronation Rd., Eagan, MN. 55122. If you are a beginner, this book is not enough to get you started, but it does give a few "how to" hints and a view of what is being done in England.

One more "book" is worth mentioning, the Wilshire Model Center catalog. This has been updated since I mentioned it before, and features a flying cat on the cover! *(Shirley the shop cat has been imortalized! wrf)* The cover alone is worth th $2 price! The contents are devoted exclusively to electrics, many of them from Germany. The catalog is the best way I know of for finding out what is happening in Europe, and if you see something you like, you can order it from Wilshire Model Center, 2836 Santa Monica Bl., Santa Monica CA 90404, (213) 828-9362.

There is a lot that you can order from Wilshire! The ASL 4 charger is an example. It is incredible, it runs off a 12-volt car battery and will charge up to 24 cells at one time! This is in series charging at that! It must contain a voltage tripler, an impressive achievement. It can supply charge current up to 20 amperes, so that tripler must be a real brute, yet the charger is quite compact. The engineering involved is very sophisticated indeed. The charger is intelligent, it keeps track of the battery pack voltage and shuts down the charge once the voltage peaks. This means no more need to time the charge, or to watch the charger. Wander off, have a chat, and come back and fly . . . *easy!* The ASL 4 has an LCD display to show you the voltage, the same model without the LCD is the ASL 3. The ASL 4 is $250, the ASL 3 is $195.

Another new item offered by Wilshire is the *Elektro* from Graupner. This is an almost ready to fly, high performance glider for the Astro 15 cobalt type motors, with a span of 2.4 meters (eight feet) and a flying weight of 2.3 kg (five pounds). The fuselage is preformed, and the wings are foam core and balsa sheeted. The price for one of these high-tech gliders is $145.95.

Wilshire has many more items: the Geist motors, the IBA ready to fly planes, batteries, folding props, you name it! They also have the new 800 mah, "cut

PLUG SPARKS

By JOHN POND

1. This 19 year old *Miss America* was restored by Monty Tyrrell for John Pond to fly in the Australia Nationals. Engine is a reworked Super Cyclone. Note "signature" on fuse side!

• Australia! What . . . again? Most modelers would figure this columnist is out of his everloving gourd as this makes three times in six years! What's the big attraction? Beer! (What else?) One Australian wag put it this way, "When Pond came to Australia, the Carlton Brewing Co. declared a dividend during those weeks." Haw!

Seriously speaking, the primary, driving reason for going to Australia was to attend the Model Airplane Association of Australia (MAAA) Nationals where the Old Timer events had been allocated three separate days for competition.

Upon discovering this in early 1983, I immediately contracted to have several models ready. Monty Tyrrell (host *extraordinaire*) volunteered to pull his old *Miss America* down from the rafters and rehabilitate this old timer. To help things along, I immediately dispatched a Super Cyclone, recently reworked by Otto Bernhardt.

As it turned out, Tyrrell was some sort of a promoter (once a salesman, always a salesman) as he was able to get Eric Bilby, the KO representative for Australia to place two four channel sets at the disposal of Tyrrell and Garrett (more on Garrett later).

The KO set was placed in the *Miss America* after much reworking of all members of balsa. It seems like every glue joint had given up the ghost, and so had the covering. Fortunately, Norm Garrett, Tyrrell's sidekick, volunteered to cover the model, hence, the *Miss America* was ready to go a month before the Nationals.

As can be seen in Photo No. 1, the *Miss America* was well "dollied" up, complete with the columnists name on the side. Not exactly sure of the "Builder of the Model" rule or not, this columnist had the brillant inspiration of having the *Flamingo* restored. This model had been left in Australia on a previous trip, as air expenses going back were dearer than the costs coming out to Aussieland, $260 to $320! Leave it there!

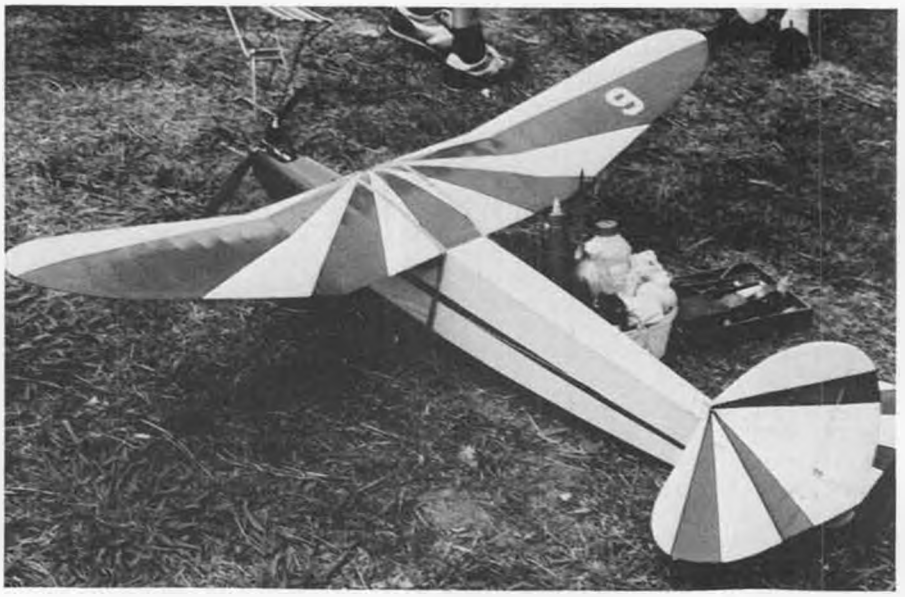
2. Here's a switch! Norm Garrett scaled up a *Model Builder* plan of a scaled up, rubber powered, Comet *Clipper Jr.* (plan No. 5832, $5).

3. Never one to give up, Ivor F gives his 1934 *Single Stick Pusher* a tweek in the wing and breath of moist, hot air to fix a warp.

Brian Potter (the custodian) was duly contacted, and most surprising, after six years, the *Flamingo* was in pretty good shape. Only the fuselage needed repairs as someone had squashed it slightly. Between the urgings of long distance calls by Monty Tyrrell, letters and packages from this columnist, Potter got the idea to get the model ready for the Nationals. As it turned out, we almost didn't get the model in time as Potter's father-in-law died, and funeral proceedings got in the way. However, he did deliver the model on the very day of the event!

This made for an excellent situation. Now two models were available. To mollify Tyrrell somewhat after all his work, I planned to fly the *Miss America* with the Super Cyke on the first day in the Duration Event (the *Flamingo* would not get to the Nationals until the third day). After that, Tyrrell could fly the model in the Texaco event.

On top of that, I still had my original fiberboard box, somewhat resembling a



4. Basil Healey carefully painted his *Red Zephyr* to match the original, advertised color scheme. (*MB* plan 674-O.T.)

5. Lounging between flights, Brian Wilson (L), and the Australian SAM president, Bill Gordon smile for the camera.

6. Monty Tyrrell snarls, "Wotta job putting on the struts for the *Miss America!*" The struts were added to give the 19 year old plane acrobatic strength.

7. Look at those beautiful lines! (The model, that is.) Dave Brown, Lithgow, NSW, is a member of the Sydney Blue Mountain Assn. His R/C Old Timer is an *Albatross,* an *MB* plan (No. 673-O.T.).

8. Brian Wilson entered this Gil Sherman *Mike* in the Limited Engine Run event.

9. Here's a rare one! It's a Bob File *Little Varmint* built by Brian Wilson. Kind of homely, no wonder it's rare! Note push rods.

suitcase available for transporting three rubber models and one .020 Replica O/T gassie . . . a *So Long*. Now we are loaded for bear! We're gonna show these Aussies how to fly Old Timer models!

For the uninitiated, trips from San Francisco to Melbourne via Sydney cost $1200 round trip during the tourist season. (You must remember that it is summer during December and January). Most trips take 15 to 16 hours as there is always a stop for an hour in Hawaii (refueling). The most disconcerting thing of the whole trip is to leave Monday evening around 6:30 p.m. and arrive 11:00 a.m. *Wednesday* morning! You lost Tuesday! Even more wild is the return trip. One can leave Sydney at 6:45 p.m. Wednesday and arrive in San Francisco, 5:50 p.m., Wednesday! That's one way to get younger!

Did I take any engines? Sure did! As per the requests of my many Aussie friends, I "flogged off" five engines (flogging off is Australian slang for evading the customs duty). All my well-laid plans went for naught as it turned out I could enter with $200 worth of merchandise . . . duty free! That, plus there was an allowance for my bottle of Jim Beam whiskey (for my buddy, Monty). Rats! You can't even be dishonest!

Having met Monty Tyrrell at the Melbourne airport (after a real zip through the customs), I was immediately steered to my favorite lunch . . . a steak sandwich and a glass of Carlton's beer (the best!!). For those who wonder, this is the lunch combination the writer had during the whole trip. The large steaks at $5.00 a plate were just too much to eat for lunch. The steak sandwiches at $1.80 were even more attractive! Eat your hearts out, men!

Actually, this columnist arrived four days early to tour Melbourne and meet those friends from the last two visists. The whirlwind tour consisted of:

1) A trip to Geelong (over the bridge across the bay from Melbourne): (a) to see Laurrie Cantwell of the Kraft agency;

10. Here's a classic one, an original *Buccaneer* as built by Kevin Leonard, NSW.

(b) to see Eric Bilby of the KO agency; and (c) various hobby shops.

2) A visit to Farnan OS distributorship to obtain an OS .80 four-cycle engine (not available in the USA, *John Maloney pay attention).*

3) Dinner, as host of Tony Farnan and six others.

4) A flying session at the PDARCS field (checking out the R/C models).

5) A fancy Hungarian dinner on New Year's Eve.

6) A visit to Dennis Parker, the editor of SAM Australia and their "PR man."

7) Several miscellaneous trips to see other modelers in Melbourne. Had enough . . . whew!

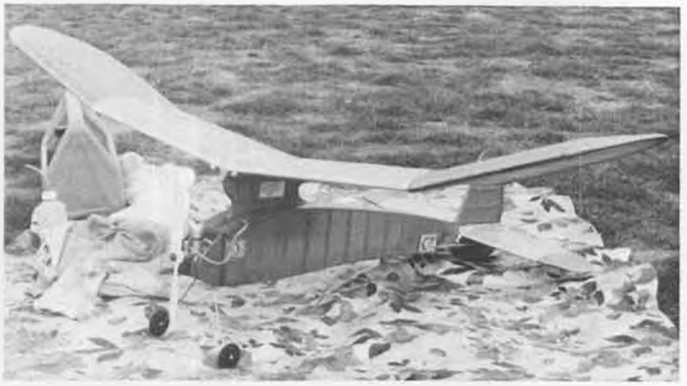
It was during this time that I discovered that Norm Garrett had taken it upon himself to construct a five-foot *Comet Clipper* for my use. (Now the reason for the second KO set!) This was duly tested by yours truly at the Pakenham and District Aircraft Radio Control Society (PDARCS) field. This field is an incredible place consisting of 105 acres. There is so much room, the club sharecrops its field to neighboring farmers. The club owns the entire field!

Photo No. 2 depicts the *Comet Clipper* built by Norman Garrett. In this case, to obtain the five-foot model, he scaled up the 54-inch *Clipper* which appeared in the May '83 **Model Builder** that was scaled up from the rubber version

11. Basil Healey really goes for this Larry Eisenger design, a *Skyrocket* (*MB* plan No. 580-O.T.). Model has 4cycle engine, wingspan of 62 inches. Originally appeared in Jan. 1940 *Flying Aces.*

12. Here's a real cutie which wasn't entered in the MAAA competition, a Cleveland *Viking.* Model had a two-channel radio system aboard.

13. Howard Gostelow shows the Dooling .29 that makes his *Hyphen* "git up and git."



14. Roy Summersby won with this Chet Lanzo design, *Swayback.* Airfoil shaped fuselage is sure different.

known as the *Clipper Jr.* It was with some apprehension that this writer decided to enter the model well-knowing the original *Clipper* family did not have flat bottomed airfoils. As it turned out, a more bitter disappointment was in store as it was discovered during processing that no scaling was allowed for the R/C Duration event. This was truly a shame, as Garrett had done such a fine job, and the model checked out very quickly, needing ony a slight shift in balance and a tweak of rudder trim.

All good things come to an end, so pack up the Tyrrell Ford and head for Sydney, 400 miles to the east. The three of us, Tyrrell, Garrett, and myself, made the trip in a leisurely 14 hours. (You have to stop to get the dust out of your throat!) Fortunately, or unfortunately (whatever way you look at it), I was unable to assist in the driving. These people drive on the bloody wrong side of the street!

Before we get into the MAAA Nats, this columnist would like to insert the section on the engine of the month. As noted before, we are rapidly running out the good subjects as the columnist insists that the drawings be made directly from the engine. It does eliminate arguments when you have worked from the real thing!

ENGINE OF THE MONTH

For this month's engine, the Cannon 300, we are indebted to Jim McMillan, 648 Martes Peak, Incline Village, Nevada 89450, for the use of the original engine. This particular Cannon engine is the 1946 version with the first 1946 timer design. Later models in 1946 featured the "Strato-Timer", designed to overcome timer floating when run at high speeds.

When the original sand cast version of the Cannon came out in 1940, the timer assembly bore a striking resemblance to the old Baby Cyclone, or for that matter, the early Atwood Bullet timer designs. (See June 1941 *Model Airplane News,*

15. (LEFT) Alan Brown makes an adjustment to his George Fuller designed *Stomper,* entered in the F/F event.

16. (RIGHT) Ron Nyberg of Sydney entered this English design, *The Clubman,* in the F/F event.

17. (LEFT) The younger set likes Old Timers too! Rown Molloy poses with his English *Slicker*, designed by Bill Dean.

18. (ABOVE) The winning flight is on its way! Colin Collyer tosses his *Brigand* into the air during a flyoff.

Cannon ad.)

However, the Cannon model we are referring to was first announced in the November 1945 issue of *Model Airplane News*. This was followed by a full-page advertisement in the December 1945 issue wherein the engine was shown in complete form. In spite of the full-page advertisement, no prices were quoted. Their slogan for the engine was, "The motor that lead the field when the war stopped production."

The design of the Cannon engine is generally acknowledged to be the work of Joe Delong and Bob Steele. In 1940, these semicustom engines (called D&S) were given to the hot competition flyers with the net result that they could claim first in Class B and C for their engine.

It didn't take long for the commercialized version, the Cannon 300 and 358, to make their appearance with the claim that their motors had won the Nationals. However, due credit should be given to the company as they acknowledged that the D&S engines (from which the Cannon was derived) did in fact win the Nationals at Chicago Nationals and the Scripps Howard Races at Akron, Ohio.

One of the interesting features of the Cannon engine is the side draft intake. This evidently was a method of fuel induction favored by Bob Steele as his later RB Special continued this practice. As can be noted from the foregoing, Delong and Steele left the Cannon organization sometime during the war to produce their own engines. Joe Delong's motor, named after himself, enjoyed an initial terrific success, but after a year or so, the competition had caught up and passed both Delong and Steele.

In reviewing the Cannon 300 and 350, the only difference was that the 350 was a "stroked" version of the 300, that is to say, both engines had a bore of .750 in. with strokes of .678 in. and .812 in. giving displacements of .299 and .358 respectively. Engine weights were listed as 6-1/2 ounces.

To pursue further discussion on the Cannon engines, the January issue of *MAN* (just in time for Christmas!) gave the manufacturer's address as Cannon Mfg. Co., 1878 East 18th Street, Cleveland 14, Ohio. Prices were announced as

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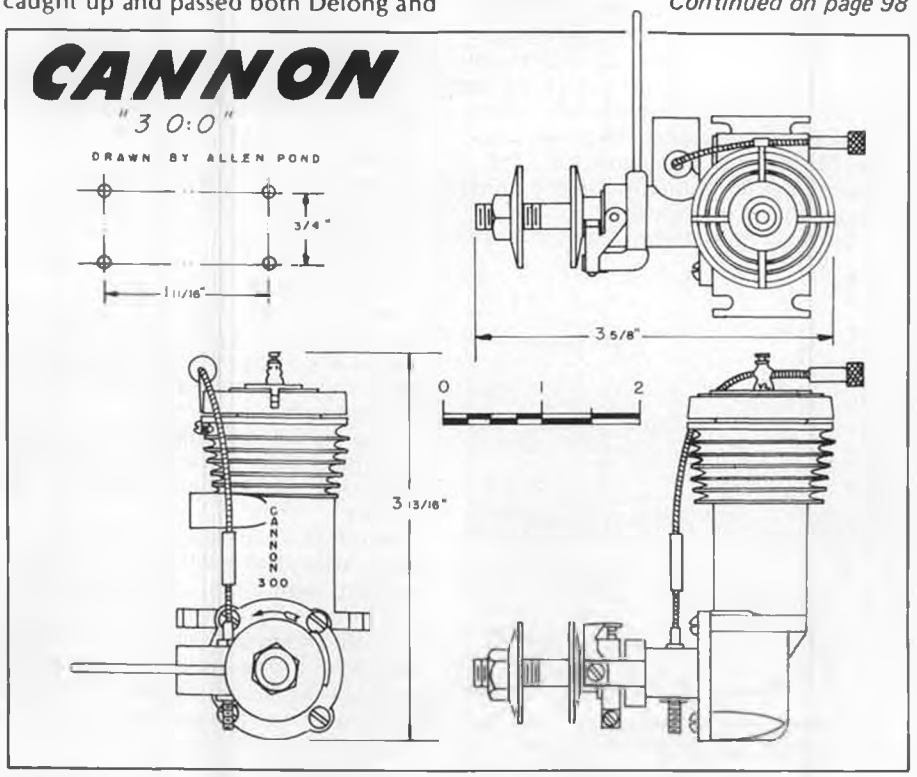
19. Here's a rarely seen *JB-3* in a beautiful silhouette picture. It's a 1940 Wakefield design from Holland, built by Geoff Cole.



R/C TLUSH MITE

By RANDY WRISLEY . . . Here's a 125% scaled version of a SAM approved Old Timer for electric powered R/C. It was designed for the Astro 020 and 035 motors, but with a little "beef up" is ideal for 05 power.

• Francis Tlush designed the *Mite* back in 1938. Used as a test bed for a small motor he had built, the model proved to be a better flier than Mr. Tlush expected. Shortly after it was completed, the *Mite*, and the engine, disappeared during a 54-minute flight!

My father Ernie turned me on to the *Mite*. He has built two of them for 1/2A Texaco. While not a skyrocket climber, the model glides very well, and thermals on the slightest bit of lift. You can get the original size plan from **Model Builder**, No. 479-O.T. ($3.00). The version presented here is enlarged 25%. With 450 square inches of wing area, it is ideal for the Astro 02 belt drive electric system with a fifth cell added to the power pack. The 035 system will work too, and I suppose the 05 would fit, but it is much heavier than I intended.

I built my model from Sig four to six-pound, "very light" wood. I stripped all the stock from three sheets of Sig 5/32 x 3 balsa. My finished, but uncovered airframe, with the wheels, weighed in at seven ounces. Completed and covered, the *Mite* tips the scales at 23 ounces with the radio and motor batteries aboard.

The author gives the *Mite* a gentle shove to get it airborne. Model will ROG as well.

The secret to good performance with the *Mite* and the 02 system is light weight. You could build yours from 3/16 stock, but remember, the heavier you build it, the lower the flight time; 'nuff said, lets build it!

FUSELAGE

Build both sides over the plan, one on top of the other. The bottom longeron should be laminated at the front to achieve the required curve.

Once the sides are dry, separate them with a razor blade. Pin the sides upside down over the top view, and cement the cross pieces in place. Take care to get the structure square and straight.

Note that the diagonals used in the top and bottom are 1/16 x 5/32 balsa and are installed opposite to one another. balsa and cemented in place on top of the fuselage.

I cut my firewall from 1/8 Lite-ply, and cemented it in place after cutting the holes for the 02 belt drive unit (see photo).

Bend the landing gear from 1/16 music wire. The front and rear legs are installed with a 1/8 x 1/4 spruce block, grooved and glued to the back of the firewall, and to a small piece of 1/8 Lite-ply added to the fuselage. Bind the legs together with copper wire and solder them together. The spreader bar is bent to shape and likewise soldered to the front legs.

The wheels are made from a couple of 1/8 ply disks, drilled in the center for a 3/4-inch piece of 3/8 dowel.

The radio floor is cut from 1/32 ply. The one shown on the plan fits a Cannon receiver and three micro servos. You can make yours longer and/or deeper if you require it. Hold the floor in place with additional cross pieces cemented underneath the floor. Short lengths of 5/32 square balsa are cemented to the uprights to help transmit the load to the fuselage structure.

To complete the fuselage, install the 1/64 ply radio box sides to the inside of the fuselage. I ran my pushrods, or rather, 1/32 cable, through the fuselage before covering the fuselage.

TAIL SURFACES

These are flat strip structures. Mine were 5/32 stock, selected for lightness. Follow the sizes indicated, and sand the completed surfaces before covering.

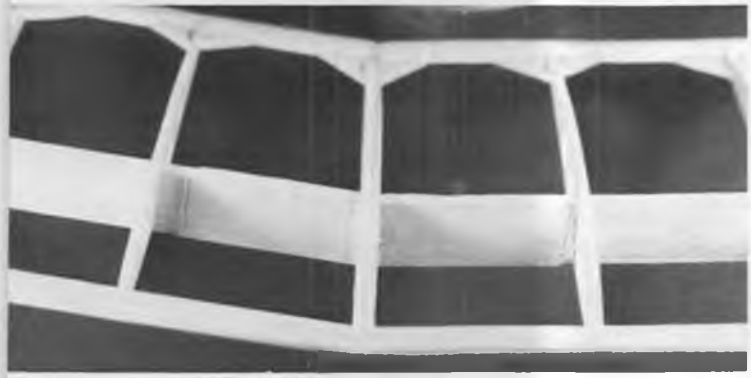
WING

Begin construction by making a template for the rib, and cutting out 26 ribs. I used 3/32 balsa, cutting out three lightening holes in each.

The spar is made from 1/8 x 3/4 hard balsa, with a 1/8 x 3/32 spruce cap top and bottom. Again, I punched two lightening holes in the balsa between the rib bays.

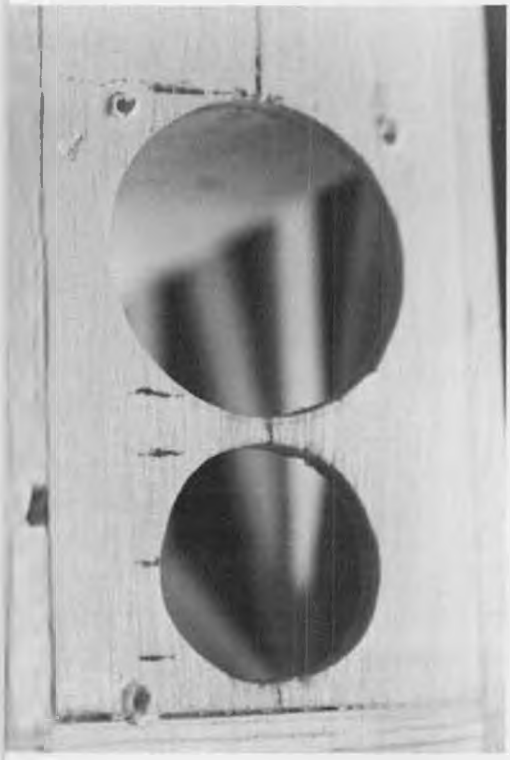
Pin the spar in place on the plan. Cement the ribs in except those at the center. Glue the 3/8 balsa leading edge on. The trailing edge is added last, followed by the 1/8 soft balsa gussets.

Once the wing panels are completed, raise one tip up 5-3/4 inches. Cut the 1/32 ply dihedral brace, and install it to



Dihedral bracing is made from 1/32 plywood.

The wing spar is capped with spruce top and bottom.



Firewall holes for belt drive Astro 020 & 035.

the front of the main spar. Sand the leading edge and trailing edge to shape, and add the soft balsa block wing tips.

I cheated in the center section and added a couple of 1/4 x 1/8 spruce subspars to the top of the ribs as shown to keep the wing hold down bands from damaging the covering.

COVERING

I used Japanese tissue to cover my *Mite*. Sig Lite Coat dope prevented any warping, so far. Don't use really heavy material, or you run the risk if being tail heavy.

ASSEMBLY

I split my motor battery up into two units, one of two cells, and the other of three cells. Place two cells on top of the motor, and three cells behind it. My 100 mah radio battery sits on top of the three motor cells.

Slip the receiver in next, wedging it in place with foam rubber. The Micro servos fit three abreast as far forward as possible. If you haven't already done so, cement the stab in place, followed by the rudder and sub-rudder.

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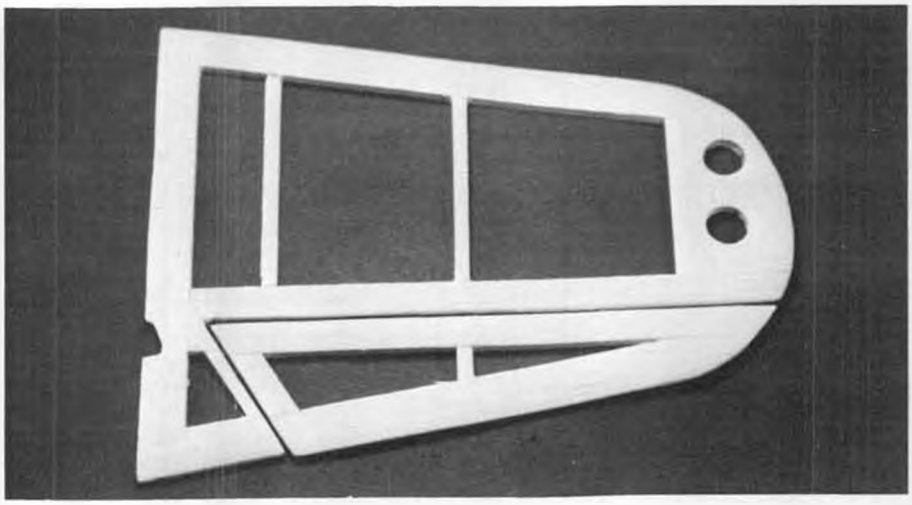
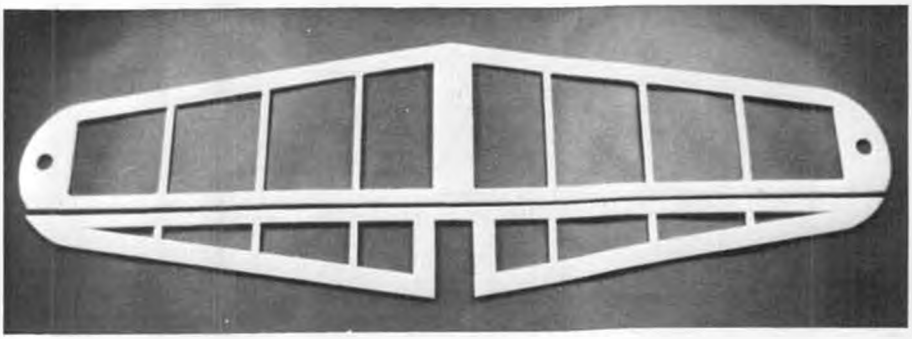
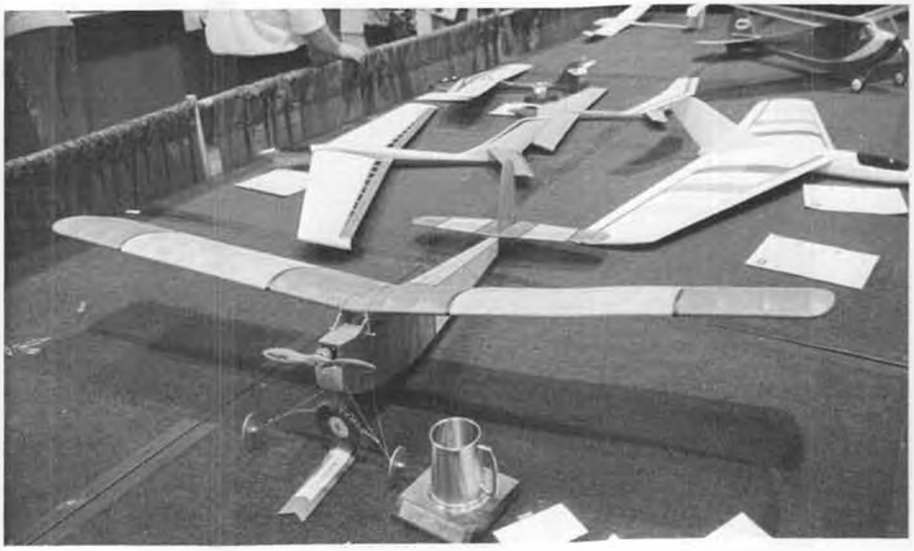


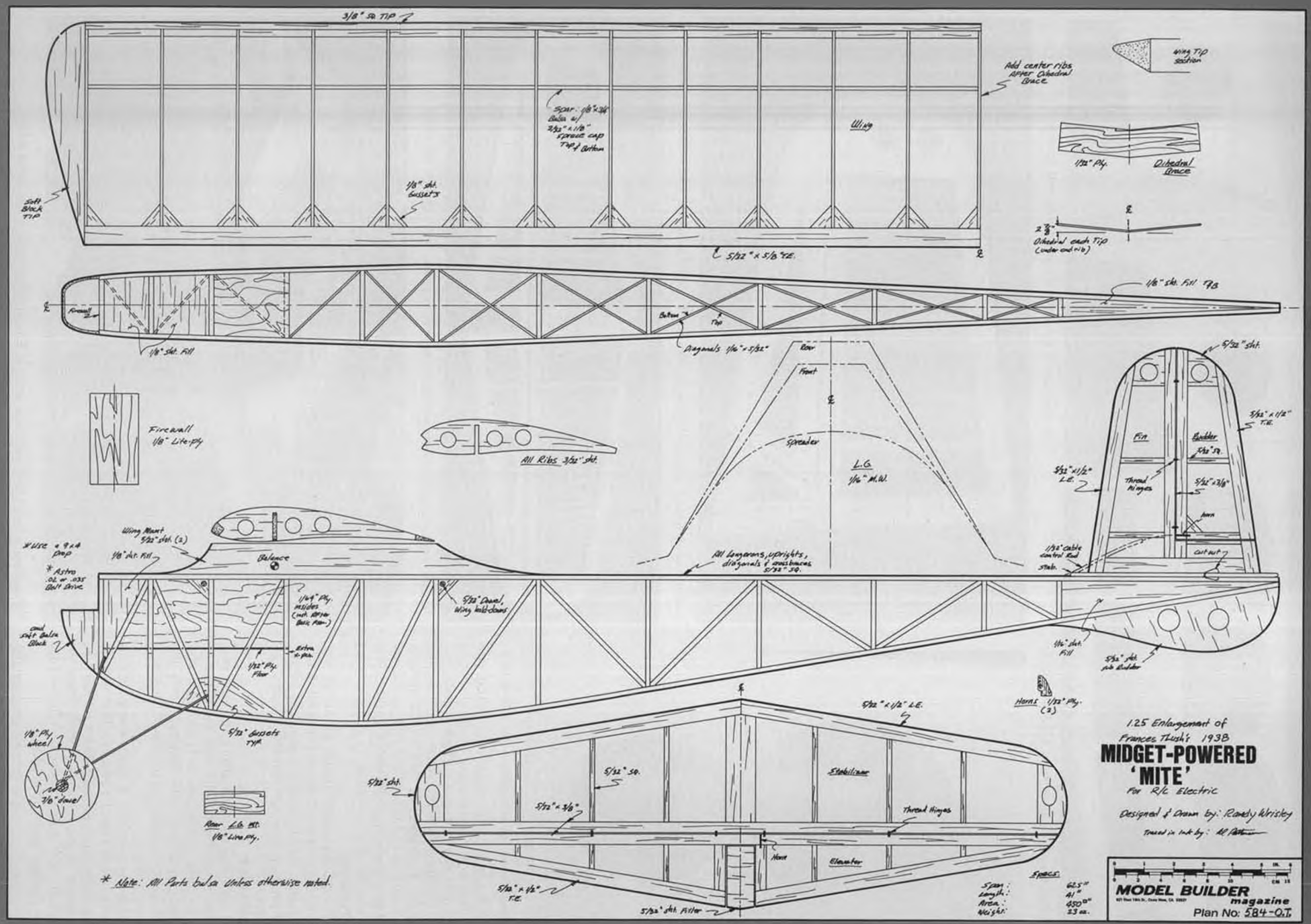
Author found rudder response lethargic with small rudder (above). Use rudder on plans!

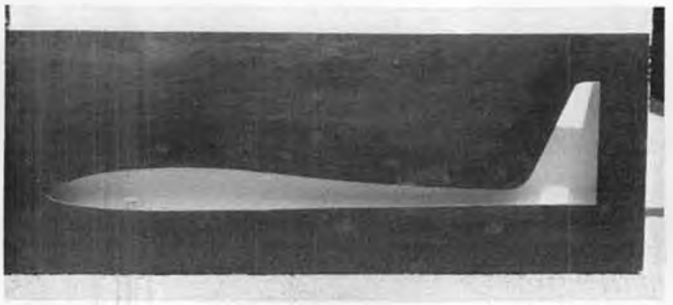


Vertical and horizontal stabilizers share identical outlines. Very simple structure.

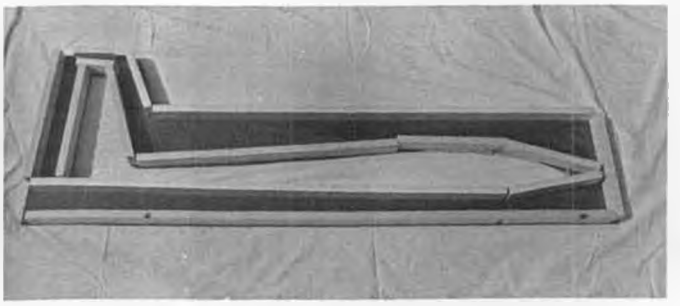


The author's *Tlush Mite* won first place in Electric Old Timer at the 1984 IMS.


3/8" Sq. Tip
Add center ribs after Dihedral Brace
Wing Tip section
Spar: 1/8"x3/4" Balsa w/ 3/32"x1/8" Spruce cap Top & Bottom
Wing
1/8" sht. Gusset TYP
Soft Block Tip
1/32" Ply. Dihedral Brace
2 3/8" Dihedral each Tip (under end rib)
5/32" x 5/8" T.E.
1/8" sht. Fill TYP
Firewall
Bottom
Top
Diagonals 1/16" x 5/32"
Firewall 1/8" Lite-ply
All Ribs 3/32" sht.
Box
Front
Spreader
L.G. 1/16" M.W.
5/32" sht.
Fin
Rudder 5/8" Sq.
5/32" x 1/2" T.E.
5/32" x 1/2" L.E.
Thread Hinges
5/32" x 3/8"
Horn
1/32" cable control Rod
Stab.
cut out
Wing Mount 5/32" sht. (2)
1/8" sht. Fill
Balance
#USE a 9x4 prop
* Astro .02 or .035 Belt Drive
1/64" Ply. Gussets (not req'd on Basic Plan)
Extra on plan
1/32" Ply. Floor
5/32" Dowel, Wing hold-downs
All Longerons, uprights, diagonals & crossbraces 5/32" Sq.
1/16" sht. Fill
5/32" sht. Rib Rudder
Horns 1/32" Ply. (2)
end soft Balsa Block
5/32" Gussets TYP
1/8" Ply. wheel
3/16" Dowel
5/32" x 1/2" L.E.
Stabilizer
5/32" sht.
5/32" Sq.
5/32" x 3/8"
Thread Hinges
Horn
Elevator
5/32" x 1/2" T.E.
5/32" sht. Filler
Rear L.G. Blk. 1/8" Lite-ply.
* Note: All Parts balsa Unless otherwise noted.
1.25 Enlargement of
Frances Thush's 1938
MIDGET-POWERED 'MITE'
For R/C Electric
Designed & Drawn by: Randy Krisky
Traced in Ink by: AP Patton
SPECS:
Span: 62.5"
Length: 41"
Area: 450 in²
Weight: 23 oz.
MODEL BUILDER magazine
Plan No: 584-QT



After the plug is completed (see last month's article), the splitter plate is made. Material used is masonite (3/16 in). Seal it with varnish or epoxy, then bevel edges as explained in the text.



A framework of one-by-twos will keep the splitter plate from moving as you work with it. Height of top surface must be higher than half of the fuselage's width when placed face up on the table.

After fuse is placed inside the splitter and blocked up with modeling clay, it's time to seal the edges around the plug with clay "worms."

Clay worms are stuffed into the crack, tamped down inside the crack with plastic squeegee. Use only enough clay to fill the crack.

supply store. An improperly mixed plaster will either be runny (and shrink too much as it dries, thus pulling away from the plug) or it will be too "solid" and lumpy (thus trapping excessive air, weakening the mold, and otherwise ruining the final product).

When the mix is thoroughly stirred, and is free of lumps or dry pockets of HydroCal, the next step is to pour it into the trough. Pour slowly so as not to create any air bubbles. After you have poured the last of the plaster into the trough, quickly rinse out your trash can (or tub). If the HydroCal hardens in the tub, it will be a mess to clean up later.

Carefully lift one end of the trough and gently bounce it on the table to clear out any air bubbles there may be in the mix. Repeat the procedure on the other end. Remember, any air bubbles which rise out of the mix and get trapped under the plug will become pits in the inner surface of the mold . . . a definite flaw.

Carefully and slowly place the wooden plug into the trough. The plug must be gently pushed into the mix up to the half-way point of the fuselage as it lays on its side. Again, do this slowly so as not to trap any air under the plug. Don't worry about the plug sinking into the mix. It won't happen.

HydroCal sets up in about 20 minutes. It would be a good idea not to leave the project during that time. To prevent any possible cracking on the upper surface as it dries out, a fine mist of water may be added from a used Windex bottle (or similar) at about the half-way point (ten minutes) in climates that are exceptionally dry and/or hot. I did not find this a problem where I live.

Let the first half of the mold harden and dry for several hours before attempting the second half (I waited two days). Do not be alarmed over the heat generated by the hardening HydroCal. This is normal. An interesting point to remember about this type of mold is that it will not completely dry out for days. If you make your wooden trough tight enough so that it won't leak, you may do away with the plastic and allow the wood to help dry out the plaster. The plywood will probably delaminate if you don't use a marine grade, but you are probably *not* going to reuse it anyway.

When making the second half of the mold, you must be careful to prepare the bare surface of the lower mold half so that when the new mix of HydroCal is poured over the old, it will not bond to it. Again, use *several* coats of the carnuba wax (it is a porous surface) and follow up with a couple of coats of that silicone mold release. This should do the trick. Here again, I used the Vaseline, and I was not pleased with the absorbtion of this substance by the plaster.

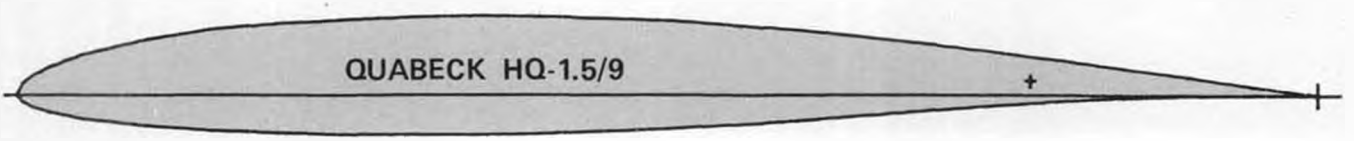
Mix up a second batch of the HydroCal and pour over the plug and lower

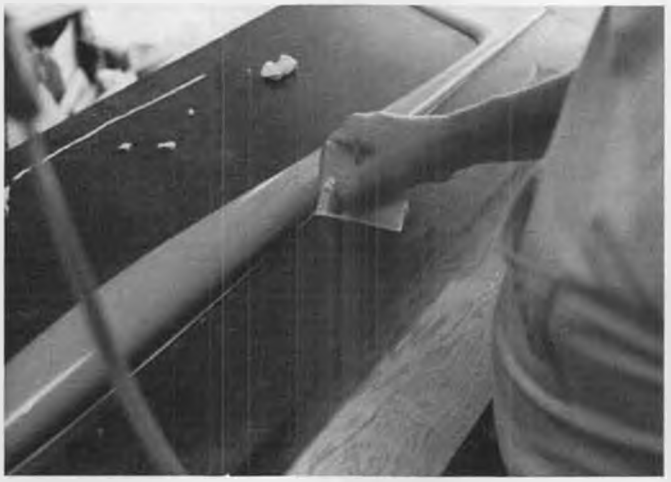
Dr. Helmut Quabeck's HQ-1.5/9 Airfoil Coordinates
(Plot points on paper, then join dots with ships curve.)

X:	0.00	.005	.012	.025	.050	.100	.150	.200	.250	.300	.350	.400	.500	.600	.700
Yu:	0.00	.009	.014	.020	.030	.041	.049	.053	.056	.058	.059	.058	.055	.048	.038
Yl:	0.00	-.005	-.009	-.013	-.018	-.023	-.027	-.029	-.030	-.030	-.031	-.029	-.026	-.020	-.012

X:	.800	.850	.900	.950	1.00
Yu:	.026	.019	.013	.006	0.00
Yl:	-.005	-.003	-.001	.000	.000

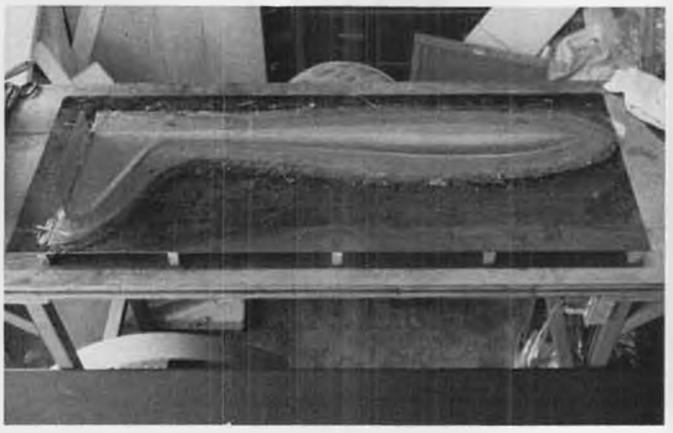
Next month we will have a short lesson in using "Airfoil of the Month data. Stay tuned!





Plastic squeegee with sharp, 90-degree corner carved into it with a razor blade is used to plane off excess clay. Be a perfectionist here.

After coating the splitter and plug with PVA mold release, wax them down with a high carnuba content mold wax. Repeat application.



Glass layup. Start with a really "wet" layup of two-ounce or finer cloth. Layer up with heavy cloth until thickness is at least 3/16 in.

After first side is done, flip over, remove splitter, clean up loose clay and PVA, repaint the PVA, wax twice, and lay up No. 2 side.

mold half. Do this slowly so as not to create any trapped air next to the plug. As the large air bubbles will rise away from the plug, they are not a concern.

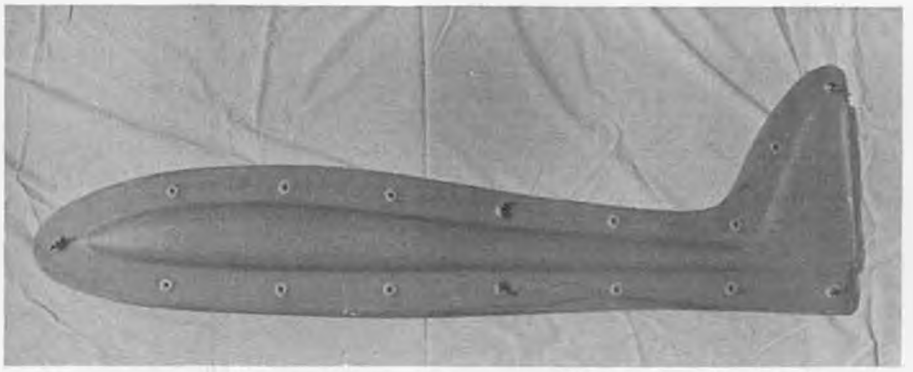
Allow a couple of days for the mold to harden and dry out before you attempt to move it or crack it apart. Resist temptation!

When the two days are up, you may pry off the sides of the trough, being careful not to hit the mold with a hammer or otherwise over stress the plaster with a pry bar. In short, use your head . . . think!

Slip a wide blade putty knife into the thin crack between the mold halves and work it all the way around the mold, penetrating the plaster no more than a half-inch or so. Next, use a thin but stiff knife or wide screwdriver to pry apart the nose end of the mold. You should be able to pop that mold apart without much trouble.

Carefully remove the plug from whichever mold half it chose to remain with. Don't mar the plug, you may wish to reuse it at a later date.

If the HydroCal still feels damp, give it another 24 hours to dry out. When it does dry out, give it several coats of carnuba wax on the facing surfaces. When you think you have the porous surface sealed enough, do a test with a small patch of resin and fiberglass cloth. If it doesn't pull up *easily*, you haven't waxed it enough. (You might also try a little silicone mold release, although I'm not too keen on its use near resin . . . the wax has always been enough for me.)



Finished mold with bolt holes drilled. Holes are used to line up the two halves when joining fuselage parts inside the mold. Aids storage also. Fin is left open in rear for internal access.

That's it for the HydroCal mold. What it has going for it as opposed to other methods is: 1) it's less expensive; 2) it's less work; and 3) it's relatively harmless to work with. Safety precautions would include eye protection and a dust mask when mixing the powder. You may wish to use rubber gloves if you are sensitive to plaster. I found that all it did to me was take the oils out of my skin leaving me with dry skin after washing.

Disadvantages of HydroCal molds are: 1) they tend to be more prone to damage around the edges where you will be trimming the fiberglass cloth with a razorblade after layup; 2) they can break if you should drop them; 3) they are heavy, *really* heavy to lug around; 4) they are more bulky to store; and 5) you cannot join fuselage parts while they are in the mold as you can with polyester or epoxy/glass molds.

The choice is yours . . . and to be sure you have a choice, the next type of mold to be described here is the epoxy or polyester resin and fiberglass cloth mold.

There is more work to be done with this type of mold, but it is by far the best if you wish to produce a lot of parts over

Continued on page 88

BIG BIRDS

By AL ALMAN

4. Stock Heathkit Thumbtach before author's mods which make it more readable.

7. Norm Rosenstock's Farman *Moustique* weighs only 7-1/4 pounds with a .40 four-stroke. Wingspan is 80 inches. Model has LOW stall speed!

THE BIG BIRD LOVERS HEATHKIT THUMBTACH SPECIAL

Or perhaps a better title would be . . . "Can You Learn to Live With, Love, Cherish, and Respect an Ersatz Expanded Scale Thumbtach?"

Remember how it was about 10 to 12 years ago when you first built that Heathkit Thumbtach? Like most of us who put one together, your spirits soared . . . because, finally, you had a piece of equipment that was gonna tell you what your engine was doing. Finally, your own tach without even having to hock anything. Life was good!

However, your peace and tranquility were short-lived. Suddenly, your Thumbtach was being ridiculed and every self-appointed flying field comedian (these guys are in abundance) who singled you out for some cruel and embarrassing one liners.

"Lemme know when you're ready to read rpm, and I'll loan you my magnifying glass," and, "It sure is cute . . . does it do anything?" were a few of the early favorites. However, just a few scant years later, most of these remarks became obsolete, and only the very succinct, "Whadya kidding?" was heard any time an attempt was made to read rpm in public.

So, in self-defense, and because the Thumbtach's scale was so absurdly small and hard to read, thousands of these Heathkits were shoved into corners, cabinets, and closets. For most of us, it turned out to be more of a novelty item and hardly worth the effort to use . . . so we forgot about the little blue box and went back to our old ways of estimating rpm. Actually, it was a lot of fun doing it this way 'cause anyone could throw in his two-cents worth . . . and who could call him a liar?

Well, guys, you don't have to "guesstimate" any longer whenever you want to check how your gas burners or four-strokers are doing . . . because here's an easy way (it's so easy, it's almost embarrassing) to "expand" your Thumbtach's scale and make it a worthy field box item. Just think! No more squinting, swearing, or sweating out any parallax in order to read rpm . . . and no more wisecracks from the gallery, either. By following these simple instructions, your tach will read from zero to 2500 on low, and from zero to 12,500 on high. True, it won't match a digital readout or one of the hundred-dollar real expanded scale tachs . . . but, when you consider that it's gonna cost you nothing to make this "conversion," and that you'll have improved the Thumbtach's accuracy by one-hundred percent . . . well, that really ain't a bad banana.

Okay, firstly, you're gonna recalibrate the tach by taking off the case bottom, aiming the photoelectric cell at *any* 60 cycle light source (the switch must be in "HI" . . . and I'd recommend installing a fresh alkaline battery), and adjusting the calibration pot (see Photo No. 1) . . . bringing the needle from its old 3,600 reading to its new 3,600 position, which will be just a bare tad over the present 7,000 mark (Photo No. 2).

Congratulations! You've now completed the recalibration and will now have twice the accuracy, reading up to 12,500 rpm on "HI," and up to 2,500 rpm on "LO" The top scale will read only 500 rpm between any two neighboring markers as compared to the full one thousand that was squished in there before . . . and the bottom scale will offer only one hundred instead of the two hundred rpm that used to be between the markers.

Now comes the fun part . . . renumbering the meter face to reflect the change in calibration. Soooooo, a little break and a sip or two of your favorite toddy might be in order before proceeding . . . and when you're ready:

1) Disconnect the two wires from the meter and mark the wire or make a sketch so that you'll know which wire goes to which terminal when reinstalling the meter.

2) Remove the four nuts (and washers) and carefully remove the meter. (If

8. Ikon N'wst has another new model for scale buffs, the 84-inch *Porterfield.* Designed for .60 to .90 four-strokers at ten pounds. A dandy flying machine!

2. Needle shows where new calibration should be (3600 rpm). Note renumbered face.

1. Recalibrate Thumbtach with this pot. The author's tach only took 1/3 turn for 3600 set.

3. Pop the meter cover off using a screw driver. (Top rear of meter.)

5. Your choice for renumbering: use the author's method with white rub ons or use white correction fluid and black pen.

yours is as old as mine, you're going to have to *gently* pry it loose from the case.) cover's top rear.

3) Locate the two indented/notched areas along the meter cover's top rear (Photo No. 3), and, using a small screwdriver blade, pop the cover loose and lift it off.

4) There are at least two different ways to handle the renumbering. As I already had the eight-point, white rub-on letters, I merely blacked out the original numbers with a Magic Marker . . . and then *very carefully* put the dry transfer numbers in their place. On the other hand, E&L's Ernie Pritchard (who told me about this simple conversion) renumbered his meter face by brushing white (typewriter) correction fluid over the old numbers, and then using a fine point, black, fiber-tipped pen.

5) If there's anything tricky about this project, it's making sure that the meter adjustment screw on the bottom of the cover dovetails into the little fork on the meter face . . . so go slow when replacing the cover, and then snap it in place.

6) Reinstall the meter in the case top, reconnect the two wires (check polarity), rezero the needle . . . and, if necessary, tweak the cal pot to get a reading of 3,600 rpm on the top scale by aiming at a 60-cycle light source.

7) When everything is copasetic, put the case together, and *voila* . . . you're ready to take accurate rpm readings. Now you can proudly hold your own, and won't have to scurry away and hide whenever the "big boys" talk tachs.

To the best of my knowledge, you shouldn't have to change anything in the circuit in order to recalibrate. I've checked with a handful of other Thumbtach owners, and recalibration was well within the limits of all our pots. If, for some reason, you do run out of adjustment while trying to "convert," give the Heathkit people a jingle; they should be able to tell you what component needs changing.

Frankly, I was just about ready to scrap my Thumbtach when Ernie told me how to make the change. Since then it's been fun to use, especially knowing that I can read rpm so much more accurately. One guy I know repainted his after making the change; it was like being reborn, he said, so a new paint color was called for. I look at it differently. I wanted everyone to know that my Thumbtach had been resurrected, so I just cleaned it up a bit. Either way you are going to love, cherish, and respect your ersatz expanded scale Thumbtach . . . because from now on, all your rpm readings will have clout.

DON'T DO AS I DO. . . . .

You know how the rest of that old saw goes. It's so easy to give advice, and to prod people about the danger of becoming lazy and/or complacent . . . but how hard it is to follow your own words of wisdom. I was too lazy, but convinced myself that I was too busy, to get off my rear and get the extra servo I needed out of another bird. I did have a close deadline, and used that as the clincher when "reasoning" with myself that everything would turn out okay. I really went for that horse-puckey I was handling out . . . and, as a result, my new, great-flying *Big 'E'* (reviewed last month) went B-O-O-M!

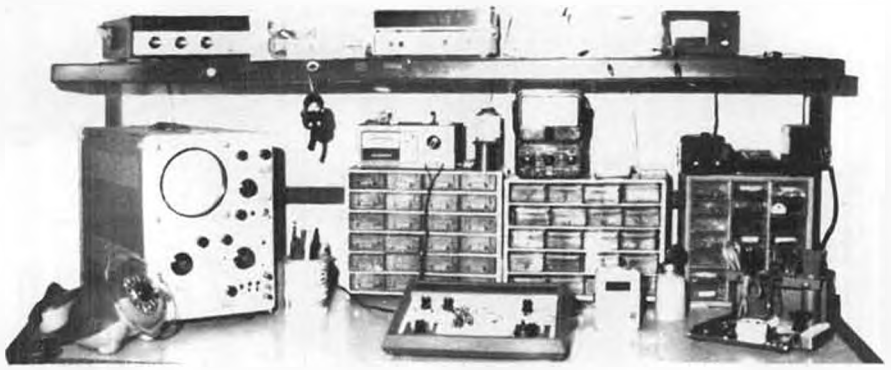
I do believe in, and always recommend, redundancy on (at least) aileron and elevator. so, what did I do? You guess it! I went flying with only one servo moving the elevator, that's what I did. The game plan was that, because of the deadline, I was just going to get about a half-dozen flights . . . no wild or heavy aerobatics, you understand, but enough airtime so I'd feel comfortable with this bird . . . and a better chance to come up with some decent flight pix. (I'm always wary of reviews that don't include shots of the bird flying.)

The long and short of this terrible tale is that near the end of the *Big 'E's* sixth flight, only ten seconds after I finished shooting the last frame, and just a bare 15 seconds prior to touchdown, the (only) elevator servo pooped out on me. *"Dybbuk"* went in at about a sixty-degree angle and self-destructed all over the place. The ground was very rocky and really took its toll; even my DGA latex pilot wasn't spared . . . he lost his head.

The servo was brand new and had well over thirty minutes burn-in time before being assigned to the elevator, and had something under ninety minutes airtime when the amplifier failed. The plane was

Continued on page 81

9. Completed the same time as the *Porterfield,* Ikon's new Aeronca C-3 *Master* is now available. It is an easy flier with a .90 four-stroke pulling its ten-pound and 90-inch airframe. Scale pilot is out for a walk . . .



Electronics Corner

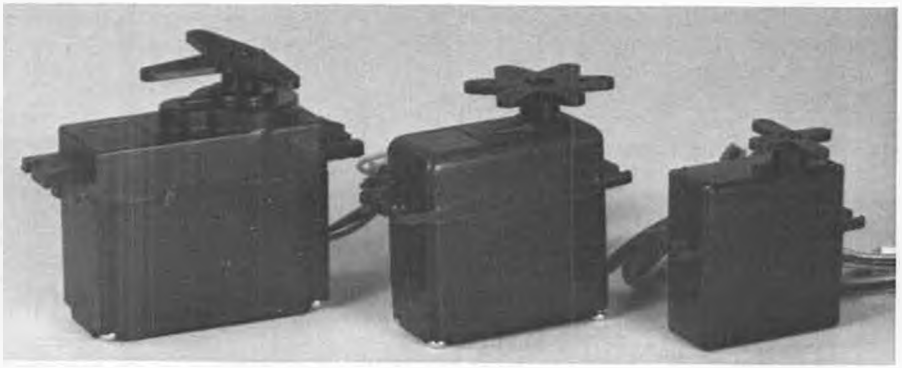
By ELOY MAREZ

ELECTRONICS AT THE INTERNATIONAL MODELER SHOW

This year's Seventh Annual International Modeler Show, held in Pasadena over the weekend of January 14-15 can only be described as a rousing success, by whatever standards you may have for this sort of an event. Model manufacturers, importers, and distributors from all over the country were there. Some late subscribers were able to attend only because some of the larger multibooth companies agreed to pull in somewhat and give up some of their space. Even with that, a couple of late comers had to content themselves with a table-in-the-corner type of arrangement. And none of them could complain about the lack of attendees!

We've all read about how this or that show had "wall to wall modelers", well, the IMS had that, but it is the **only** one which also boasts floor to ceiling models, this being the only show at which indoor model demonstrations (including R/C flying) take place right in the display area. However, you can read all about that in the general coverage of the show in this month's issue. Let's take a close look at what was new, electronics-wise, at the 1984 International Modeler Show.

We saw a lot of the standard and well-known electronic products on display, as we see at the various trade shows throughout the year. However, there were also some brand new items, from a couple of manufacturers, which to me is also significant about the importance of this relatively new trade show. Introducing new items here was a real break with tradition, as it is normally done and expected only at the Toledo show. More about these items later.



From Condor Trading Company comes the Standard, Mini, and Super Mini servos, some available with coreless motors and ball bearings. Your choice of connectors.

The Kraft Channel-Master frequency synthesis system provides switch selected frequency control of both receiver and transmitter, for the KP7C and Signature Series radios.

CONDOR TRADING CO., INTERNATIONAL

Not only new products, but new companies made their debut at the '84 IMS. One of them was Condor Trading Company International, P.O. Box 3479, Mission Viejo, CA, 92690-1479, (714) 768-5933. It showed a variety of products ranging from airplanes to engines to striping tape, but of most importance to us was a variety of servos, in three sizes, all with a neat, clean appearance and sound. Specs are as follows:

Super Mini Servo: 1.12 x 1.14 x .53 inches, .61 ounce weight, 18 oz. in. torque, ball bearings, and coreless motor . . . for $29.95.

Mini Servo: 1.37 x 1.18 x .63 inches, .98 ounce weight, 23.9 oz. in. torque, without ball bearings for $18.95, and with ball bearings for only $21.95.

Standard Servo: 1.5 x 1.5 x .75 inches, 1.4 ounce weight, 39 oz. in. torque, without ball bearings for $17.95, and with ball bearings for only $19.95.

All of these servos come with mounting grommets, assorted output arms or wheels, and may be obtained with Futaba, Sanwa (Airtronics), or JR (Circus) connectors. Orders and/or information may be obtained from the above address or phone number.

KRAFT SYSTEMS

From deep in the heart of Vista, California, came definite proof that the Kraft gang has not been asleep at the helm, and that the American R/C industry is not going to always take a back seat to the foreign importers. It introduced a new all channel, plug-in, switchable frequency synthesizer for the 7C and Signature Series transmitters, along with a companion switchable channel receiver based on the successful and proven KPR8FD receiver circuitry. Like the basic KPR8FD and its companion transmitter module, it is *narrow band FM*, legal on 72 MHz.

This new and interesting concept is called the "Channel-Master", and pro-

Leisure Electronics is offering 270 mah, five-cell RX packs for those car and boat installations which can benefit from faster servos.

Novak Electronics new NER-'91 AM receiver, same size as the older NER 1-9. Unit has double conversion, narrow band AM features, and is designed to work with 20 KHz spacing.

vides instant and immediate channel selection on **all** of the currently assigned R/C channels, plus those that will become available in 1988, and the entire complement which we will have in 1991. **Not included** are the original 72 MHz frequencies which were not assigned channel numbers. The Channel-Master system is claimed to operate with similar power and range throughout the entire band of frequencies, and does not require any changes or adjustments to the basic transmitter. I'm itching to get my hands on one, and will give it the full treatment when I do, which I will share with you in a future issue of **MB**.

The other novel and exciting Kraft product to be introduced over the weekend is an FM module for the Futaba "G" Series transmitter, to permit that popular radio to operate on the new frequencies with advanced state-of-the-art narrow band FM modulation. This makes the transmitter compatible with the KPR8FD receiver, and means that with this set of accessories, when 1991 rolls around, you'll be right in line and operating legally.

Information on both of these items should be available from your local Kraft dealer by the time you are reading this, or you can get it direct from Kraft Systems, P.O. Box 1268, Vista, CA 92083, (619) 724-7146.

LEISURE ELECTRONICS

Along with its wide variety of motors, batteries, and chargers for everything that moves on electricity, Leisure introduced a new, small size, five-cell receiver battery pack for those installations that require the extra power and speed available from servos so powered. The pack only weighs 2-1/4 ounces, measures 1-1/8 inches high, by 2-13/16 inches long, by 9/16 inches wide, yet it has a capacity of 270 milliamps, at (of course) six volts. The cells are of the Sanyo quick charge type, so that with the proper Leisure charger to go with them, there is no chance of running short of electrons out at the track or pond.

For a copy of the complete catalog, plus some interesting technical bulletins dealing with electric power, drop an SASE to Leisure, 11 Deerspring Rd., Irvine, CA 92714.

NOVAK ELECTRONICS

Bob Novak introduced his latest receiver creation, the NER-'91 AM, a narrow band amplitude modulation double conversion receiver with a string of features longer than its servo leads. Interestingly enough, it is no larger than the older NER 1-9 receiver; 2.45 L x 1.08 W x 0.7 H, and weighs in at 1.5 ounces.

For the technical minded, the NER-'91 utilizes frequencies of 10.7 MHz and 455 KHz for its IFs, with a usable sensitivity of 1.0 to 1.5 microvolts. The bandwidth at six db is ±3 KHz; at 50 db it is ±9.0 KHz. Image rejection is greater than 60 db, spurious and harmonic frequency rejection greater than 55 db, and AGC (automatic gain control) a minimum of 120 db. Voltage stabilization is used, for operation from 3.6 to 7.2 volts (three to five cells); current drain at 4.8 volts is only 5.8 milliamps. Dual double balanced mixers and high level diode noise clipper are employed.

If you like your specs without all those numbers, these are narrow band amplitude modulated receivers, compatible with all present and previously marketed AM transmitters. They meet all future FCC specifications, and can be operated with 20 KHz channel spacing. It is available on all 53 and 72 MHz frequencies, in versions with up to nine channels, though seven is standard, and with your choice of Kraft, Deans, RS, or Futaba compatible connectors.

This modernistic receiver is available only from Novak Electronics, 2709-C Orange Ave, Santa Ana, CA 92707, at an introductory price of $99.00. Available also is an attractively priced ($199.00), four-channel airborne system, consisting of an NER-'91 receiver, four NES-1A or NES-2 servos (NES-2H servos are $5 extra per servo), your choice of battery pack, a switch harness, and servo trays. Your transmitter, or transmitter RF module must accompany your order for proper tuning and matching.

I hope to have one of these in the air soon, and will report my findings!

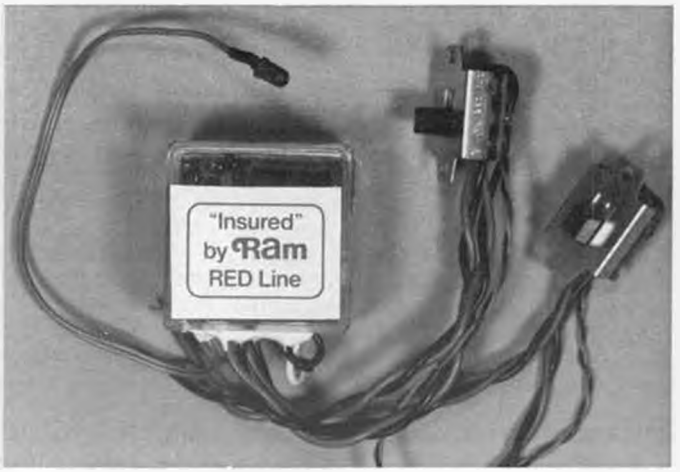
RADIO CONTROLLED MODELS, INC. (RAM)

This company, maker of a large variety of R/C accessories and safety or backup devices, has added a big brother to its Battery Backer, designed especially for those big airplanes with heavy duty, high current drain servos.

Basically, both models of the RAM Battery Backers provide exactly that type of service; you fly off of your main battery, and should it develop a fault or should you simply fly too long for its capacity, the Battery Backer senses the reduced voltage and switches over to an auxiliary battery, which is usually a lower capacity, lightweight type. It also provides a visual alarm that this changeover has taken place, so that you can recharge the main battery, or consider yourself lucky that you installed the battery backer in the first place! You can go home with your bird all in one piece.

The new one is called Big Model Battery Backer (BMBB) and is designed to provide up to 10 amps of current in the servo circuit, so that in addition to the safety feature described above, you are assured that your servos are always receiving enough voltage to operate at their design power. It also eliminates

Continued on page 93



RAM's Big Model Battery Backer provides backup power and high current capacity system for heavy duty servo flight systems. Fly insured!

PRODUCT$
IN U$E

robbe

ASW 19

By AL TUTTLE . . . Aloha from the beautiful island of Maui, home of the Pacific trade winds and great slope soaring. Al reviews the Robbe ASW-19, a three-meter scale model for the soaring pilot who is looking for a sailplane with impressive performance and realistic appearance.

For the "jaded" modeler who wants a model that "flat goes!" this is the answer: Robbe ASW-19.

• The Robbe ASW-19 is an almost ready to fly (ARF), high performance, radio controlled (four-channel) sailplane, manufactured by Robbe of West Germany, and is distributed in the US by Robbe Model Sport, Plainsboro, New Jersey.

The leading particulars are: wing span, 123 inches; wing area, 976 square inches; flying weight, 4-1/2 pounds.

The kit is shipped in a container measuring 61-1/4 by 16 by 4-1/2 inches, and can be shipped via UPS. The reason the box is so long is that the wing panels have a length of 59 inches each.

Upon opening the box, one is impressed with the quality of the kit. The wing panels, horizontal stab, and elevator foam cores are fully sheeted with what looks like obechi wood, and which Robbe calls "Siros".

The fuselage is molded of a plastic called "Plura" (a Robbe name), with both halves moulded together. The vertical fin or stab is an integral part of the fuse.

The horizontal stab/elevator is removable and is held in place on top of the vertical fin via a tail plane support assembly. One part of the support assembly is attached to the horizontal stab, and the other part is attached to the top of the vertical fin. (This is installed during the course of construction). The horizontal stab portion of the support assembly has two horizontal pins which align with two horizontal holes of the support assembly on the vertical fin. The horizontal stab/elevator is placed onto the vertical fin and slid back to engage the two alignment pins. A nylon bolt is inserted through a hole in the horizontal stab and into a threaded brass bushing molded into the vertical fin part of the support assembly. The support assembly is designed so that the nylon bolt will shear in case of an extremely hard landing. Only one of these nylon bolts is included, and it is a metric size. This could be a bit of a problem when trying to locate extra bolts. I suggest that you write to Robbe in Plainsboro, New Jersey for extra bolts. I'm sure they will sell you a few for a nominal price.

The canopy is already trimmed, thereby eliminating the tredious chore of having to whack off the flashing left from the molding process. The color of the canopy in my kit is a pleasing aquamarine.

The hardware package is something to behold, as it includes everything needed to complete the model (less covering material and radio gear).

All wood necessary to complete the model is furnished, i.e., leading and trailing edges (would you believe one-piece leading edges 60 inches long with NO splices?), plywood fuse parts, and balsa rudder block which has been cut to the rudder outline. (More on this later.) The ply fuse parts have their outlines indented on the ply sheet, and are easily identified. A jigsaw such as a Dremel is handy here, as the plywood is not die-cut.

The instruction book is printed on glossy paper, and is well written. It is done in German, Dutch, English, and French. There are good, quality photos included in the German section, and the modeler is referred to them throughout the construction.

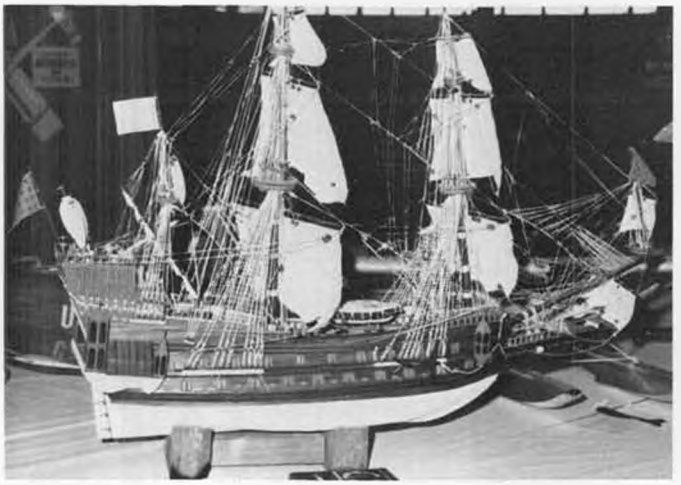
There is one sheet of detailed black line plans, in German. This presents no problems, as all parts are numbered on the plans and are cross-referenced to the material list included at the end of each foreign language section. This is a nice touch, and one that I would like to see other kit manufacturers use. It certainly saved a lot of time searching for the proper parts. All measurements and kit materials are metric.

The instruction book lists the essential

R/C POWER BOATS

By JERRY DUNLAP

AT THE 1984 NORTHWEST MODEL EXHIBITION



Northwest Model Exhibition photos courtesy of Jerry Julian.
ABOVE: *La Couronne,* 1st place, Military Scale by Michael Risley.

SMILE! NAMBA booth reps (left to right): Mike Wight, Tom Dudley, and Dennis Caines.

LET'S GET STARTED

I have a tendency to put off writing my column until the last possible moment to make the deadline for the issue that is due. I think the scientific term for this particular malady is "serverus procastinatus." I have self-diagnosed myself as a chronic case. Now, I find myself forced to get some thoughts down on paper and suffering from a mild case of flu that has been extremely active in my community lately. If what follows seems more befuddled than usual, please understand that I'm under the influence of extra strength asprins, throat lozenges, and decongestant vaporizing ointment.

Speaking of those extra strength asprins. Have any of you purchased one of those products lately? I'm telling you, by the time I finally got the cellophane off the box, then the protective tape off the box top, the "trick twist" lid off the bottle, the foil away from the opening, and the cotton out of the bottle, my headache had disappeared. I hope they never have to start packaging my favorite glues in that manner. A person could lose interest in the hobby before he ever got the glue out of the package.

MAY WE TALK ABOUT GLUES?

I am still amazed at the number of model boaters who have not yet begun using the cyanoacrylate adhesives. We're talking products like Hot Stuff, Jet, Zap, and other intant glues. Just the other day at a hobby show, I was talking to an experienced model boater who was not yet fully convinced that the instant glues had the necessary strength for model boat applications. After listening to my impassioned spiel, he went back and bought some of the instant glue that was being sold at the show.

I cannot imagine not using these instant adhesives. For the past three years, I have used cyanocrylate adhesives at every possible opportunity to construct both boats and airplanes. I am absolutely convinced that a boat constructed using instant glues is just as strong as a boat using other types of adhesives. The bonding ability of cyanoacrylates is superior.

However, the main thing I like about these instant glues is the ease of application and the time saved during the construction process. I can remember years ago when five-minute epoxy was introduced. It was the next neatest thing to sliced bread. Using five-minute epoxy, you could glue something, clamp it in place, and go talk to your wife for five minutes. With instant glues, you don't have to do that. . . . Use clamps that is.

For model boating, I find the use of the gap filling glues like Hot Stuff Super 'T' and Hot Shot accelerator the most suitable for new construction or repairs. All the major brand name cyanoacrylates

Jess Gray's *Miss Kentuckiana Paving* took 1st in R/C Unlimited Scale and Best of Show.

First place in Tunnel Hull was this scratch-built tunnel by Rod Geraghty.

LEFT: The *Frank Kenney* earned Scott Fetterly a 2nd place in R/C Unlimited Scale and a Best Finish trophy.

RIGHT: James Brown's Corp of Engineers snag boat took 2nd in Military Scale. Ship's name is the *Preston,* a sternwheeler.

have gap filling versions of their products. The gap filling glues allow ten to fifteen seconds of working time if you need it. However, once you hit the glue with the accelerator you have an almost instant bond.

I'm often asked how long it takes to build one of my wooden tunnel hull kits. Using cyanoacrylates and the accelerator, I can have a kit ready to paint in about five hours. That's just joining the parts. Radio and engine installation probably take a couple of hours. But compared to the time it used to take to build a hull using epoxy type adhesives the time saving is tremendous.

I have just finished viewing the two "Hot Stuff Video-Tips." I would highly recommend "Volumn II" to anyone who uses instant glues. There is a $30.00 refundable deposit required when ordering the "Video-Tips Volumn II." Send a check with your name, address, and phone number to Satellite City, P.O. Box 836, Simi, CA 93062. It can be kept for 60 days, and I think you'll find it most informative.

GETTING STARTED . . . AGAIN

I had the opportunity to visit with Bob McDaniel, of McDaniel R/C, 12721 Haskell Lane, Bowie, MD 20716, at the 1984 Northwest Model Exposition held during early February in Puyallup, Washington. Bob asked me how I liked the Tork-Starter he had sent me, and I replied it worked just fine.

"So, how come you haven't said anything about it in your column?" asks Bob. I said that I'd mention it in my next column.

The Tork-Starter is based on the same idea as the Bo-Starter which was reviewed in this column a couple of years ago. The Tork-Starter allows the user to loosen and tighten glow plugs when starting an engine and it also incorporates a clip-on feature that keeps the Tork-Starter on the glow plug. I have found the "Tork-Starter" especially handy for outboard engines as the clip-on feature makes it easier to keep the starter on the glow plug. The Tork-Starter is especially useful when starting engines with a gob of compression or an engine that is flooded. You can release the tension on the glow plug allowing the engine to turn over as the compression has been lessened. After the engine has started, the Tork-Starter can be used to retighten the glow plug.

The Tork-Starter is available through hobby shops or directly from McDaniel R/C. The cost of the starter and charger with L.E.D. is $29.95. Add $1.50 for shipping and handling if ordering directly from McDaniel R/C.

First place in Nonmilitary Scale went to John Green's *Mr. Darby,* Model featured fully working winch and lights.

THE PICCO PEEK-A-BOO

It seems like the source for Picco Engines and parts has bounced around like a ping pong ball in the last couple of years. Condor Trading Company International, P.O. Box 3479, Mission Viejo, CA 92690-1479 is now handling the complete line of Picco engines for boats, cars, and airplanes. The phone number is (714) 768-5933. The 1984 price list is now available.

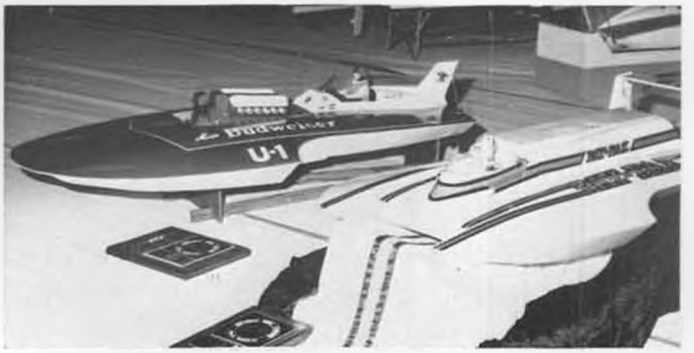
FROM THE FASHION DEPARTMENT

I'd like to pass on some information on a piece of clothing which I have found very comfortable to wear while pursuing outdoor activities in cool weather conditions. In last fall's Sears Sales Catalog, I saw the Sears Work/Leisure coveralls. I suggested to my wife that as they were on sale, this would make a nice Christmas gift. She took the hint, and I have had the opportunity to wear these coveralls while pursuing both hobby activities and tending to tasks around the home.

The Work/Leisure coveralls have a twill outer covering and are foam lined. They can be worn over trousers and a sweatshirt and you'll be warm even if the temperature gets down around the

Continued on page 82

Roger Stalcup's "rigger" took first place in Open Competition Boat class. Roger calls it the *Free Spirit.*



Dave Blacksten's *Miss Bud* was judged best in .40 Sport class, and John Boyatt's *Miss Pay N Pak* took second.

R/C AUTO NEWS

By DAN RUTHERFORD
PHOTOS BY AUTHOR

• As I write this, the Dirty Racing Team is getting ready for the start of a new season of racing, and while we like to think all is in readiness, we're probably just as far behind as you are. Actually, just a month ago we were completely prepared; we could have raced with just enough notice to get everything on charge.

Then Delta released, on time (and what a surprise that was), the '84 version of the *Eagle*, referred to by Delta as the *Super Eagle*, and known by the DRT as the *Sooper Iggle*. That shot all of our plans to . . . (well, you know where) . . . because I had to build a new car, new motor, paint a couple more bodies, and transfer the two-year-old, but oh-so-faithful Kraft radio system to the new car.

And then, in a move that was dreaded, but predicted, the club I race with decided to overhaul the qualifying system. As you may have guessed, I was against the change. However, I do believe in the democratic system, so I have decided that rather than bitch all year, it is in the best interests of the club to support the new system. With that in mind, and approaching the issue from the positive side, I suddenly realized it would be possible to campaign my full-suspension *Sooper Iggle* as well as a pan car. Not easy, mind you, but certainly not out of the question.

So my years-old *Super J* needed a complete going over. It has been race ready, in fact, some friends used it in a three-hour enduro, and another friend raced it at our Regional Champs this last year. However, lately it has been a backup car, which is a different situation than being completely top of the line throughout.

About the time I am heavy into freshening up the *SJ*, Joshua notices an "extra" *Eagle* hanging on the wall. At first, he wasn't too interested because in the past year every time he tried the car it was a little pushy (purposely so, by the way), and he prefers a car with more sudden turning characteristics. The Associated RC500 he raced last year suited him just fine.

Main components of Associated's latest upgrade kit for the RC500. Parts are much lighter than previous chain and sprocket setup.

The latest off-road body from MRP is the new Harris Super 1600, shown here mounted on a Cox off-road racer. It's light and clean, order number 1113. (What's this? Poetry?)

So he was considering all of this when I mentioned that Delta had come up with a couple of tricks to make the car turn in quicker. Now he is setting up a "four-bar" front end, installing aluminum carriers, and adding the carrier mount wing kit.

He now has enough experience to be able to critically evaluate handling characteristics (which is much different than just getting a car to "kinda" go where you want it to), and so he has the luxury of fiddling with both an RC500 and an *Eagle* before making a final decision on which car to race in '84.

It isn't as if our RC500 has been simply hanging on the wall during the off-season. We have pretty much kept up with the latest chassis mods offered by Associated. In fact, Josh completely tore the car down, dying all the nylon parts, including the wheels, a deep black. When reassembling the car, he switched to the new belt drive (looks *really* good, incidentally), the latest lightweight differential parts, lightened gear hub, he dropped the ratio a little, and we took a pass on the also-new lightweight steering blocks, as well as the ball-bearing servo saver. A roll-your-own bracket for the forward end of the McCoy pipe was whittled out of Kydex bumper material. The pipe pressure fitting was moved to the header to eliminate a consistent problem we had with fuel siphoning from the tank into the pipe while the car was laying around in the pits. (Never, ever fire a car when there is a bunch of fuel laying in the pipe.

your worst enemy is looking down the

New Associated belt drive unit mounted on motor pod. Notice the lightened differential pieces as well as the light drive hub for nylon gear.

CLAUSEN AND RC12i

OUT HANDLE THE WORLD

IFMAR INTERNATS / 1982
Stock Class World Championship

1.	Kent Clausen / USA	RC12i
2.	RePete Fusco / USA (TQ)	RC12i
3.	Frank Killam / USA	RC12i
4.	Jimmy Davis / GB	RC12i
5.	Mike Lavacot / USA	Parma
6.	Bud Bartos / USA	JoMac
7.	Ralph Burch, Jr. / USA	RC12i
8.	Mike Toland / USA	RC12i
9.	Bruce Hickman / USA	Delta
10.	Art Carbonell / USA	

WHAT MAKES A WINNER?
Ask Kent Clausen, two-time 1:12 Scale National Champ. A winner indoors and out. And Kent took his Team Associated RC12i all the way to the World Championship stock class title.
Or ask the Team. Team Associated RC12i's filled 7 of 10 grid positions for both the stock and modified Championship main.
Domination like this, at the highest levels of competition, may have shocked the rest of the RC car racing world. But it is no surprise to us.
We knew from the start our new RC12i would be a winner. We tested and engineered it to handle and respond better than any Associated car ever.
We gave the RC12i the edge it takes to make anyone a better driver.
We're proud of our RC12i. And we're proud of Kent, RePete, Frank and all our other drivers for proving the RC12i is truly World Class. ■

THE CLAUSEN MACHINE. Kent Clausen's IFMAR World Champion stock class winner i.
a meticulously constructed Associated RC12i.
Lightening holes and fiberglass dampener were personal modifications.

THE WORLD CHAMPION RC12i. Available as a complete ready-to-race system (including radio), deluxe or basic kits in 4 and 6 cell models.

THE WORLD'S 1/12th CHAMPIONS... TEAM ASSOCIATED

© 1982 Associated Electrics

Associated Electrics / 1928 East Edinger / Santa Ana, CA 92705 (714) 547-4986

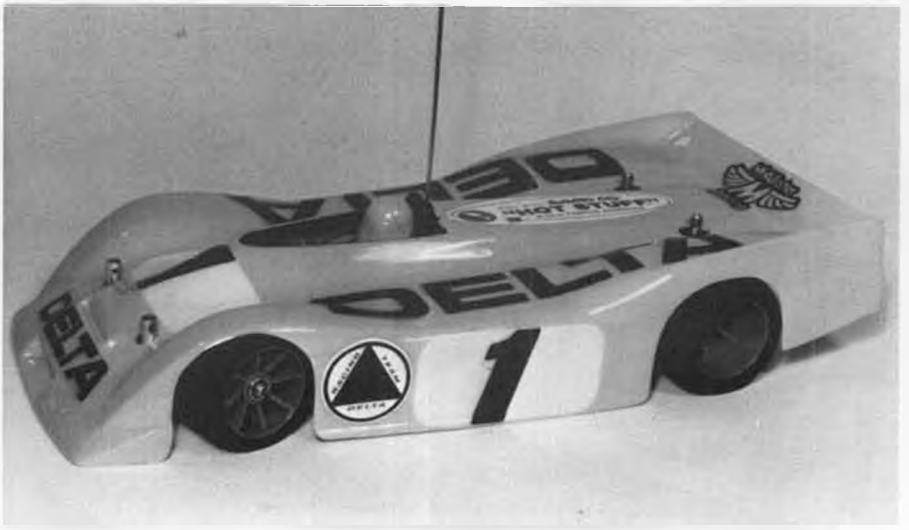
stinger of said pipe!)

Still to be added to the RC500 is a real tricko part, a magnesium bulkhead that bridges the gap betwen the top of the motor pod and the rear of the radio tray. Naturally enough, this part greatly stiffens the chassis in this area, and its use is strongly suggested by Associated. Ours would already be in the car if it weren't for the fact the tank is in the way, which means we have to do up a slightly different radio tray. In any case, with Associated claiming the bulkhead is such a necessary part, we will have it stuck in there before Josh does any serious practicing with the car.

The promised two-speed for the RC500? Haven't seen it yet; suspect that project has been put on a back burner. Remember, Associated is committed to release an off-road car in 1/10 scale; the RC12i is continually being developed (for instance, a completely new front end is due shortly), and speaking realistically, there are few tracks where a two-speed is worth much more than some razzle-dazzle show biz.

To get back to the pan car, it may seem strange for a team that already has an *Eagle*, a *Super Eagle*, and an RC500 to be prepping a pan car, but I happen to still enjoy racing the *Super J* as I completely understand it. It is a very basic race car and is simply without equal in durability. Also, I happen to be fortunate enough to belong to a club that has had the foresight to retain a pan class as well as offering an open class. (The situation actually goes much further than that, as we purposely place more emphasis on the pan class.)

Now this is an important point, so I want you to pay attention. While the suspension cars are faster, more sophisticated, and generally more fun to race . . . when they were first released, the majority of the club members (obviously) had pan cars. The club, instead of causing an exodus to suspension cars, had a responsibility to the majority of the membership, so of course it was decided to give this class the most emphasis. This may sound fairly obvious, but many clubs have not properly evaluated the situation.



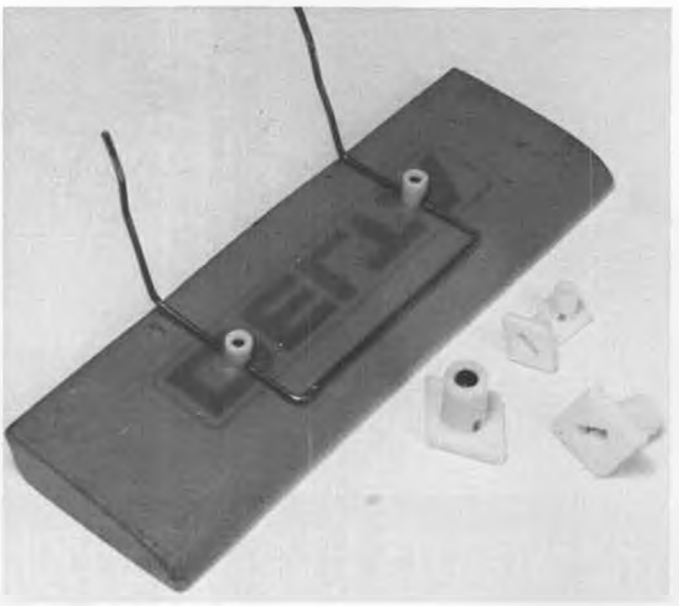
In 1/12 racing, the current hot tip in low drag bodies is the RM-1 from McCallister. It fits most all twelfthers, but drapes over a Delta *Super Phaser* like a custom fitted glove.

As a result of actions taken a couple years ago, we to this day have terrific competition in the pan class. A racer can stick with his pan car and enjoy high quality racing, adding a suspension car if so inclined and when the pocketbook permits, instead of being pushed into a suspension car and keeping up with the development of same. And while we are having racers who switch over to the boingers, the process has been slower than in many areas.

In '83 we had only three or four suspension cars at each race, this next year we will have eight or nine. As mentioned, this has allowed many to continue on with their pan cars, *and* when or if they make the switch, there exists a good market for used pan cars. This helps with the financing of the new car. Also, we have picked up several new racers simply due to the availability of proven pan cars, and the knowledge that they have a place and class in our club's scheme of things.

In my case, while running the two classes will be spreading things a little thin, what with all my heats having to count for qualifying, it is an excellent opportunity to nearly double the racing time at each race. Plus, the gear (motors, radios, etc.) that is still usable but well-worn can be utilized in the pan car. With radios, Kraft neatly obsoleted most of my equipment a couple years ago, yet with the pan class being a secondary effort, there is no reason not to use this stuff instead of just letting it sit around. Same with the motors: I have two K&Bs and two Piccos that still run fine, but have many, many hours on them and so can't be trusted like the fresh motors used in the primary cars.

The point of all this is not just to bring you up to date with what the DRT is doing, instead, it is to suggest that possibly a simple change of policy might greatly benefit your club and its racing program. Let the guys with suspension cars do whatever they want; they will do so in any case. Consider the fellows with pan cars. Is your club doing everything possible to provide them with quality racing? If not, why not? •



ABOVE: Kimbrough Products molded main gear with adapters to permit use in MRC/Tamiya cars. Innovative manufacturer.

RIGHT: Kimbrough Prod. light, clean wing mounts allow adjustments and easy installation. Wing Ties come in 1/8 and 1/12 sizes.

JIM WALKER AIR SHOW AND OLD TIME FUN FLY

Who says float planes are unique to R/C? This *Super Fireball* was built from factory kit.

No, these modelers haven't seen a UFO, they're launching 25 catapult, folding wing gliders simultaneously into the blue.

By MIKE HAZEL . . . Every year in the city of Portland, Oregon, the local NW Aeroliners club hosts an event which honors the early pioneers of control line flying. The purpose of this event is to educate the young people of America in the joys of inexpensive C/L flying, to keep alive the fascinating local C/L history, and to have fun.

• The sights and sounds of nostalgia filled the air at Portland, Oregon's Delta Park on October 8, 1983, for the third annual Old Timer Fun Fly. Many spectators and participants turned out for this event which featured old time stunt competition, and displays and demonstrations of historical models. The event was hosted by the local NW Aeroliners club, and masterminded by Frank Macy.

It seems very appropiate that an event like this should be held in Portland, as this area is the birthplace of control line flying. This city was home of Jim Walker's AJ Aircraft Company, and further south, Oba St. Clair developed control line flying.(See **Model Builder,** *November and December 1981 for a two part tribute to Oba St. Clair. wrf)* Elsewhere in the state, Bob Smurthwaite invented the three-wire throttle control system that is still in use today.

Prior to the demonstrations, the opening ceremonies honored members of the Walker family who were in attendance. Also in attendance was Eugene Kliener, who was instrumental in the design of the *Fireball.*

This AJ 744 model, produced in 1937, was a replica of the Thompson Trophy racers. The general lines of the *Fireball* were inspired by this model.

The purpose of the Air Show and OT Fun Fly was well explained by Frank Macy during the opening ceremonies: "In 1943, over three million young Americans were involved in model aviation. Today, the numbers are far less than that. One of the reasons that we are doing this show today is to show there is genuine fun and enjoyment in model aviation. Not only from a historical and educational standpoint, but just show that it's a lot of fun, and that it need not be an expensive proposition. It's a great alternative to television and the elec-

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Frank Macy describes the 1933 prototype of the AJ *Pursuit.* Rubber powered model.

Rod Russell holds his '40s O&R .60 ign. powered *Skylark 60,* locally manufactured.

Control line pioneer, Jim Roberts (Smurthwaite), flew this C/L job in demo. See text.

FUEL LINES

JOE KLAUSE
P. O. Box 2699
Laguna Hills, CA 92653

• Shortly after writing last month's column, I received a nice letter from Jerry Murphy of Colorado. In addition to his gracious comments, Jerry asked three questions that I thought would be of interest to Cox .049/.051 modelers.

Here are Jerry's succinct words, "Can I determine the best timing of my T.D. .049/.051 by measuring the gap between the bottom of the piston and the bottom of the exhaust port? Is it true that engines with the exhaust ports facing side to side will run hotter? What is the optimum subpistion induction gap for a contest free flight T.D. .049/.051?"

Let's take the questions in their order. A good look at the accompanying drawing might also be helpful in understanding the following comments. Jerry, the answer to the first one is both theoretically and practically *no*. Consider the T.D. .049. If all such T.D. parts were dimensionally, exactly equal, one could conjecture that by raising or lowering the cylinder we could find the optimum timing (without changing the transfer and exhaust relationship). Once this was determined, one would only have to measure the gap under the piston, and then set all others the same. Unfortunately, by so doing, we have also changed the compression ratio on the T.D. Well, so what's the difference as long as we have maximized rpm? You're right, as long as the temperature, pressure, humidity, and field elevation always remain the same. So much for that theory.

On a more practical level, there are machining tolerances in the production of engines. If tolerances stack, or become additive, then any single measurement, as suggested, can be misleading. Here's an example. If the crankpin is two thousandths of an inch extra off the crankshaft center line, if the connecting rod is an extra thousandths longer, and if the crankcase shoulder is (for example) three thousandths short, then the crown of the piston will be six thousandths higher than ideal blueprint specifications. That, of course, means an increase in subpiston induction, and a decrease in the transfer and exhaust periods while compression will be increased when the piston is at top dead center. Is this an exaggerated example? Not at all. Thus, we can see that measuring the space between the bottom of the piston and the bottom of the exhaust (subpiston induction gap) is not a panacea for setting up an engine for maximum performance.

Well, being practical, can the average modeler do *anything* to tune his engine . . . other then working on the fit between the cylinder and piston? Emphatically, *yes*! My suggestions are based upon two premises: firstly, the Cox blueprint exhaust timing is fine, and secondly, the production design dimension between the exhausts and the glowhead shoulder seat are held quite accurately. Therefore, if the top of the piston is exactly level with the shoulder at top dead center, the chances are that timing will be ideal. Commonly, in stock T.D.s, the piston will stick above the shoulder about nine thousandths of an inch.

The best way to measure this is with a depth micrometer. Lacking that, take a piece of five or eight thousandths thick brass shim stock and cut a full circle disc that will fit under the glowhead against the shoulder. Be sure to remove the copper gaskets, insert the disk and then tighten down the glowhead. You'll be able to feel the piston bump the disc if it tries to rise above the shoulder. Now, add shims between cylinder and crankcase until the piston does not bump the brass disc. It's best to use a variety of thicknesses . . . two, three, and five thousandths.

In this manner, you can set piston heigth exactly. (Ready-made shims are available from Kustom Kraftmanship . . . advertisement elsewhere in this issue.) With the piston at top dead center and level with the glowhead shoulder, the subpiston induction gap will be approximately ten to twelve thousandths of an inch. The minimum should be about eight thousandths, and the maximum around sixteen.

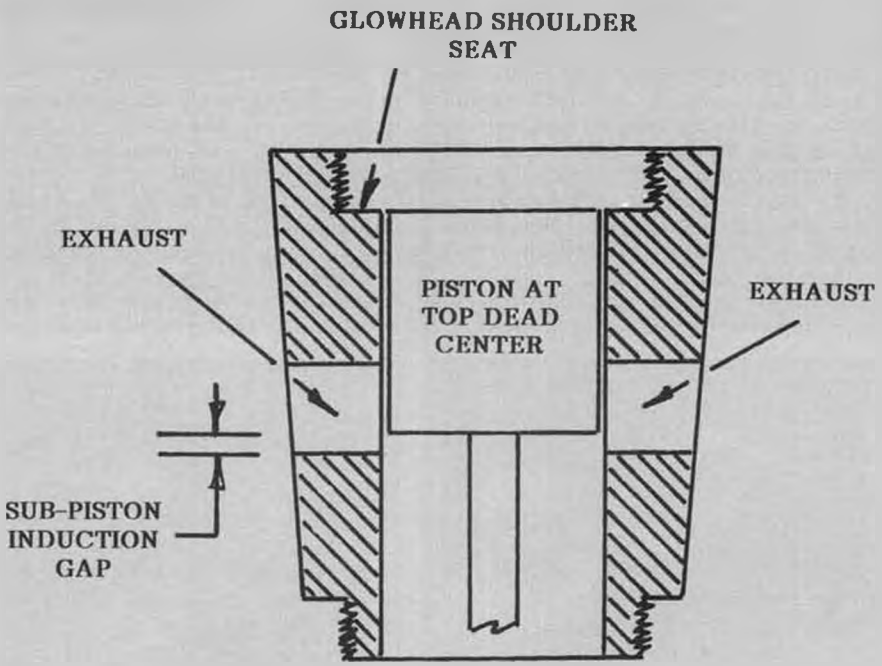
Under these conditions, you will find that you can use one copper head gasket without problems with up to 30 percent nitro fuel.

Well, that was a rather lengthy answer, but hopefully useful.

The answer to Jerry's second question is: temperature-wise, very, very little; performance-wise, no. When the exhaust ports are aligned more fore and aft than sideways, there will be a little more power. To understand why, remove the cylinder and piston, and then reinstall the backplate. Looking into the case, it's obvious that things are crowded inside. You'll notice the curved groove that has been machined so that the bottom of the connecting rod will clear the case. Now, look inside the cylinder with the piston removed. Notice the mirror transfer passages. I think you'll realize that when the transfers are aligned with that groove in the crankcase, the fuel/air mixture will have a more direct route on the way to the upper cylinder. Fuel/air transfer is a bit more efficient in this orientation. With this lineup, the exhausts will be fore and aft.

Two questions down, on to go. Wait a minute, Jerry's third one was about the optimum subpiston induction gap. I

Continued on page 98



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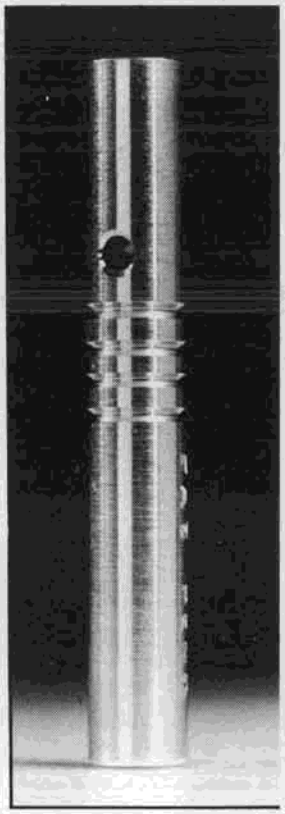

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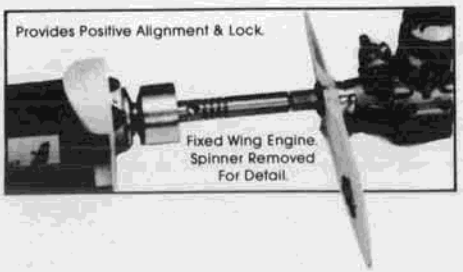

*Patents Applied For.
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BUILD OVER FLAT PLAN

HORIZONTAL TAIL ALL STRUCTURE 1/16TH BY SHOWN IS THICK AS

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VERTICAL TAIL

A

USE A 6 INCH DIA. PLASTIC PROPELLER AND THE ½ INCH SQUARE BACK WILLIAMS BROS THRUST BUTTON

CUT WING STRUTS FROM 1/64TH PLYWOOD

TOP VIEW OF BODY

A B C D E F G H

STRINGERS

CABANE STRUTS ARE BASSWOOD

B

BODY SIDE FRAMES ARE CROSS HATCHED

SIDE VIEW

D E F G H

BODY FORMERS CUT FROM SHEET BALSA

LANDING GEAR WIRE PATTERN

BALSA WHEELS AND PANTS

C

WARNER SCARAB POWERED LAIRD LC-DE

Watt Mooney 01-04-84

Walt Mooney's LAIRD LC-DE

A conventional yet challenging biplane Peanut for scale buffs.

• This Peanut Scale model of the radial engined version of the Laird LC-DE biplane was scaled up from Robert Hirsch's excellent scale drawings. It makes a very interesting little model of a classic airplane, and although it will not get higher durations than a *Fike* or a *Lacey*, it does fly very stably in smooth, clean circles. Best duration indoors so far is 35 seconds.

The model is very conventional, so there will not be a put Part A against Part B type of article here, rather, specific details will be considered. It is assumed that a modeler who decides to build this knows how to read plans and how to build balsa structures over a plan.

The structure at the front end is relatively massive because of the radial engine cowl and the large diameter wheels and the pants enclosing them. Use lightweight (rather than hard) balsa for these parts to keep the total model weight low. A Peck-Polymers plastic propeller was used on the model shown. This can be replaced with a carved balsa propeller if desired, and some weight will be saved. The original model turned out to be a little nose heavy. Balsa wheels were used and are recommended rather than hardwood wheels.

The three formers at station *A* should be laminated together cross grained. The two at *B* should be done similarly. the forward part of C can be laminated if desired (it was a single layer on the model shown). Note the top, side, and bottom formers just aft of the shaped piece. The top of the fuselage from C to *F* is covered with a wrapped piece of 1/32 sheet balsa. The drawings of the formers (below the side view) also show the approximate size and the location of the basswood body stringers.

The plywood outer wing struts are faced on each side with soft 1/32 sheet balsa and then sanded to a streamlined cross section. The cabane struts are model railroad basswood sanded to a streamlined cross section. They extend down through holes in the top fuselage skinning, and are cemented to the top longerons as well as to the skinning and to each other at the top wing.

Williams Brothers dummy cylinders are used to simulate the seven cylinder Warner Scarab engine. Cut the outside edge of the nose plug to a septagonal (seven-sided) shape as indicated in the front view to simulate the crankcase. Then slice about a three thirty-seconds thick slice off of a dummy cylinder and cement it onto the front of *A* centered in the appropiate positions as indicated by the seven radial centerlines. The slice will have to be trimmed to fit between the forward cowling ring and the trimmed thrust button.

The cylinder head rocker box clearance bumps are carved from soft balsa.

Although the trailing edges of the wings and the tail surfaces are drawn as if they are tapered down to a near knife edge, they should probably be left about one thirty-second of an inch thick to provide a little resistance to surface warping.

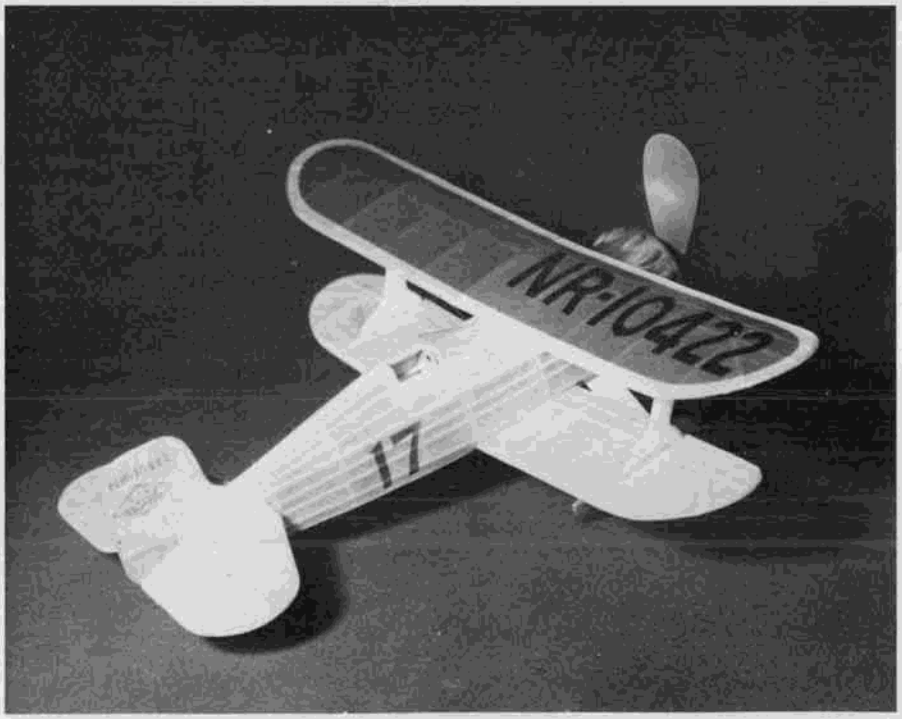
The wing dihedral angle indicated in the front view is relatively moderate for a Peanut, but has proven to be quite adequate for this model. The model should balance on the leading edge of the bottom wing.

Monofilament fishing leader was used for all brace wires. Use six-pound test leader or lighter.

The color scheme shown is one those depicted by Hirsch. The model shown was overall white, with red trim and black registration numbers on the wings. Red felt pen was used to color the cowl and the wheel pants after they had been given several coats of sanding sealer. A fine lined red pen was used to do the vertical tail lettering. The wing numbers and the racing number "17" were cut from tissue. The color pane on the top wing was put on after the white tissue had been water shrunk and then given two coats of thin dope. It was cut to shape and carefully glued in place with thinned white glue. The glue was only applied in a very thin line along the exact outer edge of the color panel. When the glue was completely dry, the color panel was water shrunk. Then, when this was dry, it was given one coat of dope. Then, the registration numbers were doped in place.

The model shown was flown in left circles indoors. It required a little left rudder and had about an eighth of an inch of washout on all wings. Because it turned out a bit nose heavy it also required all the up elevator adjustment provided for in the design. That is, the horizontal tail spar rested against the top longeron. A loop of 3/16 flat rubber twice the length of the motor base provided about the right power for the model.

Have fun flying the Peanut Scale version of the round engined Laird LC-DE. •



Walt Mooney's Peanut Scale version of the Laird LC-DE is a really sharp looking model. Flight times may not be the highest, but it will sure get attention!

INDOOR

By KEN JOHNSON

This excellent Bucker *Jungmann* was built and flown by Florida modeler, Walt Everson. Walt is active with the MIAMA indoor club.

SMITHSONIAN CONTEST

The entries are in for the National Air and Space Museum's Golden Age of Flight Art Contest. The event is for aircraft built and flown from 1919 to 1939. This time span covers many history making events in aviation. The Barnstormers of the 20's, the Bendix, Thompson, and Greve racing planes and people (such as Roscoe Turner and Jimmy Doolittle). The air pioneers such as Lindbergh and Earhart, between the wars military planes, etc.

Your editor discovered this contest in an *Art Week* newspaper several months ago. As many model builders are also artists, it was fine that such an event came along. My congratulations to the Smithsonian Institution for having the initative to hold such an event.

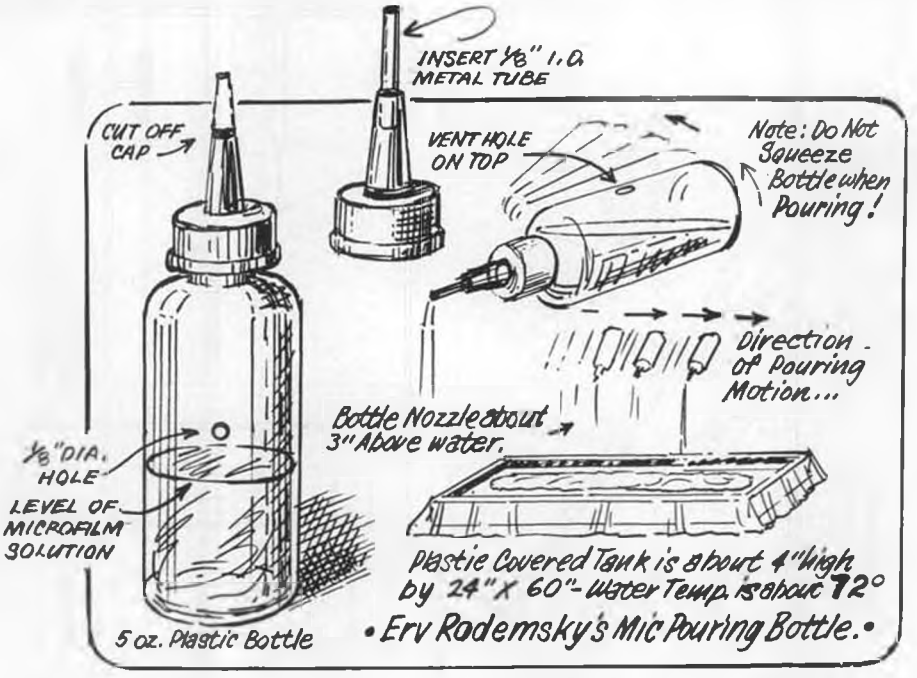
The cash prizes for this show are quite handsome and have attracted many artists, air historians, and modelers/painters. The first prize is $5000, the second is $3000, and the third is $2000. After receiving the contest material from Washington, I notified Mik Mikkelson and San Diego's Bill Noonan, as both of these men are artists. Mik is a commercial illustrator while Mr. Noonan is art director for the San Diego Zoo.

Setting aside my modeling projects for awhile, I began to search for subjects to paint. Portraits of Golden Age *aircraft* are interesting, but I felt that *events* were the most important subjects to consider. Charles Lindbergh would probably be the most popular subject, I supposed. So I decided to steer clear of this. Amelia Earhart was one of the most colorful aviators of the 1920's and 1930's, so I chose her for a painting.

Remembering that Earhart was an early *Autogiro* flyer, I looked up some facts and discovered that she had set an autogiro record for altitude in 1931. Just after Juan de la Cierva brought the *Autogiro* to the United States, a gentleman named Pitcairn was then building the *Mailwing* biplane. He ceased production on all other types of aircraft and began to develop the Pitcairn *Autogiro*.

In 1931, Amelia took instruction in the *Autogiro*. With little training, she flew the plane solo. Shortly thereafter, she went aloft to see how high the 'giro would fly. Instruments were installed to record the altitude achieved on the flight. She took along an oxygen bottle, but later wrote that her head was clear and she didn't need to use it at 18,000 feet. The altitude recorded set that day by the Pitcairn PCA-2 was 18,415 feet.

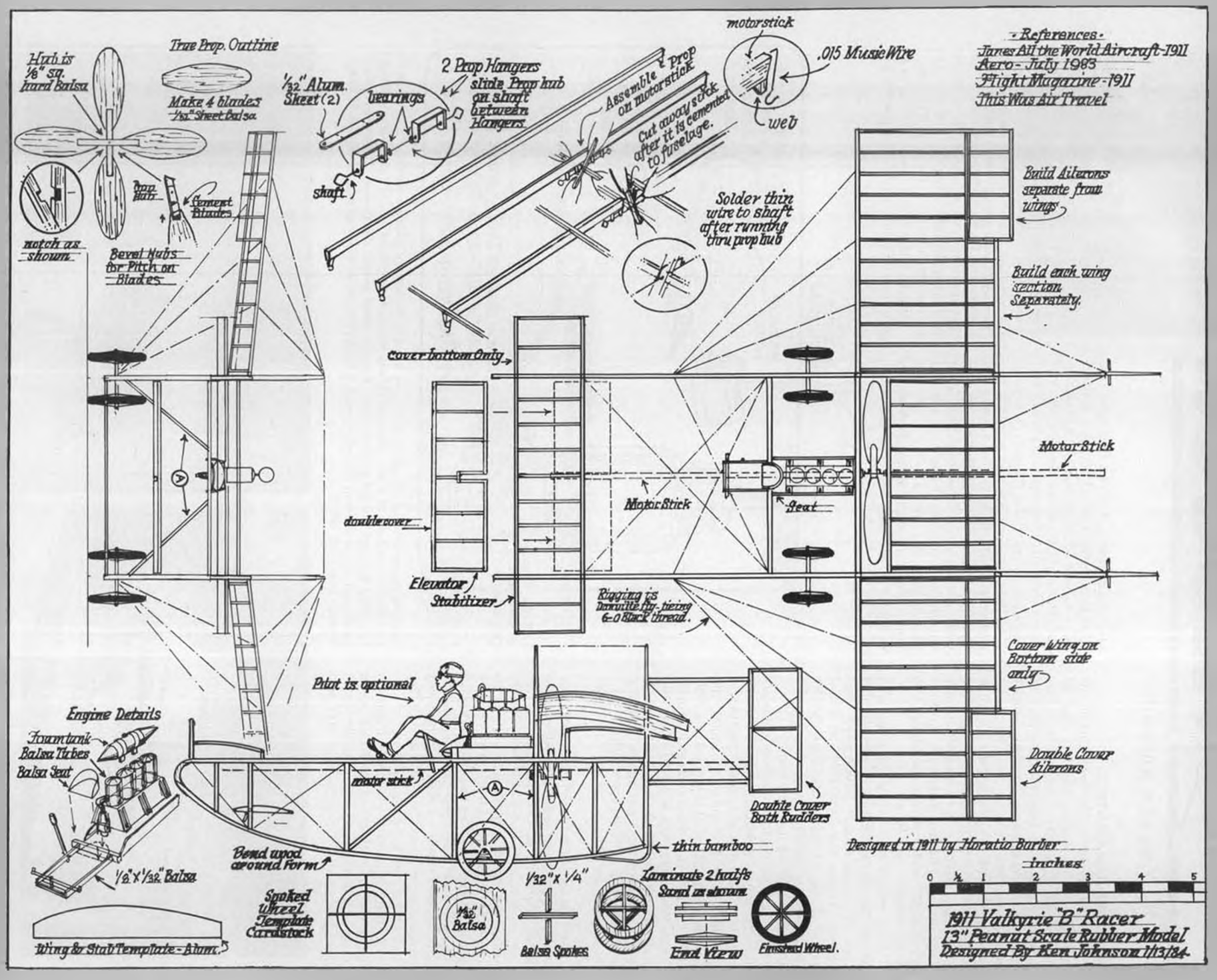
She was the first woman to solo in an autogiro. I decided to make a painting of

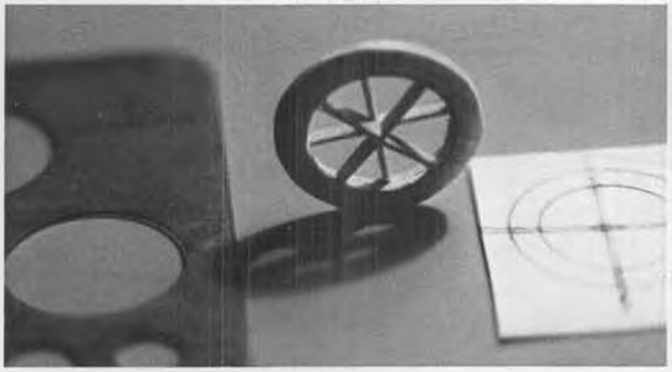


Pouring microfilm is much easier when you use Erv Rodemsky's plastic bottle. This five-ounce container is available at many drug and variety stores. Have you tried Erv's microfilm solution? It's extra dry and will not stick to itself. You can cover with it right away. The price is five bucks and can be ordered directly from Erv Rodemsky at 26 Warmspring, Irvine, CA 92714. Phone: (714) 786-0277.

Don Srull judges indoor scale entries at the 9th annual Capital Indoor Scale Aircraft Contest. The Handley Page *Gagnuc* is being scrutinized closely . Tom Schmitt photo.

Pretty Lynn Wainfan poses with some of her husband's indoor models. Lynn is an engineer with Hughes Aircraft, while Barnaby is the same with Northrop Aircraft Corp.


Hub is 1/8" sq. hard Balsa
True Prop. Outline
Make 4 blades 1/32" Sheet Balsa
Prop Hub
Cement Blades
notch as shown
Bevel Hubs for Pitch on Blades
1/32" Alum. Sheet (2)
bearings
2 Prop Hangers
slide Prop hub on shaft between Hangers
shaft
Assemble prop on motorstick
Cut away stick after it is cemented to fuselage.
motorstick
.015 Music Wire
web
Solder thin wire to shaft after running thru prop hub
References
James All the World Aircraft-1911
Aero - July 1983
Flight Magazine - 1911
This Was Air Travel
Build Ailerons separate from wings
Build each wing section Separately.
Cover bottom Only
Motor Stick
Seat
double cover
Elevator Stabilizer
Rigging is Dennitte fly-tieing 6-0 Black thread.
Cover Wing on Bottom side only
Pilot is optional
Engine Details
Fountank
Balsa Tubes
Balsa Seat
motor stick
Double Cover Both Rudders
Double Cover Ailerons
thin bamboo
Designed in 1911 by Horatio Barber
Bend wood around form
1/8" x 1/32" Balsa
1/32" x 1/4"
Laminate 2 halfs Stand as shown
Spoked Wheel Template Cardstock
1/32" Balsa
Balsa Spokes
End View
Finished Wheel.
Wing & Stab Template - Alum.
inches
0 1/4 1 2 3 4 5
1911 Valkyrie "B" Racer
13" Peanut Scale Rubber Model
Designed By Ken Johnson 11/3/84



The *Valkyrie* plan featured to the left includes a detailed sketch of this wheel. Circle template is used to make the jig (right).

Walt Everson's 1.49 gram *Grapenut Found.* The Florida indoor guys refer to Grapenut models as "Pistachio" scale. Model is a 1-min. flier.

the altitude flight. After a fruitless trip to my local library, a note to fellow autogiro fancier, Bill Hannan, brought some information on the plane. Mr. Hannan sent several photos of Amelia and the address of a gentleman who had flown the machine. George Townson of New Jersey (a close friend of Stephen Pitcairn, son of the PCA-2's builder) sent many photos and a brochure (printed in 1930) promoting the Pitcairn *Autogiro*. He enclosed an actual paint swatch of the green color. Another photo pointed out the complete color scheme.

One week later, a second letter arrived, and Mr. Townson corrected an error in the green color by sending a one-inch by three-inch scrap of the original fabric from the plane. It seems that a PCA-2 had caught fire in the air while George was spraying crops. This was the last remaining piece of fabric from that *Autogiro*. The color was corrected, and my Earhart painting was brought to completion. Needless to say, I am most grateful to Mr. Townson and Stephen Pitcairn for their help.

Two other paintings were also entered by yours truly, but the Autogiro is my pride and joy.

Mik painted a radial engine for his entry, and Bill Noonan rendered a portrait of one of the planes he has modeled. If you have seen the models Mr. Noonan builds, you know the beautiful detail and workmanship that goes into each one. I know Bill's painting must be outstanding.

Have any of you readers also entered the Smithsonian contest? Please write and send me a photo of your entry. I will report on the outcome of the contest when the winners' names are published.

The jury selection is in January '84, and the exhibition preview is set for April 4, 1984. The actual exhibition will run from April 5 to September 3, 1984. Prints of all the winning paintings will be made available to the public.

GRAPENUT PROXY CONTEST

The MIAMI indoor club of Florida is holding an international proxy contest for Pistachio (Grapenut-size models) on May 13, 1984. This meet will feature models of eight-inch wingspan or eight-inch fuselage length.

This column has featured plans for two Grapenut planes. If you plan to send in an entry for this meet, contact Dr. John Martin at 2180 Tigertail, Miami, FL 35133, or call (305) 858-6363. Single surfaces and hand launches are allowed.

Allan Schanzle, of the D.C. Maxecuters, reports that the Smithsonian has asked his club to hold a model contest sometime in the summer of 1984 on the Mall in downtown D.C. or the Washington Monument grounds. The area is not ideal for crowd control or retrieving of models . . . not to mention the turbulance from nearby buildings. The events will be decided by the Maxecuters and model size could be held to 13-inch peanuts. Non-scale categories might be a possibility. Mass launch events are a crowd pleaser, and the Smithsonian has offered to display the winners in the Air and Space Museum. They even offered to give gift certificates for purchasing books in the museum bookstore.

How many of you modelers in the Washington area would be interested in participating in this contest? Heavy indoor models would be ideal for this contest. Many indoor scale models can be flown outside. Proxy entries are invited. One of the prizes might be a tour through the museum. If you are interested in this contest, contact Allan Schanzle, 8311 Exodus Drive, Gaithersburg, MD 20879.

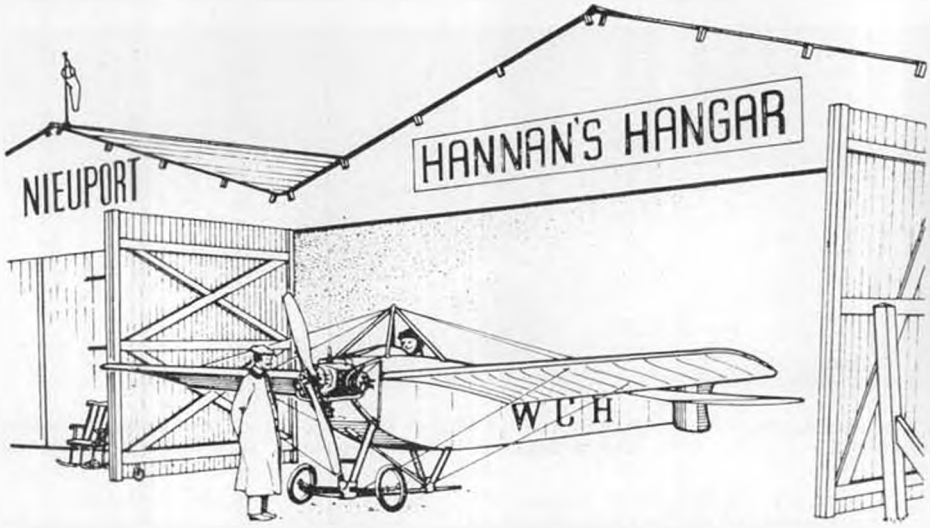
VALKYRIE RACER

In the August 1981 issue of **Model Builder**, a photo of the *Valkyrie-Type 1* canard monoplane appeared in this column. It was the first *Valkyrie* this author was to build. The year was about 1967, and the meet was in Pittsburgh, PA.

Continued on page 92

Two views of Alan Wong's pseudo MIG 15 ducted fan indoor model. See text for details.

Indoor flying at Burbank, California, high school gym. The last of the winds are going into this *Fike* Peanut.



Dieflinde Glockner, W. Germany, with her fine flying *Lacey* which was campaigned in the Flemalle, Belgium Peanut contest.

"Do not forget in effect, that life and its period of activity are limited not only by money but by time."

• Our lead-in line this month is from the philosophical reflections of Alphonse Penaud, perhaps the most influencial of the pioneer model builders, and was written in a letter to British modeler T.J. Bennett in 1879. Our thanks to Hewitt Phillips, and he in turn credits the late Pearl I. Young, former head of the Editorial Office at NACA (now NASA). We hope to present more of Penaud's thoughts in the future.

FAC NATS IV

Another the legendary Flying Aces Club national model meets is scheduled for July 14th and 15th. This year the site will be the Ford Test Track in Utica, Michigan. Slated events include the FAC originated Peanut Scale, Embryo Endurance, No-Cal Profile Scale, Jumbo Scale, Power Scale, plus the popular mass-launch competitions such as the Thompson and Greve Trophy races. The grand finale will be an awards banquet, complete with an unannounced guest speaker.

Details concerning discounts on advance reservations may be obtained by sending a pre addressed, stamped envelope to: FAC NATS IV, P.O. Box 129, Birminham, MI 48012. For complete contest rules, send an envelope and stamp to the CD, Ralph D. Kuenz, Detroit Geschwader, 14645 Stahelin, Detroit, MI 48223.

SPEAKING OF FAC EVENTS

Peck-Polymers has introduced a line of profile scale models designed to meet the FAC rules for No-Cal. Included are a Citabria, Stinson *Sentinal*, Cessna *Aerobat* and Zlin 50L. Announced as "Busy People Kits", the concept is to reduce building time to an absolute minimum. Features are: Die-cut, precolored balsa parts, an assembled propeller and nose bearing unit, formed wire parts, lightweight wheels, adhesive backed mylar markings and a rubber motor. Wingspans range from 15 to 16 inches. The sample we received was the *Stinson*, which required very little time to build, and flew immediately, adjusted exactly according to the instructions. Final trim involved only addition of nose ballast, which is also furnished in the kit.

These offerings should be available at many hobby shops, or send for the Peck-Polymer catalog advertised in this issue for more complete information.

AMEN!

The Howard Hughes giant flying boat continues to attract enthusiastic visitors to its Long Beach, California home. Kansan Dan Walton's opinion: "I'm glad they didn't cut it up and spread it around. It has to be seen in one large piece to be appreciated."

SPEAKING OF GIANTS

The modeling press still differs in describing outsize models (Jumbos, monsters, etc.) but the consensus leans toward "quarter-scale" even when the craft may not be exactly that. In France the term is "petit gros" (literally "little big"), while in Australia, according to Merv Buckmaster, the editor of *Airborne*, the category is simply "Q Scale."

FEELINGS

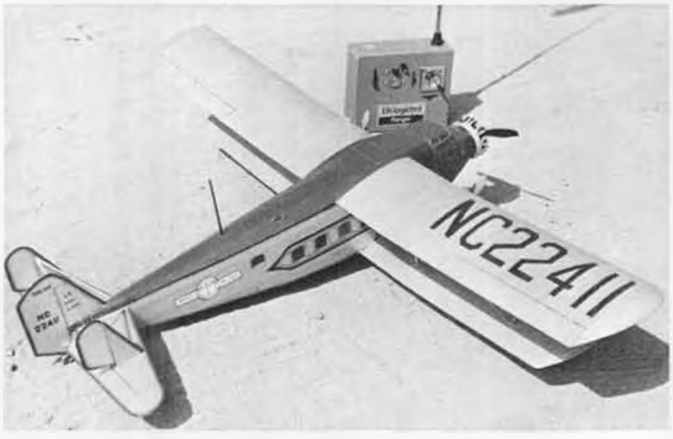
"I love the concept of rubber power free flight, but it is quite impractical here in a 20 mph average wind. I've tried some indoor with limited success due to inadequate flying sites, however, I still have the 'Romance of stick an' tissue' in my heart," writes Adrian Vallejo, of Amarillo, Texas.

NOSTALGIA TIME

"In the early thirties autos were scarce in our area . . . thus, after supper, the kids could gather under the street arc light and fly baby ROGs. we adjusted for tight circles and used a long bamboo fishing pole to assist retrieval from exceptionally rare flights. The pole would get shorter, as it provided the material for wing tips, rudders, and landing gear. (Bamboo was cheap . . . music wire cost money which was better spent on balsa wood). Covering paper was ironed (mother's), used Christmas wrapping paper. What fun we had with 10¢ or 20¢ worth of material," writes Ray Schnell, of Alexandria, Virginia.

SNOW JOB

Readers may recall an earlier mention



Beautifully done Boeing 80A R/C model by Jere Robinson of the San Diego Scale Staffel club has intricate detail.

Denis Fairlie's remarkable R/C Deperdussin is a recreation of a "magnificent men" era monoplane. Pilot and rigging very scale.

Milan Kacha, Czechoslovakia, built this CO_2 powered Curtiss *Junior*. Young Miss Kacha (daughter) poses for the photo.

Mr. Flying Aces himself, Dave Stott, holds aloft his Blackburn *Blackburn* rubber powered craft. Photo by Tom Schmitt.

in this column about an expedition trying to recover six B-17s and two P-38s which force landed in Greenland during 1942. It was thought that the machines might be well preserved under 10 or 15 feet of snow. However, when the site was finally located, the depth of the white covering turned out to be more nearly 62 feet! Team leader Jay Fiondella plans a return visit . . . with bulldozers.

JUST DETAILS

Scale modelers understand the importance of the little things, has have others. Richard Miller relays the following anonymous quote, "Trifles make perfection, but perfection is no trifle." And this one from Sherlock Holmes, "It's only a trifle my dear Watson, but nothing is so important as trifles."

MORE VINTAGE AIRCRAFT DETAILS

Georges Chaulet has been interviewing pioneer airman Jean Ordonneau regarding cockpit features of early French aircraft. About instrument coloration he says: "It seems (but I am not positive) that the dials employed during the first aircraft flights were white with black needles. It must have been during World War One when they became black with white needles." About control levers: "These were first made from a simple stick of wood. But there were some, which I saw, that were made from bicycle (frame) tubing. The inventor of the stick was REP (Robert Esnault-Pelterie). His planes, which would fly very badly, had a stick made of bicycle tubing with a rubber bicycle handlebar grip on top. Idid not pay precise attention to this detail, but all the taxis (French slang for vintage aircraft) I have piloted had a bike handgrip."

A VINTAGE MODEL

By curious contrast, the Deperdussin monoplane by Denis Fairlie, of England, shown in one of our photos, employs the steering wheel type of control. This R/C model has numerous unusual features. For example, the carved balsa pilot is articulated, so that he moves when the appropriate controls do. The model is completely demountable via tiny nuts and bolts, which have demonstrated their amazing strength by withstanding severe crashes. In the interest of practicality, the undercarriage is designed to pivot rearward to absorb landing loads.

Denis has evolved various ways of simulating off-white vintage covering, and he sent small swatches for our examination. For nylon, he employs waterproof drawing ink (raw Sienna plus a touch of yellow) diluted in methylated spirit (industrial alcholol). This is applied by dipping the fabric, allowing it to dry, then rinsing in water. The process may be repeated if necessary.

For tissue, such as Silkspan, Denis uses opaque designer water color, about 90% white, plus a tint of yellow ochre, applied while the tissue sheet is supported on a hardboard surface. After drying, the material is cut to the desired width. For instance, it may be applied to wing ribs to prevent the raw wood from showing through clear doped covering.

Denis modestly states: "The model may not be precisely scale, but in appearance, it is, I think, very representative of the period."

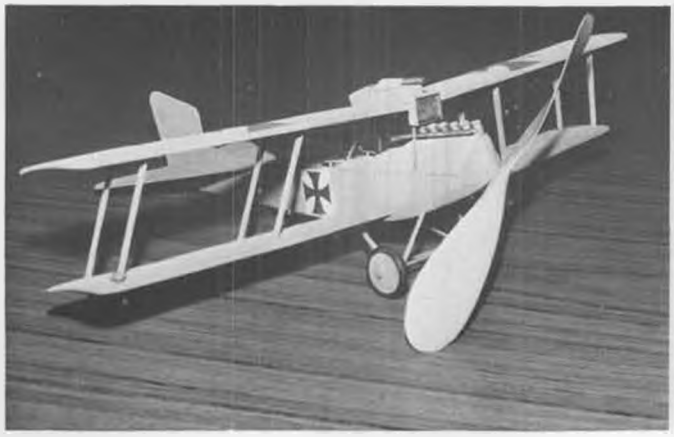
HARMON TROPHY TO JANICE BROWN

Thanks to Beulah Kee, a member of the famous 99s, women flyers' organization, we have a report on the presidential presentation of the Clifford B. Harmon International Aviation Trophy to Janice Brown, the charming chief test pilot of the *Solar Challenger* sun-powered plane. Only two women ever won the award previously, Amelia Earhart and Jackie Cochran, so Janice has at last received proper recognition for her outstanding efforts!

SCALE MODEL RESEARCH

Bob Banka is the new owner of a firm specializing in documentation for builders of scale model aircraft. With 35 years' experience, Bob well understands the requirements, and can supply a wide variety of color photographs as well as three-view drawings. For a comprehensive catalog, send one dollar and a large stamped envelope to: Scale Model Research, 418 East Ocean Front "B",

Continued on page 86



Canadian modeler Jack McGillivray built this Brandenberg C I for indoor flying. Would you look at that prop! Photo, Ross Mayo.

An original Embryo endurance model built by Ted Russell, Oberlin, Ohio, features Ritz style wing and stab airfoil.

Free Flight

By BOB STALICK

John Drobschoff tunes up his 1/2A free flight model at the 1983 Fresno Annual. Photo by Will Nakashima.

Occasionally, it does all of us well to realize that free flighters, as well as others who are steeped in their sports or hobbies, develop and use jargon that communicates very well with others in the group. What we fail to realize is that such jargon tends to be so much *gibberish* to those not inside the group. So, as a writer who is prone to use free flight jargon to communicate with other free flighters, I was surprised to receive a letter recently asking the kinds of questions that all of us take for granted. As an example this letter writer asked, "And you know there are some of us out here who would dearly love to know the meaning of abbreviations and jargon like: VIT, A/R, autorudder, Olofsson stab mount, Wakefield design, 9% *Ram-Rod* airfoil."

So, properly jolted from my jargonlike trance, I decided that if one person had the gumption to write about such questions, how many others out there read this stuff wondering, "What in the H . . . is he talking about?"

My problem is the following: Just *what* terms are befuddling the readers? I can understand terms like Olofsson stab mount . . . but Wakefield design?

To those readers who are wondering, then, I offer the following opportunity: If you would drop me a line with your suggestions and thoughts, I will do my very best to explain, describe, sketch, and/or photograph the items in question, and I promise to not use your name in order to spare you embarrassment . . . unless you expressly give me permission to use it. How's that? I've even named this part of the column so you can look for it . . . starting this month. The name: "Bullet Bob's Bits 'Bout Free Fight" . . . now, on with the show.

MAY DARNED GODD AIRFOIL: OLOFSSON 237-633

This is the airfoil that Lars Olofsson uses on his FAI Power models for the stabilizer section. A quick look at the section will show you that it is quite thin (6%) and flat. The rounded leading edge and the small amount of camber make it a forgiving airfoil for stab use. This means that it can be used for a variety of applications, especially if the model flies over a variety of speed ranges . . . as is the case with FAI Power.

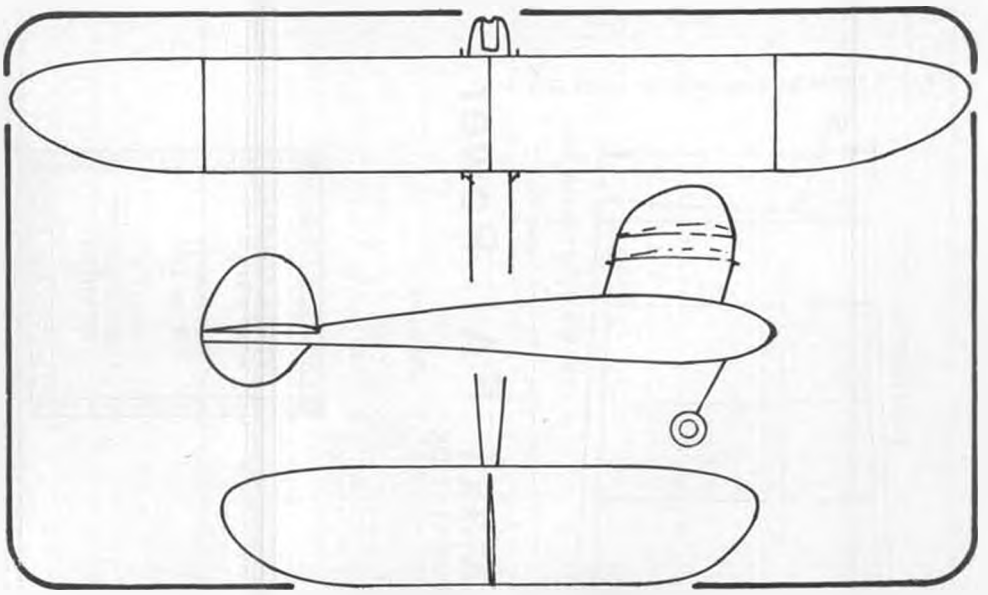
It would also be a good section for AMA gas models. Due to its thinness, it would be difficult to build unless balsa sheeted surfaces are used. Lars uses 1/32 thick sheet balsa top and bottom, covered with Japanese tissue. It's a good one, try it on your next ship.

MAY MYSTERY MODEL

According to my Midwest connections, this ship was a real winner in the early '50s. It appeared in numerous sizes from 1/2A on up, and had at least one distinguishing feature . . . the wing was mounted on a wire cabane instead of a pylon. In fact, I understand that it was tried with a pylon, and was found not to

Bill Ruff readies his *Satellite* (right) for takeoff at the 1983 Fresno Annual. Photo by Will Nakashima.

Joe Lobia listens for engine peak just prior to launch. Modified *Satellite* flies just fine. Photo by Nakashima.



MAY MYSTERY MODEL

fly nearly as well.

A hint, sketches of this model can be found in one of the zaic yearbooks. Name it, send your correct Mystery Model name to Bill Northrop at **Model Builder**, and if you are the first in line . . . you stand to win a one-year subscription to my favorite model magazine.

MAY THREE-VIEW: PRO MAX I F1C
BOB STALICK

This is probably one of the few models in existence that is named after a hair dryer. Actually, at the time I named it, I didn't know that such was the case, but one of my friends pointed out this little fact.

Regardless of all of this banter, the ship was designed to be a test bed for a couple of ideas I had for pylon height and wing mount systems. The model has many of the usual features found on FAI Power ships as can be seen from the 3-view. The wing and stab are standard sheeted versions with slightly more than minimum area required for a 2.5 cc model. The fuselage is a fairly standard box with the longerons in the outer corners as shown in the full-sized cross section shown. Beyond these standard features, the following unusual (for me) design innovations are noted:

1) The pylon is 1.2 inches above the fuselage top and contains the center section of the wing. The center section is faired into the fuselage via a teardrop section between it and the fuselage. The center section is 1.5 inches wide, contains a removeable 5/32 wire joiner (see photo), and a 1/8 key wire (it's 1/2 inch long on either side of the center section.) In addition, an aluminum platform is epoxied underneath the center section at the rear so the bottom trailing edge of the wing has a small rest to maintain proper incidence.

2) The engine is canted to the right side of the fuselage so that engine exhaust will flow away from the timer assembly.

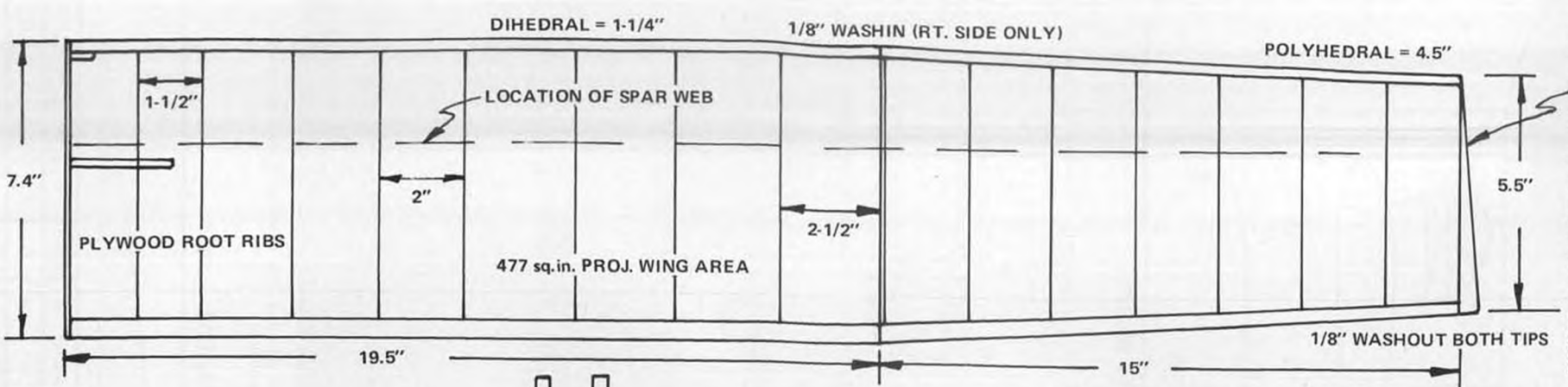
3) The Crocket VIT (Variable Incidence Tail) system is used . . . but with a difference. The VIT arm carrier is mounted vertically, instead of horizontally as planned. This allows the use of ball point pen springs to actuate the arms for VIT and DT (dethermalizer) actions.

As can be seen from the photographs, this model is equipped with a Cox Conquest .15 engine. It is mounted on an Oliver Pan, with a 3/16 aluminum spacer behind it. The spacer is drilled and tapped to accept the NFFS coiled landing gear and is held in place by a

Hal Woods finishes his starting sequence on his way to a Class C win with his *Summerwind*. Scene is the 1983 Fresno Annual. Nakashima photo.

DARNED GOOD AIRFOIL – OLOFSON 237-633

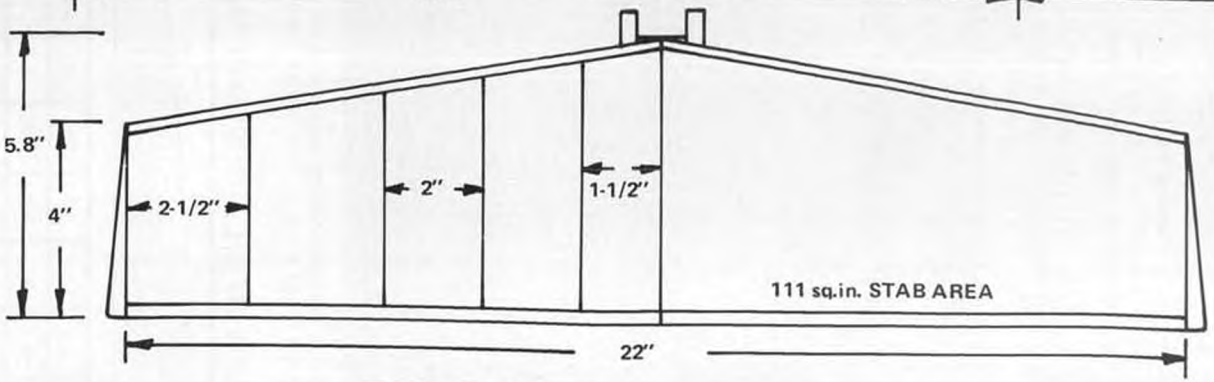
STATION	0	1.25	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	1.3	2.5	3.1	3.7	4.6	5.7	6	6	5.7	5	4.2	3.2	1.9	0.5
LOWER	1.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0

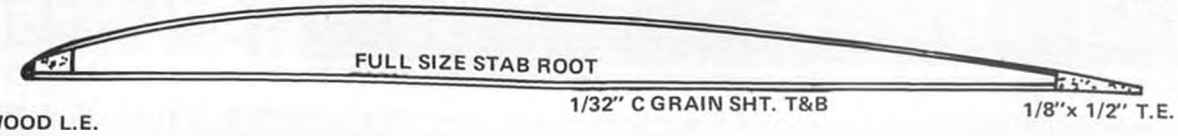


ProMaxI FAI Power

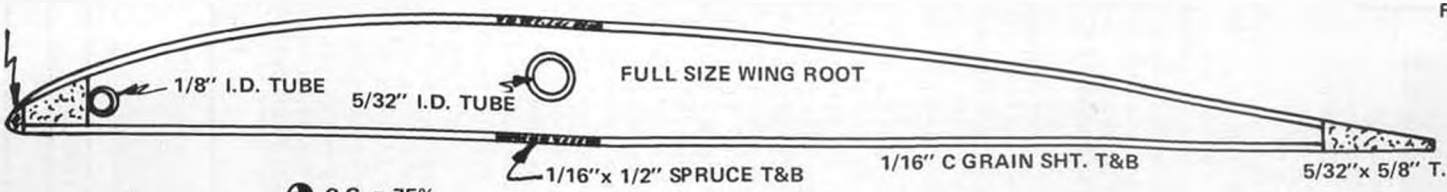
BY: BOB STALICK

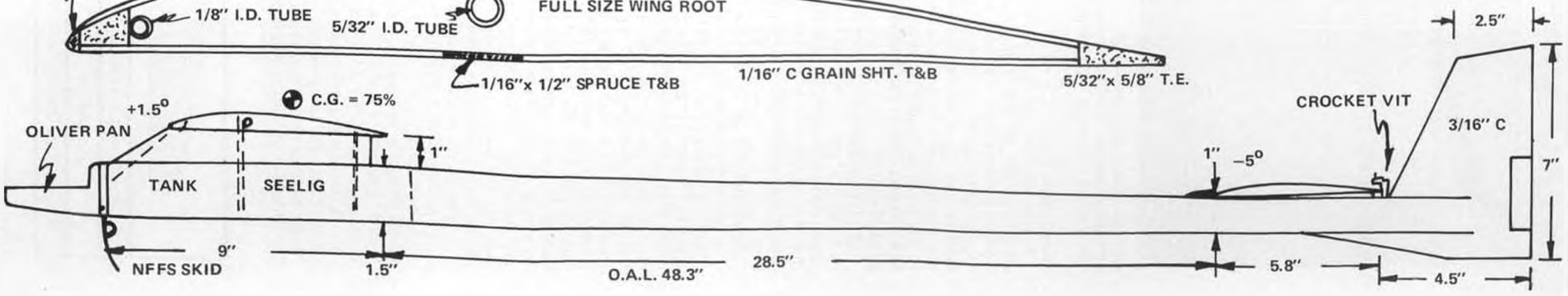
TOTAL AREA PROJECTED : 588 sq. in.
REQUIRED WEIGHT : 26.6 oz.
POWER : ROSSI OR CONQUEST .15
SCALE : 1/4" = 1" WING & STAB.
.2" = 1" FUSE.





FULL SIZE FUSE. DETAIL AT PYLON





Here is a photo of the model which is this month's three-view, the *ProMax I.* Box fuselage and low pylon are evident.

4-40 socket head bolt.

One other point about the construction is that the formers (indicated by dotted lines on the three-view) are 1/8 plywood, are epoxied into the fuselage, and extend through the pylon into the wing center. The main wing joiner tube is firmly wrapped and epoxied to the plywood former. Behind the pylon, there are no formers. Essentially, the fuselage is a hollow box between the pylon and the rear of the stab.

The model is new, and flight tests are underway. Initial flights are promising. Will it be ready for the Labor Day Finals? Time will tell . . . I hope so.

CIAM RULES CHANGES — PART II

Last month, I noted that the CIAM (the international rules making body for model aviation competition) was considering a number of rules changes that would affect outdoor free flight. The results of that December meeting are now in, and some changes did occur. These changes are, in brief:

1) F1A (A-2 Nordic) fliers may not release the towline on official flights, unless the end of the towline is equipped with some sort of marker (ring, pennant, small rubber ball, etc.). The penalty is cancellation of the flight.

2) Electronic thermal detection was not banned, as originally proposed, but action would be taken if any of the following conditions are noted: A) if it becomes apparent that electronic devices give a high certainty of finding thermals; B) competitors are using more than two sensors; C) sensors are being spread more than 25 meters from the competitor's starting position; or D) computers are being used to interpret the observations from the sensors.

3) The proposal to expand the scope of the F1C event (FAI Power) to make models more competitive with smaller engines was approved on a provisional basis with the intent to try the new rule of various international events. One modification was made to the original proposal and that was to increase the maximum supporting area allowed. The newly adopted provision allows between 30 an 40 square decimeters (approximately 465 to 620 square inches).

READY SOURCES FOR FREE SPRINGS.

So what do you use springs for? How about . . . autorudder actuation, VIT actuation, A-2 circle tow hooks, rubber model tension springs, Montreal stops, and other things? So, where do you get these little gizmoes? I get mine from unusual sources . . . and none of them cost me a thing.

ProMax I wing mount details. Main wing wire is 5/32, key wire is 1/8. Note aluminum tab at TE of mount. See text for further info.

Where, you ask? Old ball point pen springs are excellent compression coil springs. I use these for VIT actuation. Bic cigarette lighters supply two kinds of springs: the flint spring actuates the Montreal stop plungers on rubber models; and the other spring can be used for the prop shaft spring on smaller models such as P-30 and Coupes. From old typewriters, I use the springs for circle tow hooks, for VIT lines, and for autorudder actuation.

If you don't have any of the above items, just look around. My typewriter springs came from a typewriter repair shop. I asked and they gave. I also throw away nothing without taking it apart. A recently departed hair dryer yielded several two-inch long 6/32 bolts, a clothespin type spring, and a large coil of copper wire. Useful? Of course.

I have one of those little filing cabinets with the plastic drawers. Each drawer is marked with the little treasures it contains. Springs in one, different sized bolts and nuts in others, gizmoes in others, etc.

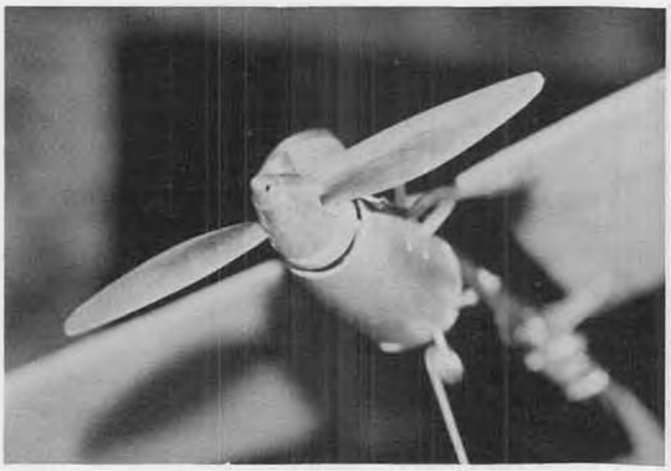
My motto is: "If it looks like it can be used in a model, don't throw it way, file it away." It's amazing how handy these things are when you need something for that unusual application. Try it!!

BULLET BOB'S BITS 'BOUT FREE FLIGHT

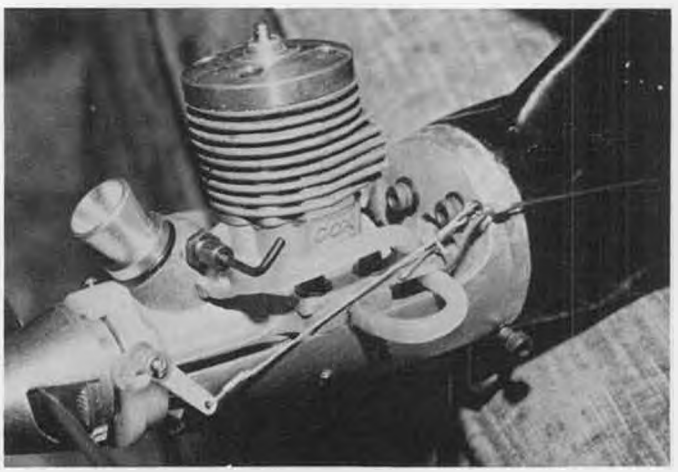
As promised earlier in this column, here are some questions that most of us take for granted . . . and the answers from Bullet Bob.

VIT means a variable incidence tail.

Continued on page 96



The front view (from below) of the *ProMax I* shows the offset angle of the engine.



Nose details of the *ProMax I* showing engine mount installation, engine offset, flood-off device, and engine brake installation.

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PT-1 . . . . . *Continued from page 25*

FLOAT CONSTRUCTION

The floats have no compound curves . . . just about as square as you can get and still have them do their thing. This makes them very easy to build.

Cut out the sides and bulkheads and assemble them upside down on your building board. Install the cross-grained bottom sheeting. Cut the interfloat struts from pine and shape the exposed parts to a streamlined cross section. This is best done before they are installed. Predrill the holes (16 of them) for the clips that will hold the fuselage/float struts to the floats. Install the interfloat struts with the whole assembly held down upside down on the building board. This keeps things nice and square.

When the glue is dry, remove and install the top cross grain sheeting. Rough shape the nose blocks and install them. Finish shaping after installation. Install the chine strips. The original floats were covered with nylon on the bottom and light Silkspan everywhere else. The final finish was dope.

Bend the wire struts as shown on the plan. Install the main struts using the clips. Mount the main struts in the strut stops on the bottom of the fuselage using elastic bands. Then wire wrap the diagonal brace struts to the main struts and solder them. Place a rag under the joints being soldered to prevent excess solder from burning the floats. These struts are "self-jigging" if you follow the foregoing instructions.

CONSTRUCTION OF MAIN LANDING GEAR

Bend the wire struts as shown on the plan. Mount them on the fuselage, wire wrap them, and solder them together. Again, use a rag to prevent burning. Install the wheels.

WING CONSTRUCTION

The built-up wings shown in the plans are very strong and still relatively light. With Coverite's Micafilm, each wing weighed 4-1/2 ounces. Built-up wings can be used wherever a "Clark Y" type, 270 square inch, 42-inch span wing is appropriate. The material that follows is more of an assembly sequence than a detailed set of instructions. However, you will find it helpful to avoid some mistakes that were made while building the original wing.

Build the wing on a flat surface. Attach the plan to the surface and cover it with waxed paper or Saran Wrap. Then, build the wing over the plan. Pin the various parts to the board (or the part already built) as they are called for in the following list:

1) Bottom spars, *use 1/32 sheet scraps to raise them 1/32 inch off the board.*
2) Install the R1 ribs.
3) Install trailing edges.
4) Install the dihedral braces (on one side only).
5) Install the R2 ribs. Use 1/32 scrap under these ribs to space them from the board. Tilt the center ribs to the dihedral angle.
6) Install the sub-leading edges.
7) Install the top spars.
8) Install the 1/32 to top front sheeting on the side with the dihedral braces installed.
9) Join the two panels by pinning the side without the top sheeting to the board and then, adding the other panel carefully blocking it up to the proper dihedral angle.
10) Add the top front sheeting to the panel pinned to the board. *Now,* if you want washout under the tips . . . about 3/16 inch is recommended . . . the trailing edge should be blocked up by several shims (or a tapered strip about 1/2 or 3/4 inch wide) whenever a panel is pinned to the board during the remaining assembly steps.
11) With the panel pinned to the board, install the top *rear* sheeting, first on one panel, then on the other.
12) Install the bottom sheeting (both panels). This is done with the wing off of the board . . . be careful not to build a warp in at this time.
13) Install the webbing between the spars . . . one side at a time with the panel pinned to the board.
14) Install the leading edges . . . one panel at a time, panel pinned to the board.
15) Install the gussets at the corner of the spars and the R2 ribs.
16) Rough shape the tip blocks and cement them in place.
17) Sand the tips and leading edge to final shape.
18) Sand overall and finish with the covering technique of your choice.

CABANE STRUTS CONSTRUCTION

The most difficult parts of biplanes are the building and aligning of the interwing and cabane struts. In this case, the interwing struts were simply omitted . . . a total, but unscale-like solution. The cabane struts had to stay! They were made simply by designing and using the jig shown on the plans. The main struts and diagonal wires are bent to as good a fit as is practical . . . don't be too fussy. The straight wires that go directly under the wing are cut and mounted in the jig. *Before you solder this assembly,* slide some fuel tubing over the center parts of the straight wires to act as cushions and

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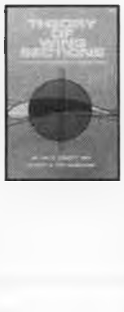

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anti-slip devices under the wing.

Wire wrap the struts together and solder them . . . you are done! The jig assures squareness and automatically builds in the proper incidence.

TAIL CONSTRUCTION

The vertical and horizontal tail members are made from 3/16 sheet and are about as simple as they can get. If you like, circular lightening holes can be cut, and hard balsa strips (3/8 X 3/16) added each side of the hinge lines.

Another trick to improve flat surfaces of this sort is to inset strips (3/8 X 3/16 would be o.k.) at right angles to the grain to help prevent warps. The original has none of these frills and seems to be just fine.

Mount the vertical stabilizer on the horizontal stabilizer. Cover and finish each individual piece and add the horns. Then, hinge the elevator and rudder (in that order). The assembly should then be glued to the fuselage . . . nice and square!

FLYING THE PT-1

The moment of truth came long after the water got soft in the Boston area. The roll-out was in midwinter, but the first flight was made a week before Brimfield in May! The wet, windy spring made test flying either impossible, or totally foolhardy.

The first flight was in relatively constant 15 mph winds . . . onshore, thank goodness! A short taxi test came first . . . and we couldn't wait any longer . . . full throttle, a few bounces on the tops of three to four-inch waves and it was airborne! The crosswind landing was a bit hairy, but we taxied back to the beach without problems (the real test of a seaplane).

Next week at Brimfield, it turned out that the original balance point was too tail heavy. With this corrected, the PT-1 flew very well. The only other correction was to lower the water rudder an inch (as shown on the plans). It was coming out of the water at normal taxi speeds as the model rose up out of the water.

A few instructions on flying the PT-1 may be of interest.

1) Use all the rudder throw you can manage . . . a little more rudder area could be built in.

2) Elevator response is good with the clevis in the horn's third hole out.

3) Getting on the step may require a bit of *down* elevator. Gather speed at neutral elevator and then hold down a bit to lift the float aft ends out of the water.

4) Landings will take some practice. With the flat bottom airfoil and light loading, the PT-1 has to be flaired out immediately before touch down, or it will balloon and try to keep flying. However, even "splash downs" are relatively gentle.

All-in-all, you will find the PT-1 an easy-to-fly water plane. It taxis well and does not tend to tip badly in the wind as it turns.

The PT-1 has lived up to my expectations. It will provide all of the fun-flying features of the *Rumplestadt* and add to it the fun of water flying. To date, the land gear has not been tired. However, it would be difficult to imagine poor results.

The author has a thing about seaplanes: why risk spoiling a good seaplane by flying it off the hard, hard ground!

POSTSCRIPT

Summer came, and the land gear was installed. It flew great! And, so far the only dings have been during transportation.

Ed McCarty suggested an incidence change in the top wing. (The *Rumplestadt* with the Range 42 wings needed negative incidence in the top wing, and that's the way the PT-1 was built originally. [The plans are correct.])

Bob Martin made the second test flight, and the results were great. All of the three-channel maneuvers are solid. You have to be quick to stop it at a single snap roll! Takeoffs and landings track very well.

Oh, well, we can't help it if it flies as well as a land plane! Even this old duffer feels competent to fly it and enjoy it. •

R/C Mite . . . . . *Continued from page 33*

I used thread hinges for the control surfaces. My control horns were made from 1/32 ply, but the choice of materials is yours.

Once you get the wing dowels on, you can carve the cowl from a soft balsa block.

Now that your *Mite* is finished, it has to balance on the main spar. See, I told you to keep the tail light! (Mine did balance on the spar, WITHOUT ballast!)

FLYING

Do all your testing in calm weather. In fact, do all your *flying* in calm weather! The *Mite* is a real floater, and doesn't penetrate really well. Like her ancient sister, this model will grab a light thermal and give you long rewarding flights. Due to its light weight and slow speed, she makes a great school yard model too.

Proof of her abilities is a first place win in the only contest I have entered to date: the IMS static display, in Old Timer Electric!

Have fun, fly electric! •

ASW-19 . . . . . *Continued from page 45*

lever are already installed.

The two straight steel jig dowels used during the installation of the brass wing joiner tubes are slid through the appropriate holes in the fuse, and the fuse is then blocked up on the jig dowels such that the fin is vertical and at right angles to the work surface. The top of the vertical fin must also be horizontal to the work surface. A steel quick link is then soldered to the elevator control rod. The tail plane support assembly is then installed, aligned, and glued in place. However, prior to performing this step, I

added a modification to the vertical fin tail post. The plans call for the rudder hinges to be glued into the precut slots in the vertical fin tail post. Because the tail post thickness is only about 1 mm, I felt that there would be a problem of the hinges not staying glued in place. Because of this, I glued a 1/4 by 1/2-inch lightweight balsa stick to the inside of the vertical fin tail post.

A half-inch thick styrofoam disk for supporting the rudder and elevator pushrods is furnished. Two holes for the pushrods are drilled in the foam disk, the disk is threaded over the pushrods and then slid down into the rear of the fuse until is wedges securely against the fuse sides. A length of 1/4-inch diameter birch dowel was used to push the disk in place as it ends up about half-way back in the rear of the fuse and one cannot reach it using one's fingers. The disk is held in place using 5-minute epoxy. Epoxy can be smeared on via a long piece of scrap balsa.

The two steel jig pins were then removed, and the ply formers and aileron support plate were cut out and installed in the fuselage.

The plans call for a Robbe linear aileron servo. If you have a linear servo that will fit in ths area, then you are home free. Otherwise, you will have to do some changing around to have the aileron servo align with the aileron pushrods. I didn't have a suitable linear servo, so I used a Kraft KPS-24 rotary servo. The formers and aileron servo plate were temporarily installed. The wing joiner dowels were slid into place, and the wings were installed. I then marked the servo outline onto the aileron servo support plate, removed the assembly, and cut a starter hole in the aileron servo support place for the servo. Wings and dowels were then removed, and the formers and aileron support plate were glued in place.

The airbrake assembly was installed next. I found that I had to open up the precut hole in the fuse to allow the airbrake to close flush with the fuse top. I then reassembled the wings to the fuse and opened up the hole in the aileron servo support plate such that the servo, when installed, would allow the servo wheel to line up with the aileron pushrods and not interfere with the airbrake operation. With my installation, I found it necessary to bend the aileron pushrods back slightly, so that when connected to the servo, they wouldn't interfere with the airbrake hinge assembly. The large star wheel was used on the servo, and a quick link was soldered to the left hand aileron pushrod. This quick link hooks into the left leg of the servo star wheel. The right hand aileron pushrod is connected to the right leg of the star wheel via a short piece of 1/16 inch diameter wire attached to the star wheel and a wheel collar clamping this wire and the aileron pushrod wire together. I know it sounds like a *kluge*, but it works, and I have experienced no problems with it to date.

The rudder is installed next, along with the rudder control horn and pushrod assembly. The rudder quick link, as well as the aileron to bellcrank and airbrake control rods, are adjustable via threaded steel couplers, one end of which is soldered to each control rod.

The tow hook assembly is installed next, and held in place via three bolts and nuts. As I do a lot of slope soaring, I made this assembly removable by making a nut plate out of 1/16-inch thick ply, gluing the nuts to this plate, and then gluing this assembly to the inside of the fuse.

The forward ply servo floor was then set in place, and the servos were temporarily put in position to locate their proper position. Plans show Robbe rotary servos and servo mounts. I used Kraft KPS-14's, and fabricated servo mounts which are glued to the floor of the servo plate. The servos were then mounted to servo plate, and the assembly put in place (plate not glued).

The airbrake pushrod assembly was then fabricated and installed. This assembly consists of an adjustable universal joint type assembly attached to the servo wheel, and a quick link soldered to the airbrake end. The entire servo assembly was aligned, and the servo plate was then glued in place. This assembly was positioned at the exact location as shown on the plans. The radio, switch harness, and battery were then installed, rudder and elevator pushrods hooked up, and control surface throws checked out.

Next, the wing dihedral dowels were put in place, and the wings were assembled onto the dowels. The wings are held in place by four wing retainer bolts (two per wing). These so called "bolts" are plastic dowels, notched at one end, a steel screw eye hook at the opposite end, and a small diameter hole drilled through the dowel part-way along its length. The notched end of the retainer bolts are pushed into the wing retainer sockets until a loud "pop" is heard. The wings are slid into position on the fuse. A tensioned rubber band (furnished) is then put over the screw hooks, front left to front right, rear left to rear right. These hold the wing in position, and keep them from sliding off the dowels during flight. With the wings held in

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place via the rubber bands, the wings are checked for proper dihedral, and the steel wing dowels are epoxied in place. The aileron pushrods are connected to the aileron servo and adjusted for proper throw . . . which is AS MUCH THROW AS YOU CAN POSSIBLY OBTAIN!!!

The wings are disassembled in the following sequence: open the airbrake, disconnect the aileron linkage, pull one wing panel away from the fuselage until the holes in the retainer bolts are visible, plug the stop rods (furnished) into the holes and rotate them one way or the other until the retainer bolts disengage from the retainer sockets. The stop rods are left in place in the retainer bolts. The tensioned rubber bands hold the rods and retainer bolts in place. To install the wings, simply push the wings into place until the bolts pop into position. The stop rods are placed in their vertical position for this operation. After the retaining bolts are engaged, the stop rods are removed, and the ailerons are hooked up to the aileron servo.

The canopy was then fitted to the fuse. This required minimal trimming of the edges to achieve a good fit. The front of the canopy is held in place by a notch which is cut in the leading edge of the canopy (I used a small die sinker file to cut this notch). Sliding this notch under a sheet metal screw head which is attached to the fuse secures the front. The rear of the canopy is held in place by a Zues type fastener. A quarter-turn of the fastener's slotted head allows removal of the canopy.

BALANCING

Even though I had the 500 mah pack and receiver as far forward as possible, I had to add several ounces of lead in the nose to achieve the balance point indicated on the plane. I feel most of this tail heavy condition is the result of the heavy rudder. Finished, ready to fly, all-up weight of my bird is *five pounds, four ounces.*

FLYING

I did the first test flight at a place called Poli Poli wich is located at around the 4500-foot level of Mt. Haleakala. This slope is located such that it is a couple of hundred feet below the cloud line (dew point terminator). On a GOOD day, a lot of half-way decent thermals are generated. The warm air from the valley results in a very light breeze which a thermal soarer can use as slope lift and get up to where the thermals are popping. On this particular day, there wasn't much activity, especially for a heavy bird like mine. Although a couple of people were getting plenty of flying with their two-meter floaters.

Undaunted, I assembled the machine, took a couple of photos, and then heaved it out over the slope. With the ship being so heavy, I had already fixed in my mind that it would have an L/D of a dump truck, so I was prepared to keep it as straight as possible and at least try for a half-decent landing. Was I in for a surprise! The old gal took off like a bullet, and instead of dropping like a rock, darned if it didn't maintain its altitude!

The thermals were non-existant when I launched, but the slight breeze was creating some spotty, very light slope lift. The ship looked like a stone skipping across the water. As it hit some lift, it would gain a bit of altitude, drop down slightly, and then repeat this again when it hit the next up draft. Consequently, the plane wasn't gaining any altitude, nor was it losing any. With this no-win situation, there was nothing to do but make a gentle right hand turn and come back to the launch site.

The ailerons are quite effective, but you do have to coordinate rudder and ailerons in the turns, otherwise, using ailerons only results in a pronounced skid or sideslip when rolling into and out of turns. On the return leg, I tried the airbrakes, but I wasn't able to reach any conclusions as to their effectivenes. They didn't appear to change the trim. The landing was uneventful, and I was able to flare the ship nicely without running out of elevator.

The only conclusions that I could make at this poing were: 1) it is *FAST;* 2) elevator response is not touchy, even though the model is rather short coupled; 3) the ailerons do raise and lower the wings; 4) the airbrake doesn't appear to cause any adverse trim changes around the lateral axis (pitch); and 5) it will fly.

I hung around for a while, but activity did not increase, so I packed up and went home.

The following Saturday, I rounded up my son Perry, who is my photographer and pack mule, and went to my favorite slope soaring spot at Kahakuloa. The slope is a 375-acre field which drops down at about a 15 to 20-degree angle for some distance, and then drops almost vertically to the ocean. It is approximately 1500 feet above mean sea level. It is a beautiful spot, but a lot of climbing is necessary to get to it.

We assembled the glider at the car, and with the plane, transmitter, fishing tackle box with the necessary tools, two SLR 35 mm cameras, video camera and recorder, we proceeded to climb up to the field. Upon arriving at the flying site, we found the wind to be a gentle 10 to 12 mph breeze.

With Perry manning the cameras, I heaved the glider out over the slope. When it hit the updraft (or vertical shear) at the cliff, the plane climbed like a homesick angel. *SUPER!* With this lift, the plane really came into its own.

It is fast for a glider, and the controls are responsive. With the plane cruising along, the ailerons are quite responsive. Slow it down too much, and get a wing down, you are in trouble . . . unless you have enough altitude to put the nose down and get the plane's air speed up. Penetration is excellent, and elevator trim is very effective.

Now for the picture taking segment: I had a few frames of B&W left on my Nikon F, and as we had a new roll of B&W with us, I told Perry not to bother putting the telephoto lens on the Nikon.

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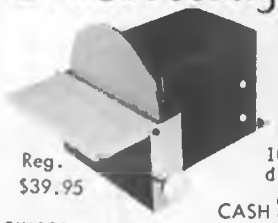
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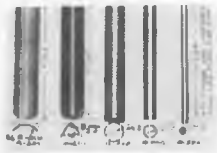
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This would have necessitated transferring it from the Canon to the Nikon. Anyhow, he shot the remaining B&W frames, and because I wasn't too familiar with the plane at this point, I didn't attempt to get the ASW-19 in very close to the camera. I wasn't too concerned . . . we had another roll of B&W. . . .

Upon opening the fresh, NEW box of Kodak Plus-X, I heard Perry say, "Uh-oh! Guess what? There ain't no film cartridge in the plastic container!" Here we were, ten miles from town, a butt-busting climb to the site, and we have no B&W film. *SUMBISH!*

Oh well, there was nothing left to do but shoot the transparencies with the Canon and the 90-350mm zoom. After completing this task, Perry fired up the video equipment and shot about 30 minutes worth of flying, including my attempts to land!

There is a flat area on the top of the slope where you can get out of the lift and land. You can also come cross-wind across the top of the slope and slip the plane in for a landing. As luck would have it, there were two groups of horses grazing in both landing areas. All I could do was fly downwind past the lift, turn into the wind, deploy the airbrake, and try to set it down between the horses and just before the brow of the hill.

The first attempt proved one thing: the airbrake will not slow the plane enough to land, unless you can make a long, shallow approach to bleed off the airspeed. This can be done without using the airbrake.

Just before touchdown, the plane hit the lift, and up it climbed, airbrake deployed and all! Three more passes ended up with the same results, and the horses would not move from where they were standing . . . even though my final approach was right between the two groups. By this time, the plane had been airborne for one hour and 20 minutes, and enough was enough!

On the final attempt, I brought the plane down as low as I could, and just as the plane came over the brow of the slope, I pushed the nose down. The plane skidded across the grass, hit a tufted hummock, and flipped over onto its back, knocking off the horizontal stab.

When I got to the plane, I found the epoxied glue joint had failed at the vertical fin. The nylon bolt didn't shear. The tailplane support has since been glued on with Hot Stuff.

SUMMARY

Although this is an ARF kit, it took me 70 hours from the time I started, until it was ready for its first flight. I'm sure that it can be constructed in a far shorter time. Part of this time was used in figuring out the aileron servo hook-up. I also took great care in aligning the flying surfaces, and paying attention to details. After all, this was or *is* a product review, and the manufacturer deserves to have his product assembled and tested as close to his specs as possible.

This care and attention paid off as no trim changes have been required to date. The plane does spin nicely, but I feel that I have a tad too much weight in the nose. I have read and heard it said that there ain't no such thing as a model (kit, not scratch built) flying right out of the box without having to make some trim adjustments. In this case "tain't so", and I have three witnesses (glider guiders) who can attest to it. I will admit, however, that it doesn't happen to me very often, but once in a while I get lucky.

I only have a couple of criticisms, and they are meant to be constructive: I would like to see the construction sequence changed so that the flying and control surface construction and covering are performed in a serial sequence. Presently, the rudder is constructed and covered just prior to installing the radio gear. This is *OK IF* you have lots of room in your workshop where the carving and sanding of the rudder will not let balsa dust get all over the rest of the model. Otherwise, you have to prepare for construction and covering twice. The balsa block for the rudder could be made from a much lighter piece.

I would like to see a piece of balsa included which could be attached to the inside of the vertical fin tail post to give the hinges more area to glue to. This should be of light balsa also. There are a couple of areas in the instructions that are confusing, particularly the aileron hinging and airbrake installation, but careful perusal of the instructions and studying the pictures will eventually sort things out.

There is one area that concerns me, and that is the method of using quick links to attach the aileron pushrods to the aileron servo. If you should have a landing hard enough to shift the wings, structural damage could conceivably occur, i.e., tearing an aileron horn loose, or damaging a servo. Perhaps a break-away connection at the aileron servo could be devised. I haven't experienced any problems yet, and I've had some pretty tough two-point landings (nose first, then tail).

Robbe advertises this as a "high performance sailplane," and they ain't just a woofin! It flat goes! In fact, you can tear the wings off if you go "down hill" too fast. This baby is so clean that it will accelerate to this condition before you know it. This condition can be readily detected, as the wing tips will start fluttering. When this happens, deploy the speed brake immediately, and gradually ease in some up elevator. The airbrake is effective for this, even though it doesn't seem to do much elsewhere.

This is definitely NOT a beginner's airplane. However, if you are getting a bit jaded flying the average ho-hum thermal soarer, then build and fly this baby. Not only is it fun to build and fly, the completed plane is a beautiful Standoff Scale model of the ASW-19. In fact, you don't even have to fly it to get attention, just take it out to the fields, assemble it, and stand back. I find that this plane attracts more attention than

flies to honey! Even the local power fliers who normally turn their noses up at gliders are interested. I fly power as well as gliders, and during the course of construction, all of the power fliers that dropped in to visit were quite taken with it, and wanted to be present when I flew it.

After the first test flight, a stranger who had been watching from the safety of his car, came over and introduced himself as a modeler from the state of Washington. He stated that the plane was about the prettiest glider he had ever seen, and where could he buy one. I showed him the plane, and at that point he gave me his business card. He asked me if he sent me the kit would I build it for him as he didn't have the time. I told him that my time was quite expensive ($1.25/hr); he stated that he didn't care how much it cost, he wanted one! Now that's a pretty good testimonial for an airplane.

To date, all of my flying has been slope soaring, and I have not yet had the opportunity to do any flat land thermal soaring. This is mainly because my heavy duty high start bungee has seen better days, and it won't even launch a two-meter job. My flying buddy, James Martin, has a home built, gasoline powered winch that has enough pizaz to launch the space shuttle. I hope to use it when we get a good thermal day. I'm sure that the plane will thermal well, given the right conditions. Its directional stability is very good, so there should be no problems going off a winch or high start.

A word about the flying weight ... Robbe's magazine ads state a flying weight of 4-1/2 pounds. However, the specs in the instruction book give a flying weight of 2400 g which, I believe, works out to 5 lbs., 4.6 oz. So, my plane's weight of 5 lbs, 4 oz. isn't too far off. But, it could have been lighter if it wasn't for the extra nose weight necessary to compensate for the hard balsa rudder block.

The ASW-19 is a fine kit, and the factory workmanship is excellent. The price is downright reasonable for the quality and performance.

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Jomar SC-1 . . . *Continued from page 19*

attach a pigtail to the SC-1 so that it can be plugged into the throttle jack on the receiver, and to wire the other side of the unit into your motor wiring harness.

You also need to make and install a sheet aluminum heat sink of at least four square inches so that heat can be dissipated from the power MOSFETs which actually handle the motor current. The instruction sheet that comes with the control concisely describes how to do this, and I will only add some hints and comments based on my experience.

Firstly, I resisted mounting the diode (which is for suppressing the RF spikes that result from rapidly turning the motor on and off) directly to the motor, as I wanted to use the controller with several motors, and because some motors, for example, Astro Flight cobalts, don't have exposed terminals that one can solder to. I wired the diode into the harness at the motor connector. This can be seen in the photo where the controller and wiring are pulled out of the bottom of the plane. It seems to work satisfactorily, but Joe Utasi (who is Jomar) feels that the farther the diode is from the motor, the more chance some RF noise will be radiated. It therefore seems wise to locate the diode as closely as possible to the motor. *Be sure to get the polarity correct on the diode.*

By the way, if it is desired to solder a diode to more than one motor, diodes with the proper ratings (3 amps, 200 volts) are available at Radio Shack (Cat. No. 276-1143) at two for 89 cents.

The motor wiring can be done pretty much as shown on the instruction sheet. Be sure to use large enough wire in the motor harness (at least 18 guage), and be sure to make the wiring harness long enough for the installation you have in mind. Most ferrite motors draw at least 10 amps at full power; the cobalts can draw up to 25 or more.

The only things to watch for in making up the lead from the controller to the receiver are correct polarity and adequate length for the pigtail (so you don't have to do it twice, as I did). Getting a connector to match your receiver may be the hardest part.

The requirement for a heat sink may be the most peculiar part of installing the SC-1 in your plane. I used some 1/32 aluminum sheet (from the K&S rack at the hobby shop) for a minimum size heat sink of four square inches for bench tests, and for the heat sink in my large *Showmaster* for flying tests. To attach the SC-1 to the heat sink, I followed the instruction sheet's suggestion and used some short 4-40 machine screws and nuts through the tabs in the MOSFETs and holes in the heat sink (1/8 inch drill works fine). During my bench tests, the four square inch heat sink got warm to the touch. The one I'm flying, which is about nine square inches, barely gets above ambient air temperature. The heat sink on the bottom of the plane turns out to be a very convenient way to mount the SC-1 anyway, as you bolt the unit to the heat sink, then use it as the bottom skin of the fuselage near the motor, instead of 1/16 plywood or whatever (see the photos).

Once the unit is all wired up and a heat sink is attached, there is one adjustment to make: setting the high throttle point with the pot in the circuit board (indicated by the pecil in the photo). Hook it all together on the bench: motor (no prop), control, motor battery, receiver, receiver battery, and transmitter. TURN ON THE TRANSMITTER FIRST and be sure it is set to low throttle. (If you turn on the receiver first and the motor is on, it will start and run up to full power.) Then turn on the receiver, and finally the motor switch. Nothing should happen. Now, slowly advance the throttle stick. You'll hear a whistling

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sound and the motor will start to run, slowly at first.

Finally, go to full throttle and then, using a small screwdriver, adjust the pot so that the whistling just stops at high throttle (with the trim where you would normally have it for flight). Then pull back to low throttle. The motor should just stop.

That's it.

If you turn the pot too far in one direction, the motor won't stop at low throttle. If you go the other way, you'll never get to full throttle. I found that I didn't need to use the trims on the transmitter at all to achieve the off to full power range.

For higher currents than 12-15 amps, you may also connect the negative (–) motor lead to the heat sink rather than the circuit board.

BENCH TEST DATA

The SC-1 very smoothly throttles the motor, from a minimum speed (which is dependent on the motor/prop/battery combination) up to full power. The motor responds to movements of the throttle stick as quickly as the inertia of the motor and prop will allow . . . there is no noticeable lag.

The power loss for the motors I tested (several 05s) ranged from 250 to 500 rpm on direct drive, with a corresponding decrease in current draw of about one amp. For example, the Astro 05XL Sport which I tested (eight-cell wind, seven Sanyo sub-C cells) turned a Cox 6X4 at 11,700 rpm without the control, and 11,300 rpm with it at high throttle. At the half-throttle position, it was turning 8,000 rpm, but drawing only 1/5th the full power current! The minimum speed this combination would run was 2,300 rpm. Moving the throttle stick lower caused the motor to stop.

The control itself draws almost nothing from the receiver pack . . . the best measurement I could make gave me a figure of approximately five milliamps regardless of throttle position, which is less than an idling (not moving) servo. So, for flight time considerations (for sizing the receiver battery), the throttle channel need not even be considered.

In general, the unit performs outstandingly.

I did have two minor problems with it, though. The first one was that its use seemed to accentuate the natural sensitivity to motor noise of the receivers I use (Royal Vanguards). It took me awhile to come up with a satisfactory installation that gave me adequate ground range. Normally, my motor-on ground range is much less than motor off, but with the speed control in the circuit, especially near "idle", it was a little worse. The instructions suggest a couple of possible noise "fixes".

The other "problem" I observed was a slight control interaction between the throttle and the other functions (rudder and elevator) on my test plane. This showed up as a slight slowing of the motor when, say, the rudder was commanded to move, until it reached its new position. Then, the motor resumed its previous speed. This is only noticeable on the bench or during taxiing, and even then it's not much of a problem. In the air, it is unnoticeable.

HOW IT FLIES

In a word . . . *great*. A typical flight might go like this: I set the plane down at the end of the taxiway, turn on the transmitter, receiver, and motor switches (in that order), then advance the throttle just enough to get the plane to move and taxi down to the runway. I pull the stick to low and stop the motor to check for traffic. When it is clear, I taxi out to the takeoff position, stop, then advance the throttle to full power to take off and climb out. I then pull back to about 3/4 power to cruise about.

At this point, I might get into the landing pattern to shoot a touch and go or two. With full, precise control, these are much easier. If I'm way too high I can throttle back all the way to off, then feed in power again whenever I need it.

Another possibility is to climb up and throttle back to minimum sink and cruise up high for up to 15 minutes. Then, when it's time to land, I can come in, touch down, then taxi back and shut down before entering the pit. In other words, I can do anything I could do with a good running, reliable gas engine, with the *additional* ability to start and stop the powerplant without touching the plane. This is nice on a badly done "touch and go" (yes, I admit it!) where a gas engine would be killed, but as long as my prop isn't broken, I can still do the "go" part.

I regularly get 13 to 20 minutes of *powered* flight on a system that would normally run about seven to eight minutes without throttle (Astro 05XL Sport). One calm evening, I had a 15-minute flight of nothing but shooting touch and goes. Another flight, where I was showing a non-R/C pilot friend what it was like, I took the *Showmaster* up high and set the throttle and trim so it would just maintain altitude. That flight lasted 20 minutes, during most of which my friend Mark had a ball steering the plane around in the sky.

On landing, I have never noticed the heat sink on my plane to be much more than just slightly warm to the touch. Very little of the power is being lost as heat.

MISCELLANEOUS COMMENTS

For those of you who want to know how the SC-1 works in detail, Joe Utasi had a construction article in the June 1983 issue of *Model Aviation*. In it he describes why he developed the SC-1, how it works, and for those so inclined, how to build one rather than buy one.

For those of you, like me, who'd rather buy one, they may be available at your favorite local source for electric power goodies. However, again if you're like me and have no such local source, they are available directly from Jomar for $49 postpaid. I have made a couple of orders to him in the past few months and his service is quite fast. I was getting them in about a week to ten days, which isn't bad for round trip mail from Wash-

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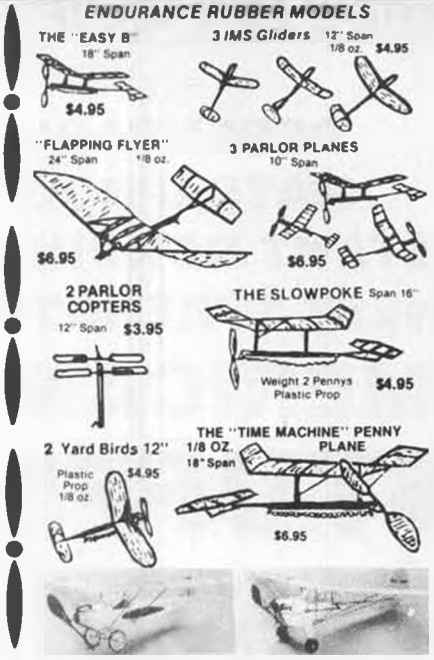

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ington state to Ohio. Also, if you order four or more, there is a 25% discount, which makes the price $36.75! The address is: Jomar Products, 2028 Knightsbridge Drive, Cincinnati, Ohio 45244, and the telephone number is (513) 474-0985.

For those who want an even more efficient controller, or would like an override function for no loss at the top end, or would like to switch in a braking resistor at low throttle, Mr. Utasi has developed a new control, the SC-2, which incorporates all these capabilities. It has four MOSFETs in parallel instead of three as in the SC-1, so the loss will be 25% less at full power. It also has the capability to control relays both for high and override (so that there is *NO* loss) and for a braking resistor. All of this goodness has a penalty . . . a slightly larger, slightly heavier unit than the SC-1 (though still less than one ounce unwired) and an $11 higher price. Also, the installation will be somewhat more complicated if either or both of the relay controlled functions are implemented (they are not required to use the SC-2).

I have an SC-2 to test, and hope to try it out on my Cobalt 05 and Cobalt 40 motors. It is available now from Jomar along with the SC-1.

All in all, the Jomar SC-1 is just what the doctor ordered for any electric plane. Get one, or better yet, several.

ADDENDUM

The SC-1a was developed to "toughen up" the original SC-1. It is easier to use with power packs of 10 cells or more. The ground trace has been widened on the circuit board to handle the extra current load without any additional reinforcement. Without any further modifications, the SC-1a can handle up to 20 cells (or 35 volts).

Included with the updated SC-1a instructions is a section on troubleshooting . . . just in case your R/C system "acts up." The newcomer should be successfull with his electric system the first time out. •

R-22HP . . . . . *Continued from page 39*

the wire, otherwise the epoxy will have difficulty holding on to the round wire, and the stinger will easily break loose.

PAINTING

All ABS and aluminum must be sanded with 600 paper before painting. Time and time again, K&B Superpoxy has proven to be the only way to paint a model. I primed everything with K&B primer, sanded it wet with 600, shot the base white, sanded it wet with 600, shot the red trim, and sanded it with 600 wet. Then, I added the panel lines with India ink and the registration letters cut out of Trim Monokote. A final coat of Superpoxy clear sealed everything, making for a long lasting, durable finish.

INSTRUCTIONS

For the majority of assembly, the instructions are good. Keep in mind that the kit is for intermediate skills and up. It is not a novice's helicopter.

Probably the weakest area of the instructions is in detailing the cut of the ABS pieces. Here you have an item that is molded out of a large flat piece of plastic, and nowhere does it tell you where the excess plastic ends and the real piece begins! However, a few photos can save you the several hours it took me fo figure everything out. CMI is aware this problem, and they will be making suplemental photos and drawings available.

The other hazy area is the arrangement of plywood and foam tape for the fuselage support at the front landing gear attachment point. I still don't know how they wanted it done, I just know that what I used is working fine. I trimmed the plywood pieces endwise so they fit between the side frames, and epoxied them (together) to the side frames. Then, I added one-sided sticky foam tape to the plywood support. When the fuselage is in place, the landing gear squeezes the fuse against the foam tape, giving firm yet cushioned support (photo).

As we're looking at the instructions, I'll throw in a few "assorted hints" at this point. (1) Bush the hole where the throttle push rod runs through the firewall. I used a short length of Ny-Rod. (2) Wrap the mainshaft pipe with cloth tape to prevent the elevator(!) lever plate (2-01) from rubbing against the pipe and generating electrical noise. (3) Don't get Loctite on the ABS pieces, it will eat them up . . . (4) Shorten the lengths of pushrods 5, 6, and 7 to 35mm, 35mm, and 50mm respectively. (5) Make all pushrods and "break in" the ball links before assembling the MCS. Don't assemble the MCS with only the ball links as the drawing shows.

RADIO INSTALLATION

I used Airtronics' long awaited single stick helicopter radio with 554 series coreless servos. A more complete review is in the future, but I will say that this radio has impressed me with its solid performance. Not one glitch to date. The servos really excite me too. There is virtually zero deadband, and they deliver 73.5 oz. in. of torque! *Strong, tight servos are an absolute must for any flybarless helicopter.*

Back in the February 1982 issue of **MB**, I discussed various control forces needed for flybarless helicopters . . . 40 oz. in. *minimum, preferably more.* That was over two years ago, when anything over 40 oz. in. of torque was "special". Servo technology has advanced dramatically since then. Quite frankly, if you want the best performance from your R-22, don't skimp on the servos.

The 554 servos drop right into the preformed metal servo tray. JR and Futaba servos will also fit perfectly. With other size servos, the trays may have to be modified slightly. You will have trouble if your servos are *larger* than these mentioned. Each has mounting holes spaced 10 mm wide (center to center), and 48 mm long (center to center).

Due to the CG in the R-22, a 1200 mah pack should be used in the radio box. If a gyro is used, its 500 mah pack will fit nicely under the dash (photo). Even at this, some lead will probably have to be added to the nose. My extra lead is shown in the photo of the front landing gear attachment point and fuselage.

With my stock 1200 mah battery pack in the battery box, there was not room for the receiver with sufficient foam padding. I improvised slightly and de-

signed 1/8th inch plywood "ears" on either side of the radio box (photo). They screw to the flange on the side frames provided for the radio box. The ears also offer a neat attachment point for switches and charging jacks.

SETUP

Any flybarless helicopter will have more critical setup than its flybar counterpart. Again, this kit is for people who know what they're doing during setup. If you follow the given guidelines, you won't have any problems. The first item of setup is the washout control (6-10).

Proper phasing of the washout control is something you want to pay careful attention to. As you stand over the tail and look down over the body of the helicopter, the front rotor blade should be placed at the 11:30 position on the clock, or just to the left of the nose. With the blade at this position, move the washout control so it is perfectly parallel to the fuselage's centerline. Tighten the set screw. You are essentially "leading" the control into the blade before it reaches the 12 o'clock position. (In the full-size R-22, the control actually "lags", or comes in after the blade has passed 12 o'clock.)

If you set the model up with the blade and washout control in line, it will hover very crisply, but it will precess once at the end of an approach (one rotation of a pie plate as it spins down on a table top). The adjustment process above takes a little crispness from the hover, but eliminates nearly all of the precession on approaches.

Kobe's gravity guided pitch gage works well, make sure you use it. Collective pitch angles should run anywhere from -1 to -2 degrees at idle, 2-1/2 to 3-1/2 at hover, and 5 to 6-1/2 at full pitch. This is with a strong O.S. 50 FSR-H from sea level to around 1,000 feet. Your numbers will vary slightly depending on these various conditions.

To arrive at these numbers, stand at the front of the ship and look at the radio compartment. I'll describe servo throws in terms of positions on the clock. The collective servo should run from 3:00 to 3:30 (flat pitch) to 5:00 to 5:30 at full pitch. Because the MCS is very linear, *you have to run differential throw at the collective servo.*

For the throttle servo throw using a strong .50 engine, start at 5:30 to 5:00 at idle (high trim), running to 3:00 to 2:30 at wide open. For weaker engines, these numbers will change for more linear throttle throw to 4:00 to 4:30 to 1:30 to 2:00. Any .60 used will have to be set up using the "strong engine" arcs.

Cyclic pitch throws should be set up to provide four to five degrees of blade pitch in one direction; i.e. neutral to full right cyclic. Cyclic pitch throws are much more critical on flybarless helicopters. *Measure them.*

BLADE WEIGHT

As the blades are being built, you can vary the tip weight if you want. I would suggest an absolute minimum of two pieces of lead. (Three is the most you can

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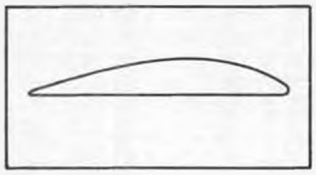
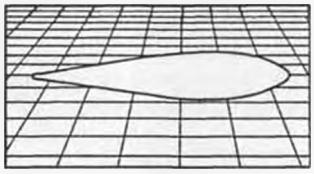


A flat-bottom airfoil used by some trainers changes lift with speed, won't fly inverted, etc



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have.) Two and a half is a nice average. As the tip weight decreases, the control response will be faster. As the tip weight increases, the response will be slightly slower. For scale flying, use all three pieces. For scale flying with some "razzle dazzle" occasionally, use two and a half pieces. If you want quick response the majority of the time, use two pieces.

In any case, the blades must be balanced so that the CG is identical in both blades, then the entire head (blades attached to the hub) should be balanced on a High Point balancer.

FLYING

Before flying, a thorough check of the entire helicopter is in order, after which you can make provisions to strap it down on the initial runup stand. (See February 1984 **MB** for suggestions.) I do want to mention that for any of the flybarless helicopters, keep cyclic input to a bare minimum while the ship is strapped down. This is a good idea for all types, it's just that anything that approaches a rigid rotor becomes more critical as there's so little give at the rotor head.

Once everything has proven glitch free, track the blades, double check the rotor rpm, and lift it off for some hover work. You'll find everything very positive, yet smooth. Lift-offs and setdowns should be done with care as overcontrolling on left-right cyclic can result in a quick tip over. The rotor head is very powerful because it is nearly locked to the main shaft.

Forward flight is extremely smooth, with excellent disk rigidity. More forward cyclic than what you're used to will have to be fed in during forward flight. This is because the rotor disk flaps significantly less than a flybar helicopter. Less flapping must be compensated for by additional cyclic input.

With strong servos to handle the rotor head, the R-22 is capable of loops, rolls, and split-S's. I have not personally tried any aerobatics with it yet. There is no question about the ship being capable, as it has won at least one aerobatic competition in Japan. I just like to fly it as a scale helicopter.

ASSORTED HINTS AND MODS

I gave a few of these earlier, so there's not much left on my list. I did modify the tail rotor control run. I used a piece of piano wire inside the small piece of Ny-Rod provided. This way the tail rotor trim doesn't change with temperature.

CRITIQUE

Below I've listed the points I feel are a little weak, along with the strong points in the R-22.

POINTS THAT NEED IMPROVEMENT

1) The MCS should have better bushings (ball bearings) to keep it "tight". There is a tendency for it to loosen up (with an increasing number of flights) more than it should. Suprisingly, the looseness doesn't show much in flight, which is good. This is because the looseness primarily affects roll, which is not nearly as critical as pitch.

2) The antirotation link for the swashplate develops play fairly quickly, too. It could use better bushings.

3) The stock fuel tank is too small.

STRONG POINTS

1) The flybarless rotor head, rotor blades, and control system (MCS) represent the state of the art in flybarless technology. The "guts" of the helicopter are very well done.

2) The R-22 is not only extremely scale in looks, but in construction as well. You get a beautiful model that is trouble free, and can be flown on a day-to-day basis with little maintenance.

3) Overall quality is high.

4) While it is scale, it does have the capability to loop and roll for you. But please try to fly it realistically . . . .

That concludes the review on the R-22. Due to my time pressures, the column will appear every other month, even though there is enough material for *two* columns a month. For details see Bill Northrop's April *Workbench*. See you in two months. . . .

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Seaplanes . . . . *Continued from page 22*

Perhaps a note is worthwhile on those aircraft that use long floats or hulls (like Henry Struck's venerable *Seacat*). The "long planning hull" works well if the aircraft is light and uses a high lift wing/tail configuration. In this case, relatively little forward speed is required to develop the necessary lift for takeoff.

The actual step height can be relatively small. The step allows the aircraft to run on the surface with the minimum amount of the float bottom area in contact with the water. This minimizes water drag, water tension, and Bernouli Effect. The latter effect tends to cause the float to be pulled into the water as its speed increases. It is related directly to the amount of area exposed to the water.

A number of special step designs exist: tapered, "ventilated," viper (fork shaped), etc. All of these have some virtue. However, a simple step seems to

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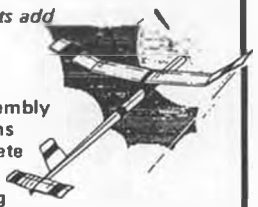

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work well for model applications.

The same can be said for the float/hull bottom designs. A flat or simple vee shape performs well. Curved vees and reversed vees (so called "cathedral" bottom) and several other variants have been used, but no striking advantage is apparent.

Incidentally, full-scale floats/hulls use vee bottoms to ease the jarring that occurs when going through rough seas. This makes for passenger comfort and longer airframe life. Neither of these are of any real concern in the model case.

Attention should be given to the chine edges. These should be relatively sharp to cause the water to break cleanly away from the float. The water should be thrown to the side and not up onto the model, the gear struts, and, especially, not into the propeller. The latter will rob power (particularly during the early part of the takeoff run) and can prevent takeoff.

Models with undersized floats/hulls perform pathetically. Full-scale seaplanes would perform the same way. Therefore, full size floats *are* large and generally conform with the rules given above. Models must cope with scale wave heights that are *far* bigger than their full-size equivalents . . . again, this calls for *large* floats.

To float the model nose high, the fore body of the float/hull must be larger than the after body. Incidentally, it is nice if you can arrange it to have the overall float and mounting strut assembly *by itself* balanced at the step. This means that it will cause minimum unbalance to the aircraft when it is added to the land plane configuration. If you look at the drawings that accompany this article, and generally follow the configuration recommended, this will occur without special effort. Additionally, note that (in the side view) the bottom of the fore-body rises sharply from the step forward. This provides an upward force as the model moves forward and tends to get it "on the step" quickly. Even with this pointed step design, models are normally easy to run at high speed on the water. Some down elevator with high motor speed will allow you to travel at good speed without taking off . . . a great feature when you want to get back to the dock quickly.

FLOAT MOUNTING CONSIDERATIONS

Floats will be more efficient if they are made in a rigid assembly tied together with a good set of struts. Nonrigid float assemblies tend to warble across the waves, toeing in and out and up and down. This creates unecessary drag, hard steering, and frequently results in destruction of the struts. It goes without saying that the rigidity we are discussing is an inherent feature of the flying boat configuration.

Floats should be well separated to help prevent capsizing during turns or because of side wind. Separation of the float centerlines by at least one-quarter of the wingspan is a good rule. More than this will help water landing but may cause some aerodynamic problems in turning.

The angle of attack (if this term is appropriate) of the floats is ideally that which minimizes aerodynamic drag and causes no tendency to climb or dive. Actually, it is always interesting to find how little change there is when floats are added to a land plane model. For well designed floats, a slight negative angle appears best.

If your floats are not the best design, and takeoff is difficult even at full power, try considerable negative angle. This will raise the nose and increase the lift while running for takeoff. The added drag most likely will be very little noticed and can be offset with a bit of up trim. In any case, this approach may save the day if you are an occasional water flyer.

Wing tip floats are most effective and strongest if they are like those used on the Lake and Teal amphibians. These do not use struts to mount them. They maintain the float shape all the way up to the wing. They provide increased righting force the farther they become immersed. Strut mounted tip floats provide no increase in righting force once they become submerged.

SEAPLANE CONSTRUCTION

The most important aspect of seaplane construction is waterproofing. Yes, you can fly a model off the water that isn't waterproofed. Even if it gets wet, if you dry it out quickly the damage will be small (even to the radio gear). Incidentally, flying from salt water is *not* advised! Even with good waterproofing, it rusts or corrodes anything it can get at: linkages, motors, metal fittings, etc. If it does get to the radio . . . all bets are off. The best thing to do in this case is to thoroughly rinse the radio in fresh water and dry quickly.

Some ambitious waterproofing approaches have been seen and published. However, the most practical is to make the fuselage compartment(s) that contain the radio "watertight," and seal the inside of *all* the structure by coating it with clear dope or epoxy. These may be diluted 2:1 with thinner to make them easy to apply.

A compartment can be made watertight by using solid bulkheads and providing a "hatch" (with gasket), held down tightly to assure the gasket does its job. Thin (1/8 inch is good), closed pore foam rubber cut into 3/16 strips makes a good gasket. Goodyear Pliobond makes a good adhesive for the gasket material. The hatch can usually be installed with little difficulty under (or over) the area below (above) the wing. (Don't count on the wing itself. It's supposed to come off in a rough landing!) Build a frame under the opening that will accept the gasket and provide mountings for blind nuts to hold the hatch cover in place.

Pine (about 1/8 inch thick) makes good hatch covers . . . but hard balsa is as good. Stiffeners can be added cross grain to assure flatness and that good gasket contact is maintained all the way around. Push rods can enter the compartment (*and* fuselage) through plastic tubing that is a sliding fit. The inner (yellow) part of a Nyrod push rod makes a nice conductor for 1/16 music wire.

Silicon grease may be applied to the entrance and the first inch or two. This will help prevent water entry and rusting. Assuming you do not want your model to double as a submarine, this sort of seal is adequate for push rods that function with straight through motion.

Aileron rods that do not have a straight push-pull action are more of a challenge. Commercial plastic fittings are sold to do this trick. However, the most effective devices are homebrew. The author uses a "split bell crank" method. The crank is split such that it has one arm inside

connected to the servo rod and the other outside arm connected to the control surface via a rod and horn. The crank bearing provides the water seal. The crank is made from shim brass and telescoping brass tubing soldered together.

A popular approach for the occasional water flyer is to wrap the radio parts in sandwich bags and use rubber bands to "seal" them around the cords and servo rods. This will get you through a few flights quite successfully. However, the *real* joy of seaplane flying is the all day flying session where makeshift approaches prove disappointing.

An important reference for the true water enthusiast is George Myers' "Radio Technique" column in the February 1982 issue of *Model Aviation*. In this column, he treats in detail the protection of the electronics gear. Rather than paraphrase his work here, it is recommended that you get a copy and read it.

Many little tricks have been developed, such as the Witkos rudder discussed previously. Another is the watertight charging jack cover that Lenny Poor first made. To make it, you cut 3/8 of an inch off the top of a plastic pill box that is about an inch or so in diameter. Discard the bottom of the box. The box, top is set into the side of the fuselage, and the box cover becomes the jack cover. The circular cutout (made when you inset the top of the box in the fuselage) can be trimmed and epoxied inside the box top. A hole for the charging jack then can be made in the inner piece and the jack epoxied into it.

Foam or foam filled floats are frequently used. These tend to be heavier than those with built-up structures, but have the distinct advantage of withstanding a lot of rough handling. They may be "holed and flown again with minor or, many times, no repair. If you fly where the shore is rough, or foresee some landings on the beach, bear this approach in mind. Another help in this case is fiberglassing the bottoms of the floats. This, at one time, was the standard way of strengthening float bottoms. Currently, nylon covering for the bottoms is recommended with Silkspan and dope for the sides and top. However, think about how much abuse your model will get and build accordingly.

Cloth and dope still make the driest seaplanes. If you go the iron-on route, make a special effort to seal all of the seams. Much to the horror of some of my friends, I still use Titebond for most of my construction. If the inside of the structure is waterproofed with dope or epoxy, the water from a fair sized crack-up will not cause the Titebond to become untrustworthy . . . *if* you drain the structure promptly and dry it out. A heat gun helps. Do not be afraid to use "open structure surgery" to allow the water to drain. The latter suggestions apply no matter what glue you use!

A PRACTICAL EXAMPLE

Part II of this article deals with the construction of a fun seaplane that proves that most any aircraft lends itself to seaplane conversion. Fred Angel once flew a model glider with floats!

It is best if you start out with water flying in mind and do the recommended waterproofing as you build the model. If you didn't, try the conversion any way. What has been said in the foregoing paragraghs are rules of thumb . . . but not gospel.

Try the water versions of R/C. The landings are always softer, and you can always take off and land into the wind! •

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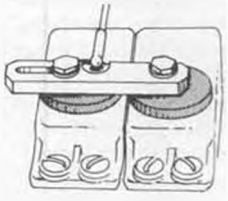
BIG Birds . . . *Continued from page 41*

not being "horsed" around, the hinge line gap was absolutely minimum, and the control system was solid . . . no slop or play at the surface. And yet, for whatever reason, something in the servo electronics died.

So, not only do random failures happen . . . but, in spite of a lot of wishful thinking, they don't always happen to "the other guy." This time, *I* was the other guy! There's no doubt in my mind that this crash could have been prevented or at least minimized, if I'd had two elevator servos on board.

The "funny" thing is that I'd bought one of CB's Servo Doublers to try out, instead of the usual installation where each elevator half is driven by its own servo. As you can see from the sketch, this "doubler" setup brings back memories of the old elevator trim bar used when flying with reeds.



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The point is, of course, that *any* kind of redundancy would have been better than winging it on the one servo.

You know, that crash really hit me hard (no pun intended) in a few ways: I hadn't wrecked a plane in quite awhile, and I was really getting to believe that I was beyond all that. To top it all off, I'd just moved the balance point back six percent which transformed that birdie into a sweet flying machine; she was "on the step."

So, fellow BIG Bird lovers . . . please do as I say, and not as I do. I learned one helluva lesson the very hard way. Not another aircraft is gonna leave my shop without that second elevator servo. Naturally, in a crash, the radio and engine also suffer damage . . . if not complete destruction. I've got three servos to fix and a badly messed up Zenoah. In fact, I shipped the "remains" back to E&L for repair, with a note that read, "Dear E&L: My sweet Zenoah suddenly stopped running, and I'm having one helluva time getting her to turn over. Even the PK Super Starter can't do the trick. Please advise!" I can't wait to see what kind of answer Ernie

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construction of a fun seaplane that proves that most any aircraft lends itself to seaplane conversion. Fred Angel once flew a model glider with floats!

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BIG Birds . . . . *Continued from page 41*

sends back. . . .

DALOTEL

I just finished browsing through Doug Mac Brien's new *Dalotel* plans . . . and he is consistent. Doug can't seem to do anything else but turn out first rate stuff.

He test flew the *Dalotel* with a Zenoah Quartz 2.3 up front, and knowing how well my Zenoah pulled the BIG 'E' (straight up, and up . . .), I can recommend this smooth running powerhouse for your *Dalotel*. It makes no sense to fly an aerobatic aircraft without giving it the power it needs for all wild and wonderful gyrations.

Doug's address is: 24 Truby Street, Granby, MA 01033. And don't forget, with the plans are included some of the best instructions and photos.

FARMAN MOUSTIQUE

And while on the subject of instructions and photos that really do the job . . . Norm Rosenstock should feel good about his Farman *Moustique* package. The plans, eight pages of instructions, and four pages of pntos are all clear and easy to read . . . and they supplement each other nicely. *All* the information is right there, and easy to find. And although his intructions aren't "wordy," they're complete and to the point. After seeing so many construction instructions, and four pages of photos are real cockle-warmer to read Rosenstock's stuff.

This Farman has made me rearrange my priority list . . . *again*. I like it a whole bunch. Why? Because it's an 80-inch, 7-1/4-pound, easy flying bird that's designed for .40 to .60 four-strokers . . . and I *love* four-strokers as much as I love easy flying, classy-looking birds.

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IKON'S STILL AT IT

Still more four-cycle designs . . . from the fertile mind of Emil Neely (Ikon N'West, P.O. Box 566, Auburn, WA 98002, (206) 941-8248). He's really gotten caught up in the four-cycle craze, and because these engines lend themselves so well to powering pre-WW-II classics, Neely has now added a 90-inch Aeronca C-3 *Master* and an 84-inch Porterfield *Collegiate* to his lineup. Both birds weigh in at 10 pounds, and both were designed for sixty to ninety four-strokers. Mr. Neely advises that a 1.2 would be way too much power. I didn't get a chance to fly either of these new designs, but I did watch "Mr. Ikon" wring them out. They both flew well . . . with lots of appeal.

I tried to find out from Emil what he was planning on net, but he wouldn't even give me a hint. From what I remember being kicked around during a recent bull-session, however, I think he's going to pare a number of pounds off of his *Monocoupe* so it'll fly with a big four-stroker, also.

IMAA'S FOURTH ANNUAL FLY-IN FESTIVAL

It's definite! The International Minature Aircraft Association's '84 Fly-In Festival is going to be held at the Sepulveda Basin, Los Angeles County Parks Department, from August 16 to 19.

As always, this will be a noncompetitive, four-day fly-in, that'll be big on fun and socializing . . . and *flying*. IMAA will host a Friday evening family style picnic with live entertainment as well as a Saturday evening gala banquet with good food, music, and dancing.

Guys, take note that there will *not* be any full-scale air shows or unrelated events to detract from the festival format of relaxed, low key flying. There are dozens of hotels and motels within minutes of the site, offering l-o-w rates . . . and there is plenty of room for on-site camping.

This'll be the premiere BIG Bird event of the year, and will probably draw over 500 pilots and close to a thousand aircraft. Each year there are fewer "hangar queens" 'cause most everyone comes to fly.

For complete info packages, contact: Don Godfrey, IMAA President, 91 Blackstone Ave, Binghamton, NY 13903, (607) 724-0115; or Walter Clark, Festival Event Coordinator, 5255-2 White Oak Ave, Encino, CA 91316, (213) 345-3910. The registration and reservation deadline will be August 1, 1984. Don't miss this one!

ROCS SECOND ANNUAL BIG BIRD BASH

The Puget Sound Rocs Second Annual Big Bird Fly-In is all set up for the third weekend in July (21 and 22). We now have our own field (no trees allowed), and will have it all gussied up for the fly-in. There is room for campers and RVs although we don't have any plug-ins.

Natually, we're IMAA and AMA sanctioned, so a current AMA license is mandatory . . . and so is an FCC ticket if you fly on six meters. We'll be flying from nine to six, and all aircraft will undergo the IMAA Airworthiness Inspection (no test flying, please). Safety, of course, is going to be the bottom line!

Our flyer will have a map and motels listed on the back, so drop me a line if you're interested. I'll be the "Bash Boss," and I'll have flyers ready to mail by the time you're reading this. We had a fantastic turnout last year, and from the feedback I've been getting, the '84 Fly-In is gonna be a WHOPPER. See ya in July!

TIP OF THE MONTH

"No man is lonely while eating spaghetti; it requires so much attention."

Al Alman, 605 168th Street, East, No. 95, Spanaway, WA 98387. Thanks for all the cards, letters and photos, guys . . . and don't forget to keep 'em coming. Hey, if you've got a fly-in scheduled, let me know and we'll tell everyone.

FLY SAFELY. •

R/C Boats . . . *Continued from page 47*

teens. They can be machine washed and dried. The Sears Work/Leisure coverall, together with warm shoes, gloves, and a cap for the ears, will offer great protection on those cold days when you're out trying to have a good time with that model boat.

It seems somewhat out of place to be talking about cold weather in a column that will be appearing in a spring issue. However, if I don't mention this now I'll forget about it by the time the weather starts turning cold again. I'm most satisfied with the protection and warmth this outfit has provided. As model boating is something that I generally do out of doors, there is no reason to be uncomfortable.

GO AHEAD, HIT THAT BUOY

It seems like this is going to be the cry this season in a couple of the NAMBA districts out here on the west coast, both Districts 19 and 8 have decided to permit

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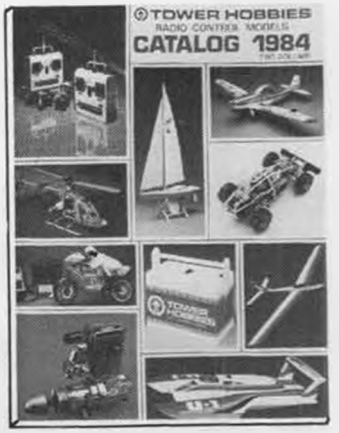

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the hitting of buoys during a race without a penalty lap being assessed. This has not been adopted by NAMBA on a national basis. However, there is some amount of merit to this proposal.

In full-scale racing, it is permissible to hit a buoy and not receive a penalty if the buoy is not destroyed or dislodged. It is sometimes extremely difficult to determine if the model boat actually hit the buoy or if it was the spray off the model that caused the course marker to move. There have been times when I was convinced that I'd missed a bouy that a course judge said I'd hit. There's probably been an equal number of times when I thought I'd hit the marker and the course judge made no call. Anyone who has ever served as a course judge knows how difficult it can be to make some calls.

The change, as adopted in Districts 19 and 8, will actually make corner judging easier. All that needs to be watched for now is boats that miss the marker on the right side. A model destroying or dislodging a marker will be assessed a penalty.

I personally think this proposal will make for much better model boat racing. Many is the time I've seen a really close boat race become no contest when one of the contestants touched a buoy. In most race situations, there's virtually no way one can overcome a lap penalty assessed for hitting a course marker.

In the classes in which I do most of my racing, hitting a buoy often means you end up dumping your boat. It has been my experience in tunnel racing to end up dumping the boat about fifty percent of the time after hitting a buoy. However, the probability of surviving a collision with a course marker with a deep vee or hydroplane design is somewhat better than that of a tunnel. I don't think that removing the penalty will encourage people to attempt to touch the buoys in hopes of gaining an advantage as the possibility of the buoy causing the boat to flip is still a distinct possibility.

Others of you may wish to give this idea a try at one of your local races. I'd be most interested in any feedback you might have after using the idea for a race or two. I feel there is a possibiltiy that a rule change may be forthcoming to have this proposal submitted to NAMBA for national adoption.

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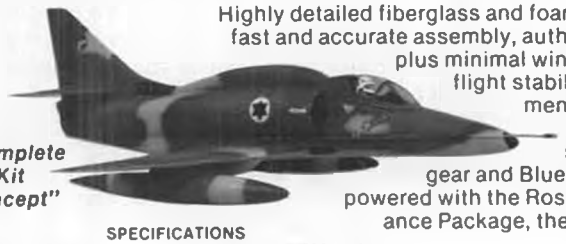

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DOES ORGANIZATION RESTRICT CREATION?

It was during a conversation with a model engine manufacturer at the 1984 Norhwest Model Exposition that this topic was laid on my ears. The main thrust of this individual's argument was that both NAMBA and the IMPBA dictate what can and cannot be done in the sport of model boat racing. It was his contention that by defining, restricting, and specifying what is allowable, the real challenge of creative modelling has been eliminated. As the gentleman obviously had some rather strong convictions, I inquired as to what he thought should be allowed.

According to him, what is needed is a true Unlimited Class where the only restrictions would be length (he suggested six feet), and the type of propulsion. For propulsion, he stated that the boat must use a propeller in the water. He told me there are many people in his area, Los Angeles, who ask him about just such a class. I certainly was in no position to argue with him about how many people would be interested in such a class. It doesn't particularly interest me, but neither do many of the established and popular classes that are currently being run in this hobby.

Are the national organizations restricting development? Is there a need for the type of class he is proposing? As I also serve on the NAMBA Technical Committee, I'd be most interested in hearing from anyone with further thoughts on this subject.

GETTING STARTED . . . AS IN A RACE

A few issues back I discussed the need to make certain you knew how to get your engine started within the allotted starting period. It's really difficult to get into the race if you don't make it to the water within the time limit. For purposes of this discussion, we're going to assume that you were able to get your engine started. The next big obstacle we must confront is the actual start of the race.

There are basically only two ways of starting a model boat race. In a LeMans type of start, all the boats are launched at the same time or nearly the same time. In a clock start, some type of timing system is employed to count down to the time when the boats may begin the race. Events employing the Le Mans type of start are usually for a specific length of time. The time is usually between five and fifteen minutes. Clock starts are used for lap races. Most lap races, also known as heat races, last for five laps.

There is no doubt in my mind that the start of a race, either Le Mans or by a clock, presents one of the greatest challenges in model boating. It is the only time during the entire race when the potential exists for all boats to be in the same area at the same time. The Le Mans starting method assures this situa-

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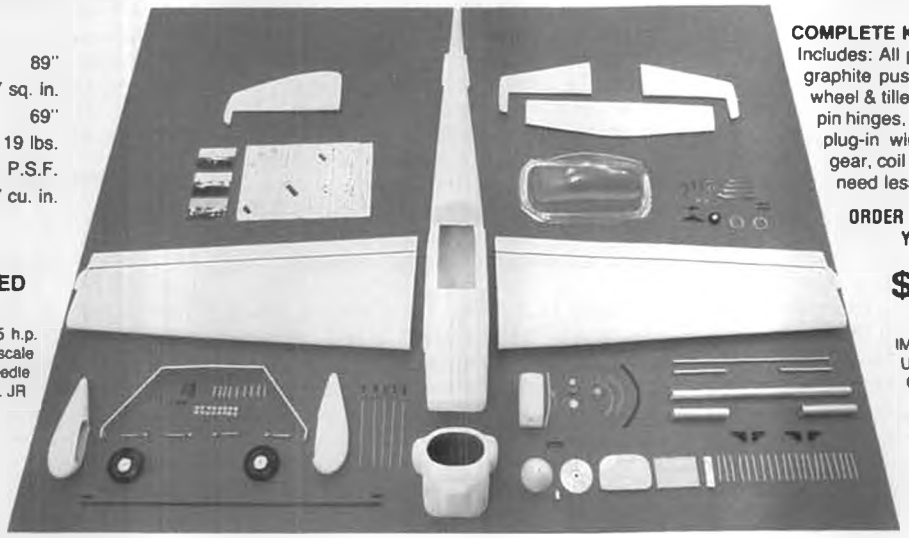

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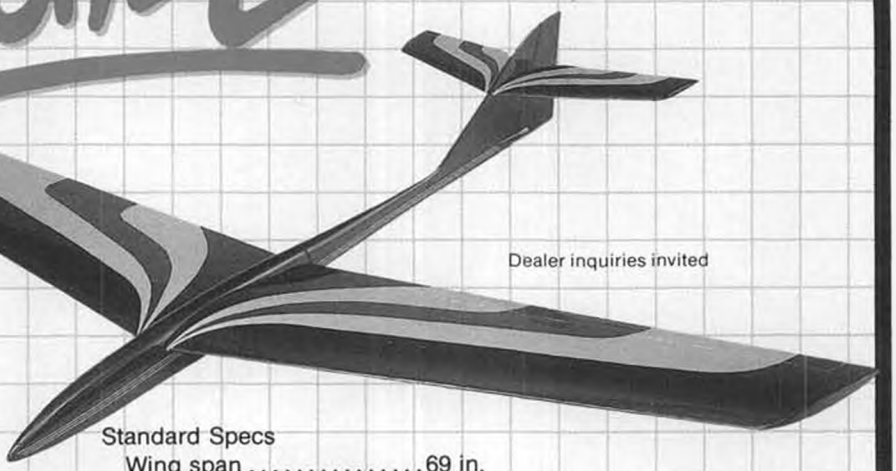

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tion. It doesn't happen all that often in a clock start that all boats reach the starting line together.

Let's consider the Le Mans start. A modified version of this start is used in the District 19 Outboard Championship Series. In this event, the boats are flagged off the beach at approximately one-second intervals toward a right corner marker that serves as a scatter pin. After making a sharp right turn around this marker, the boats are off and racing down the front straight. This staggered type of Le Mans start has proven preferrable to launching all the boats at one time. However, it certainly isn't without some drawbacks.

The biggest problem I observed with this staggered Le Mans system was the tendency on the part of some contestants to try winning the race on the way to the scatter pin. A fair share of boats were eliminated right at that initial run for the scatter pin because someone didn't use good judgement and charged too hard into a very tight corner.

I think the real concern of anyone involved in events using the Le Mans start should be surviving the first few seconds of the event. The participant needs to remember that the race usually runs for a minimum of five minutes. To attempt the win the race in the first few seconds is very poor race strategy. Try to avoid following too closely. If possible, leave yourself some escape routes should things suddenly get congested in front of you. Expect someone to screw up. Be prepared to react. Try not to oversteer when avoiding congestion. This type of over reaction will often dump your boat. Remember, the boat has throttle control as well as steering.

The Le Mans start makes for much excitement. It is very popular with spectators . . . but to be honest, most spectators are probably hoping to see some crashing and bashing. That may have spectator appeal, but it is hard on equipment, tempers, and usually doesn't help put any laps on the score card. I believe my suggestions should take some of the hazards out of the Le Mans start. The important thing to remember is *you are in control.*

Learning how to make good starts on a clock is a real struggle for many model boaters. I believe the most important thing about making a clock start is knowing where you want to be on the race course at a certain point in time prior to the expiration of clock time. Over the years, I have tried a variety of different starting techniques. I've had success with different techniques, but I think one method I use is probably the most consistent starting method I've found.

I have found that I can make a good run towards the start if at ten seconds prior to the start my boat is just heading into the right corner at about three-quarter throttle. I try to position my boat about twenty feet off the corner markers at the entrance of the left turn as I begin the approach to the starting line. As I make my final approach through the right turn, I gradually begin pulling the boat closer to the buoys. It is my intention to position my boat right next to the exit buoy of the right turn as I make the run towards the starting line. If things have gone as I have planned, I can now apply full throttle and have good boat speed as I cross the starting line.

It would be rather presumptious on my part to say that this is the best method to use in making a clock start. It happens to work well for me. All too often, however, I find that many model boaters don't have any plan at all for making their starts. There's a reason certain model boaters generally make good starts. They have a plan to assist them.

I know one model boater who figures the best way he can make a good start is to follow one of the more experienced model boaters to the starting line . . . well, least he has a plan.

Jerry Dunlap, 119 Crestwood Dr. S.W., Tacoma, WA 98498. •

Hannan . . . . . *Continued from page 61*

Newport Beach, CA 92661. For overseas readers, SMR can furnish addresses of their agents in Germany, Finland, Norway, Japan, and New Zealand.

THE GREAT ALASKAN BUSH PLANE CONTEST

Dave Gibson writes, "On December 26, 1983, a total of two modelers and one model assembled in Canton, Ohio for the first ever Alaskan Bush Plane Profile Scale Model Event. The temperature was 1° (one degree), and the chill factor with

the wind read like an area code.

"After waiting a while for other contestants and spectators to arrive (we wondered if we were the ones who were at the wrong site at the wrong time on the wrong day), Bob Howard, event originator, decided that one flight of the one entry (his) would be made. We wound the model inside the cab of Bob's truck, stepped outside, and he lanuched away. The craft moved ahead and up roughly three feet in very stable flight. It then abruptly departed downwind at significant speed, losing its wing on the twentieth impact with the ground. All parts were retrieved over the next two hundred feet, then we dashed back to shelter, promising to meet again in April, for the second event in the series. I drove the ten miles home with my car heater on full blast, and spent the rest of the afternoon watching a football game . . . still wearing everything I wore to the contest."

ANYONE FOR COMPUTER PROGRAMS?

Dr. Frank Gadek has been experimenting with computer analysis for small models, especially Pistachos (eight inch wingspan) and Peanuts (13-inch wingspan), and wonders if anyone else may have similar ideas. Frank feels that such an approach might simplify determination of optimum configurations, rubber weight, rubber peg locations, etc. He also sees a potential benefit in attracting the younger, computer oriented generation to apply their interest and enthusiasm. Who knows, perhaps PAC-MAN could be allied to PISTACHIO-MAN?

AND ON THE SUBJECT OF YOUNGSTERS

Bruce Kennewell, of Australia, mentions another facet of the technology generation gap. Apparently, a six-year-old schoolgirl could not identify with the terms "clockwise" and "anti-clockwise", because all of the timepieces in her home were digital! •

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Electric . . . . . *Continued from page 27*

reduction gear box with a Graupner Electroprop 550 (at Wishire or T&A). The Robbe No. 4016 prop ("red banana") is an equal or better substitute, also available at Wilshire or T&A.Use these props with the seven-cell pack.

Secondly, for more expensive hop ups, use the Mabuchi FG3 preassembled motor/gearbox, a 10-cell sub-C pack, and either of the props mentioned. Don't worry about the extra weight of the batteries, the airfoil used on the *Ultra Mk IV* will hardly notice it. The fellows flying this combination felt that the extra weight actually INCREASED performance, especially in windy conditions.

Finally, the ultimate hop-up is the Keller 25/12 or Geist 30/12 samarium cobalt motors (Keller from Leisure, Geist from Wilshire) with a battery pack of 12 sub-C cells. A 10-6 wood prop modified for folding with a 40 mm middle piece giving a diameter of 11.2 to 11.5 inches seems to work the best. Wilshire carries props modified this way. A hole in bulkhead No. 3 so that you can place the receiver in the aft portion of the fuselage will give you the room for the batteries.

In my opinion, this combination should be awesome! I use the Keller 25/12 in my seaplane with 12 cells, and it hauls it up in a hurry at four pounds. The *Ultra* will be lighter than that by at least half a pound.

Mike recommends that you do not charge the larger packs in parallel, i.e. five plus five and six plus six. His experience has shown this to be a very "iffy" proposition even for the expert, and he has seen several battery packs destroyed by parallel charging. Mike strongly recommends the automatic chargers described in this column and commends that the Robbe charger does a good job. The Robbe is available from either Wilshire or T&A.

You can, of course, charge 10 to 12 cell packs from two 12-volt, lead-acid batteries in series or use the voltage multiplier sold by Astro if you wish to use your present chargers. However, do not do this with the Leisure digital charger unless it is modified, contact Leisure on how to do this, or have them do it for you. Otherwise, you can ruin the digital display.

Thanks, Mike, for the update and the timely comments on charging. I have had no experience with parallel charging. In the last column, I ran advice on this subject from the SEAM newsletter, which says it is possible if the packs are matched to within 0.1 volt. I would stay on the conservative side myself, and always charge in series.

MINIATURE RX BATTERY UPDATE

One last item, as we are on the subject of charging . . . a few months back, I mentioned that the GE 9 battery packs I have been using have a limited life. Well, it seems that I have been overcharging them! For some reason, I never got around to checking their capacity until now, and now that I have, I find (by my own tests) that they are 60 mah (.060 Ah) cells. No wonder mine have been leaking, I have treated them as 100 mah cells . . . a boo-boo.

The correct charging procedure is to charge them at .250 amps for 15 minutes if they are totally run down, or to their voltage peak at .250 amps. This should increase their life a lot, up to the two-year level or more. If you have an overnight charger for 100 mah packs, it should be all right for these cells too, it is only at the higher rate of charge that damage can be done.

I can get these for $7 for six cells, so they really are cheap, and at under one ounce for a pack, they are ideal for my 020 and 035 planes. This capacity (60 mah) is enough for two flights before checking them, at the price, why not have two packs . . . or three? You can have two of them charged at home, then switch after two flights at the field.

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Till next time, fly high with electrics!•

Soaring . . . . . *Continued from page 37*

a long period of time. The other drawback is expense as epoxies and polyester resins cost more than HydroCal, and there are yet more materials to consider in the technique. This is the type of project where you either want a buddy to help split the cost in exchange for the right to use the mold, or you will want to sell fiberglass fuselages to make back the money. The latter is probably the least time efficient, but believe me, if you fly with a club, and your design is a good one, people will buy your fuselages!

Firstly, let me tell you the basic outline of what it is you are trying to do. As with the HydroCal mold above, you are trying to make a right and a left half. However, the resin and cloth mold is only 3/16 to 1/4 of an inch thick and cannot be simply poured over the plug. You must have a device to split the mold in half as you lay it up. You may call it a fence, divider, or a splitter plate, but whatever you call it, it is essential.

The first mold half is laid up over the plug and the splitter. It is allowed to harden, then the splitter is removed. The hardened flanges of the first mold half then become the form for the flanges of the second half. The second mold half will be a pefect match of the first with only the thickness of a layer or two of PVA mold release separating the two. I prefer this method over the two-piece plug method where the plug halves are laid flat on a board and the two mold halves are laid up simultaneously . . . because of the *very* precise fit of the mold flanges using this method. Also, with this method, you will be able to key both flanges by drilling bolt holes before they are separated. This is explained below.

Begin by making the splitter plate out of masonite. Masonite is a hard, thin composition board (usually a dark brown in color) with a shiny, smooth surface. It comes in varying thicknesses, but for our purposes, any one that is between 3/16 and 1/4-inch is fine. You will need enough to extend six inches beyond any dimension of the plug. If you cut out your plug's profile view using a band saw, you can use the female image of the plug as template to trace off the shape of the fuselage onto the masonite. If not, carefully trace around the plug with a pencil, or use your original full-size drawing as a pattern.

Cut out the masonite a little undersize (1/16 inch) as it is better to grind or file the splitter to a tight fit around the plug than it is to have large gaps. When this is done, bevel the edges slightly (approximately 20 to 30 degrees) so that the wider side of the splitter opening faces the upper side. Put another way, have the splitter opening flare upwards and outwards. This will be explained later.

What comes next is a little bit tricky . . . we have to get the splitter to stay put, and the plug to stay put, so that neither one will move, and so that the splitter is resting exactly along the middle line of the fuselage as it rests on its side.

We will do this by using "one-by-twos" under the splitter, and by using modeling clay under the plug. The one-by-twos might actually have to be taller if the fuselage is wider than four inches; the idea being to get the masonite MORE than half-way up the side of the plug by a little bit. Then, with the modeling clay, we will fine tune the positional relationship of the two parts, shimming up the plug here or there as needed. (See the photo of the bottom side of the splitter plate for the best positioning of the one-by-twos.) When the splitter rests at the exact line which splits the plug into two equal halves (right and left), you are half-way home.

The next step is to seal off the crack between the splitter and the plug so that when it comes time to apply the resin to the whole affair, the resin won't drip past the splitter. The idea is to build only one side of the mold at a time! We do this with modeling clay. The best technique is to roll out the modeling clay with the palm of your hand over the table top so that you make little clay worms. These clay worms are then worked into the crack with a plastic squeegee (see photo). Do not use metal as it will scratch the surface of the plug.

When the crack is sealed all the way around, it is time to put on some mold release. As I indicated earlier, we will use PVA (polyvinyl alcohol) as the mold release agent. If you have spray equipment, use it. If you don't have spray equipment, then get a fine, soft hair brush and carefully paint on the PVA. It dries very thinly and quickly, so brush marks will not be a problem with the first coat. Apply a second coat of PVA. When using the fine hair brush, do not brush over any area twice as this will remove the first layer after it is dissolved by the fresh PVA. It is not a difficult task, believe me.

When the PVA hardens, wax the surfaces with carnuba mold wax. Repeat the wax job. The first half of the mold is now ready to be laid.

Here is where the modeler may choose to use either polyester resin or epoxy resin. Epoxy is more stable over long periods of time and can be worked with rather easily, but it is more toxic than polyester resin, as well as more expensive. The only dangerous thing about polyester is the hardener or catalyst which must be used to get the resin to turn from liquid to solid. Get this stuff in your eyes and you will be blinded . . . no second chance!

You may wish to use gelcoat as your first layer of the mold. On my first mold I used a polyester gelcoat with good success. Mold number three was an epoxy mold and I used no epoxy gelcoat. It was not significantly different than the number one mold, so I don't believe it is necessary. By the way, don't try and mix polyester and epoxy, the two resins do not mix at all!

My method is to apply a fillet of thickened epoxy along the corners of the plug so that the fiberglass cloth doesn't have to make a 90-degree bend between the plug and the splitter plate. To thicken epoxy, I use colodial silica, a dusty, very lightweight, translucent substance used specifically for this purpose, and sold by California Custom Yachts, 531 No. Francisca Ave., Redondo Beach, CA 90277, (213) 376-0469. This company is also a good source of epoxy resin. I buy the West System epoxy which is manufactured by Gougeon Brothers, Inc., 706 Martin, Bay City, MI 48706.

A layer of two-ounce cloth is first. Lay it up rather wet as you don't want any tiny air bubbles next to the surface of the plug. This wet layup also hides the weave of the cloth better for a smoother mold surface. Allow this layer to harden.

I follow this two-ounce cloth layer with another two-ounce layer *and* a four-ounce layer. When this hardens, I apply heavier layers of cloth (10-ounce) until the mold is anywhere from 3/16 to 1/4 of an inch thick. Try not to lay up more than three layers of cloth at one time, however, as you will start to build up excessive amounts of heat which may cause the lower layers to warp.

When you have finished the first mold half, separate the mold from the splitter and set the splitter aside. Clean off any clay or leaked PVA from the plug and mold flange. Set the mold faceup on the table and brace it so that it won't wobble.

Now it is time to put on the PVA on the second half of the plug and the exposed flange. As these two surfaces determine the appearance of the second half's surface, the same care that was taken on the plug and splitter when applying the PVA should be taken here. The same layering sequence should also be followed when laminating the second mold half.

When the second half is laminated (and cured) to the same thickness as the first, it's time to drill some holes in the flanges. The holes should be spaced about eight inches apart and about two inches away from the plug. These holes will assure you perfect alignment of the mold halves when it comes time to make the fuselage part later on. They also help keep the mold from warping over long periods of time when it's not in use.

After the holes are drilled, it's time to trim the flanges to a neat, clean edge. You will need a band saw again, this time with a metal cutting blade to do the job right. If you lack this tool, a hacksaw will do, but it is lots more work. (I know, I've had to do it this way.)

With the holes drilled and the edges cleaned up, you are now permitted to pry apart the flanges, thus separating the mold halves. If your PVA and carnuba wax treatment was adequate, the halves should just pop apart! The only remaining steps being to remove the plug from the side it's still stuck to, and washing out the PVA and wax with soapy water.

This two part treatise on mold making has been rather general. Indeed, there are entire books written on the subject which are more thorough than this, but the basics are here, and you now have more information available to you than I did when I made my first polyester/fiberglass mold back in 1976. If you have any questions, you are welcome to write or call me. The address is Bill Forrey, c/o Model Builder, P.O. Box 10335, Costa Mesa, CA 92627. If you can't stand to wait the two or three weeks that it sometimes takes me to answer letters, try giving me a call at my home: (714) 777-4514. Please limit your calls between the Pacific time zone hours of 6 p.m. and 9 p.m. I will be happy to answer your questions.

MAJOR CONTEST ANNOUNCEMENTS

I would like to make this a monthly feature of this column as I feel that it would serve a much needed purpose in the national R/C soaring community. *Communication* . . . getting the word out . . . is the most important aspect of precontest preparation. Without it, contests typically draw only those local fliers who "know somebody" who is somehow more informed, or who are members of the host club and are informed through the club newsletter. If there was some other way of communicating to intereseted fliers on a larger scale, perhaps we would see a resurgence of soaring enthusiasm, participation, and general interest. I propose this section of this column as such a communication device.

As there are literally *hundreds* of soaring contests held on a monthly basis during the summer months, it would be

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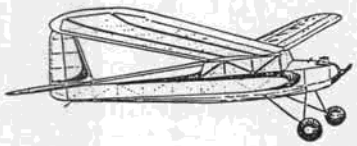

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very impractical to run lists of them all. I wish that I could . . . but it would really be a mess. Therefore, if I could get all of you ambitious CDs out there who are planning the really big contests (interstate draw or more than 50 contestants expected or any FAI soaring event) to send in a brief summary of your contest plans along with a referal phone number, it would be greatly appreciated. Five things are very important in these announcements: 1) events to be run; 2) location of flying site; 3) entry fee; 4) date of event; and 5) who to contact (name, address, phone).

One last thing . . . remember lead time. As magazines are complicated things to assemble and print, there is a three month lag between information received and information printed. For example: my deadline for this column is the first working day of every month (the earlier the better, actually). This column was due on the first of February. . . . It is in the May issue which comes out in early April (don't ask me why this is, but it's true of all model mags). If you had a contest in May, it would be a good idea to have it announced in the May issue because of the more timely one month advance notice. Due to space limitations, we are going to have to limit the announcements to a one-time blurb. The following is a list of deadlines for future issues:

April 1 for July contests
May 1 for August contests
June 1 for September contests
July 1 for October contests
August 1 for November contests
September 1 for December contests

Save this list for future reference, or just remember the three month lead time. If you are a day or two late with your announcement, send it anyway as I may be able to squeek it in. Anyway, for the first few announcements, see below.

MAJOR MAY CONTESTS

CALIFORNIA

ANAHEIM — May 20. Southern California Soaring Clubs monthly contest for thermal duration with spot landing. Host club is Pacific Soaring Association, contact Bill Forrey, 5815 E. La Palma No. 281, Anaheim Hills, CA 92807, (714) 777-4514. Entry fee is $5.00. Field to be announced later, contact Bill Forrey.

SUNNYVALE — May 20. FAI/F3B. Contact Competition Chairman Mick Carlin of the South Bay Soaring Society for details: 2211 Mesa Verde Drive, Milpitas, CA 95035, (408) 263-3576.

SAN JOAQUIN VALLEY — May 26-27. First FAI cross country race with newly adopted, provisional FAI rules. International entries welcome. Contact Jerry Krainock, 5942 Whitsett, Apt.

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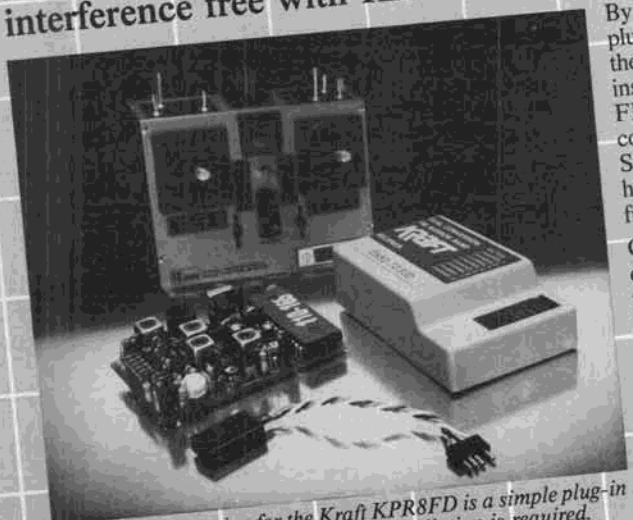

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ARIZONA

SIERRA VISTA — May 26-27. Fourth Mesquite Modelers Spring Soaring Contest for 2-Meter, Standard, Unlimited Classes, with Sport Scale. Site is Sierra Vista Com.Center, D. Mulligan CD, 931 Cactus Wren Lane, Sierra Vista, AZ 85635, (602) 458-7677.

AIRFOIL OF THE MONTH: HELMUT QUABECK (HQ) 1.5/9

The latest *MTB (Modell-Technik-Berater)* book on airfoils is now available from the publisher of *Flug + Modell-Technik*, Verlag fur Technick und Handwerk GmbH, Fremersbergstrasse 1, 7570 Baden-Baden, Postfach 1128, Federal Republic of Germany. (And probably from Wilshire Model Center as well: address in ad this issue.) It is the *MTB 7*. It features all of Dr. Helmut Quabeck's best-known airfoils in varying thicknesses (8%, 9%, 10%, 12%) with the following mean camber lines: HQ-1.0/ . . ., HQ-1.5/ . . ., HQ-2.0/ . . ., HQ-2.5/ . . ., HQ-3.0/ . . ., and HQ-3.5/ . . . . There are several lengths featured of every airfoil from 140 mm to 270 mm so that constructing a wing not mean plotting out a zillion need points on graph paper first.

The book is written in German, as you would expect, but it is mostly a book of airfoils and very useful to all modelers.

The Airfoil of the Month this month is Dr. Quabeck's choice for multi-task thermal *and* slope soaring. It is relatively low in mean camber at 1.5%, and moderately thin at 9%. The HQ-1.5/9 was designed for camber changing flaps. For thermalling, launching, or landing, where high coefficients of lift are sometimes called for, the pilot has the option of dropping the full-span flaps for increased efficiency. Likewise, for speed or wind penetration, the pilot may choose to raise the flaps for the very least drag at low C_L.

The small cross mark in the rear end of the airfoil indicates the best position for the flap hinge.

No profile polars were printed for this airfoil, but performance should be similar to the HQ-2.5/9 featured in my January 1984 column, page 31 . . . with a slight shift in the unflapped curves toward lower C_L. All-in-all, this is an excellent section for use in a wide variety of aircraft.

IN CLOSING . . .

Well, I see that another column has come and gone and I've still got a hundred things to catch up on! Please be patient with me all of you good readers out there who have sent me things for this column . . . I will get to them!

Next month, I will tell you what you can do with your fuselage mold . . . I mean, I'll write about using the F/G or HydroCal fuselage mold for what it was intended. Also, we'll see some interesting data on two-meter design from the world-renown Martin Simons, author of the book, *Model Aircraft Aerodynamics*.

Remember to send in any questions you may have about any aspect of R/C soaring for the Q&A section of this column (which hasn't been plugged lately!)

Enough already! •

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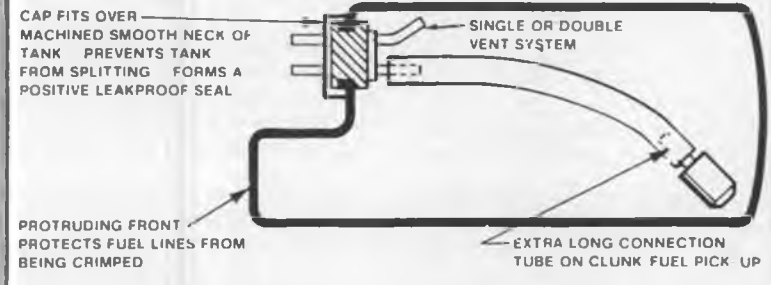

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Indoor . . . . . *Continued from page 59*

A later racing version of this plane was noted in a book called *This Was Air Travel*. A search of an early *Jane's All the World's Aircraft* netted a good two-view of the racer. A 16-inch model was drawn and constructed.

The configuration of the open fuselage warranted the use of a solid motor stick to support the rubber motor. As the propeller was located near the center of the plane, a rear-placed motor stick was tried. The model was tail heavy.

Then, a forward motor stick was substituted, and the CG was nearer the ideal position. Although somewhat nose heavy, the forward plane angle was increased and the model flew well. The major complaint was that it was difficult to attach the knotted end of the rubber (fully wound) to the front hook. This was accomplished by using an extension hook to clear the front end of the plane, and then removing this hook with the winder after hook-up.

Later, an 11-inch version of the racer came off my building board. It flew OK, but not as well as the larger version. The size of the small model made construction of the four wire wheels difficult, and I was not proud of my workmanship on these wheels. Both models remained with friends when we moved to California. More recently, a photo of the *Valkyrie B* was printed in my column (Dec. '83), and I received several inquires for plans and information on it.

It was decided to scale the plans to 13-inches (Peanut size) and feature it in the column. The model plans were drawn right over the two-views, so the model is very faithful to the real machine. The rib spacing is true to scale, as are the stab and fin sizes.

One deterent to a modeler tackling this subject (I felt) was in constructing the four wheels. Before the days of the marvelous Hungerford spoked wheels, many builders shied away from early planes because of the wire wheels. I feel that to make the *Valkyrie* attractive to model, the wheel construction has to be simplified somewhat. Sure, you can journey to your local hobby shop and plunk down the $17.00 for the Hungerford wheels, or if that sounds a little steep, you can build the Johnson version shown on the plan. It's up to you.

The all-balsa wheels are built in two halves and cemented together. The one-inch size made me think that a simple eight-spoked version was in order. The purchase of a circle template from the local drafting or art supply store is necessary. The one-inch outline of the wheel is traced onto white card stock and a smaller circle is centered inside of the outer ring. A vertical and horizontal line are drawn through the center of the rings. This will be the plan over which the eight half-wheels are constructed.

The same circles and lines are drawn onto soft 1/16-inch sheet balsa. Next, carefully cut a line along the inside circle with a NEW, No. 11 Uber Skiver knife. Be careful not to tear the wood as you repeat this cut on each of the eight inner circles.

Then, wrap a short length of fine sandpaper around a 3/4-inch diameter cylinder, and sand the inner circle smooth and round on each. The outer circle of the wood rim can now be cut and sanded smooth and round. One at a time, the wood rings are tack glued to the card stock plan and the four 1/8 x 1/32 ribs are cemented in place. Note that the grain on the ring is parallel to the vertical rib direction.

When all eight half-wheels are completed, cement them together in twos, making sure that the rim wood is cross-grained on each wheel. See the plan for clarification.

After the wheels are dry, sand the spokes at an angle toward the outer rim on each tire. Then, sand the tire on the outside edge only, to the rounded shape of a tire. Spray the entire wheel with black enamel, and then paint the outer edge of each spoke silver. The inner edge of the tire will also need a coat of silver.

The only task remaining on the wheels is to sink a small hole at the hub for the axle wire to pass through each wheel. A very thin beading needle is ideal for this task. The resulting spoked wheels are presentable, and take only an hour or so to build.

The fuselage of the *Valkyrie* is like two giant sled runners. The structure is open and braced with wire. We will use fisherman's fly tieing thread to simulate the wire rigging. The 1/16 x 1/16 soft balsa structure is precolored with Dr. Martin's concentrated water color dye. I use a Q-tip cotton swab dipped in brown dye to do the job. Simply run the swab along the length of the wood on each side, and allow the pieces of balsa to dry before beginning construction. The bottom longeron is taped to a cardboard form (precut to the proper curve and sanded to a smooth shape) while wet and baked in a 300° oven for 20 minutes. The thread bracing is cemented onto the fuselage sides while they are still pinned down to the board.

The rudders and support arms are

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built as part of the fuselage sides. All covering on the model is condenser paper, left in its natural color. The real plane had white canvas covering. The stabilizer (the upper front plane) and the wing are covered on the bottom side only. Yes, the original was single covered. While the two rudders and the elevator (the lower front plane) are double-covered.

The wing construction is 1/20 square, medium balsa. Remember, the wings are braced, so lighter wood can be used. The three-part wing is built with moveable ailerons which can be cemented into place to give the proper washin on the inboard wing. The ribs are 1/20 square. The two front planes are built with the same wood sizes.

This airplane was built with several engines. The Gnome rotary is very pretty (my earlier model had a Gnome), but the inline version is much more practical for this model. The balsa wood and foam construction makes it lighter, and the prop can easily be lowered to the proper position to fit the motor stick.

Although you can build the model with the front motor stick only, the one pictured on the plan uses one fore and aft of the prop. This puts the center of gravity at the proper position. The stick is made in one piece, and after the prop hangers are in place (along with the prop), it is glued to the airplane. The stick can be separated at the prop.

Winding the model is not difficult. Simply hold the prop with the left hand and put the turns in the front motor. Then rotate the model to face the other direction and wind the rear motor.

The *Valkyrie* must be held from underneath by the propeller, and pushed away from above on the hand launch. ROG is somewhat difficult as the center wing wires get in the way of hand holding the propeller from above. If the model dives in flight, adjust the lower front plane to a steeper angle and cement it at its pivot points.

Spraying the condenser paper covering is very tricky. If it is not too loose, I prefer leaving it unsprayed. If spraying is necessary, use an adjustable nozzle trigger spray bottle, and spray a very fine mist of water across and above the wing or other part. Let only the dust from the spray float down on the surface. Use only a little. If you warp the structure, it must be recovered. This adds weight each time dope is applied. DO NOT DOPE THE MODEL. This only takes away flying time.

You may find it necessary to string the model while it is cemented to a jig. A 1/8 sheet balsa jig with a long horizontal base and uprights that are tack glued to the wings works well. Just make sure you can remove the model from the jig without catching the rigging wires on the jig and destroying something.

You may want to carve a foam pilot to sit in the open seat on top of the fuselage. Keep it light and paint it only with opaque water colors.

The propeller is made of 1/32 sheet balsa, bent and baked around a can. A four-blade prop will give you more area. The open space in the fuselage for the prop allows only a small blade size, so a four-blader is good. It is necessary to use a small locking wire soldered to the shaft and running through (and cemented to) the prop hub. See the plan drawing for clarification.

I guess you can tell that I like unusual subjects in scale, pre-World War One is my favorite. Try this one if you dare. It flys well, and I think you can win with it . . . or you can just build it for fun. You'll get a lot of satisfaction from seeing this little "early bird" cruise around in your favorite indoor flying site.

The original *Valkyrie B* was built in 1911 in England and was designed by a Mr. Barber.

DUCTED FAN MODELS FOR INDOOR?

Mr. Alan Wong, of Gardena, California, is interested in rubber powered ducted fan scale models. This engineer at Northrop Aircraft was told by his associates that rubber powered ducted fan was impossible to build and fly indoors, so he tried it.

At our local Paul Revere Jr. High School indoor session in December, Alan tested his pseudo MIG-15 and it flew quite well. (Barnaby Wainfan assisted in the trimming flights.) Now, Alan is ready to tackle a true Peanut Scale ducted fan subject. There's always something new happening in indoor modeling.

Next month I'll discuss indoor scale gliders. Back in Cleveland, Ohio, some years ago, I remember a fellow towing Peanut-size sailplanes with a *Cub* peanut. It worked great! I always wanted to try this. Now's a good time . . . gonna start construction on one right away.

Send PHOTOS, questions, and comments to Ken Johnson at 16052 Tulsa Street, Granada Hills, CA 91344. •

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Electronics . . *Continued from page 43*

those glitches which sometimes happen when two or more high drain servos are used simultaneously, and cause an excessive current drain and voltage drop at the receiver.

The BMBB (pronounced "Bimbee-bee!") is available at your local hobby shop; for more information on this and the entire line from RAM, write to 4736 N. Milwaukee Ave, Chicago, IL 60630.

TECH R/C

Lots of news here, from what should not be an unfamiliar name, as it was used by Royal Electronics for its line of R/C systems and accessories for years. Tech R/C is a newly formed company that is now producing those items which we have come to know as Royal Electronics products, and is servicing all systems and all accessories previously produced by that company.

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Beautiful planked-fuselage 9' streamliner from 1939 M.A.N. By Thracy Petrides.

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Hot A/B pylon (no-window cabin) never before published, 4-ft. span. Carl Hermes.

No. 780-O.T. STRATOSPHERE $3.50
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Sort of a 'squared off' Zipper, from 7/40 Flying Aces. 72" span. By Jerry Peeples.

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Chet Lanzo's famous "Record Breaker." Two large plan sheets. By Phil Bernhardt.

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No. 573-OT-1 AERBO .020 $3.00
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Tech R/C plans to continue to produce all of the products previously available from Royal Electronics, with the exception of complete radio systems. However, during the changeover, some delays have occurred, as will happen at such times, and a couple of the popular items are in suspension. The Cycle Charger is one of these, though the problem was caused by the discontinued production of the clock module used in it, requiring a redesign. An announcement will be made when the Cycler is once again available.

Another delayed product, one which I hope is taken care of soon, is the Royal Protach, which is in my opinion the best engine tachometer made, as I have not yet been convinced about digital displays in this application. The Protach is pending a source of meters, and will be available as soon as that is firmed up. Tech R/C is maintaining a list of those interested, and will surely add your name if you like, for notification in the future.

The address for Tech R/C is Box 24593, Denver, CO 80224, for both mail and UPS service, arrangements having been made for delivery of the later. There is limited phone service around the middle of the day, Monday, Wednesday, and Friday only, though there is a recorder on the line the rest of the time and you are urged to use it to leave word about your requirements. The number to call is (303) 757-4082.

We know that there are a lot of Royal Electronics R/C systems around, if one of your friends has one, tell him about these changes so he'll know where to go when and if he needs service and replacement parts. Better yet, tell him to become an **MB** reader, so that he too can always be up to date!

Adios for now, thanks for walking through the IMS with me. As I stated earlier, there were any more of the old standard electronic goodies to be seen and admired there, the above are *the new ones which caught my eye.* Next month, we'll get back to our usual questions and ideas from our readers, and I'll try to fit in a short, nontechnical explanation of double conversion receivers.

Before I go though, I want to share a "funny" with you, one of those things which come up now and then that prove to ourselves that we'll never know for sure just how we are going to react under unusual circumstances.

As the story develops . . . I was testing a new Silver Seven receiver I had just assembled from a kit, flying in a four or five year old MRC *Trainer Hawk*, veteran of much flying and testing of various airborne components. Everything was working well, I'm flying a series of horizontal eights, slow and lazy, just getting time on the system, when all of a sudden a big orange airplane appears in my vision, and before I can decide if I am in his way, he cuts off one of my wing panels and goes on his way as if nothing has happened.

That's *not* the "funny" . . . as I am spiraling out of the sky and it is obvious that full opposite rudder and all the high-rate "up" I have is not going to save me, I stand there waiting for it to hit the ground . . . at which time a thought flashed through my mind: "Houston, we've got a problem!" •

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**Walker . . . . . ** *Continued from page 51*

tronic machines. It's a lot more fun, and you can learn a lot. One of the things that Jim Walker did was accomplish the production of flying model airplanes which spread world-wide. They were magnificent models, and we have many of them here today. We want to generate interest to bring those days back, and get young people involved with model aviation again."

Also making announcements was Pat Webb, who manned the public address system throughout the day, keeping the spectators abreast of the details regarding the displays and flying demonstrations.

It was notable that at least two enthusiasts made long journeys to this event. Hube Start came from Winnipeg, Manitoba, and Doug Dahlke motored in from Oshkosh, Wisconsin.

Bob Smurthwaite flew a *"Super Firecat"* design in the demonstration segment. This model is a one of a kind prototype that Bob had built for Jim Walker in 1957 for future kit production. However, Walker died before negotiations and never saw the plane. Though Bob had not flown a CL plane in some time, he showed that he was still quite adept at maneuvering this three-wire throttle control aircraft.

Other flying demonstrations included a "three-plane-at-once" attempt by R.F. Stevenson, and the sabre dance routine by Roy Beers. These were just a little short of successful, but will be tried again next year. As Pat Webb said, maybe Jim Walker was the only one meant to do those tricks. Other flying included demonstration of whip control models, and several other CL planes. The end of the demonstration flying was marked by the grand finale, simultaneous catapult launching of 25 folding

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wing gliders, by Scout Troop Number 259.

There were beautiful ribbon awards for the top participants, and a special engraved Fox 35 for the top stunt competitor. Here are the winners: Old Time Stunt: Bob Emmett, of Renton Washington, flying a *Barnstormer*. Best Flying Ignition Model: Rod Russell, of Salem, Oregon, flying a *Skylark 60*. Best Flying Glow Model: Doug Dahlke, of Oshkosh, Wisconsin, flying a *Barnstormer*. If you missed this event this year, try to make it next time. •

Pattern . . . . . *Continued from page 11*

the spin recovery without inducing a secondary spin. Spell that, S-N-A-P R-O-L-L.

Enough flying, my fingers are numb.

I have received considerable feedback from fliers who are experimenting with the new engines, props, and equipment desirable for the new Pattern. The four-stroke 1.2 is really being well received. Also, the 800-inch, eight-pound parameter still looks good for a "good all around" design. If you have come up with something *other* than the norm for this year, by all means speak up! I will gladly add your idea and your name, if you desire, in a future article. •

Free Flight . . *Continued from page 65*

Usually, the term is used to refer to a stabilizer that changes its angle of attack to allow the modeler to trim the model to fly with less drag during the power phase of the flight an make the transition into a better glide. It is normally used on power models, but is also used on rubber powered models and A-2 types as well. Almost without exception, the actuation of the VIT is caused by a multifunction timer such as the Seelig. Occasionally, VIT is used to indicate autorudder as well as autostab.

AUTORUDDER (also abbreviated as **A/R**): These terms mean that the rudder or a rudder tab changes during the course of the flight. Normally, this change occurs at the end of the power run on a power model and is used to help the model transition from the power phase to the glide phase. In many cases, the auto rudder also sets the tightness of the glide turn. It is used on all towline gliders, many power models and some rubber powered models. On power models, the A/R is actuated by a timer. On towline gliders, the A/R is actuated by release of the tow ring from the model.

WAKEFIELD: This is a type of rubber powered model that is used in international competition. A Wakefield has a maximum wing and stab area of 294.5 square inches and a minimum weight of 6.7 ounces less the rubber motor. The motor may not weigh over 40 grams (1.41 oz.). Wakefields fly to a maximum single flight time of 180 seconds. The name comes from the name of the donor of the original trophy used to award the winner of the competition: Lord Wakefield of England.

I'll be back next month with some more puzzlers. If you have questions you've always wanted to ask, but were afraid to look like a beginner, this column is for you. Write them down on a post card and send to **Model Builder**. Thanks.

CHAMPION MODEL PRODUCTS CATALOG

I thought that George Schroedter was just the purveyor of fine kits and rubber, as mentioned in my last column. Not true! The recent catalog includes some real goodies, including Esaki black tissue (the good stuff), Plyspan tissue, KSB timers, D.T. fuse, small orthodontic type rubber bands, rubber motor winders, and fine quality balsawood.

If you want to know more, drop George a line at Champion Model Products, 880 Carmen Court, LaVerne, CA 91750. Tell him **Model Builder** sent you.

Well, I'm just about out of space for this month. I'll be back next time with the EZ To Make Thermal Pole, the national Nostalgia rules, and some info on a variety of stab mount systems. Stay tuned.

In the meantime, get out and fly . . . and catch a thermal for me. •

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Fuel Lines . . . . *Continued from page 52*

think that was covered in answering the first question. Remember? It's about twelve thousandths of an inch when the crown of the piston is level with the glow plug shoulder. Gees, I guess that's it Jerry. Hope it's been informative.

Guys, as always, your letters or postcard comments are welcome and appreciated. Take care. . . . •

Plug Sparks . . *Continued from page 31*

$19.75 for the 300 engine and $21.50 for he .358 engine. In each case, the engines came complete with the recommended 14-inch propeller, plug, coil, and condenser.

Full-page advertisements ceased with the April 1946 issue, cutting to a 1/3-page. With the advent of the new, successful Delong 30 engine, Cannon ads jumped back to full-page size in June 1946. In the October 1946 issue, the Cannon ad was reduced to a 2/3-page. The handwriting was on the wall: the new Delong 30 engine was proving to be extremely popular, and its successor in turn, the new K&B Torpedo was making tremendous inroads in the engine sales on teh Pacific coast.

The main feature of the Cannon engine was the contention that the higher compression made for better running. In addition, the 1946 version had the port area increased by 20%, while utilizing a larger rotary valve at he the same time.

For those interested in the technical aspects of the engine, the cylinder and crankcase were aluminum alloy die castings. An iron alloy cylinder liner was provided with the steel piston. To get away from having to provide bushings for the connecting rod, the rod was made of manganese bronze, thus providing a bronze on steel bearing surface. On the other hand, the hardened steel crankshaft ran on bronze bearings which were said to be replaceable.

Performance wise, the engine was rated at 1/5-horsepower. The manufacturer provided a special 14-inch prop which was claimed to be turned by the 300 at 5000 rpm and 5500 rpm by the 350. In a "stroker" type engine such as the Cannon, this is good performance considering the size of the propeller. However, the newer postwar engines featured higher rpm with smaller propellers that fit the needs of the smaller models at that time gaining popularity with the modelers.

By Christmas time in 1946, the Torpedo engine was definitely on the increase. The Cannon people had changed their ad to read the "dependable" engine. Thus, like so many engines that bridged the World War II era with no appreciable improvements, the introduction of the new high speed engines quickly sounded the death knell of many of the old style engines.

AUSTRALIAN NATIONALS

The 37th MAAA Nationals were held in the Richmond area (north of Sydney) which is the home of the Richmond RAAF. Although none of the activities were held on the base, the MAAA president, Bob Carpenter, was a Tech Sgt. on the base and wielded considerable influence on the township. This writer thinks Carpenter is the greatest bloke in the military as he is arranging to have the long lost *Flamingo* shipped back to the states. This is simply great!

Upon arriving at the Nationals site, it didn't take long to get thoroughly confused as to the location of the Hawkesbury Agricultural College. (We were doing this all week!!) Finally locating the administration building, this

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writer discovered a line an hour long.

Deciding this was too much waiting (I'd come back later to a smaller line), this writer went over to the Hawkesbury dormitories just in time to intercept Gordon Burford, MAAA treasurer, and noted engine manufacturer of such things like the Taipin, Sabre, etc. In less time than it takes to describe the action, five of the new Deezil engines, plus two for Garrett, were separated from Burford. Of course, only one of the engines was for this person as the rest were being brought home for Carlson, Brodsky, Critch, and Wallock. Howzat for being a pal?

Backtracking to the administration building after stashing the engine loot, we ran into Ivor F, the most amazing modeling character you would ever want to meet. Immediately, I demanded one of the new "Sesqui" engines. While standing in line, Ivor pulled in his box and promptly transacted a deal . . . much to the grumbling of other people in line demanding to keep the line moving.

One interesting item about the engine Ivor produces (in partnership with Gordon Burford) is that he keeps a ledger on who has received which engine. He religiously keeps this file up to date as much as possible. Another fascinating feature about Ivor is his last name: "F", legally changed from Stowe. Ivor is one of those fellows who is his last name: "F", legally changed from Stowe. Ivor is one of those fellows who is a disciple of simplified English. He even went to the point of reducing his name to a single letter!

Photo No. 3 shows Ivor F in his typical contest garb, in this case working on a *Collin 1934 Single Stick Pusher*. Tremendous credit should be given to Ivor for the interest and promotion he does on behalf of the young modelers. He even has a large building in back of his house where supplies can be obtained and models built!

Regardless, the boys love to tease Ivor F about his name. Upon observing him erasing his name of Ivor Stowe from the posted results on the outdoor F/F billboard, I innocently asked why. This brought on a tirade about how much he had spent to have his name legally changed. Just about the time I would get him cooled down, one of the modelers sitting in background shade would set him off again by addressing him as Ivor Stowe. Finally, in desperation, I volunteered to wind his model for official flights . . . and I did wind that rubber!!

The first day of contest flying featured O/T Duration R/C models which we in America call the Limited Engine Run event. In this event, you are processed for appearance, workmanship, "fidelity to scale", and the general vintage. The most interesting feature of this event is that there is, in effect, no overrun to make a flight unofficial. Instead, for every second over the alloted time, you are docked 10 seconds. Not a bad idea, and it does speed up the flight line.

Getting to the field on opening day proved to be a hilarious trip. According to the maps provided (and signs posted), we were supposed to fly in an area marked for R/C flying. Imagine our surprise, when upon arriving at the off-road, a sign indicated no flying there as frequencies interfered. The next half-hour was spent searching for the field only to end up at the same off-road. This time, the sign had been removed. Upon arriving on the field, we were informed this field was for soaring gliders only. We had spent an hour searching for the wrong field! Worst part Gordon Burford was following, confident we knew the way!

Arriving at the contest field for O/T R/C (all Australian Nats are pretty well decentralized in this respect), the columnist spotted a flock of good looking models, photos of which he promptly snapped. Photo No. 4 shows Basil Healy's *Red Zephyr* powered by an Ohlsson 60. You could tell Basil had been flying the model on a regular basis as he had no problems turning in his flights.

In O/T R/C, the Australians run their events by the round system, just like their free flight counterparts. It is the writer's observation that this may be good for small groups, but as the O/T events get more entries, either the number of flights must be reduced, or a more free choice of flying time must be allowed.

Photo No. 5 shows what the writer is addressing. Shown are Brian Wilson and SAM President Bill Gordon waiting for a flight. It is the writer's contention that when frequencies are open, they should be used to the fullest. A considerable

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amount of haste could be avoided when being called to fly.

To give the reader an idea of the lovely flying field being used for O/T R/C, Photo No. 6 shows Monty Tyrrell trying to fit his struts on a *Miss America*. Despite the grimaces, the area was terrific, most fields being sod farms, i.e., grass being grown and sold for prelaid lawns.

Readers will point out that the *Miss America* did not have struts, but Monty felt that the age of the model warranted some safeguards. The struts don't appear to detact from the glide too much, but any loss was offset by that confident feeling that those old wings were going to stay on.

In wandering around, the columnist ran unto Dave Brown with a simply gorgeous George Reich *Albatross* seen in Photo No. 7. Although the model only placed seventh, this writer thought this was one of the best flying *Albatross* models he had seen. The model was completely silked, with an OS .40 four-cycle for power. In the background can be seen Leo O'Reilly's *Lanzo Record Breaker* that won the Texaco event the next day.

To digress for the moment, Leo used an Enya .60 four-cycle (being the distributor) to power his model. He scored maxes in all rounds. The *Lanzo* win reminds this writer of the early days of R/C Texaco competition, where the *Lanzo Record Breaker* was winning quite regularly. Eventually, the other designs, such as the *Dallaire*, *Anderson*, etc., caught up and passed the design for popularity.

Most of the R/C contestants used their models for both events: Duration and Texaco. One of those who did not was Brian Wilson, as seen Photo No. 8, who used a *Mike* as designed by Gil Sherman and published in June 1940 issue of *Flying Aces*.

Jumping ahead one day, Photo No.9 shows the versatility of Brian Wilson as he did use models other than the general run, such as *Playboys*, *Sailplanes*, etc. He selected subjects that have not been seen on the flying field. Photo No. 9 is indicative of his practice, as this pic shows a *Little Varmint* as designed by Bob File who won his fame by flying a towline glider of his own design to an impressive Nationals win.

Up to that time, File's experience with gas models was limited to a *KG-1* on which he learned the tricks of starting and flying a gas model. The design is not all that pretty, but the model is functional (which means it is a good flying sport model) and will give many hours of enjoyable flying.

DURATION EVENT

The Duration event was flown in rounds of three minute maxes and five rounds. One nice feature was that only four rounds counted, with the one bad flight being dropped. As mentioned before, Basil Healy won the event handly with his *Red Zehpyr*. Results looked something like this:

1. Basil Healy (*Red Zephyr*/O&R 60) 909
2. Mel Gillott (*Clipper*/OS 40 4C) 892
3. Bill Gordon (*Playboy*/OS 40 4C) 855
4. Geoff Brown (*Playboy*/Enya 40 4C) . . .854
5. Leo O'Reilly (*Lanzo*/Enya 60 4C) 823

Also of interest is the summary of engines used:

Four-cycle engines 7
Original Pre-1950 4
Spark Ignition 4
Glow 9
Diesel 1
Schneurle 1

TEXACO EVENT

This was a day that was alternatively warm and cold with a threat of rain which never materialized despite the thunderstorms in the immediate area. Again, the Aussies run the Texaco event like the rest of their events, on the round system, with five flights for ten-minute maxes. The contestant was given the option of dropping the worst flight. All models were allowed fifteen minutes to get airborne after being called. Would you beleive the Enya .60 four-cycle in my *Flamingo* could not be started in 15 minutes! I lost two rounds this way! Finally we found that the valves were set at forty thousandths clearanced. No wonder the engine was constantly flooding out!

Duration event) that Monty and I decided to take out the Super Cyclone and install the OS 60 four-cycle in the *Miss America*. Not knowing of the impending trouble with the Enya .60 in the *Flamingo*, the author confidently bet a five dollar bill that his model would out perform the Monty Tyrrell *Miss America*.

To top it off, I advised Monty of all the tricks employed to get the maximum run out of an OS 60 four-cycle such as adding gasoline, running large propellers, maintaining the lowest possible rpm and yet climb, and lastly, to maintain as even a flight pattern as possible to eliminate fuel surges.

Wouldn't you know it, after the dust had cleared, Tyrrell was an easy winner over Pond and his recalcitrant engine. Upon presenting the five dollar bill to Monty, the ragged rascal said, "Not Australian money. I want a Yankee five dollar bill." How about that? For the first time in quite some years, the Yankee dollar commands $1.10 Australian. In other words, Tyrrell got to this Yank for $5.50. Nothing left to do but to have Tyrrell buy the first round of Carlton draft . . . haw!

Buccaneers are an inevitable as death and taxes. These models always show up at Old Timer events as can be seen in Photo No. 10 of Kevin Leonard, New South Wales, and his original *Buccaneer*. The model, powered with an Enya .60 four-cycle, was entered in both events, placing 9th in Duration and 13th in Texaco. He had his problems too!

For some reason, some modelers didn't preregister their models, and were then subject to the late entry fee of $25.00. This was a little steep for most of the boys, and a considerable number of models were flown and/or entered. Photo No.11 shows a Larry Eisenger design called the *Skyrocket*, as built by Basil Healy. For those modelers not aware of Larry Eisenger, he was the model editor of the *Model Craftsman* magazine during the late thirties and forties. Quite a few good designs appeared in these issues during this time, having contributors like Schoenbrun, Mountjoy, Bayha, and, of course, Eisenger.

After most of the flying was completed, Healy took his *Skyrocket* out and showed how a Texaco model should fly. After viewing the performance, this writer was of the opinion that Healy should have not selected his *Red Zephyr* as his Texaco entry. No question about it, the Saito four-cycle powered *Skyrocket* was a real winner!

Also encountered was a real cutie, a Cleveland *Viking* as seen in Photo No. 12. We think Bruce Ramsay built it, but did not get a confirmation. However, the builder was smart enough to realize that a small model would have virtually no chance against the big ones in the Texaco event. Our advice is to hold on to the model until the event for smaller models becomes popular.

Results for the Texaco event ended up like this:

1. Leo O'Reilly (*Lanzo RB*/Enya 60 4C) 2480
2. Dowler/Brown (*Playboy*/OS 40) 2460
3. Ian Avery (*Simplex*/OS 40) 2401
4. Geoff Brown (*Privateer*/Enya 60) 2383
5. Bob Mooney (*TD Coupe*/OS 60) 2377

Engines show a heavy propensity for four-cycle engines of all types: O.S., Enya, and Saito.

Four cycle engines 13
Spark Ignition 2
Glow 2
Diesel 1

AUSTRALIA SAM BUSINESS MEETING

If the American modeler thinks he has problems with his SAM rules, he should try putting himself back at least ten years to a time when the SAM rules were in a very fluid state. This is about the situation that Australia SAM finds itself with everyone putting forth his pet idea for an event.

Although a committee had been appointed to study the rules and make recommendations, it was Gordon Burford, the Secretary-Treasurer of MAAA that brought the rules discussion to a head by announcing the old unworkable rules would again be published in the official rule book, unless something was forthcoming before April. This writer thought Burford had the right approach: threaten them with the old terrible rules unless they do something to help themselves.

President Bill Gordon, and Vice-President Dave Owen attempted to point out the rules were not complete for all events. This gave the Victorian contingent a chance to voice its opinion about the cutoff vintage date being extended to 1956 from the present 1952 cutoff date. (This would coincide with the English Vintage cutoff date.)

Instead of immediately referring all ideas to the Rules Committee, and incorporating the Victoria boys in the act, President Gordon allowed the membership to express its many viewpoints. This resulted in an interminable discussion that was finally cut off with the hope the Rules Committee could sort it out.

The SAM Annual Championship was again scheduled for Goulbourn during Easter week. This is a great place to fly, but the weather is so unpredictable it would drive a weather forecaster nuts. Ask the boys who attended the recent RAI F/F Championships. Pretty much the same story.

So, if you are a member of SAM USA and have been griping about the rules and SAM Champs site locations, count your blessings! Compared to other countries, the USA modelers have it made!

FREE FLIGHT O/T

The third day (it has been amazing how the Old Timer events have expanded at the MAAA Nationals) featured three events lumped by the National organizers into one event. However, David Owens propsed three separate events that he would sponsor on top of the trophies given by MAAA. This gave an additional three trophies.

It was one of those rare days with temperatures in the eighties with only a very light breeze in evidence. The light models, like the author's *Ying Class D Cabin* profited greatly from this delightful weather.

Noted among the gas models was the large amount of postwar English designs such as the *Eliminator*, *Slick Stick*, and *Jimp*. A few American designs such as the *Pacer*, *Red Zephyr*, and *Super Phoenix* were also seen on the field.

Here again, the round system was in effect, altough not as strictly as the R/C events. The events consisted of four flights, each of three-minute max duration with the provision for a four-minute max flyoff.

In this event, all models were processed as explained previously, but the points for age were added to the flight times. This age bonus consisted of the following: one point per year for models originating between December 31, 1952 and January 1, 1943; and two points per year for models older than December 31, 1942.

Hence, a model design published in 1952 would receive one point whereas a 1949 model would receive 4 points. If the USA SAM model designs later than 1942 were allowed to enter, this system of points might be considered.

In the Power event, this writer was attracted to the Howard Gostelow version of Alan King's *Hyphen*. King will be remembered as the only Australian who won the Wakefield Trophy. Unfortunately, King died at a very early age. This great climbing model simply had to be pictured as seen in Photo No. 13 with a hot Dooling 29 engine in the nose. Although Howard made perfect flights every time, he lost out to Roy Summerfield who acquired the model did fly well with an Elfin 2.49 flights.

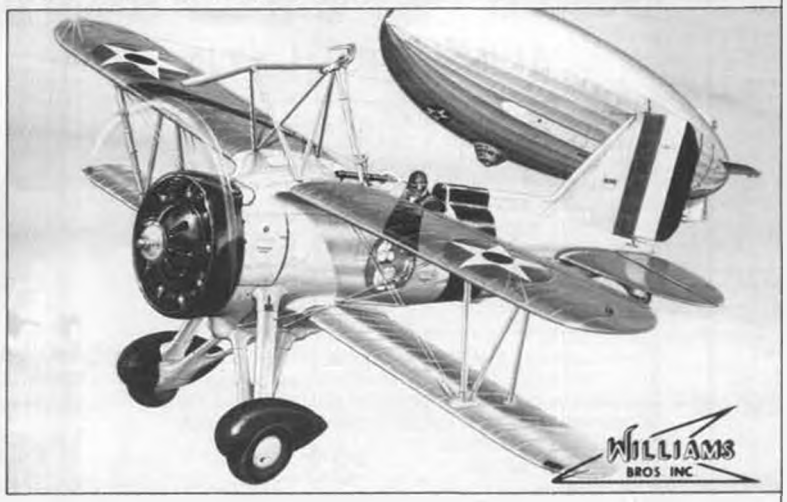
Photo No. 14 depicts the Chet Lanzo design, *Swayback*, that won for Roy. The interesting feature of this model is that the fuselage has the shape of a Grant X airfoil. Whether it contributes to the lift of the model or not is problematical, but the model did fly, well with an Elfin 2.49 cc, an English diesel.

George Fuller, noted English free flighter, has had a lot of designs reproduced. His *Stomper* is one of his more popular models. Photo No. 15 shows Alan Brown, of 50 years' experience, with his Elfin 1.49 cc powered *Stomper*. Alan, sadly, had a ten-second flight that did him in in his overall total.

Another English design in the Power event was *The Clubman* as flown by Ron Nyberg. Photo No. 16 shows his model with a Burford Sabre 19 for power. Test flights looked good, but Ron was unlucky in one flight and had to withdraw.

We couldn't get by without showing a Bill Dean design. This prolific English designer created the *Slicker* which turned out to be the most popular kit in England, even in three sizes! The best part about the *Slicker* is its ease of construction and flyability. Photo No. 17 shows a Junior, Rown Molloy, holding a *Slicker 42* powered by an E D Fury 1.46 cc engine. Unfortunately, another scratch!

Curtiss SPARROWHAWK



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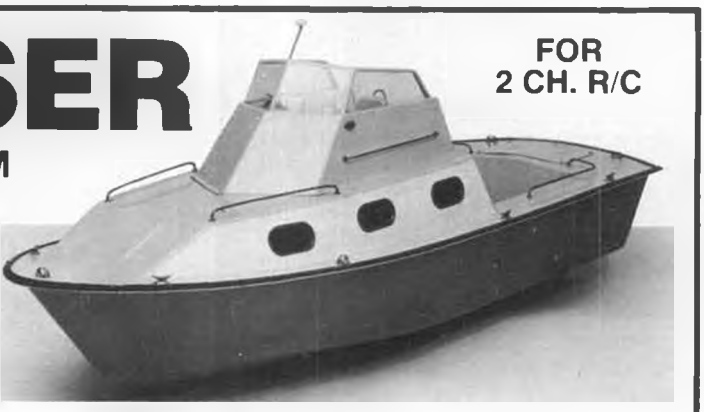

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Getting down to the bottom line, Photo No. 18 is presented showing Colin Collyer's *Brigand* off on its winning flight in the flyoff against Pond's *Ying Cabin* model. This high flying model outclimbed the lighter *Ying* in the early morning air. Now I know how the US skipper felt who lost the America Cup.

I don't know of any way of closing off the discusion of the free flight events, but to present Photo No. 19 in the waning hours of the meet. This model, a *JB-3* of Dutch ancestry, is a Wakefield model that placed fairly high when Korda won with his impressive flight. Geoff Cole thought the model was good enough to compete against the more modern designs, and proved it by placing.

Results? Well, look them over:

GLIDER
1. Paul Straney (*Quickie*) 496
2. Bill Gordon (*Jader 60*) 393

(No other officials registered)

RUBBER
1. Colen Collyer (*Brigand*) ..... flyoff 553
2. John Pond (*Ying*) ..... flyoff 516
3. Dick Sherman (*Hi-Climber*) 311
4. Geoff Cole (*JB-3*) 309
5. Ivor F (*Hamilton Pusher*) 304

POWER
1. Roy Summersby (*Swayback*) 555
2. Howard Gostelow (*Hyphen*) 544
3. Dave Thomas (*Eliminator*) 540
4. Peter Stone (*Super Phoenix*) 527
5. Danny Masbwicz (*Slick Stick*) 515

In summary, lest anyone think I was the only American nut there, this writer must acknowledge his old friend, Dick Sherman who showed up from New Hampshire via Perth, Australia. Talk about doing it the hard way! Kinda like going to New York via San Francisco (starting from New Hampshire). Dick also reports he had a good time driving across the Nullabor Plains (2000 miles!) from and to Perth. Certainly, he did get to see Australia!

This writer would be remiss if he didn't acknowledge his hosts, Monty Tyrrell and Norman Garrett, for their untiring patience with this columnist who would be constantly involved in one bull session or another. Also, thanks must go to Tony Farnan who is truly a magnificent host. Henry J. Nichols of England can tell you about that! To all Australians, I had a great time, thanks to those who made the trip so enjoyable.

THE WRAPUP

Probably the most humorous incident occurred when this columnist visited Dennis Parker in the company of Monty Tyrrell and Norm Garrett.

After everyone had sat down in the front room, all were asked what they cared to drink. In my case, Dennis simply said, "I know what you want," and promptly produced a beer much to the dumbfoundment of the others who had ordered lemonade well knowing Parker was a teetotaler! Dennis had gone to the trouble of having several beers on hand just for this columnist!

I don't think Monty Tyrrell (a good man with the bottle himself) and the rest of the fellows will ever let me forget this incident. I got the beer while they had lemondade!

To top it off, during the bull session when Dennis was bringing out his various Old Timer models for discussion, he mentioned the difficulty he was having in trying to cover the *Zipper* with silk. Before you could say, "Jack Robinson," Norm Garrett opened his mouth about the ease of covering with silk, and promptly got stuck with the job! This reminds this columnist of the old saying, "It is better to keep silent and be thought a fool, then to open one's mouth and dispel all doubt." Double Haw-w-w! •

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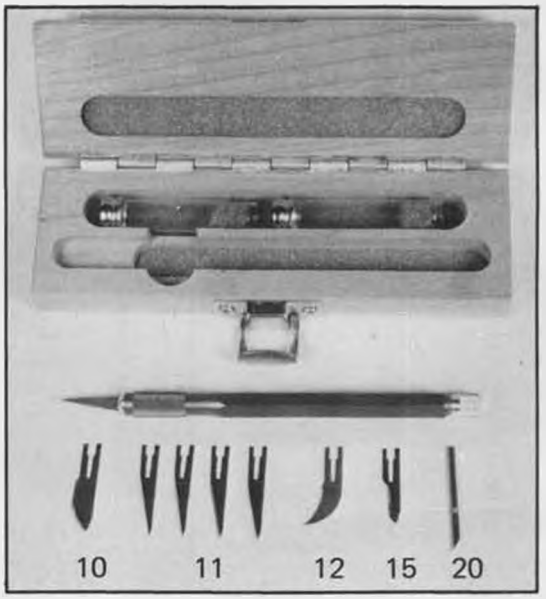

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Counter . . . . . *Continued from page 10*

construction photos, three-view, plastic prop and bearing assembly, lightweight wheels, rubber motor, sandpaper, weights, and a large set of decals that gives the model a beautiful, finished look.

The models are rubber powered, 15 to 16-inches wingspan, profile type airplanes, and meet rules for F.A.C. No-Cal contests.

The first four of the series are the Citabria *Champion*, Stinson *Sentinel* L5, Cessna *Aerobat*, and Zlin 50L. These planes are available now from your local hobby shop or direct from Peck-Polymers. If your hobby shop does not have them, ask them to order some.

For complete catalog, send $1.50 to Peck-Polymers, Box 2498, La Mesa, CA 92041.

★ ★ ★

Novak Electronics, 2709-C Orange Ave., Santa Ana, CA 92707, announces the release of a great new receiver which meets all 1991 FCC specifications. Called the NER-'91 AM, this new receiver measures 2.45 inches long, by 1.08 inches wide, by 0.7 inches high. It weighs only 1.5 ounces, has a voltage stabilizer which permits operation on three to six Ni-Cds, can operate seven channels, connectors are compatible with Kraft, Deans, RS, or Futaba, compatible with all AM transmitters, and much more! If you're interested in obtaining more information on this new receiver, you'll have to contact Novak at the above address.

★ ★ ★

A recent news release from Top Flite Models, Inc., 1901 N. Narragansett Ave., Chicago IL 60639, (312) 622-2630, announced the newest product in that company's lineup. Top Flight now offers a spray-on MonoKote® Cleaner/Polish. The new product comes in a handy eight-ounce bottle with spray pumper. This makes it fast and easy to clean, polish, and protect MonoKote, Econo-Kote®, and other plastic coverings, even most painted surfaces. After applying, simply buff to a lustrous glaze with a regular, soft kitchen paper towel. In addition, it's anti-static to repel dust while resisting fingerprints. It's non-flammable, does not streak, leaves no film or residue, and it's safe to use as a polish.

The compact size makes MonoKote Cleaner/Polish convenient for the modeler's field box. Easily buff your aircraft coverings, canopies, and cowls to a beautiful shine right on the flight line. It's ideal for preparing aircraft involved in competition. Try using it on your model before winter storage for a clean, polished finish in the spring. Even most old finishes can be restored to a brilliant shine with a quick application of MonoKote Cleaner/Polish.

While designed to be a useful accessory for the modeler, Top Flite's MonoKote Cleaner/Polish is an excellent way to give any plastic surface a fast cleaning that leaves a lustrous, glazed finish. As a protectorant, it helps keep the treated surface supple, while filling mirco-blemishes.

For more information, plus the latest catalog with MonoKote® color chart, send $1.00 to: Top Flite Models, Inc., 2635 S. Wabash Ave., Chicago, IL 60616.

★ ★ ★

Ikon N'wst is now shipping its latest kit, an Aeronca C-3 especially designed for use with .60 or .90 four-cycle engines. This 90-inch span plane weighs ten pounds. Its performance is very scale like, and it is very easy to fly.

For more information on this, or any other Ikon N'wst plane, write to Ikon N'wst, P.O. Box 566, Auburn, WA 98071 and send $1.

★ ★ ★

Beehive R/C Model Aircraft Co. has added another preassembled or partially assembled (kit) old timer aircraft to its line of quality products. It's an exact replica of the well-known and popular *Miss America*.

The ship has a seven-foot wingspan, and weighs in at four pounds, less engine, radio, and covering. When shipped, the fuselage is spliced into two parts due to UPS container size limitations, but reassembles in just a couple of minutes including all gluing, clamping, and alignment. The splice is actually stronger than before!

The preassembled *Miss America* comes with quarter-inch aluminum

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engine plate bolted to hardwood engine bearers. This allows quick engine removal and replacement. It also comes with an installed six-ounce clunk tank, throttle cable, and preinstalled internal control mechanism for both elevator and rudder (no exposed push rods or clevises).

The preassembled *Miss America* features bolt-on stab, landing gear, removable engine plate, and removable cowl. Included in the deal are two 3-1/2-inch wheels, Gold-N-Rod push rods, clevises, nylon landing gear brackets, tail wheel, and Robart hinges. . . . No, we aren't through yet . . . there is a vacuum-formed, clear plastic windshield, and plastic material for the flat, side windows. Whew!

The above described *Miss America* may also be ordered as a kit or partially assembled aircraft. It features the same accessories with the exception of the 3-1/2-inch wheels. The kit is very easy to assemble as it features preassembled fuselage sides, presoldered landing gear, and preassembled control mechanism. All major components are precut and sanded.

For more info on these labor-saving, quality aircraft, contact Bob Gray at Beehive R/C Model Aircraft Company, P.O. Box 744, Layton, UT 84041.

★ ★ ★

If you are into nostalgic, high-performance R/C aircraft, you'll be able to appreciate the latest plan combo package from RC Sweitzer Enterprises, P.O. Box 834, Hillsboro, OR 97123. Announcing the *Hog and Ahalf* by Dave Weigandt. As the name implies, this BIG Bird is a 150% reproduction of the famous, early RC *Astro-Hog* designed by Fred Dunn in 1957.

Included in the plans package are the following items: three plan sheets measuring three feet by eight feet with the complete wing shown, a materials list to get you through the construction, an 8X12 color photo of the completed aircraft, and a sturdy mailing tube for the whole works. Soon, a fiberglass cowl and accessory package will be available.

For more information, write to RC Sweitzer Enterprises at the above address.

★ ★ ★

WW-II scale model airplane builders and fliers will be interested in the latest kit from Great Lakes Model Company, P.O. Box 308, Tawas City, MI 48763. We speak of the new AT-6, SNJ, *Harvard* probably the most famous of all military trainers.

The new .60 size, 1-1/2-inch scale AT-6, SNJ, *Harvard* has molded urethane wing panels, ailerons, rudder, fin, stab, and elevator. The fuselage is a detailed, molded composite of high impact styrene plastic and urethane foam. All hardware is included, and the buyer has a choice of four canopy arrangements. Scale wheels and struts are included. The model has exact scale outlines and airfoil.

Urethane foam has been used in construction of big aircraft for years and can be painted with most paints and glued with most glues: cyanoacrylates and epoxies work very well. It is not affected by model thinners or fuels.

The model is designed to fly nose down like the real AT-6 and has been test flown. It is fully aerobatic and even flies "hands-off." Ready-to-fly weight is 8-1/2 to nine pounds.

Send SASE for free brochure to Great Lakes Model company at the above address.

★ ★ ★

Slope soaring enthusiasts will take note of the photo of Craft-Air's newest glider, the *Freedom X-cell* as it has some

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WANTED: Plans for Scientific's 20-inch span Curtiss Helldiver, Vance Flying Wing, Fairchild 22, and 24-inch span Monocoupe. Jonas Josselson, 20091 Lawson Lane, Huntington Beach, CA 92646.

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For more information, contact Craft-Air 20115 Nordhoff St., Chatsworth, CA 91311, (818) 998-3700.

★ ★ ★

Hunt Models has a line of super F/F scale models for CO_2 power. Latest in the series is the *Fly Baby 1B* biplane for the Telco CO_2 motor. Known as kit number CO102, the *Fly Baby* bipe has a 21-inch wingspan and very nice features.

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Contact Hunt Models, P.O. Box 21B, Dassel, MN 55325, for more information.

★ ★ ★

If you saw the kites amongst the photos of model airplanes and cars, you've come to the right place to read about them. Each one of those six kites flying in formation is a *Skyfox*. As you can see by the photo, *Skyfox* can be flown in "trains," but it can also be flown singly. A single *Skyfox* has a wingspan (if you can call it that) of 27 inches, weighs a mere 2-1/4-ounces, and is the ultimate in performance and quality at a low price. The *Skyfox* is a tough kite, as the

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★ ★ ★

Power Products, 766 Broadway, Seaside, CA 93955, has announced the availability of a whole bunch of new products for model boaters. They fall into the category of *hardware*.

What makes these hardware items unique is that the major components are manufactured out of a tough, space age, fiber filled nylon rather than heavier, more expensive stainless steel and aluminum.

For your convenience, Power Products offers these new components in a kit (No. 4002) containing the following items: a 3/16 inch flex cable 18 inches long, cable ferrule, 3/16 inch hardened stub shaft, drive dog, Teflon thrust washer, a 9/32 inch brass hull tube, a 1/4 inch brass stuffing box tube 18 inches long, an adjustable strut assembly, a turn fin assembly, a wedge rudder assembly, and complete mounting instructions. In short, everything you need to get your hydro into the water is included, except for the motor mount, engine, cable nut, and propeller.

If this sounds like something you'd be interested in, you should sit right down and write Power Products a quick letter and ask for more information. Use the above address.

★ ★ ★

While we are on the subject of waterborne vehicles, Midwest Products Co., Inc., would like to let you know about its newest R/C boat. Actually, the *Fantail Launch II* is the second release of the Midwest/Laughing Whale boat line. It's an authentic, 19th century steam launch constructed from die-cut and machined parts, simplified balsa and bass wood planking, and lots of mahogany trim. Full-size plans, assembly instructions, and propeller are included.

Specifications of the *Fantail Launch II* are: length, 19 inches overall; scale, 1/12 (one inch to the foot); suitable for single channel R/C.

The small, Model VI Stream Engine, Boiler, and Burner are available separately. Yes, it has a functional, live steam engine!

Contact Midwest Products Co. Inc., 400 S. Indiana St., Hobart, IN 46342, if you wish further information on this product.

★ ★ ★

If you are interested in building lighter and stronger models you need Bob Violett Models Magnalite composite materials. Bob Violett Models has developed a product line of various laminates of carbon fiber in combination with epoxy glass and end grain balsa to help the serious modeler reduce airframe weight by as much as 20% while increasing the strength in certain high stress and damage prone areas. Application of these laminates allows removal of plywood and aluminum, and facilitates the use of lighter balsa and finishing techniques.

As most pattern planes are of similar design and size, it was possible to put together a structural improvement kit that provides the correct Magnalite composite materials in the appropriate size to improve the strength to weight ratio and overall durability of your next pattern plane project. Fully illustrated instructions are included in this kit to help you properly apply the products. Once you work with Magnalite composite materials in your pattern plane, you will see how they can be applied to any flying model.

If you wish further information, request Bob Violett Models Information Brochure ($1), 1373-B Citrus Rd., Winter Springs, FL 32708.

★ ★ ★

When contacting manufacturers featured in "Over the Counter," tell them you saw it in Model Builder! •

Dear Jake . . . . . *Continued from page 7*

Radio Control Society) who always wear their blue club shirts. They're a mixed bag of male and female whites, blacks, and Hispanics who operate under the watchful eye of a tough, but fair and honest Italian club president. Their club field is in a seedy neighborhood full of residents who constantly complain about the noise.

Each week several stories unfold simultaneously. In the first episode, for example, President Furillo has to deal with an emotional divorce while trying to advance from Expert to Masters Pattern; scale modeler Mick Belker bites a scale judge who gave him low static points; and curvaceous Lucy Bates tries for LSF Level IV.

What do you think, Jake? Sounds like it might catch on, huh? I'd be willing to serve as technical advisor of course, and do all the model flying scenes for the show. Do you think I should submit my idea to a TV producer or go directly to the networks?

—Original Thinker in Oregon

Dear Original Thinker:

I think if I were you, I wouldn't take my hat off anytime two or more squirrels were present.

★ ★ ★ —Jake

IMS Show . . . . *Continued from page 18*

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Robart Mfg. Co.
S&S Slot Racing Products
Society of Antique Modelers (SAM)
San Valeers F/F M.A.C.
Society of Electric Aircraft Modelers (SEAM)
Scale Model Research
Scan Am International
Sig Mfg. Co., Inc.
Tatone Products
T&A Hobbies
Technical R/C
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Workbench. . . . *Continued from page 7*

modeling events in 1984.

First comes the Fan Fly Festival on June 23 and 24, where any ducted fan jet model qualifies to participate. Trophies will be awarded for Slow Flight, Pilot's Choice, Fastest Jet, and Shortest Takeoff. Speed events will be timed by a runway radar device. In addition to prizes and trophies, each Fan Fly Pilot who pre-registers and participates will receive a free Byro-Jet Ducted Fan. Registration deadline is June 1, 1984.

After sponsoring and conducting two consecutive IMAA Fun Fly Festivals in 1982 and 1983, Byron Originals will be holding its own Giant Scale Fun Fly Festival for 1984 on August 17, 18, and 19, just one weekend after the close of the 1984 Nationals, in Reno, Nevada. All Giant Scale Pilots who pre-register and participate will be eligible to win trophies and prizes. Pilots need not be IMAA or QSAA members to participate. A highlight of this year's festival will be the return of the Christen Eagles. Registration deadline is August 1, 1984.

A total of $15,000 in merchandise drawings will be awarded during the two events, and you'll also get to see the new scale hangar, complete with control tower, and the world's first 600 foot scale runway equipped with cross runways and the radar speed tra . . . er clocking device for checking air speeds.

Pilot registration for each festival is $10.00. Write to Bryon Originals, Box 279, Ida Grove, Iowa 51445, or phone (712) 364-3165 for more information.

SPOKANE SCALE MASTERS

The U.S. Scale Masters Championships will take place on June 15, 16, 17, 1984 at Deer Park Airport, north of Spokane, Washington. Events will be Expert, Sportsman, Team Scale, Giant Scale, and Electric, with awards from 1st to 3rd, depending on the number of entries. Entry fee is $17.00 per event, with an additional $3.00 for Scale Masters finals. Pre-registration is required by June 10th, with $5.00 extra for late entries. For additional information and registration requests, contact Marcie Nelson, East 807 Vicksburg, Spokane, WA 99208. Contest is hosted by the Barons Model Club of Spokane, Bruce Nelson, C.D. (509/484-5631), Joe Fox, Assist. C.D. (509/456-0500).

NATS

Two reminders about the 1984 Nationals. Unless there is a last-minute change, free-flighters should figure on using timer D.T.'s, as fuses could create a fire hazard at the current location.

Also, a warning to C/L and R/C fliers. particularly in the scale categories, where power loadings are sometimes marginal. The flying site is around 5,000 feet above sea level, and in August, the air temperature makes it even worse, the so-called air density altitude ranging between 7 and 8,000 feet!

WARBIRD WEEKEND

The Black Hawk R/C Pilots, of Waterloo, Iowa, are holding a "Warbird Weekend", August 18 and 19, 1984. Any 1939-1946 military aircraft with .40 to 1.5 (4-cycle) power qualifies. Contest consists of static judging, fun fly schedule, and pylon racing. Engine displacement vs. wing area is specified, with a 10% minimum wing thickness. For complete information, call Dave Ramsey, C.D. (319/236-1297) or Bruce Stone (319/232-5428).

MEDICAL REPORT

Paid a visit to Dan Lutz just before leaving for the Northwest Model Exposition in Puyallup, Washington, (report next month). As you read this Dan, hopefully, may have left Sharp Rehabilitation Center, and will be at home . . . 455 South Stage Coach Lane, Fallbrook, CA 92028. He remains paralyzed from the chest down, but has full control of everything from there on up. Steel pins have been removed from his smashed upper left leg, which is now in a more or less normal cast. The operation on his broken neck was a complete success and he now has full and normal control of head movement.

All Dan wants to do now is get back to model building and maintaining his Ford show cars. Drop him a line when you get a chance.

PHOTO STORIES

Jim Barr came down from British Columbia to attend the Northwest Model Exposition and compete in the static model display. His 22% full size De Havilland Beaver on Edo floats took a well deserved first in Scale Seaplane. But the model that caught my eye was one he didn't bring! It's the Supermarine Walrus, and he gave me the photo shown herein! Natch, it's a biplane.

The model, which has been flying for two years, spans 80 inches, power is a Webra .91, radio is Kraft, and the retract gear is modified Pro Line. Under ideal conditions, the model can be taxied into the the water, the gear retracted, and takeoff accomplished. Also, the wings can be folded back in scale fashion.

Believe it or not, the original aircraft was designed, for the Australian military, by Reg Mitchell, creator of the famous Spitfire. Jim is sending us tapes of the model in action, as well as of the Beaver. If luck is with us, we'll convince him to do a construction article on the Walrus.

★ ★ ★

Charlie Smith, Colorado Springs, Colorado, who in the past provided us with construction articles for the Curtiss XP-23, the Curtiss Shrike, and the stubby little SparrowHawk, sends in photos of two more recent projects, both of which he has been flying this past summer.

The Douglas O.46A is 1-3/8-inch scale, spans 62-1/2 inches. Weight is seven pounds, power is an Enya 45. Built up of balsa and spruce, it is silk covered, finished with Pactra dope, and has all controls plus flaps. Plans were created

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...AND NOW --- FOR SOMETHING ENTIRELY DIFFERENT, THE INLAND SOARING SOCIETY INVITES YOU TO THE

1ST ANNUAL R-C HAND LAUNCH GLIDER CONTEST JUNE 3,1984

The rules for this contest will be very simple. Any glider with a span of 60 inches or less (projected span) will be eligible, any number of functions will be allowed. Anyone may throw your glider for you, and all flights must terminate within the grassy area of the field. The tasks will be duration with one spot landing event.

There will be many exciting prizes and every contestant will receive a free set of plans for an R/C hand launch glider when they register. For more information, write or call:

INLAND SOARING SOCIETY

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$2.50 Pre-registration or $3.50 at the field
June 3rd, 1984 University Middle School, Riverside, CA
8:00 AM Registration: 9:00 AM Pilots Meeting

If you don't already have a hand launch R/C glider, register early, include an additional $.50 for postage and receive your free plan, and start building now !!!!!!!!!

from a combination of Wylam and Westburg drawings.

The Curtiss N2C-1 "Fledgling" was also created from Westburg drawings. At 1-1/2-inch scale, it spans 58-1/2 inches and weighs 7-1/2 pounds. Construction and finish is the same as the O-46A, but the engine is an Enya 60. Radio is Kraft.

INDUSTRY NEWS

While we're on the photo kick, Bill Cannon sent in two pics of Tony Recht's 20-inch span R/C scale Zero. Tony, from Van Nuys, California, modified an all-foam Bentom rubber powered $9.95 kit into a two-channel R/C model that weighs only six ounces. Using a Cannon Super-Micro Flite Pack and Charlie's R/C transmitter, the Cox .020 or G-Mark .03 powered model provides lively but stable flights, even in windy weather, and glides quite well with power off.

Modifications include rework of the wing seat to decrease incidence, a 1/16-inch hard balsa firewall, and slightly heavier landing gear wire to handle the extra load. The engine area is epoxied for extra strength and fuel proofing, and the engine is offset five degrees down and three right.

The total radio flight pack weight, with a new 70 mah Cannon battery pack, is only 2½ ounces, using two channels! In case you want to give it a try, the Bentom line also includes a Mustang, Spitfire, and Messerschmitt. All items mentioned, except the Cox engine, are distributed by Cannon R/C Systems, 13400-26 Saticoy St., North Hollywood, CA 91605, phone (213) 764-1488. The Bentom line is also distributed by California Model Imports, Box 1695, Garden Grove, CA 92642.

According to Bill, a special note of appreciation should be handed to John Castranover, Fort Lauderdale, Florida. who he believes was the first to experiment with this type of aircraft and radio control (with Cannon Micro equipment, natch!)

FIRECAT TECHNOLOGY

Frank Milo, the purposeful and powerful pusher of Pacer products (Zap, etc.) has just severed relations with Pacer. He and his wife, Lois, have formed a new company, Firecat Technology, which will feature new, space age, model oriented materials. Will a line of C.A. glues be included? "We'll see," says Frank.

MUSEUM BOUND

Do you remember Ken Johnson's (he's our *Indoor* editor) construction article on Gustav Whitehead's "No. 21", 1901 monoplane, scale model of an aircraft that many experts believe was flown prior to the Wright brothers' historic flight? (July 1982 issue, plan No. 7822). Well, Ken's original model is headed for the Gustav Whitehead Museum, located in Whitehead's home town of Leutershausen, West Germany. (In German, "Whitehead" becomes "Weisskopf", a name familiar to anyone who follows professional golf).

The model will be transported under extreme care and safety and delivered by Germany's Lufthansa Airlines. Ken points out that this same model also made an appearance on national TV, as part of the "Believe It or Not - Ripley" show, emceed by Jack Palance.

Not bad for a "stick and tissue toy airplane"!

PAINTINGS FOR SALE

Bob Benjamin, 1222 26th Ave. N.E., Olympia, Washington 98506, is offering several selected original paintings for sale. Included are a few of the ones that have appeared on the covers of **Model Builder.** Bob welcomes any serious inquiries.

WHAT NEXT?!

Seen in the December 1983 issue of the Valley Forge (Pennsylvania) Signal Seekers newsletter *Hear Ye*, Tom Kozel editor, under Irv Weinburger's by-line. . . .

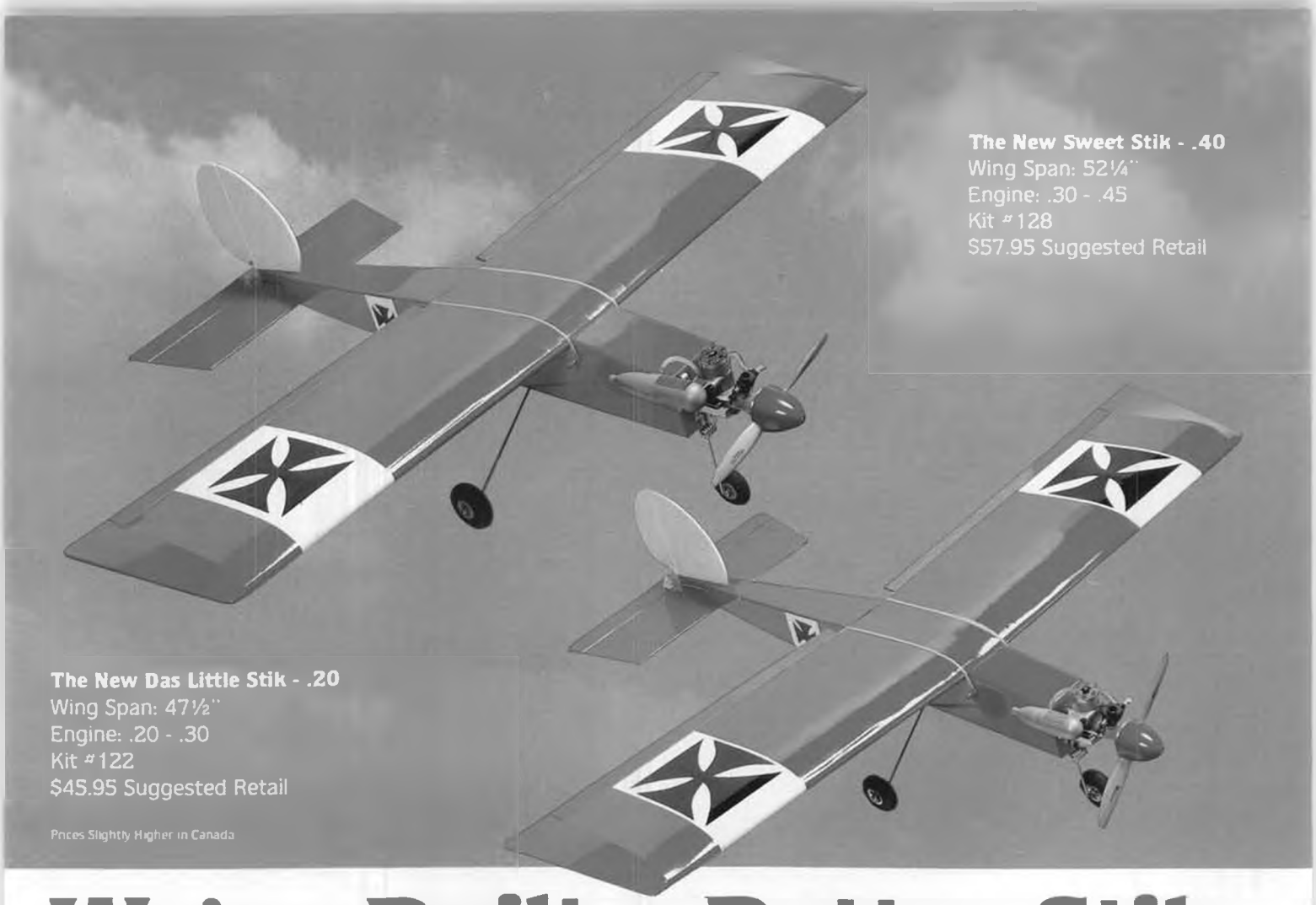
CARL GOLDBERG CRITICIZED FOR HIS 2-METER SAILPLANE KIT

Chicago (IW) - Women's lib activist Shiza Loolu has launched a vitriolic campaign against Carl Goldberg Models, Inc. In an effort to avoid ugliness and to appease Ms. Loolu, Mr. Goldberg has announced that all future packaging of his 2-meter sailplane kits will bear the name "Gentle Person."

AND FINALLY . . .

For the first time since moving to the Los Angeles/Orange County area, we flew out of Long Beach Airport, this on our round trip to Sea Tac (Seattle - Tacoma) Airport for the Northwest Model Exposition. It was also our first trip on Alaska Airlines, Long Beach being its most southerly stop. After the frantic hustle and bustle of LAX, the laid back atmosphere at Long Beach was a real treat.

But what really stuck in our minds were a couple of P.A. comments by the stewardess on the return flight. As we took off, the otherwise run-of-the-mill announcement came on . . . "The smoking section is confined to rows 22 through 28, the breathing section is all other seating in the aircraft." And after about a four judging points landing at Long Beach, which must have lowered the 727's dihedral by a couple of inches, she came on again . . . "In case anyone might not have noticed, we have just landed in Long Beach!" ●



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Instead you'll find machine-cut formers, machine-cut and sanded tail surfaces and sturdy one-piece Micro-Lite Plywood™ fuselage sides.

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We've changed our wing construction to include bigger spruce spars, full-length balsa shear webs, fiberglass center section reinforcing and dihedral for improved flight characteristics. The airfoil remains the same, however, a more blunt leading edge shape improves low speed characteristics and our new wing tip/aileron design eliminates high speed flutter.

Pilots who prefer their Stiks without dihedral can still build a flat wing version.

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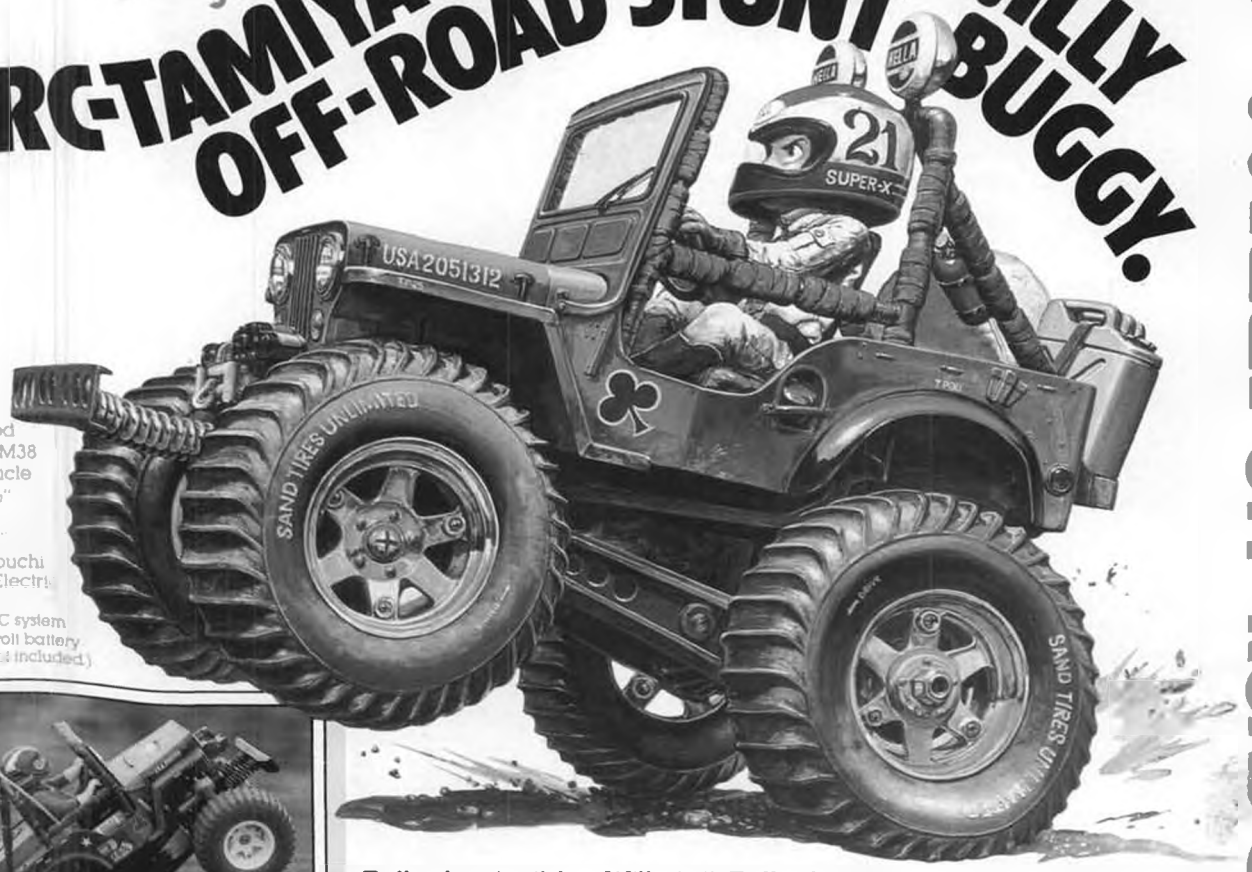

KIT SPECS
Body derived from Willys M38 military vehicle
Length 13½"
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Height 10½"
Power Mabuchi RS-540 Electric Motor
(3 channel R/C system and 6 or 7.2 volt battery required - not included.)

Talk about wild... Willy is it. Talk about fun... Willy's the one. It's MRC-Tamiya's stunt buggy kit. Its been geared for everyone... whether you're into R/C off-road, or ready to take the plunge. ■ To begin with, it looks like fun. From Willy in the driver's seat, to its oversize sand tires and rugged, jeep-like chassis, through its spring loaded front bumper that soaks up shocks and bounces Willy back into action, Willy was made for stunting. Its wide track and short wheelbase make it perfect for wheelies, spinouts, donuts, figure eights, and uphill climbs... Wild Willy was engineered to do it all. From asphalt to mud, from sand dunes to rocky slopes, Wild Willy takes them in stride. ■ **STUNTABILITY**... It's all in the engineering... technology that only MRC-Tamiya could create. We've given Wild Willy an ability for super, quick acceleration beyond conventional off-road cars. And we've coupled this with a front wheel independent suspension, four ball bearings, long trailing arms and differential gear on the rear axle. It adds up to stuntability you're going to love. Then, to make sure this wild buggy keeps its balance, we engineered spring wheelie casters to keep it right side up while it's hotdogging through the boonies. But just in case, we had a strong roll bar built into the rugged chassis to keep Willy in one piece. ■ Wild Willy... engineered, conceived and built to be the first, high performance, off-road stunt buggy ever made. It's pure pleasure. Go for it.

MRC TAMIYA

WILD WILLY OFF-ROAD STUNT BUGGY