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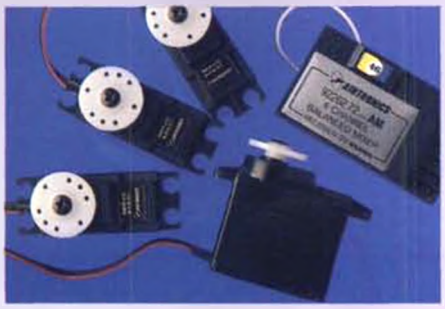

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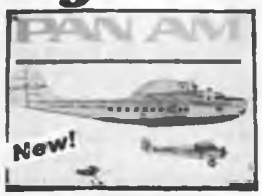

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CONSTRUCTION

Cover: Felix Vivas' dramatic photo from this year's Reno Air Races captures the heart-stopping action as a classic P-38 Lightning leads a venerable Mustang fighter 'round the pylon. For more exciting race photos, see page 18.

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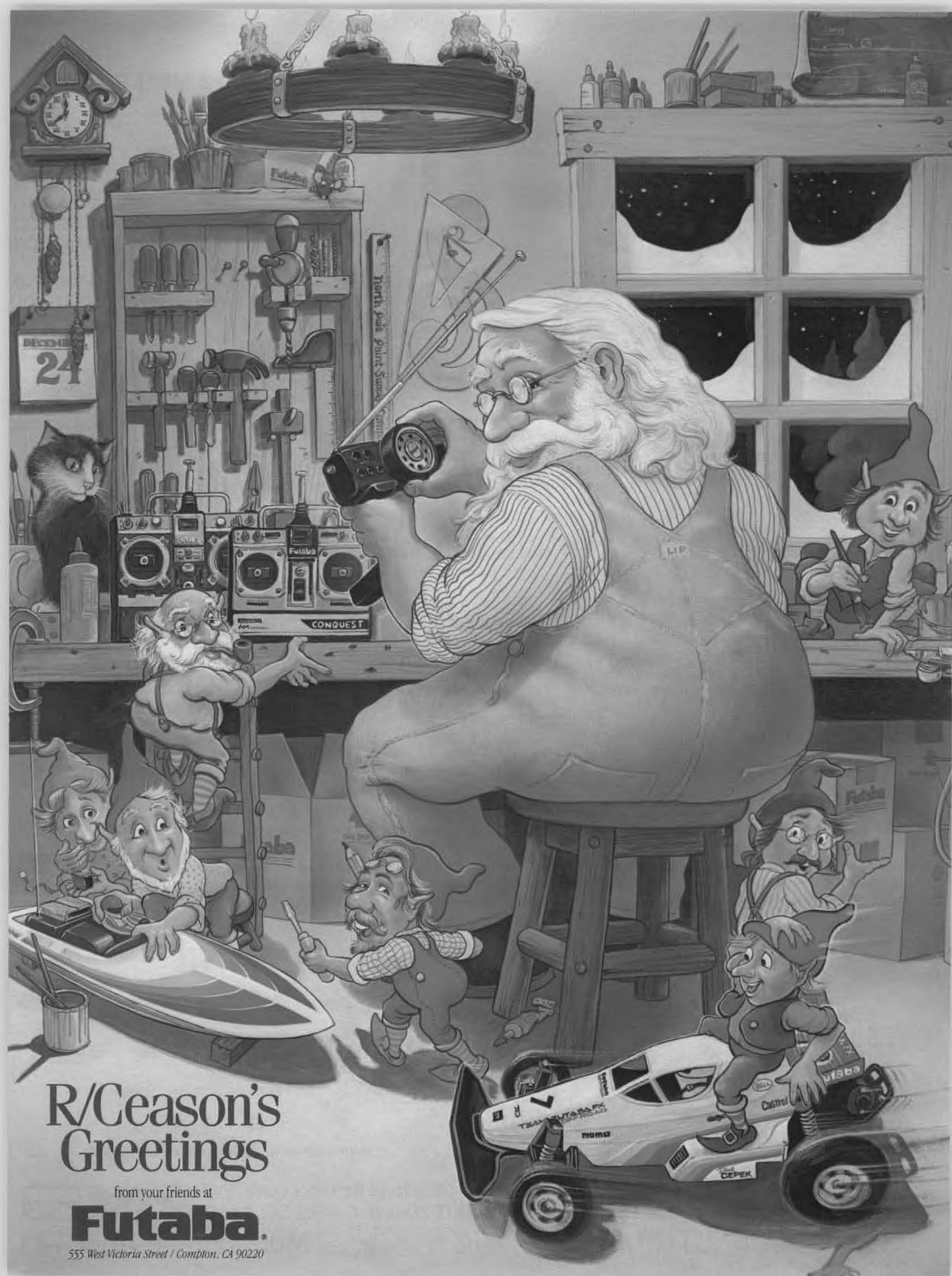
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SIOUX CITY
Tri-State R/C
3201 Viking Drive
PH 712 255-8190
SPIRIT LAKE
Spirit Lake HobbiCraft
1621 Hill Ave PH 336-5586
WATERLOO
Bob's R/C Supply
2401 Falls Ave
WAVERLY
R/C Hobby House
916 E. Bremer Ave.
KANSAS
JUNCTION CITY
R/C Hobbies
115 W. 7th St.
PH 913 238-1877
KANSAS CITY
R/C HOBBIES
5620 State Ave
LIBERAL
Miller's Bike & Hobby Shop
105 E. Seventh
MANHATTAN
Wings & Wheels
463 E. Poyntz
Town East Center
PH 913 776-6099
WICHITA
Big Frank's Hobby Center
2269 N. Amidon
Sweetbriar Shopping Center
KENTUCKY
LEXINGTON
X-Cell Models, Inc.
211-215 New Circle Rd NE
PH 606 293-2951
LOUISIANA
BAKER
Hobby Haven
260 Main St.
BATON ROUGE
Hobby Towne
3112 College Drive Suite A
BATON ROUGE
Hobby Towne
6996 Airline Highway
GRETNA
Boy's World of Hobbies
605 Lapalco Blvd
MANDEVILLE
Mercury Hobbies, Inc.
Rt. 6 Box 734A
PH 504 892-7204
MONROE
American Classic Hobby Shop
1314 U.S. 165 North
PH 318-343-5554
SHREVEPORT
Bardwell's Hobby Shoppe
6505 Line Ave #8
MAINE
WATERVILLE
Piper Radio Control
Riva Ridge Vassalboro
MARYLAND
MIDDLETOWN
Larch Lane Hobbies
18 Larch Lane
WALDORF
Doug's Hobby Shop
Waldorf Shopper's World
WESTMINSTER
Bobby's Hobby Lobby
65 E. Main St.
MASSACHUSETTS
CHICOPEE
J & J Hobbies
133 Frontenac St.
PH 592-1472
EAST FALMOUTH
R/C Hobbies
153 E. Falmouth
EAST LONGMEADOW
Bill's Hobby Supplies
600 N. Main Street
PH 413-736-7711
EAST WEYMOUTH
South Shore Hobby Centers
777 Broad St.
PH 617 331-1234
FISKDALE
K/N Hobbies & Toys
559 Main St
FRAMINGHAM
Fisher R/C
17 Salem Road
GREENFIELD
Chano Hobbies
40 Bank Row
PH 413-773-3300
MERRIMAC
George's Hobby Shop
22 Merrimac Square
REVERE
Tony's Hobby Shop
90 Kimball Ave
PH 284-8756
WALPOLE
B & B Hobbies, Inc
938 East Street
WORCESTER
Ray's R/C Specialties
12 Sherman St.
PH 757-5883
WRENTHAM
B's Tire, Auto, & Hobby
383 Burnt Swamp Road
PH 617 384-8237
MICHIGAN
ANN ARBOR
Rider's Hobby Shop
115 W. Liberty
BATTLE CREEK
Hobby House
1035 W. Territorial Rd
PH 964-9105
CHARLOTTE
Hussey's Hobbies
222 Lansing St.
PH 517 543-4400
COLDWATER
Hobby Heaven
7 So. Monroe
PH 278-5894
COLEMAN
Lang's Aero & Hobby Shop
5812 Old U.S. 10
DEARBORN
Joe's Hobby Center
7845 Wyoming Ave
PH 313 933-6567
EAST DETROIT
Joe's Hobby Center
17900 E. 10 Mile
PH 313-733-6294
FARMINGTON
Joe's Hobby Center, Inc.
35203 Grand River Ave
PH 313-477-6266
GRAND RAPIDS
Rider's Hobby Shop
2055 28th St. S.E.
HOUGHTON LAKE
Craftsman's Cove & Tradingpost
5729 W. Houghton Lake Dr
PH 517 422-5714
LANSING
Rider's Hobby Shop
1609 E. Michigan Ave
PH 517 485-0700
PONTIAC
RC Hobbies
921 Huron
ROCHESTER
Joe's Hobby Centers, Inc.
Campus Corners Shp Ctr
105 S. Livernois
SAGINAW
Roger's Hobby Center
5658 State at Wheneke
Ray's Shopping Center West
PH 517 790-0080
SAGINAW
Tad's Hobby Shop #2
3270 Bay Road
TRAVERSE CITY
Ray's Radio/Control Shop
517 So. Union PH 947-4949
UTICA
Henderson's Family Hobbies
2441 Auburn
WALLED LAKE
Richie's Hobbies
2604-A Benstein
WARREN
Prop Shop Hobbies
23326 Van Dyke
4 Block N. of 9 Mile
MINNESOTA
BLOOMINGTON
Jolly's Hobby & Craft Center
Southtown Shopping Center
LITTLE CANADA (St. Paul)
Hub Hobby Center
82 E. Minnesota Ave
PH 612 490-1675
MANKATO
Don's Hobby Co.
424 S. Front St
PH 507-387-1330
MINNEAPOLIS
Jolly's Hobby & Craft Center
Apache Plaza
MINNETONKA
Williams' Hobby World
5757 Sandal Drive
MOORHEAD
Valley Hobbies
17 South 5th St
RICHFIELD
Hub Hobby Center
6416 Penn Ave S.
ROBBINSDALE
Hub Hobby Center
4114 Lakeland Ave N
ST. PAUL
Gulliver's
1526 W. Larpenteur
PH 612-646-8249
ST. PAUL
Jolly's Hobby & Craft Center
Sunray Shopping Center
2127 Hudson Road
ST. PAUL
R/C CITY
961 W. 7th St
W. ST. PAUL
Jolly's Hobby & Craft Center
1891 S. Robert
MISSISSIPPI
CORINTH
C & D Jernagin Co
Route 3 Box 217
OXFORD
Creative Sources
1010 Jackson Ave
MISSOURI
GRANDVIEW
Flo-Mow Co
700 Blue Ridge Exit
PH 816-761-6471
GREATER KANSAS CITY
Hobby Haven
Metcalf South &
Independence Center
MARYLAND HEIGHTS
Flying Models Hobby Center
2723 Creve Coeur Mill Road
ST. CHARLES
Mark Twain Hobby & Craft
Mark Twain Mall N. 5th St.
ST. LOUIS
J & J Hobbies
5511 So. Lindbergh
MONTANA
VICTOR
Murph's Hobbies
239 West View Drive
NEBRASKA
LINCOLN
Lincoln R/C Hobbies
4518 N.W. 51st St
PH 402 470-2393
NORTH PLATTE
Patterson's Hobbies
103 North Jeffers
NEVADA
LAS VEGAS
J.J.'s Hobby Den
4972 S. Maryland Parkway#8
NO. LAS VEGAS
Peterson Hobbies & Crafts
3262 B Civic Center Drive
RENO
High Sierra Models
953 West Moana Lane
PH 702 825-9098
NEW HAMPSHIRE
KEENE
Leisure Time Hobbies
141 Winchester St
PH 603-352-1518
MANCHESTER
Queen City R/C
760 Hevey Street
PH 603-623-6913
NASHUA
Hobby Emporium
Royal Ridge Mall
NORTH CONWAY
C V Machine Co
Kearsarge St
SALEM
Bill's Hobby Barn
326 S. Broadway
PH 603-898-9241
WOODSVILLE
North Country Hobbies
Central St Route 302
PH 603-747-2165
NEW JERSEY
BOUND BROOK
CJ Hobbies
423 West Union Ave
PH 201 469-8844
CLINTON
Hobbies To Go
310 Highway 31 N
Ridge Plaza
MARLTON
Hi Fly Hobbies
Route 70 & Cropwell Road
Marlton Square Shp Mall
PH 609-983-8060
POMPTON PLAINS
Hobby Hut
567 Route 23
PH 835-2077
RAMSEY
Hi Way Hobby House
806 Route 17
RANDOLPH
Carl's Hobby Center
508 Route 10
PH 201 366-4300
RED BANK
Hobbymasters, Inc
62 White Street
RIDGEFIELD
Ridgefield Hobby
508 Broad Ave
RIVERDALE
Zeppelin Hobbies
62 Hamburg Turnpike
WILLINGBORO
Wilmo Hobbies
Country Club Plaza
Beverly Rancocas Road
NEW MEXICO
ALBUQUERQUE
Valley Hobbies
4522 4th St. N.W.
PH 505-345-9688
CARLSBAD
The Schettlers
1009 N. Eighth St.
NEW YORK
ALBANY
Competition Hobby Supplies
67 Exchange St
BROOKLYN
Brooklyn's Model Masters
1192 Gravesend Neck Road
PH 718-339-9250
CANANDAIGUA
Finger Lakes Hobby
& Gift Center
222 South Main
PH 716-394-7509
CHEEKTOWAGA
Field's Hobby Center
3523 Union Road
PH 716-681-6440
ELMSFORD
Andy's Hobby Shop
36 Main Street
PEEKSKILL
Lenco Hobbies
819 Washington St
ROCHESTER
Dan's Crafts & Things
352 Empire Blvd
PH 716-654-8388
ROCHESTER
Edmund's Hobby Shop
1521 Mt. Hope Ave
SYRACUSE
Walt's Hobby & Craft
4300 W. Genesee St
UTICA
Hobby & Sport World
2107 Whitesboro Street
PH 315-724-4959
NORTH CAROLINA
ASHEVILLE
Carolina Art & Craft Supply
128 Swannanoa River Road
BURLINGTON
R/C Hobby Workshop
1358 S. Church St
CHARLOTTE
Action Hobbies
2819 S. Boulevard
PH 704-527-2596
GOLDSBORO
Hollingsworth R/C Shop
Route 14 Box 93
PH 919 735-5098
HENDERSONVILLE
The Hobby House
1211 Asheville Hwy
PH 692-6683
HIGH POINT
Bernie's Craft & Hobbies, Inc.
2291 English Road
KING
King R/C
Old Hwy 52 PH 983-3969
WINSTON SALEM
The Hobby Corner
136-C Oakwood Drive
PH 723-3589
OHIO
AKRON
Miller's Hobby Shop
1018 Kenmore Blvd
PH 216-848-2264
BALTIMORE
Frank's Service
145 Baltimore-Somerset Rd N.W.
BERLIN HEIGHTS
Daniel's Hobbies
36 Center Street
CENTERVILLE
A Hobby Shop
13 N. Main St. Suite 13
PH 513-433-7127
CHAGRIN FALLS
Trains, Boats & Planes Co.
Stepnorth 100 North Main
CINCINNATI
Carl's Hobbies
1188 W. Kemper Road
CLEVELAND/PARMA
National Hobby, Inc.
5238 Ridge Road
PH 216-749-2450
FINDLAY
Jim's Model Supplies
721 Rockwell Ave
JACKSON
Prop Shop
127 Pearl Street
LAKEWOOD
Wings Hobby Shop Inc
17112 Detroit Ave
PH 221-5383
LANCASTER
Slater's Inc
Plaza Shopping Center
1141 N. Memorial Drive
MANSFIELD
John's Hobby Shop
15 N. Main
MAPLE HEIGHTS
Southeast Hobby
5150 Warrensville Ctr. Road
MARION
Lew's Whistle Stop & Hobby
603 Marion Cardington Road W.
PH 389-3464
MAUMEE
J & M Trains & Hobbies
2566 Parkway Plaza
PH 419-893-2621
MIDDLEBURG HEIGHTS
American Modeler
7559 Pearl Road
MILFORD
House of Hobbies
204 Main St
NORTH CANTON
Aero Tech Hobbies
531 N. Main
NORTH CANTON
Modeler's Haven
4255 Portage N.W.
PH 499-6000
OREGON
Buckeye Hobby Shop
1153 Eastwood Ave
STRONGSVILLE
Hunch's Train & Hobby
8788 Pearl Road
PH 216-243-6050
TOLEDO
The Hobby Stop West
4558 Monroe Street
UPPER SANDUSKY
Jim & Ken's Hobby Shop
14635 CH 58 R3
PH 419 294-1712
WAPAKONETA
Dad's Toy Shop
123 W. Auglaize St
PH 419-738-2007
YOUNGSTOWN
Boardman Hobby Center
6820 Market Street
OKLAHOMA
OKLAHOMA CITY
Campbell's Hobby House
3500 N. MacArthur
OKLAHOMA CITY
Hobby Corner
Corner of 30th & S. Robinson
3101 S. Robinson
TULSA
Action Hobbies
4423 E. 31st St.
TULSA
Wings 'N Things
5153 So. Peoria PH 745-0034
OREGON
CANBY
Northwest Hobbies
266 N.W. 1st Ave
CORVALLIS
Trumps Hobbies
1875 N.W. 9th St.
EUGENE
Eugene Toy & Hobby
32 East 11th Ave
PORTLAND
Norm's Hobbies Unlimited
4503 N. Interstate Ave
PENNSYLVANIA
ALLISON PARK
Wildwood Hobbies Corp
4678 Route 8
PH 412-487-0706
BATH
Dick Wetzel's Hobbies
514 E. Main PH 837-6681
ERIE
Maxwell's Repair Center
5014 Station Road
EVANS CITY
Cranberry Hobby Depot
20327 Perry Highway
HUMMELSTOWN
The Hidden Hangar
145 S. Hoernerstown Road
LANSDALE
Penn Valley Hobby Ctr
837 W. Main St.
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 672-5200
YORK
Mel's Hobbies
935 East Market St
YORK
Skelly Sporting Goods
2227 W. Market St
SOUTH CAROLINA
HARTSVILLE
Clyde's Hobbies
P.O. Box 2455
MYRTLE BEACH
Ed's Hobby Shop
702 Main Street PH 448-8685
PELZER
Pelley's Hobbies
591 Cooley Bridge Road
SOUTH DAKOTA
ABERDEEN
Ken's
406 S. Main
WATERTOWN
Hollon's Hobbies
Route 2 Box 14
TENNESSEE
KNOXVILLE
M & N Hobbies
1923 Brannville Rd PH 525-7532
KNOXVILLE
Mike's Keys & Hobbies
4011 Chapman Highway
KNOXVILLE
Tennessee Model Hobbies
8909 Oak Ridge Hwy
PH 615 482-2900
NASHVILLE
The Toy Mart
113 Greylynn Drive
PH 615-883-1648
OAK RIDGE
Ridge Handicrafts Inc
205 Jackson Sq
TEXAS
ARLINGTON
The Hobby Hub
903 A Pioneer Parkway W.
AUSTIN
Command Hobbies
6929 Airport Blvd. Ste 146
CANADIAN
Yarnold Hobbies
Highway 60 83 South
DALHART
Hobby Discount
P.O. Box 1249
PH 806 249-2455
EL PASO
Hal's Hobby Shop
4886 A Hercules
PH 915-755-1914
FARMERS BRANCH
Bold Hobbies, Inc
101 Valwood Village Shp Ctr
PH 214-241-8492
FORT WORTH
Matt's Hobby Shop
7241 Grapevine Highway
PH 817 281-0921
HOUSTON
Larry's Hobbies
1560 F. 1960 East
PH 713-443-7373
HURST
Roy's Hobby Shop
1309 Norwood
LONGVIEW
Leslie's Hobby Shop
2726 Gilmer Road
McALLEN
B & B Hobbies
2117 Noland
ODESSA
GT Enterprises
805 N. Jefferson
PH 915-381-5377
ODESSA
The Windsock Hobby Center
Grandview & 42nd St
PH 915 333-2317
PFLUGERVILLE
Ted's Hobbies Crafts & Gifts
1406 FM 1825 Suite 301
PH 512 251-0599
SAN ANTONIO
Clayton Hobbies
5707 E. Mobud
SULPHUR SPRINGS
Hudson's R/C
508 Merrill Drive
WACO
Beverly Hills Model Shop
3421 Memorial Drive
VERMONT
NO. FERRISBURG
Vandow's House of R/C
Route No. 7
VIRGINIA
RICHMOND
The Hobby Center
1709 Willow Lawn Dr
WASHINGTON
BELLEVUE
R/C Model Shop
14010 N.E. 21st St
PH 506-747-9914
BELLINGHAM
Bayside Hobbies
1534 D Birchwood
PH 206-671-5541
BELLINGHAM
Hobby Hive
703 W. Holly
PH 206 734-4090
SEATTLE
Webster Hobby Shop
1116 N. 183rd
SEQUIM
Fred's Hobbies and Guns
349a W. Washington
SPOKANE
R/C Hobbies of Spokane
W. 1104 Wellesley
TACOMA
All Hobbies
Narrows Plaza
2310 Mildred West
TACOMA
Bill's Hobby Town
13923 Pacific Ave
PH 206-531-8111
TUKWILA
Express Station Hobbies
668 Strander Blvd.
WALLA WALLA
Harley's R/C
Route 1 Box 277A
PH 509 529-2618
YAKIMA
Model Aircraft Supply Center
505 N. 20th
PH 453-8238
WEST VIRGINIA
CHARLESTON
Fountain Hobby Center
200 W. Washington St
WISCONSIN
APPLETON
Galaxy Science & Hobby Center
756 Northland Mall
FOND DU LAC
Focus
75 S. Main St
WAUSAU
Pope's Hobby Land
640 South 3rd Ave
CANADA
BAWLF, ALBERTA
Alberta's Littlest Airport
Box 6
PH 373-3953
CALGARY, ALBERTA
Calgary Hobby Supply, Ltd
Box 3173, Stn. "B"
CALGARY, ALBERTA
P.M.B. Hobby Craft
154-495 36th St. N.E.
Northgate Village
ROCKY MTN. HOUSE, ALBERTA
JB Crafts & Hobbies Ltd
Box 538 4918 50 Street
PRINCE GEORGE, B.C.
M.S.M. Enterprises
3980 1st Ave
PH 564-5228
VANCOUVER, B.C.
Silverwing Hobbies
2721 East Hastings
WINNIPEG, MANITOBA
Cellar Dweller Hobby, Ltd
1354 Main St
PH 589-2037
ST. JOHN'S, NFLD.
Capitol Hobby Centre, Ltd
6 Freshwater Road
BURLINGTON, ONTARIO
Skycraft Hobbies Inc
141 Plains Road West
PH 416 529-0559
800-263-9331
KITCHENER, ONTARIO
Flite Craft Model Co.
1595 Victoria St. N.
LONDON, ONTARIO
Flite Craft Model Co., Inc.
1700 Dundas St. E.
MISSISSAUGA, ONTARIO
Hobby Hobby, Inc.
128 Queen St. South
SCARBOROUGH, ONTARIO
National Hobby, Inc.
1875 Lawrence Ave. E.
PH 416-755-1766
STREETSVILLE, ONTARIO
Hobby Hobby
128 Queen St. South
PH 416 858-7978
WILLOWDALE, ONTARIO
Keith's Hobby Shop
5205 Yonge St.
PH 222-4721
LAVAL, QUEBEC
Carl's Hobby Shop
1500 Labelle Blvd.
MONTREAL, QUEBEC
Can Air Hobbies
5850 Gouin Blvd. Quest
PH 514-332-3565
ST. GEORGES BEAUCE, QUEBEC
Place Bureau Enr.
12515 1ere ave est Ville de
VILLE ST. LAURENT, QUEBEC
Hobbyville
949 Decarie
PH 514-744-8280
NORTH BATTLEFORD, SASK.
B & C Supply
103 2062 100th St.
REGINA, SASKATCHAWAN
Aero Specialties
200 Shannon Road
SASKATOON, SASKATCHEWAN
Collins Aero Craft
113 2301 Ave C North
Hascamp Centre
PH 652-4775
YORKTON
Radio Control Hobbies
221 Roslyn Ave
PH 783-4747
COSTA RICA
SAN JOSE
El Hobby Shop
Box 529 Centro Colon
ENGLAND
NORFOLK, NR17 1DG
Pegasus Models Ltd
Caston, Attleborough
PUERTO RICO
GUAYAMA
Mowing Hobbies
Calle Gardenia D-8 El Dorado
PH 864-7165

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

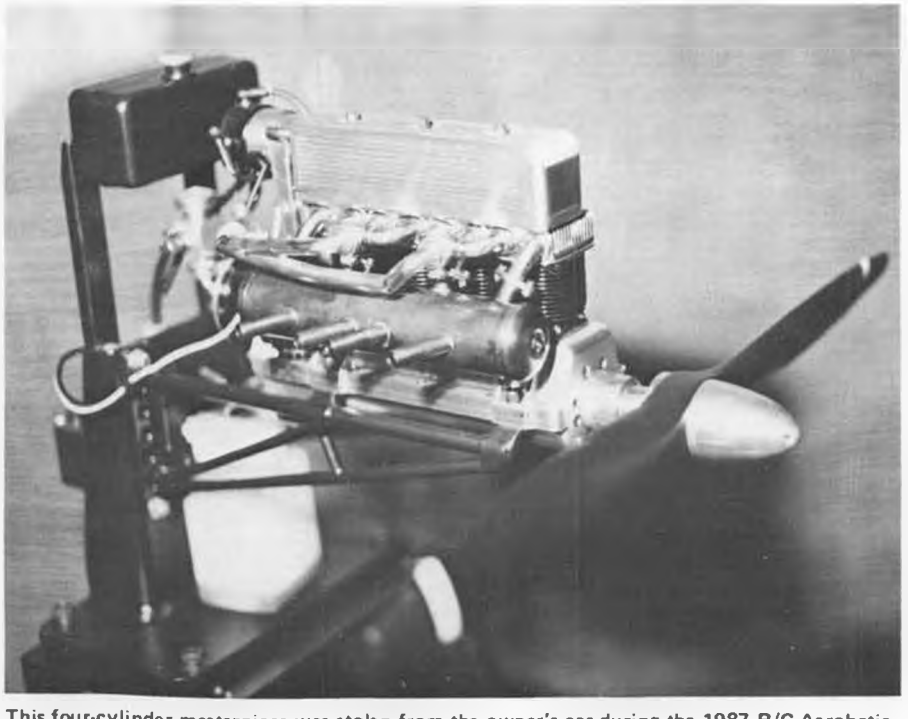
from Bill Northrop's workbench

• We have talked with various modelers in recent months who lament the fact that fewer and fewer R/C scale construction articles are appearing in the model magazines, and they wonder why. Right or wrong, we seriously believe the answer to this question is as follows:

The creative ability to design and build model aircraft of any type, be it R/C scale or just about any other class, including free flight and control line, comes from nothing less than a whole lot of experience gained from basic model construction materials. Depending on frequency of activity, this skill could take anywhere from a year to ten years to develop. After sufficient experience is gained through building kits and/or scratchbuilding from existing plans, and from trimming, flying, crashing, repairing, and flying, etc., again many times over, a modeler gradually attains the skills required to design, create construction drawings, and build models that he or she first only envisions and then desires to bring to life.

In aircraft modeling's never-to-be-repeated Golden Era, from the early 1930s and on up through the beginning or radio control and into the early 1950s, nearly all of those who actively participate in the hobby were model builders of varying capability. What few were not, commissioned and/or purchased hand-built models from builders.

With the coming of more easily available, almost and entirely ready-to-fly models (pretty much limited to R/C aircraft) in the past twenty-five years, the *hobby* of building and flying model aircraft has been gradually transforming to the *sport* of flying model aircraft (note that the sport does not include building, any more than one would build his or her own tennis racquet or set of golf clubs). With few exceptions, and my apologies to any newcomers to the *hobby*, a larger and larger percentage of today's R/C model fliers have no building experience, and have very little interest in becoming builders. They are in the *sport* of model flying, not the *hobby* of building and flying. As a consequence, the ratio of true model hobbyists continues to diminish, as those with the skills of designing, building, and flying gradually, let's face it, die off or retire from the hobby and are not equally replaced by a sufficient number of new genuine hobbyists. Note that the creators of most new scale designs published tend to be adults in the 40 to 50. . .even 60-year age bracket. This is particularly prevalent in the quarter-scale or giant-scale category, where you'll find most of the "good old boys" from yesterday's roster of skilled model designer-builder-fliers. There are very few total kits for these giant model aircraft, just a wide variety of parts and accessories, and it takes a *model builder* to know how to use them.



This four-cylinder masterpiece was stolen from the owner's car during the 1987 R/C Aerobatic World Championships in Avignon, France. Be on the lookout for it. More info in column.

UNITED AIRLINES

FLY UNITED TO IMS

United Airlines has been designated the *Exclusive Official Airline* for the 1988 International Modeler Show. As such, United has arranged to offer fare discounts to exhibitors and attendees of the show amounting to five percent off any applicable fare or 40 percent off full coach fares from January 1 through January 17, 1988, to and from Burbank, Ontario, Los Angeles International (LAX), Long Beach, Orange County (John Wayne), or San Diego airports. Discounts, exclusive of any transportation tax or other charges, apply on United's scheduled service within the U.S. to the specified destination. Reservations must be booked via United's Convention Desk. Tickets may be issued by United or by any United-appointed retail travel agency.

For further information prior to applying to United for flight reservations, contact IMS at (714)548-4700.

INDUSTRY NEWS

It might be safe to categorically state that our hobby industry is definitely on the move. . .at least in the cases of Cannon Electronics, Davey Systems, and Top Flite Models. All three companies have relocated to new addresses during 1987.

To quote Bill Cannon exactly, "After more than 25 years at the 13400 Saticoy address in North Hollywood, California, Cannon Electronics, Inc. (Cannon R/C and Charlie's R/C Goodies), is relocating to 2828 Cochran St., Suite 281, Simi Valley, California 93065, phone (805)581-5061. Both old and new customers will continue to be served, with even more emphasis on *mail order*. This change brings the business closer to the new residence in Simi Valley."

In the case of Davey Systems Corporation, the company's move from Malverne, Pennsylvania, to 675 Tower Lane, West Chester, Pennsylvania 19380, phone (215)430-8645, somewhat coincides with a considerable expansion in the airplane kit selection. Davey Systems now manufactures and distributes the former Champion Model Aeroplane Company series of trainer, sport, and scale R/C model aircraft kits, bringing the Davey Systems product line to a total of 26 kits, plus the original DSC glider winches and hi-starts, braided tow line, drag parachute, meters, prop adaptors, electronic flight motors, etc.

Top Flite actually relocated its general and sales offices back in April of this year, while the factory address at 2635 S. Wabash Ave., Chicago, Illinois 60616, phone (312)842-3388, remains the same. The general and sales offices moved to 2801 S. 25th Ave., Broadview, Illinois 60153-4589,

phone (312)343-0955 (Telex: 279907).

MICROWAVE POWER

Don't get the idea you should take along your microwave oven the next time you go flying, unless you plan to warm up some hot dogs or last night's leftovers. But not long ago, in Ottawa, Canada, a radio-controlled model spanning 10 to 12 feet was flown on electric power, and the power was supplied to the aircraft from a ground-based satellite dish beaming microwaves to a receiving antenna on the plane (no, it didn't also warm up food aboard the aircraft).

Reader Jim Coughlan, of St. John, N.B., Canada, sent us a clipping from the St. John's *Evening Times-Globe* newspaper, dated October 1, 1987, in which the first successful microwave-powered flight was reported. Equipment aboard the aircraft converts the microwave energy into direct current to power the electric motor. According to the report, the next step will be to fly the test model for more than a week, with the idea in mind that a full-size version of the aircraft could be used like a low-flying satellite to transmit radio and television signals much farther than possible with a ground-based transmitting tower and at a far lower cost than a satellite. The whole experiment is being conducted by the Canadian Department of Communications Research Centre in Ottawa. The newspaper photo of the test model discloses a glider-like configuration with a T-tail and a straight-tapered, V-dihedralled wing mounted on a streamlined pylon (that could also contain instrumentation), with the motor pylon-mounted above the wing. A large, apparently flat disk with diameter reaching from fin leading edge to wing trailing edge is mounted through a slot in the aft fuselage. It doesn't appear to provide lift for the aircraft.

According to the clipping, the concept has caught the interest of researchers around the world, who are working on everything from microwave-powered space shuttles to aircraft for exploring the planet Mars.

"LOST" ENGINE

Our lead photo is of a four-cylinder, in-line four-stroke, spark ignition engine with overhead camshaft, and with a 20cc displacement. It, along with tools, clothing, car documents, cameras, money, passport, and more, was stolen from a blue Opel Kadet stationcar (caravan), Dutch license BH 98 RD, between 9:00 and 10:15 p.m. on August 4, 1987, during the F3A Precision R/C Aerobatics World Championships, near Avignon, France. The car was parked in Carmon sur Durance (84) Place du Marche au Raisana.

The engine was completely homebuilt by Wim V.D. Hoek, Violierstraat 23, 3073TS—Rotterdam, Holland, phone Holland 010-4847501. Wim sent the photo and information to Ron Chidgey, our R/C Aerobatic representative to the FAI, who in turn sent it to us. It is hoped that if someone spots the engine, they will report it to Wim. He can also be contacted through the Netherland Royal Aero Club, Koninklijke Nederlandse Verenlging voor Luchtvaart, Jozef Israelsplein 8, 2596 as 's Gravenhage, Holland, phone Holland 070-245457.

We can all understand why Wim would like to have the results of 2,000 hours of work returned to him! The supercharger shown in the photograph was not mounted. When stolen, the engine had two upright carburetors, each mounted on a U-shaped manifold directly connected to the cylinders, above the muffler. Crankcase number is 20 12 85 (starting date of construction). Engine was mounted on a welded steel motor mount and 35 by 40 cm wooden base, all painted black.

IT'S THE JANUARY ISSUE, BUT. . .

As this issue is being put together in November, but appears in December in spite of its January cover date (What did he say?), we must grab at this opportunity to wish all of our readers a very Merry Christmas and all the best in 1988. And remember, don't make any appointments for February 29! •

ADVICE FOR THE PROPWORN
—By Jake

Dear Jake:

My airplane crashes when I do this.

Barney in N.Y.C.

Dear Barney:

Don't do that.

Jake

* * *

Dear Jake:

Which AMA came first—the American Medical Association, the American Motorcycle Association, or the Academy of Model Aeronautics?

Historian in Hyannisport

Dear Historian:

None of them. The first AMA was the Asian Mongol Allegiance. They conquered Assyria and enslaved the Marmoots. They were famous for their curved scimitars and their mastery of dysentery on horseback.

Jake

* * *

Dear Jake:

I understand that aerodynamic theory provides mathematical proof that bumblebees can't fly. I guess nobody told the bees, huh?

Logan in Addison, Texas

Dear Logan:

There have been recent developments in the paradoxical impossibility of flight by bees. Scientists in Murfreesboro, Tennessee, investigated a swarm of bees which was found walking across a highway in the southeast part of the state. At first it was assumed that the bees were a new flightless species that had arrived in the United States from Africa or Mexico. But further research discovered that the bees had obtained an advanced degree in mathematics and had studied aerodynamics under Von Karmaann. They reviewed the proof that bees can't fly, found no mathematical fault with it, and started walking.

Jake

* * *

Dear Jake:

Hi, it's me, Tommy Smith. Just thought I'd write and let you know that I'm not in any trouble. I haven't glued any people together lately, and we haven't had to shave the hair off any of our pets for over a month now. No paint spills, no sanded cats, and no canary seed balls. Bye for now. Your Friend,

Tommy Smith

Dear Tommy:

Get well soon.

Jake

* * *

Dear Jake:

I flew on a jet airliner fifteen years ago. I'm flying on another one now. I thought there probably would have been a lot of improvements in fifteen years. There's all kinds of new airplanes like 767s and A320s, but the interior of this airplane I'm sitting in doesn't seem any different than the one fifteen years ago. Same old cramped seats, tiny windows, rickety fold-down trays, and air vents that blow your hat off. Haven't they made any progress in all this time?

Traveler Enroute

Dear Traveler:

You must not be very observant. There have been many modernizations in airline

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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 MB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by MB.

• If the winter winds haven't driven you inside by now, just wait; they'll be coming! Like most of the country, we've retreated inside to the workshop to begin some long-delayed projects and savor the warmth of the fireplace. We have some books to tell you about, and a few new models and products worth your while.

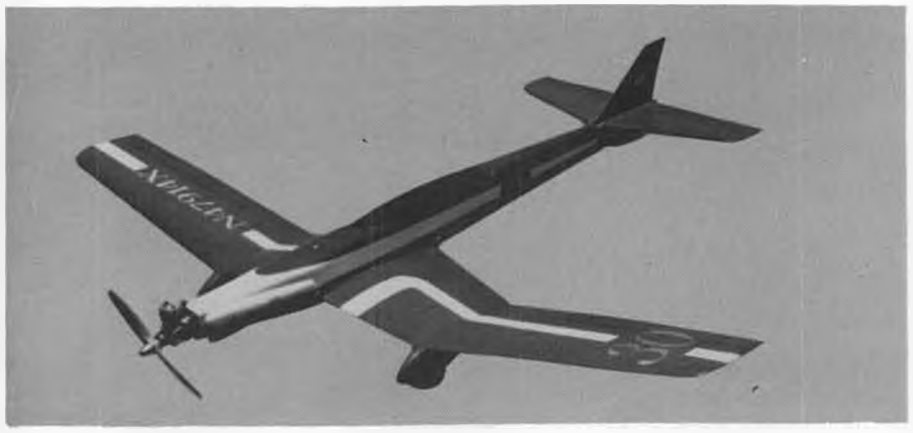
From Pharis Models, Box 804, Folsom, California 95630, comes a Low Rider 30 as it's called, an unusual free flight design with gull wings and a streamlined racer look to its shape. The Low Rider 30 is a stable, fast climbing craft with a 30-inch wingspan and is adaptable to micro R/C installation. The kit includes handpicked contest printwood, full-size plans, and wheels. The kit sells for $15.95, plus $3.00 for shipping.

* * *

From Byron Originals comes a completely different craft from the Low Rider 30, a ducted-fan sport jet dubbed the Byron Bullet. Featuring inboard ailerons on its plug-in wings, the Bullet has been clocked at nearly 170 mph! The Byron kit includes all hardware, less radio, fan, engine, retracts, and finishing materials, plus tires, cockpit, and canopy. Constructed of lightweight, strong fiberglass, the fuselage is ready to finish, along with the injection-molded wings and tail surfaces. For more information on this Byro-Jet powered speeding Bullet, contact Byron Originals, Box 279, Ida Grove, Iowa 51445. And watch for a full kit review coming soon in *Model Builder.*

* * *

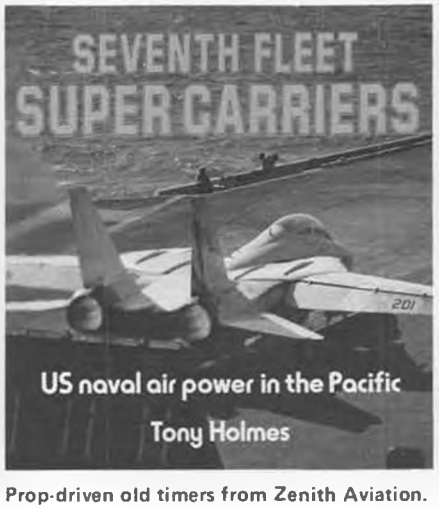
New books this month from Zenith Aviation Books include *Big Props*, a colorful Osprey book full of great photos of Constellations, DC-3s, DC-6s, and more. A whole



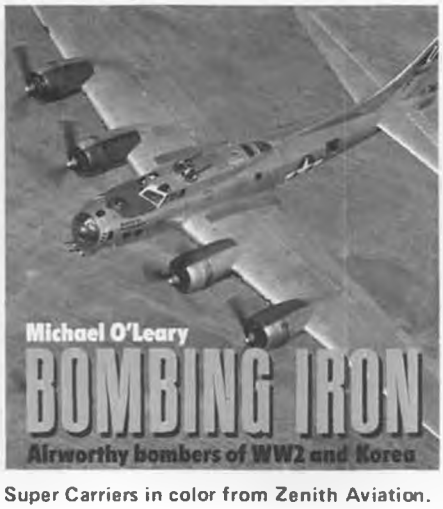
Low Rider 30 Free Flight design from Pharis Models.

New Byron Bullet ducted fan model from Byron Originals.

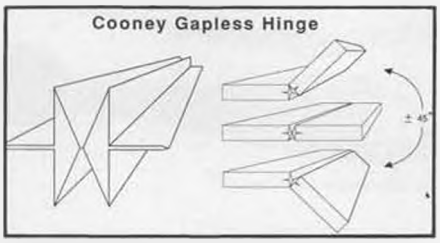
Big Bombers book from Zenith Aviation.



Prop-driven old timers from Zenith Aviation.



Super Carriers in color from Zenith Aviation.



Gapless Hinges from Fourmost Products.

Super Tigre G-49 engine from Great Planes.

chapter is devoted to turboprops, and the family of Convair twin-engined airliners. If you love the Pratt & Whitney engines, then this book is for you.

Seventh Fleet Super Carriers takes us into the action aboard the USS Carl Vinson, USS Enterprise, and the USS Ranger as F-14 Tomcats, F/A Hornets, and Corsairs leap from the pitching carrier decks to do imaginary battle in the skies. With 122 color photos contained in its 128 pages, Super Carriers of the Seventh Fleet provides more than enough armchair thrills for the aviation buff.

If carriers and prop transports are too tame for you, then how about *Bombing Iron*, a full-color look at the B-17, B-29, and medium bombers like the Marauder, Invader, Mosquito, and the Ventura? They're all there, along with many more mighty aircraft in stunning color photos. These planes have survived hours of combat and are still in existence. The photographs attest to their prowess and tenacity and provide a close-up look at some of our finest big planes in the air and on the ground.

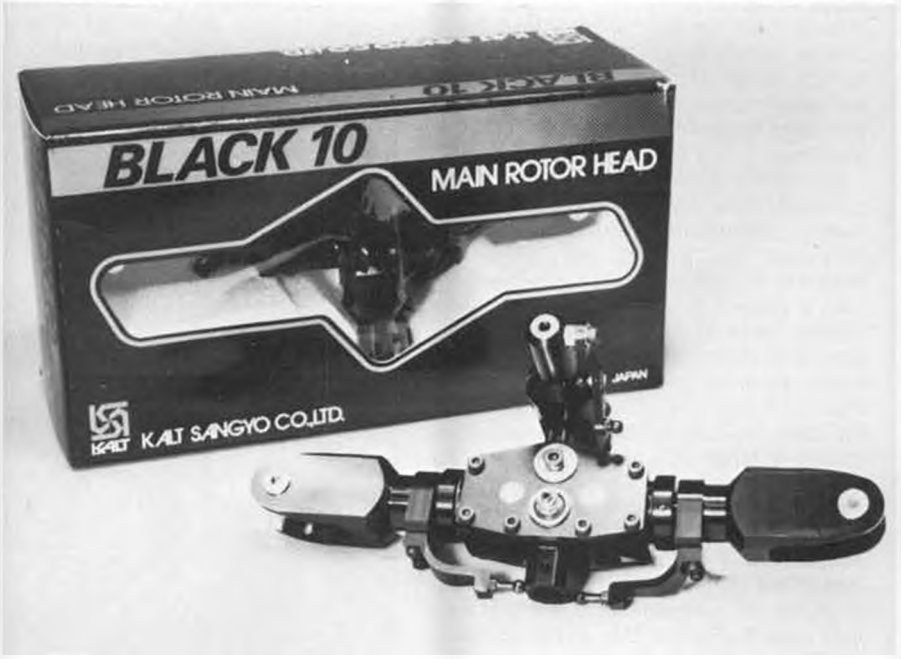
All these books, along with many more aviation-related publications, are available from Zenith Aviation, Box 2-MB, Osceola, Wisconsin 54020. Tell them *Model Builder* sent you.

* * *

We've all asked, "When are they going to perfect the lowly hinge?" Well, Fourmost Products has done just that, with their new, improved gapless hinge. An updated version of their original gapless hinge, this one is extruded in polyurethane for strength, and is available in white. The Cooney Gapless Hinge is a continuous strip of polyurethane that completely seals control surfaces against air loss, providing greater aerodynamic efficiency. Easily installed with a hobby knife and cyano glue, the hinge can be finished with paint, or iron-on material. For more information, contact Fourmost, 4040-24th Ave., Forest Grove, Oregon 97116.

DGA Designs' new Pilot Bust Kits.

1/2A Gas Model Kit, the T-Bird, by Campbell.



Circus Hobbies' High-Performance Rotor Head.

Baby Pacer R/C kit from Aerodrome Models.

* * *

DGA Designs has released three new pi-

Continued on page 94

CHOPPER CHATTER

BY DICK GROSSMAN

• The Lone Ranger's trusted Indian companion Tonto rode a horse named Scout. When the time came to give chase to the bad guys, the Lone Ranger would leap on his horse and shout "Hi-Yo, Silver." Tonto would chime in with "Git-em-up, Scout." That the name of Tonto's horse managed to attach itself to Dieter Schluter's latest R/C helicopter is proof of one thing; we're *dangerously* close to running out of names for new helicopters. Perhaps *Scout* sounds more exotic in German. After all, what sounds more romantic than Aerospatiale's *Ecuriel*, which as you probably guessed is French for "a rodent that lives in trees and eats nuts." So you may not be thrilled with the name, but I think you're going to like the machine.

Back when Robbe acquired the Schluter company, there was more than a little trepidation concerning the future of that helicopter line. By their own admission, Robbe in the U.S. was quite unprepared for such a sudden plunge into the helicopter market. You might have hoped that a company with their excellent reputation in the hobby business would have maintained that usual high level of quality and service for their helicopter line. In another instance, a large U.S. model company acquired a major brand of helicopters only to let it die on the vine from neglect.

However, in April 1987 at Toledo, Ohio, Frank Heinrich, president of Robbe, U.S.A., looked me in the eye and told me that his company was going all out to promote their helicopter line in the U.S.; to provide technical backup and parts support to its dealers and to develop a network of top fliers to give demonstrations and conduct clinics throughout the country. How well did they do? Ask some of the people who attended the Indianapolis fun-fly this summer, Al's Helicopter contest in Chicago, or more recently, the special helicopter workshop at Al's Hobby Shop in Elmhurst, Illinois, just a few weeks ago. It was conducted by Mark Powellson, who flew in from Columbus, Ohio, for the weekend. The day's activity started out in Al's Hobby Shop and then adjourned to the parking lot across the street for a test flying and trimming out session. Mark has a variety of helicopter-related interests in addition to a full-time job. As owner of Capstone Rotors, he is the sole distributor of Peka parts and accessories in the U.S., including the Peka fiberglass rotor blades that are so much in demand he can barely keep them in stock. But his weekends are devoted to being a field representative for Robbe; and this year he attended over fifteen different R/C helicopter demonstrations, contests, fun-flys, and clinics. With all the time Mark spent repairing, adjusting, trimming, and test flying everybody's helicopter, he didn't have much time for talk. But I wasn't going to let him leave without telling me about the new helicopter he brought with him, the *Scout 60*.

SCOUT 60

I wasn't sure just where the Scout 60 fit into the scheme of things. The Schluter Champion is already one of the top competitive choppers in the world, and the Scout is priced about the same. Mark told me that this was actually a good beginner's helicopter because of its simplicity. For example, in setting the rotor pitch, you set a metal square (provided in the kit) under the swashplate as a temporary guide to finding the correct pushrod lengths. After that is done, the only adjustment you ever make to adjust the pitch is to *one* pushrod for each blade.

The Scout is the latest helicopter to go to a composite rotor head. Just as they don't make hats out of shoe leather, there doesn't seem to be a good reason to make rotor heads out of aluminum or steel. The catchy phrase "bulletproof rotor head" may be

Note washout at 45-degree angle to flybar.

Long, sleek lines of the Schluter Scout 60.

Schluter Junior 50. Note difference in tank location and start shaft.

good promotion, but why do you need it? Nobody's shooting at your helicopter! One of the unusual features that jumps right out at you is a washout assembly at a 45-degree angle to the rotor head. You might think this was a "snafu" by somebody. Not so. Let me explain, starting from the beginning with some background on collective pitch systems.

SLIDING ROD VS. MOVING SWASHPLATE

When you have one control surface that has to perform more than one function, there has to be some method of mixing the functions. With fixed-wing aircraft, we see combinations like "flaperons" (flaps and ailerons) and "elevons" (elevator and ailerons). With a helicopter, the control surface is actually the main rotor blades. Collective pitch is increasing or decreasing pitch of each blade the same amount at the same time to regulate altitude and forward speed; while cyclic pitch is changing each blade's pitch in opposite directions, at different times and in different amounts, to control pitch and roll. The cyclic pitch is transmitted from the servos to a swashplate that rides on the rotor shaft but does not rotate. A second part of that swashplate is not stationary, and actually does turn with the rotor head. As it does, it is guided by the tilt of the stationary part of the swashplate. It then transmits that angle to the rotating rotor blades and flybar through a system of pushrods and mixing arms, allowing the helicopter to bank, climb, dive, loop, and roll. But somewhere combined with those cyclic movements, we need to have the ability to introduce collective pitch changes. One method is to have a separate control rod running through a slot in the main rotor shaft, thereby bypassing the swashplate entirely. This is the method used in the Schluter Champion and the Kalt Baron helicopters.

The Schluter Scout uses the moving swashplate system (as do the Hirobo and GMP helicopters). The swashplate actually rises and falls along the length of the rotor shaft. This movement combines with the tilting movement of the swashplate to give the proper amount of pitch change to the rotor blades. The moving swashplate has many advantages over the sliding rod system. Of course, it eliminates the need for a groove in the rotor shaft. Also it allows a greater amount of pitch change which facilitates setting up a chopper for inverted flight. Another major benefit is that it allows a multiblade rotor system to be used, since collective and cyclic changes can be made to *any number of blades simultaneously.*

Pretty Long Ranger with Champion mechanics built by Mark Witt of Mattoon, Illinois.

The moving swashplate is not without its problems, however. Normally a swashplate is supported at three points; with two pushrods controlling fore and aft (elevator) and one controlling roll (aileron). The fourth point is reserved for some anti-rotation device which will allow free movement on every axis, but not permit the *entire* swashplate to rotate around the rotor shaft. Collective pitch changes are made by mixing the collective servo with the elevator servo. Instead of having the collective servo connect directly to the swashplate, it connects instead with the elevator servo, and actually moves that servo through the use of a sliding or tilting servo tray. This means that only two points on the swashplate are doing all the work in changing collective pitch.

The Scout has improved this system in a couple of different ways. Schluter felt that the sliding swashplate needed more rigidity to provide positive collective control. Their solution was to provide support to all four axis of the swashplate and make the anti-rotation point a fifth point. This meant dual pushrods on *both* aileron and elevator. Since the cyclic controls on Schluter helicopters are transmitted by way of 90-degree bellcranks on the side of the mainframes, it was necessary to rotate the swashplate 45 degrees so that down elevator and left aileron are on one side, and up elevator and right aileron on the other. Likewise, the washout is set at a 45-degree angle to the rotor head. Except for looking a little weird, this works out just fine because it permits a very short and direct route for all the pushrods from the servos on up. All that matters is that the helicopter pitches and rolls precisely on the correct axis; e.g., that a bank or roll is on the exact longitudinal axis of the chopper.

Besides providing extra rigidity to the system, utilizing all four points of the cyclic control helps eliminate a problem inherent in most moving swashplate systems; cross-control. This is the introduction of some unwanted movement in one control as a by-product of a different control input that is being made. For example, some down elevator might occur from decreasing collective pitch. The fact that everything is connected to everything else makes it hard to

Continued on page 68

Mark Powellson demonstrates a Junior 50.

Mark helps some novice fliers get airborne.

BIG BIRDS

• Most clubs bestow awards upon their members. Some of these presentations are for dedicated support and service, some are for finally going solo, and some, like our FenceBuster Trophy, help to keep us smiling in spite of the carnage inflicted by ubiquitous airplane-hungry perimeter fences.

So far many of the Puget Sound Rocs have earned this most prestigious award, with a few of our more capable pilots qualifying for ownership a second time. Even yours truly received this coveted trophy a few years ago when my Wimpy settled on the fence. Of course, in my case it wasn't because of the usual pilot error stuff like bad judgment or poor depth perception. Y'see, my carburetor iced up, but they made me accept the award anyway.

Anyhoo, one of our members, the sly and wiley Roger Monette, deserves extra special recognition because his fence-busting exploits are sure to be unequalled in the annals of model aviation. Not only did he nail the fence two weeks in a row, which had never been done before, but after getting a feel for it that first Sunday, he'd refined fence-busting into a class act and near artform by the following weekend.

This time, instead of merely running into the fence on takeoff or landing as everyone else has done, Monette dove straight down from 500 feet (after a snap roll sent his right wing fluttering down like a falling leaf), hitting the barbed wire which cleanly sliced the left wing off. His expertise as a 'Nam Forward Air Controller finally paid off.

There was only one problem, however, on both strikes Roger had been flying someone else's birds, and some of our people felt that he should be disqualified because we are an AMA-chartered club and therefore AMA's Builder of the Model Rule should apply.

And this became even more of a sticky wicket when other clubmembers sided with Monette, insisting that we recognize his outstanding feat of airmanship by awarding him permanent possession of the trophy.

To date none of our club officers have been available for comment.

This humongous Sage Hen(HUSH) is a super-sized version of Peck-Polymers' Prairie Bird 50. It's a great trainer, slow and stable, with a Saito 45. Soon to be a construction article in MB.

THE COVERING CONTROVERSY

Seemed as though I've made a number of MonoKote lovers very irate. One modeler in Haiti has gone so far as to make an Al doll and blunt the tips of all his pins and needles.

Even Ace FenceBuster Roger Monette sent me a missive on the subject of plastic covering.

"The letter from Gene Mathis really got me hot, especially the part that stated, 'plastics are okay for hangar queens but are no good for working airplanes unless one just loves sags and wrinkles.

"Remember that Enya 80 four-stroke-powered Balsa USA EAA Bipe I flew throughout two very hot summers, including our BIG Bird Bash? Well, it was covered with MonoKote and didn't have a sag or wrinkle anywhere. I put that plane through every maneuver I could, from loops and rolls to outside snaps and lummies; and when it was sold, the bird still looked great.

"If done correctly, MonoKote will stay taut and make any bird look attractive, and won't smell up the house or shop. First, use Balsa Rite on all seam edges on both the

Doc Mathews, who designed this Ace-kitted 4-120, dressed his up with wheel pants; they do make a difference.

Roger Monette's Nieuport 17 flies well, even though it's covered with MonoKote(!). See text for the story behind the story.

fuselage and wings and then sand lightly to remove fuzz. Using a MonoKote iron, seal down all edges. Then take a heat gun and shrink tight. After the covering cools completely, go over the entire structure again with the heat gun. And that's all there is to it!

"Just remember not to pull or stretch the MonoKote while ironing; that's what causes most of the sags when the plane sits under a hot sun.

"I'd like to point out that you, also, are using MonoKote with excellent results; and that after many, many flying sessions your Humongous Sage Hen doesn't have any sags or wrinkles either.

"Enclosed is a picture of my Nieuport 17 done in silver MonoKote, and then burnished, or is it silk and dope?

"Thanks for listening. Roger.

"P.S. Please put this in your column so that we Plastic Body Bag users get equal time."

Okay, I don't want to start beating up on a dead horse because this plastic versus other types of coverings argument could go on ad nauseum, but Roger did point out two important steps that plastic iron-on users should pick up on. Not pulling or stretching the film while ironing and going over the whole bird a second time with your heat gun definitely will minimize the "baggy" look, and this applies to polyesters, too.

Now, it's no secret that I'm not a staunch advocate of plastic coverings. They have their place, of course, but rarely on a BIG Bird because 1) they impart little or no strength to the structure in comparison to polyesters or silk 'n' dope and 2) are so damned prone to hangar rash, punctures, shattering, etc.

Just about the only exception would be a BIG aeroplane like the Humongous Sage Hen that Roger mentioned; it was designed to be a light, slow, stable three-channel basic trainer. And, as a matter of fact, this happens to be a 7-1/2-pound, 1300 square-inch version of the Peck-Polymers Prairie Bird 50 that will probably be a construction article soon.

SMALL KINGFISHER

Although Doug MacBrien's BIG Kingfisher plans have sold well, he's had a lot of requests for a slightly smaller version, so there will be a 1/6 size soon, he sez.

"I've already completed the working plans and will be starting construction very soon. The new bird will have a 6-foot span, should weigh no more than 14 to 15 pounds on floats (less on wheels), and could be powered with many different engines, such as a 1.2 four-cycle, ST-2000, Maloney 1.2 or Zenoah G-23, which is what I am going to use.

This seven-foot Union Hobby Supply Norseman weighs only about 7-1/2 pounds, and a .60 four-stroker is all that's needed. But who is the lovely lady?

"I won't sell any plans till I have built the prototype, because I'm likely to make a few changes in stock dimensions or other details as I build.

"I've already redesigned the water rudder hookup so that the cables are inside the main float, making it look better and easier to connect. I've modified the plans and instructions for the BIG Kingfisher to reflect this improvement and, by the way, have proven this mod on the Curtiss SOC Seagull.

"I'll be rewriting the instructions to suit the new model and taking pics for the "photo book" to be included with the package, so it'll be first-class all the way. I hope to have this available by Christmas, and the price will be the same: $50 complete, including shipping and the special LG springs. I plan to have available vacuformed canopies (front and rear) and possibly the cowl, but prices are not known right now.

"Had to cut into the Seagull's main float to make the water rudder change, and then decided to refinish the whole float. The fiberglass had leaked slightly, as evidenced by some mildew on the wood. Polyester fabric does a better job of making the float watertight."

Okay, by the time you read this, Doug should be close to having the smaller Kingfisher plans ready. His address is: Doug MacBrien, 24 Truby Street, Granby, Massachusetts 01033.

UNIONVILLE HOBBY SUPPLY

. . . is a Canadian kit manufacturer (P.O. Box 135, Markham, Ontario L3P-3J5, Canada; 416/884-1683) that's been in business for over six years producing the "Cana-

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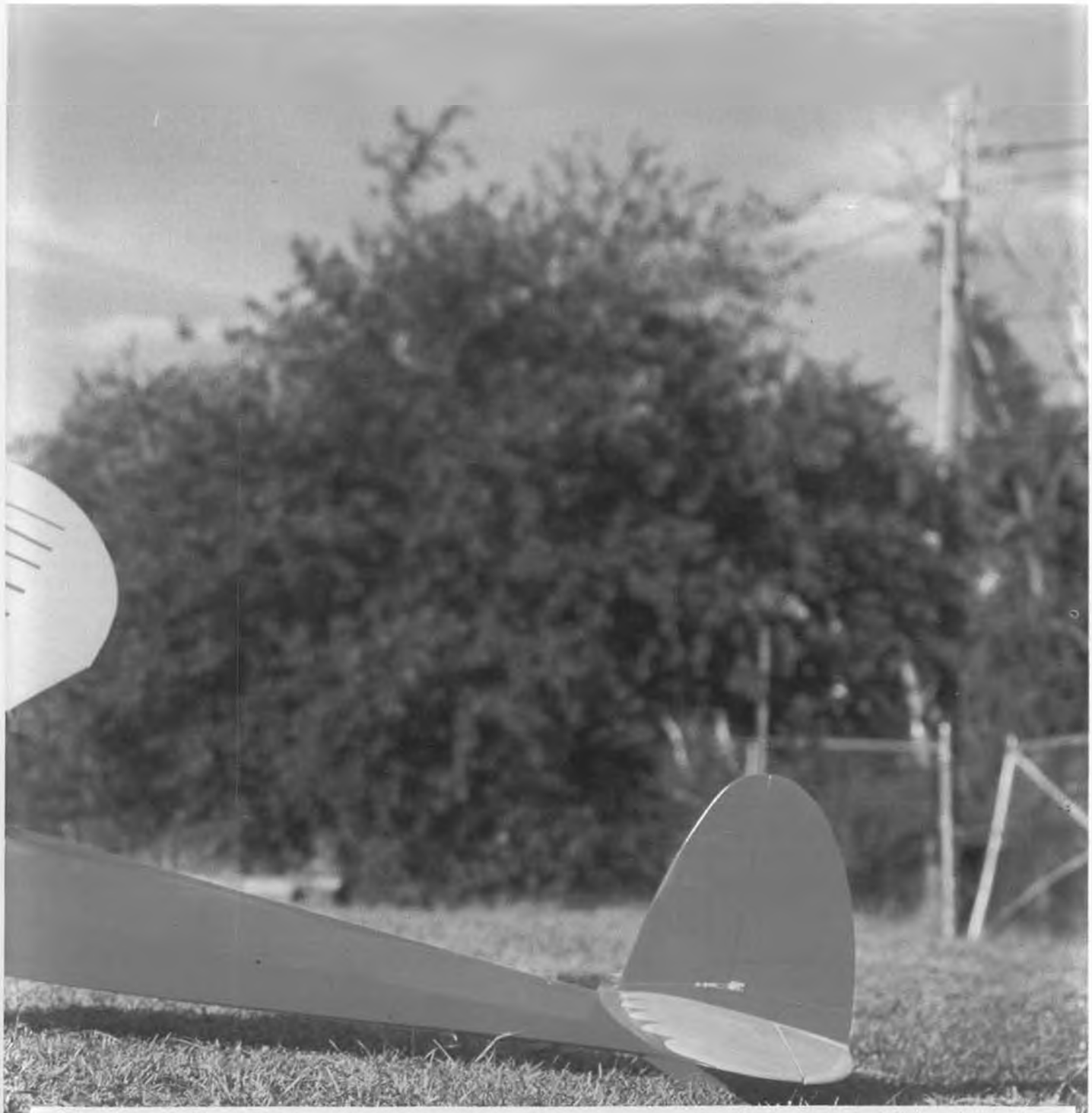
This J-3 on floats is the fine work by Jerry Gray. An opposed O.S. flat four up front looks like it was designed especially for the J-3.

Doug MacBrien's big Kingfisher on takeoff. Plans for a 6-foot version are almost ready.

SUPER PLAYBOY

By AL NOVOTNIK & DIXIE CUTRONE. . .How's this for large scale? The famous Cleveland model with a nine-foot wingspan. A real floater!



• One of the most popular free flight models of days past was probably the Cleveland Playboy, originally built as a free flight Class C version, powered by such engines as the Ohlsson .60, Super Cyclone, etc. Then there were the smaller versions; B-size, then A-size, and not too long ago a small 1/2 A. There were even CO versions. Then there were the electric versions. So with all these examples behind us, Dixie Cutrone and I thought why not a big one? So the Super Playboy was born. The Super Playboy, the ultimate in old timer R/C flying. We had thought a R/C version this size would be a super flier, so the challenge was to build one that was S.A.M. legal for a .60 two-stroke or the popular .90 four-stroke. Presented here is prototype. A new one is under construction with a few modifications to save a little weight.

The Playboy is a very straightforward model to build and would not be a difficult project for the newcomer in R/C. As a trainer for R/C, it is an excellent flyer giving plenty of time to think as it is a real floater. In fact, it really doesn't like coming back to the ground. The one thing that you have to remember is that the model is rather large (big is the word). It has a 112-inch wingspan. It's nice to have a friend with a van to transport it to the flying field. This original model is powered by an O.S. .90 four-stroke and performs very well.

The best way to get started is to send in a few bucks for the full-size plans, see page 106. When the plan arrives, create yourself a lumber list and then proceed.

One of our main concerns when building the model was the pylon construction, which was redesigned from the original method. The pylon is cut from 1/4 aircraft ply with lightening holes cut in. It is now laminated on both sides with 3/16 sheet balsa installed at 45 degrees. You'll notice that the pylon is epoxied on the sub-firewall and the rear bulkhead with triangular stock on both sides. The main mounting plate is fastened between the fuselage sides. The wing mounting plate is keyed into the pylon and epoxied in place. A piece of 1/2 triangular stock is cemented under the mounting

With a wingspan of more than nine feet, the nine-pound weight of the Super Playboy was relatively inconsequential. With care, it can be built much lighter without sacrificing strength.

plate and to the pylon. The main plate also serves as the servo plate.

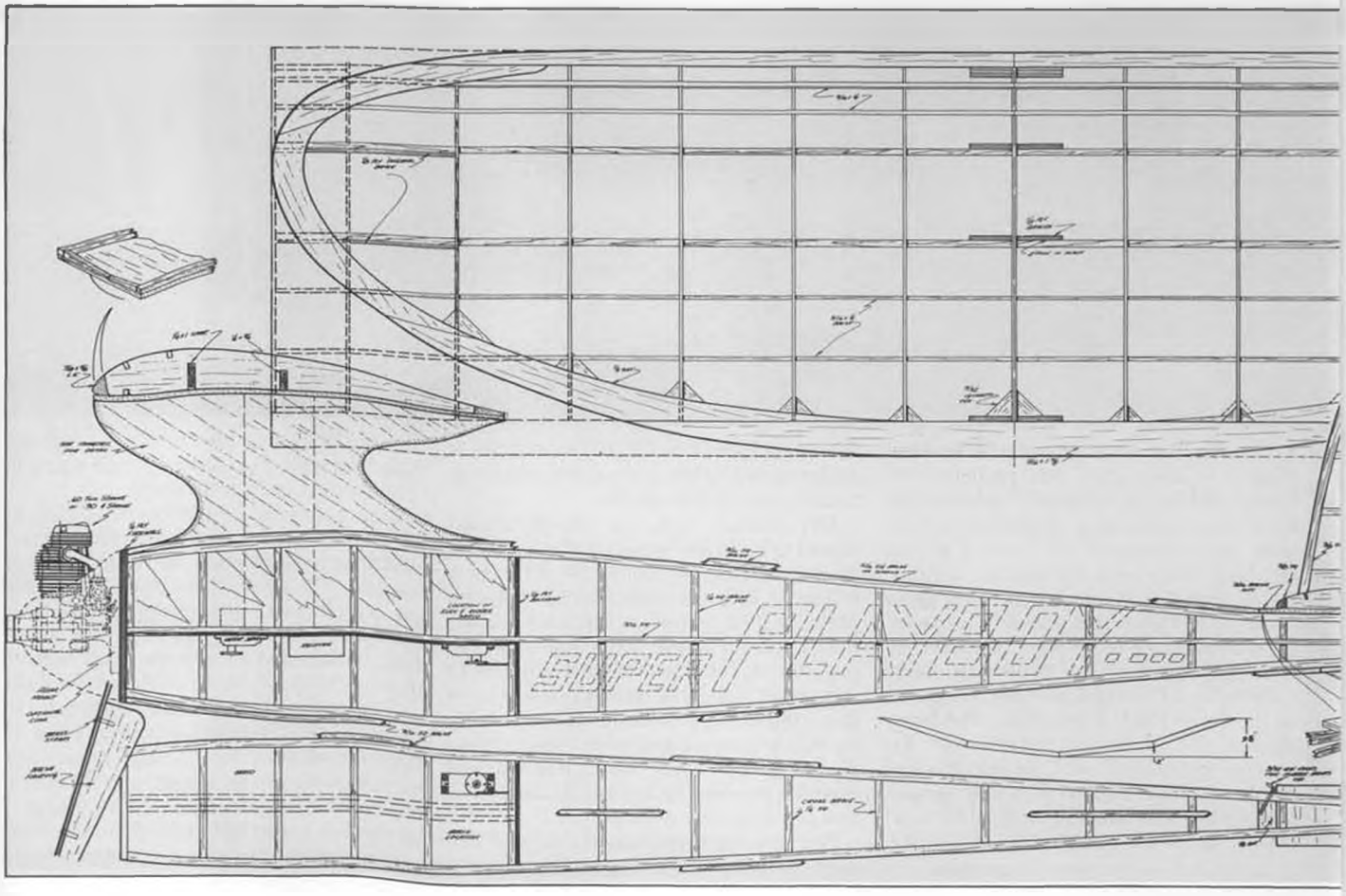
Start construction of the fuselage as you would start a stick model. Lay a piece of wax paper over the plan and begin by pinning the 3/8 square balsa longerons in place. The vertical braces are cut to size and glued in place. With one side finished, make a duplicate for the other side. With the two sides built, start the fuselage assembly cutting the cross braces and gluing them in place. The 1/8 plywood pylon floor is epoxied in place between the vertical braces, sub-firewall, and the rear plywood bulkhead. Set the pylon in place and make sure it is square with the fuselage. The triangular braces are secured in front and against the rear ply bulkhead. Add the cross braces on the top of fuselage around the pylon. The fuselage stringers are added and the 1/16 balsa front sheeting installed. Fit the access door on the bottom of fuselage and epoxy the firewall in place. The landing gear is secured to the firewall with metal clamps and the aluminum mount for the engine installed.

The platform for the stab is secured in place along with the sub fin. The last thing to do is put the platform on top of the pylon for the wing. This must be located square to the pylon. For added rigidity add a piece of triangular stock on the bottom side of the platform epoxied to pylon. This about takes care of the fuselage construction.

The wing and stab are straightforward and present no problems. One suggestion would be to install fairly long dihedral braces in center section of wing at least two ribs long on each side. These should be made of 1/8 plywood. (See plan.)

The tail feathers on the prototype were made removable for easy transportation. They can be held in place with rubber bands or secured in place with nylon bolts. Use your favorite method of fastening the stab and rudder. The rudder and vertical fin are constructed of balsa. Cut out the rudder area and install hinges per manufacturer's instructions. The elevator outline is shown on the plan but not a method of construction. It can either be built up construction or sheet stock. Make certain you put in a plywood support for supporting the control horns on both elevator and rudder. Don't leave the gussets out either on stab or wing. They add a lot of needed strength. All the wing tips, stab tips, rudder tips, and sub fin are cut from 1/4 sheet balsa.

The wing on the prototype was built as a one-piece structure, and I strongly suggest



that it be built in three pieces. The center section and the tip panels can be made removable (plug-in type). The spars are cut from hard balsa.

When all parts are fabricated, trial fit all the components for final fit. The prototype used cables for rudder and elevator control, but pushrods can be used if you so choose. With all controls and radio equipment installed, the time has come to cover the Super Playboy. We used WorldTex to cover the entire model. It goes on extremely easy and is very easy to work. The trim was painted on, the logo and AMA number decals were put on, and the entire structure was given a light coat of clear polyurethane to seal the structure.

With the Super Playboy trimmed and ready to fly, we had only to wait for the perfect day to fly. Well the day came and the big Playboy was loaded into the van for transportation to the flying field. With a one-piece wing, you need a van. A check on the batteries on both the transmitter and flight pack were made to make sure we had a full charge. We filled the tank with four-cycle fuel, checked all the surfaces to make sure they were moving in the correct direction, and were about ready for flight number one. Oh, yes, one more thing before that happens! A few photos just in case there is no second flight. With that done, we're ready. . . .

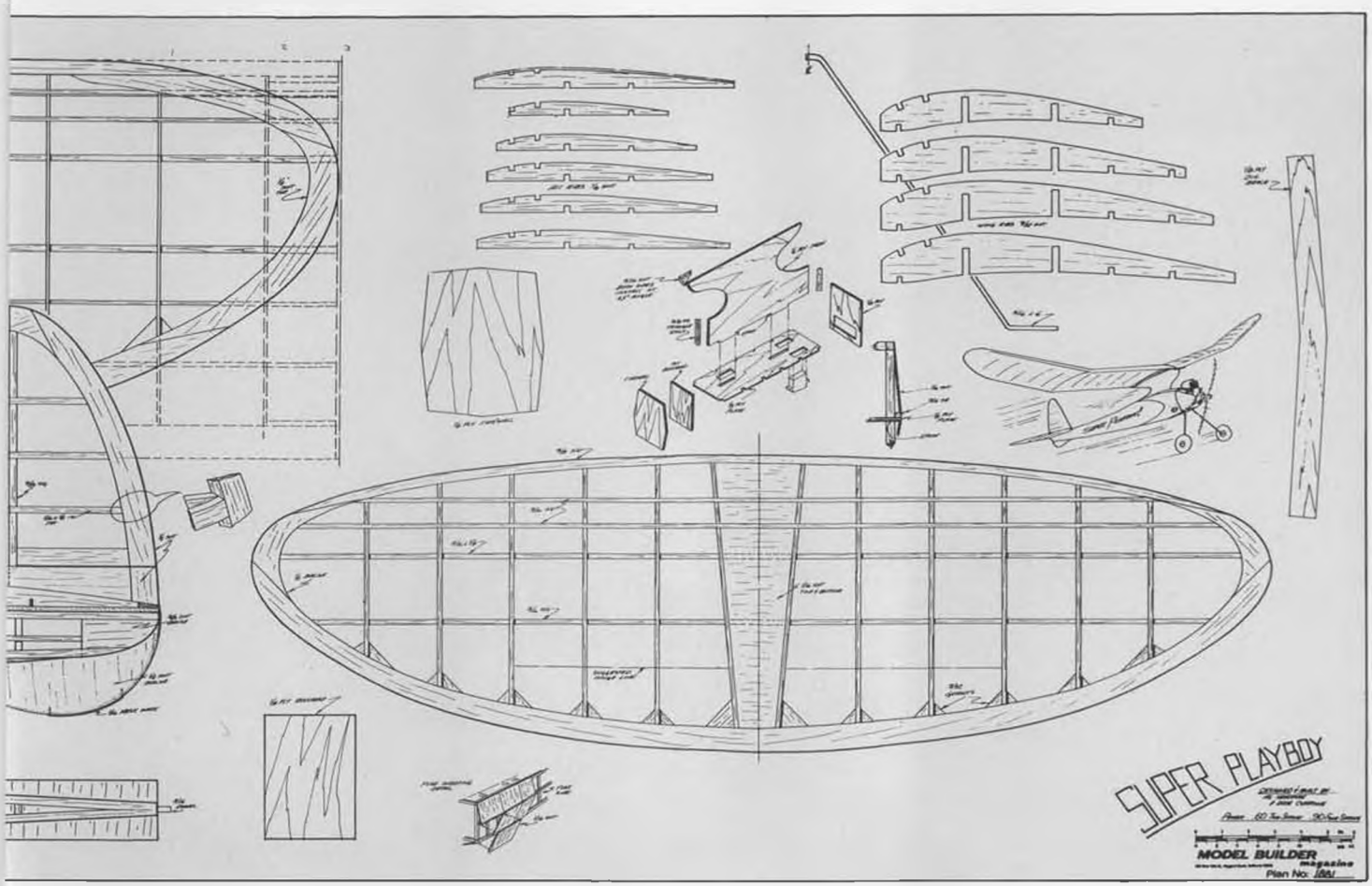
Clip the battery to the glow plug, a couple flips of the prop, and the .90 comes to life. The radio used was a Futaba four-channel which has proven to be extremely reliable in other models. Dixie was pilot for the inaugural flight. The throttle was eased forward and in a few short feet, the Super Playboy was airborne. No trim adjustment was necessary, and the Super Playboy flew as graceful as a big bird. Once at altitude the throttle was eased back and the graceful bird soared through the air with the greatest of ease. The Super Playboy is a very easy and forgiving model to fly. This could be an ideal plane to learn to fly R/C with. The one thing it doesn't want to do is come back down; it likes to fly, and it does not do loops, rolls, or inverted flight.

A real floater, the Super Playboy is tough to get out of the air. It's easy and forgiving and would be a good trainer for learning to fly radio control.

The flying weight of this model was a shade over nine pounds. This coupled with a span of over nine feet is no problem at all. I'm sure the next one will be lighter, but I doubt if it will be a better flyer.

So go get your plan, wood, etc. and start building and having a great time flying the Super Playboy.

Any interest in a Super Duper Playboy? •



FULL–SIZE PLAN AVAILABLE–SEE PAGE 106

Reno

AIR RACES

By FELIX VIVAS. . .Stunning pictures from the Nevada desert as pilots pushed their machines to the outer limits.

• The shrine of air racing is Reno, Nevada, and this last September it was a mecca to about 150,000 avid aircraft racing fans.

The fans get their yearly fix of the heavy roar, smells, and excitement of highly modified World War II fighters, the AT-6s, and the buzzing bee-like F-1s and biplane midgets, flying low around Reno's pylons looking for glory and money.

This last September 17 through 20 was four days of warm, blue, clear skies filled with wing-walkers, sky divers, and aerobatic aircraft leaving trails of smoke to attest to their breathtaking artistic maneuvers.

Monday, September 21, began the Odyssey to Reno's Championships for 1988 of a few unusual future stars and their visionary supporters.

Robert Yancey of Klamath Falls, Oregon, flew into Reno with a Russian Yak II, two-seat trainer highly modified to become a beautiful single-seat aesthetic-looking unlimited air racer, bringing to mind Howard Hughes' H-1 racing plane of the late 1930s.

Robert is an owner/operator of a small aerial chemical spray company in Oregon. Robert picked up his Yak II fighter/trainer for $30,000, which at today's value of unlimited iron is pocket change to the high rollers of unlimited air racing.

Yancey and his visionary supporters, Bill and Dan Whitlatch, putting in long hours of hard work, brought to Reno a 165-square foot winged unlimited racer hooked to a large P&W R2800 CB engine with three hours total flying time.

Their thoughts were only to get some racing time and experience for their liberated Russian steed. Maybe it is a shoestring-financed team but turning 386 mph with a new "green" aircraft is not bad!

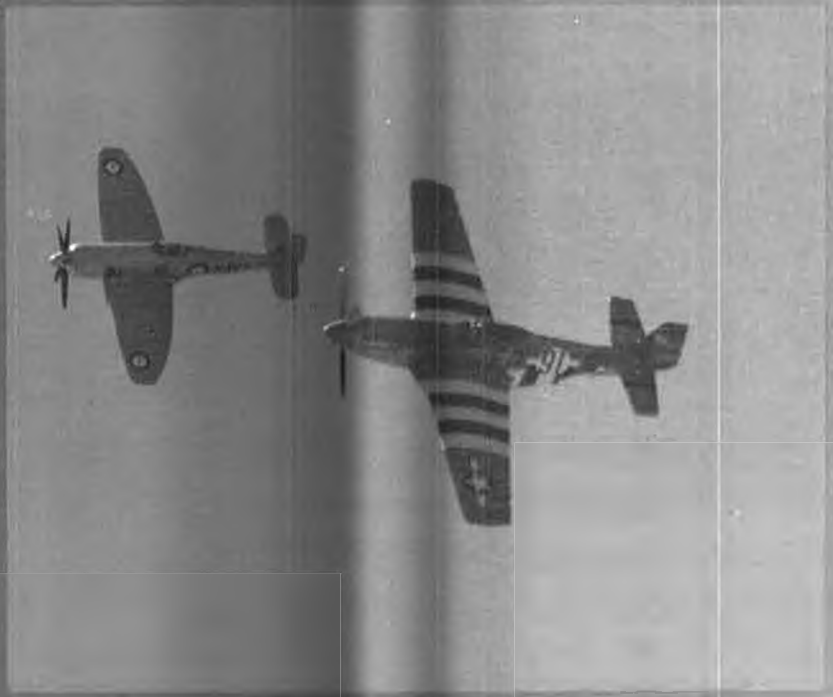
Now at home, Robert and the Whitlatch brothers are fine tuning, remodifying and with new ideas are now starting their odyssey to Reno's 1988 Gold Unlimited Championship.

Another new competitor looking for glory is Joann Osterud, a 17-year popular air show aerobatic pilot employed by United Airlines as a flight engineer on Boeing 727s.


Furious

At left, the familiar but seldom seen U-2 spy plane got everyone's attention by a VERY low fly-by during Saturday's racing activities. Nearly 150,000 people attended the four day race program in the desert outside Reno.

At right, a contestant in the biplane event goes through a last minute rev-up before heading upstairs for a qualifying run. Tom Aberle, of Fallbrook, California, raced his biplane to a top speed of 196.473 to win his division. Tom also broke the old qualifying record with a speed of 199.823. Below left, Errol Roberson, of Las Vegas, rounds the pylon in his Formula One racer "Puffin" Roberson finished in Seventh Place in the Formula One Gold race. At bottom right, Dean Cutshall in his Mustang takes the inside line as a modified Sea Fury comes up on the outside.



The spectacular P-38 White Lit'nin' piloted by Lefty Gardner, of Mercedes, Texas, banks hard around the racing pylon at Reno. Lefty is a former cropduster, as well as one of the founders of the Confederate Air Force.

Sharing her vision is Eric Lorentzen—gentleman, sportsman, and businessman—owner of Blind Man's Bluff, a high-tech modified 3350 Sea Fury that is the first racer to use nitro/alcohol and onboard computer telemetry via satellite to the ground crew's computer.

Mr. Lorentzen and Ms. Osterud's dream is for Joann to be the first woman to pilot an unlimited racer to first place in Reno's Gold Championship. Patiently waiting for her to acquire heavy iron flying time and experience, they're pointing toward Reno and maybe fame in 1988.

A stroll down memory lane and a renewing of a lost camaraderie from 35 years ago led me to a successful Formula One race pilot/owner, Robert Drew, a former P-38 Air Force fighter pilot in the Pacific during World War II. Prior to Bob becoming an eminent test pilot, he flew P-51s in the notable California Air National Guard 195th Fighter Squadron, and who thoughtfully gave plenty of dual flying time to an aspiring young pilot who was also his parachute rigger: me!

On introducing my fiance to Bob and his aircraft in his hangar, she exclaimed, "His airplane looks like your radio control glider; it uses tape and removable fiberglass wings too." I thought my F3E nine-pound glider didn't quite put me in the same category as my pal, F-1 Racer of the Year, Bob Drew!

Drew is one of the few pilot/owners who last year reported a profit to the IRS, made possible through partial sponsorship by Freiberg Electrical, Inc., along with skillfully flying his way into Reno's Sunday's Gold Finals. Not bad for a competitively natured recent quadruple heart bypass surgery patient.

For Bob and his supporters, their quest begins with the building of a new lighter wing, a new down draft cowl, all made with the latest state-of-the-art composites along with fine tuning his number two with some races leading up to his drinking champagne and being driven past the grandstands as Reno's "1988 Championship Air Race's Formula One Winner." •

Planes at the Fan Fly-In, clockwise from top left: Jim Howard's P-80 from the Sterner Engineering kit; Ed Couch's detailed F-84F Thunderjet; Col. Bob Thacker and his Byron Kfir; Mike Kulczyk's DeHavilland Sea Vixen; Bill Harris' Starfire II from the Jet Model Products kit in Blue Angels regalia; Ron Ables' Byron F-15 following its maiden flight; and Butch Stickles' unfinished Concorde airliner.

Greater Southwest Fan Fly-In

By MARK FRANKEL, with photos by DAN PARSONS. . .The cream of the ducted-fan fraternity showed up in Texas to strut their stuff with lots of spectacular flying demonstrations and new models on the flightline.

• September 12 and 13 marked the fifth year that ducted fan modelers from all parts of the United States met in Texas for the annual Greater Southwest Fan Fly-In. The event was sponsored by the Mid Cities R/C Club and was directed by Ed Couch and Dawn Buckley. The site, Copeland field near Fort Worth, is a private strip which provided a perfectly level and spacious paved surface for model jet operations.

Early morning thunderstorms threatened the activities on both days, however, by 11 a.m. the skies cleared. This year's fly-in yielded few surprises, but reinforced the fact that ducted fans are gaining popularity among sport and scale fliers throughout the country.

Three high performance non-scale designs appeared in substantial numbers. They were Bob Violett's Sport Sharks, Aggressors, Vipers; Tom Cook's Starfires; and the new Byron Bullet. In addition, Terry Best of Fenton, Missouri, demonstrated a scratchbuilt design called the Invader. The most unusual feature of Terry's jet is the fan system which consists of a Viojett rotor in a homemade shroud powered by a marine version of the K&B 7.5. Terry's Invader was clearly in a performance category with the other high-performance jets at the Fly-In.

Ron Schaefer, of North Lauderdale, Florida, flew an unusually painted Violett Aggressor. The model was finished in a "splinter" camouflage pattern similar to the type seen on some Saab Viggens. Bill Harris and Dennis Crooks flew two superbly finished Starfire IIs kitted by Tom Cook's Jet Model Products. Bill's airplane carried the Blue Angels' markings while Dennis used a Coors Light color scheme. Both models have been flown extensively, yet their finishes remain absolutely flawless.

Bob Violett displayed a new carbon fiber tuned pipe system in his three-year-old Sport Shark. This pipe is being developed to

Karl Hibbs' Byron Bullet in flight. Karl is a member of the Skyriders Demo Team.

Mike Kulczyk's DeHavilland Sea Vixen powers overhead. It was later lost in a crash.

Bob Violett's Viper during a spectacular demonstration flight.

Ron Ables' F-15 on its second test flight.

Don Yockey's F-16 with drop tanks, built from the Byron kit.

Hugh Jones' F-15 from the Dwayne Johnson kit makes a high-speed flyby.

This huge Concord by Butch Stickles is nearing completion.

reduce the noise levels emitted by his high thrust propulsion system. The results seem quite promising; not only was Bob's Sport Shark noticeably quieter in the pit area, it was remarkably quiet in flight. I discussed the new pipe with Bob, and he informed me that he intends to do further work on the noise issue. In addition to improvements on the pipe, Bob hopes to experiment with sound suppression material around the fan installation. The carbon fiber pipe has reduced the noise level to approximately 98 decibels from a typical fan which produces 108 decibels. Bob expects to achieve another three to four decibel reduction in the near future. It is commendable that Violett is developing products to reduce jet noise. Now that we are seeing several fans that provide very high thrust levels, it is important to the growth of jet modeling that the propulsion systems become "better neighbors."

The Skyriders of Puyallup, Washington (Ronnie Kemp, Terry Malcolm, and Karl

Another view of Mike Kulczyk's beautiful Sea Vixen, which was unfortunately lost during maneuvers aimed at coaxing down the landing gear.

Contest Director Ed Couch's Douglas A-4 and Republic F-84F, both beautifully built models.

Gibbs), flew two Byron Bullets in formation demonstrations. The Bullet is an easily built, high-performance jet that uses the Byro Fan. Like the Cook and Violett models, the Bullet is well streamlined and has no auxiliary air inlet (cheater hole). Ronnie Kemp informed me that the Byron factory intends to begin shipping Bullet kits shortly. This aircraft should prove to be an excellent introduction to jets for those modelers who want a less expensive sport jet that can be built quickly.

Scale jets were present in great abundance. The most ambitious model was Mike Kulczyk's DeHavilland Sea Vixen. The Sea Vixen is a twin engine derivative of the Vampire. It flew in the British Royal Navy's inventory from the late 1950s through the 1970s. Mike designed and built an all-balsa airframe which was powered by two O.S. 25s driving RK-20 fans. These fans are now available through Larry Epifanio of

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Takeoff run by Don Yockey's Byron F-16.

Dennis Crooks' Starfire about to touch down.

The Byron Bullet about to touch down.

Kyosho's PETIT ROBIN 850

By ELOY MAREZ

• Electric model power technology has now greatly improved from the early days when all such model planes were merely gliders which used the electric motor to get to altitude. New motors, better batteries, new accessories made especially for electric flying models have greatly improved the capability and performance of such airplanes.

One fine example of this is the "Petit Robin 850," which definitely does not have any sailplane characteristics. The Robin is designed and built by the well-known Kyosho Company in Japan and is imported into and distributed here in the United States by Great Planes Model Distributors, of Champaign, Illinois. The Robin 850 is

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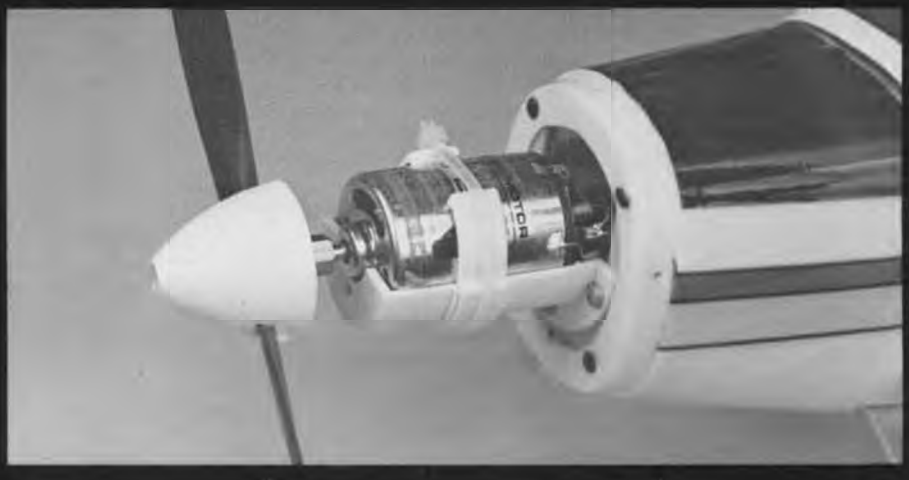
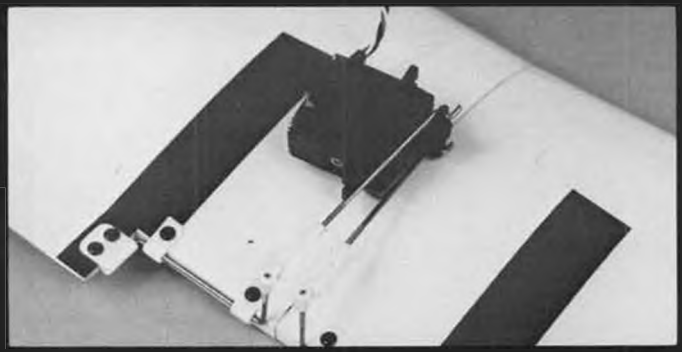


A LeMans AP-29 handles things in the power department, and is furnished complete with a 6-volt 450 mil Ni-Cd battery and a 12-volt input timer-operated fast charger.

The removable canopy gives access to the flight battery for charging. Elevator servo also shown. Pushbutton switch starts the motor independent of the radio.

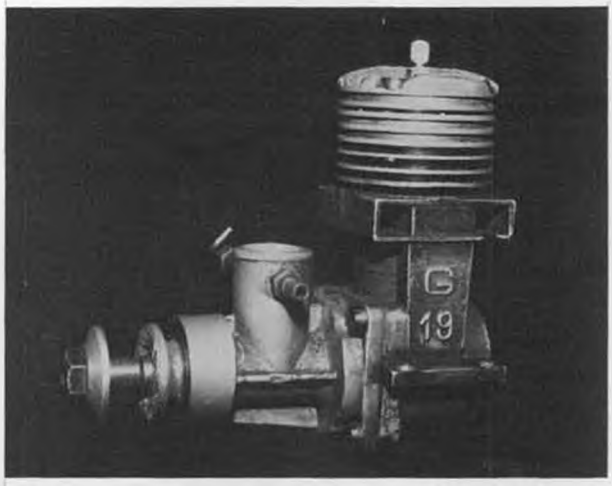


Aileron servo installation is like that on larger planes. A piece of plywood is epoxied to balsa wing covering with servo attached.

ENGINES OF THE WORLD

...by Stu Richmond

Super Tigre G 19 Typo A



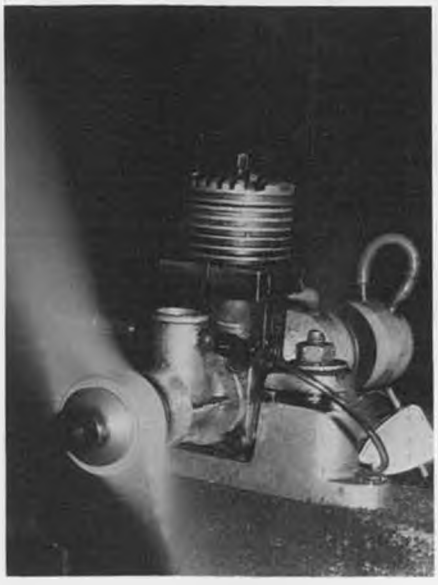
VITAL STATISTICS: 3-1/8 inches long to face of prop's drive washer. 1-9/16 inches across the mounting lugs. 3-3/8 inches to top of cooling fins. Weighs 9-1/2 ounces. Engine is a .29 from early Italian Super Tigre production.
UNIQUE FEATURE: This 39-year-old diesel is a teacher's aid today.

• 1987's Engine of the Year is Super Tigre's current X-40. It won first, second, and third places at the FAI F3D World Pylon Champs in Australia last April, a very unusual clean sweep against a variety of .40s from all over the world.

But it's been very hard to trace back the *early* history of the Super Tigre engines for you. *MB* readers Evan Towne of Huntington, Indiana, and Doug Wendt of Whitefish, Montana, make this month's story possible. The early Super Tigres exist in Amato Pratti's 500-piece collection in Italy, but language and distance is an unsolved problem.

I've said that every public school system in the USA should own a Cox, Fox, and K&B model engine for teaching/training purposes. When I started researching the early S.T. production, it was Evan who responded with the loan of this month's engine and other data. Evan uses this engine in the Salamonie School in Warren, Indiana. His interesting letter follows:

"O.k., I will send the Super Tigre to you—*dirt* and all! I am tempted to send it with the huge prop that I use on it. Here's how I use it in my classes. I would usually talk about diesels, then put a squirt in the intake and flip it hard, usually after five to six flips it would fire and run for a couple of seconds or more. Once it had run, I would give it another squirt and ask if anyone in the class would like to start a diesel. Usually one or two would like to try it. When they would have good luck, then the others would like to try it too—and most succeeded! (The heavy prop helped in most cases.) When I remember the reluctance of the Drone diesel to start, the ease of starting the Super Tigre has always amazed me. You may look inside if you have gaskets to put it back in running condition! Yes, please clean it up before pictures. . . ."



Engine was running in 15 seconds on the test stand. Raising/lowering the fuel tank made no rpm difference.

In another letter Evan wrote:

"I traded a McCoy .19 glow in 1950 to an Italian boy for this Super Tigre. It is the easiest starting diesel I have ever encountered. I would guess over 200 students (7th and 8th grade boys and girls) have started the G-19. I am an Industrial Arts teacher and I use the model aircraft engine to teach "How And Why" a two-cycle engine runs. And I use my collection to teach the development of a modern industry. . . ."

Evan also included a photocopy of the 1949 letter from Italy to him that initiated the 1950 swap. It says, "I found your name and address in a recent *MAN* issue in connection with a very fine stunter of yours. I too have built a Hot Rock with great success. I powered it with a Super Tigre G-19 diesel of 5cc (.29). I enclose some literature on this engine, as I'd like very much to arrange some swap with you. For us foreign modelers is very difficult to get model supplies from the States. The G-19 is a very advanced diesel engine. It features two ball bearings, aluminum piston with rings, variable compression ratio and so on. It has an extremely high speed up to 15,500 rpm. My Hot Rock travels about 85 mph with 9 by 12 props. Last September I entered a national

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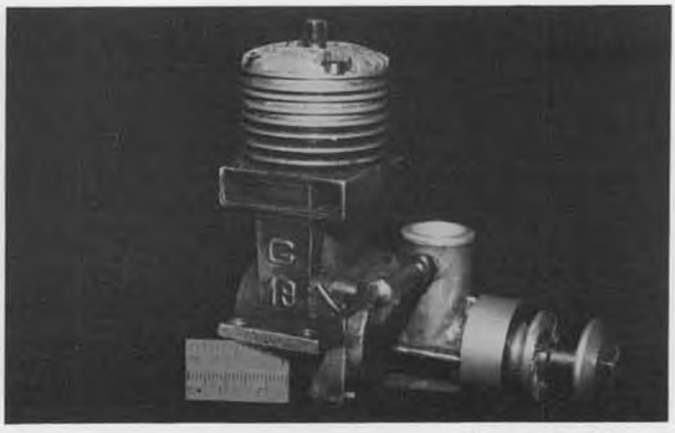
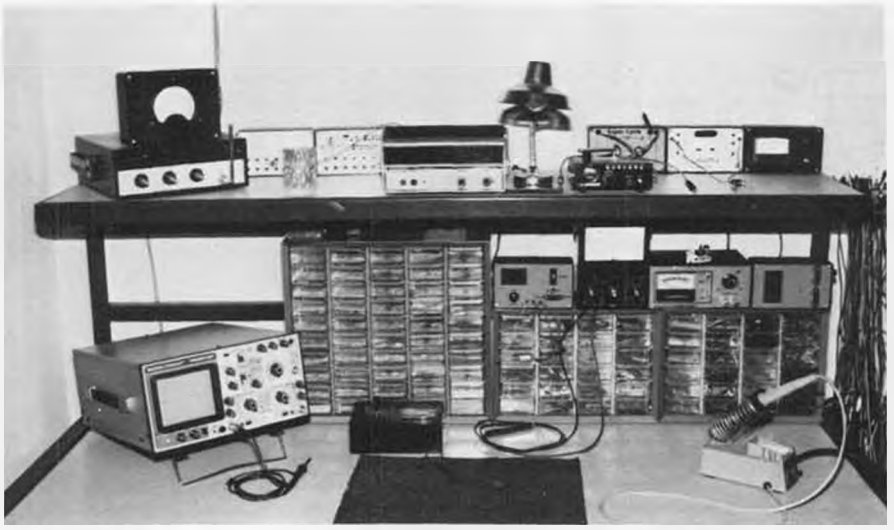
Square steel ke locks drive washer to prop shaft. Super Tigre pioneered the tapered split collet used today to lock drive washer.



Today's X-40.Super Tigres trace racing heritage back to this G-19 that was power rated at 15,000rpm in the late 1940s!



Electronics Corner

By ELOY MAREZ

• Welcome to 1988! Don't know about you, but I wasn't always sure I'd make it. Anyway, here we are, I hope that you had a Merry, and a Happy, and that you are being successful at keeping those New Year's resolutions. Let's see now, there was the one to finish that model now on its third year, to build a *competitive* scale airplane, and, oh, yes, to learn how to turn right!

A new year generally brings changes, and there is to be one here at EC. For some time I have been having second thoughts about the wisdom of continuing my policy of sending out free copies of whatever interesting information came my way that could not be published for some reason or other. I have no way of knowing the numbers, but they have been considerable for some things, and just so-so for others. For example, there was the schematic of the "Super Cycle," which was an all-time best seller and which is not one of the ones that have created some reservations in my mind. I am sure everyone that asked for this schematic had a unit, either not working or he was just planning ahead, which is something I approve of completely.

The requests which I have begun to doubt are those that asked for *all* Wee R/C model plans—and were generally accompanied with a single envelope with one 22-cent stamp. I can't help but ask myself if anyone really needs thirteen plans at one time, and whether he would be asking for them if he had to pay for them. There have been others, but I won't belabor the point, except that while I enjoy helping out, looking at it

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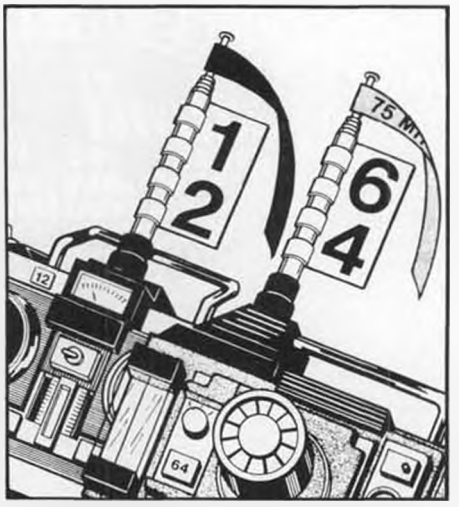
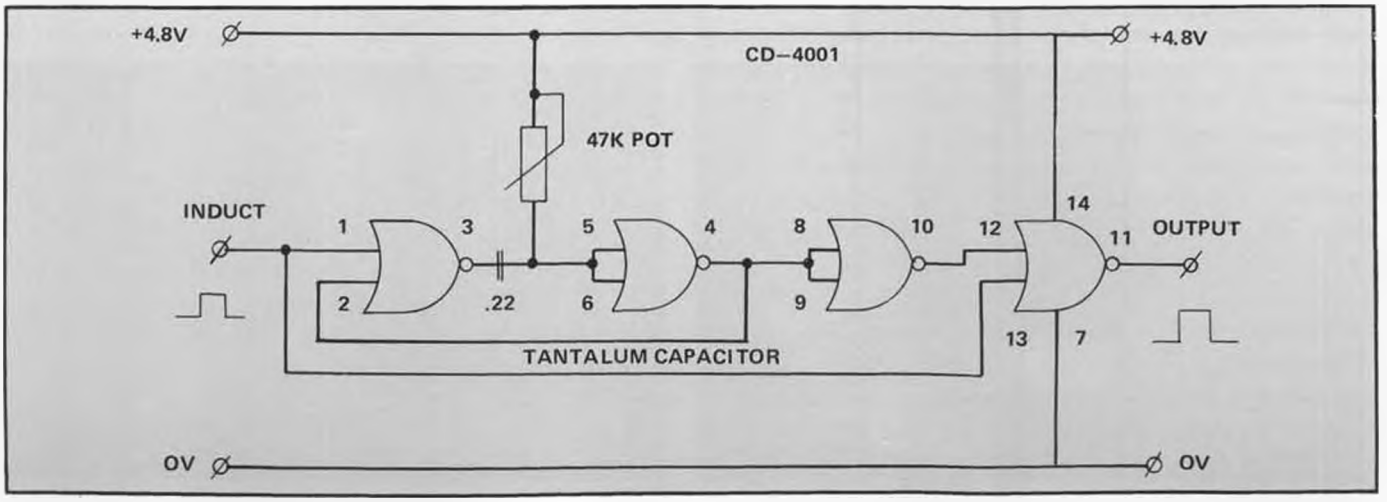


Du-Bro Products' new style frequency flags are available as separate pieces; you buy the correct top banner and one each of the two numbered ones needed.

Ace R/C frequency flag system consists of appropriately marked streamer and precut grid placard for numerical identification.

Industry/AMA plan is going into effect to identify narrow band and non-narrow band channels. Gold is for narrow, silver for non-narrow band transmitters.



Servo reversing circuit, using only three components. This is much easier to assemble if the components are identified. For more information, see the December issue's Electronics Corner.

PLUG SPARKS

By JOHN POND

• This columnist is indebted to "Bucky" Walters of SAM 39 for the lead article in this month's column. For the benefit of those who were unaware, Chet Lanzo has been suffering from acute back pains for the past six months. So, when Lanzo was persuaded by Tom McCoy to fly his model at the 50th Anniversary Wakefield in England, Walters took the time to tell you, the reader, about Lanzo and also the doings of SAM 39.

The idea of going to England was instigated by Tom McCoy who has a 1937 Lanzo Duplex. Tom thought it would be a great idea if Chet Lanzo built a Duplex and also went to England. However, Chet had gone to Sun City, Florida, in order to do some first-class laying on his back on a cot and daydream (also to help out the back pains).

Tom was completely undaunted and made a special trip to pep Chet up about the pilgrimage to England. Upon arriving in Sun City Center (south of Tampa), Tom found his enthusiasm overwhelmed Chet, and, in short order, Chet agreed to build the model from the wood supplies and plan provided by Tom. Tom was so elated, he had to call Bucky long distance announcing the good news. This is where Bucky came in, as the modern hobby store does not stock nitrate dope and thinner.

Provided with all supplies, Chet returned home in the spring to Valley City, Ohio. After breaking in the rubber motor, some short trial flights were taken at the local R/C fields. Fine, but what we need is a large area to check out the model under full power.

Walters to the rescue again! As a retired NASA employee, Bucky knew about everyone there and in no time contacted Jack Ross (also an O/T R/C flier) to arrange for the use of a portion of NASA Plum Brook Station, through the Station Manager and the Ohio State Wildlife Department. Talk about red tape!

As can be seen in Photo No. 1, Chet has a grin like a Cheshire cat with his reproduction of his Duplex. Photo No. 2 is a better view of Tom McCoy and Chet Lanzo and the surrounding area. The trees in the background are not the most encouraging aspect of free flight flying. Sure enough, after Tom McCoy registered a minute-plus flight in front of the trees, Lanzo promptly stuck his in the top of a pin oak tree.

Chasing was done by Joe Macay as he figured Chet was unable and Tom was dressed too well. Haw! Pin oak trees are notorious for the long sharp thorns, six to eight inches long that grow from the main trunk. As luck would have it, a young 37-year-old pattern flier, Ken Weiland, happened by and volunteered to climb the tree. He was assisted by Howard Johnson's grandson, Jason, who acted as the halfway point in passing down the parts.

Californians take note! Photo No. 3 clearly shows the problem in retrieving free flight models in the Ohio area (or the Midwest for that matter). As a matter of fact, this situation was again repeated as Joe Macay put his model up in a similar oak tree.

Not content with the foregoing, Tom built a beautiful box to carry Lanzo's model to England. To say that Tom was the main force in getting Chet to England would be the understatement of the year! Everyone had a great time at Old Warden, England.

SAM 39

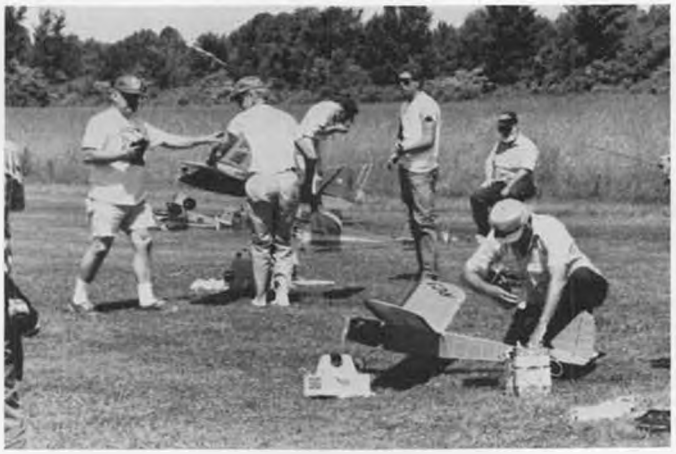
As a follow-on, Walters also sent a write-up on SAM 39 which encompasses activities in northern Ohio. Walters sent quite a few photos of SAM 39 members seen at the North Ridgeville, Ohio, contest.

Photo No. 4 gives an excellent indication of the activity. If you can't identify the models and modelers, the left edge is Ralph Turner with a Peerless Rocket followed by the right edge (also out of sight) about to fly his RC-1 that Jim Deats is holding. More fun

2. Chet Lanzo and Tom McCoy shown with Chet's Duplex (cabin version) just before test flights. Photo: Robinson.

1. "It's great to get out and fly again," sez Chet Lanzo, with new Duplex.

3. Same old story! Free flights always end up in the tallest tree! See text. Photo: Warner.



4. The SAM 39 gang on an outing at North Ridgeville, Ohio. See text for names.

5. Thad Kusak, SAM 39, warms up his engine in an Ideal Air Chief, a Steve Kowalik design.

in the background; Bucky Walters also with a Lanzo RC-1 and Thad Kusak in the background with his ever-present cigar.

The club contests are fairly well attended and these meets are the only way you can get award points for the club trophy. SAM 39 runs the point system the way it should; a graduated scale based on the number of contestants. For example, if you take a first place and are the only one in that event, you receive only one point. If you win with five contestants in the event, you receive five points, the others get graduated points for subsequent places; four, three, two, and one.

The main point, as Bucky points out, is to get everyone out. We (the experts) don't want to scare anyone out because he thinks he can't qualify. Those who do come to fly get a pleasant surprise. You can win and have fun at the same time!

Walters also makes the point that some new events like Joe Beshar's Vintage event, may help stir further interest in SAM. The only problem with Joe's event is that you need a free flight field. No such thing in northern Ohio! most all fields under cultivation are off limits to free flight. R/C fields are quite small and completely surrounded by trees. Bucky thinks this event would be fun at the upcoming SAM Champs at Lawrenceville, Indiana, in 1988.

Before closing out Walters' report, we would like to run Photo No. 5 showing Thad Kusak's Ideal Air Chief. This design by Steven Kowalik was based on his successful Miss Delaware design. Both designs fly well!

SAM 57

Found the right slot for this report on the SAM 57 contest held at Mid America Airport, the site of the 1988 SAM Champs. Thanks to Bud Brown, R.R. 4, Box 51, Lawrenceville, Illinois 62439, we have a good report on what to expect at the 1989 meet.

Brown reports the Annual Variety Old Timers meet attracted 59 brave souls. They had to be brave to face those 25 mph winds. The toll of broken airplanes was high. One fortunate thing was that the prevailing wind was in the right direction.

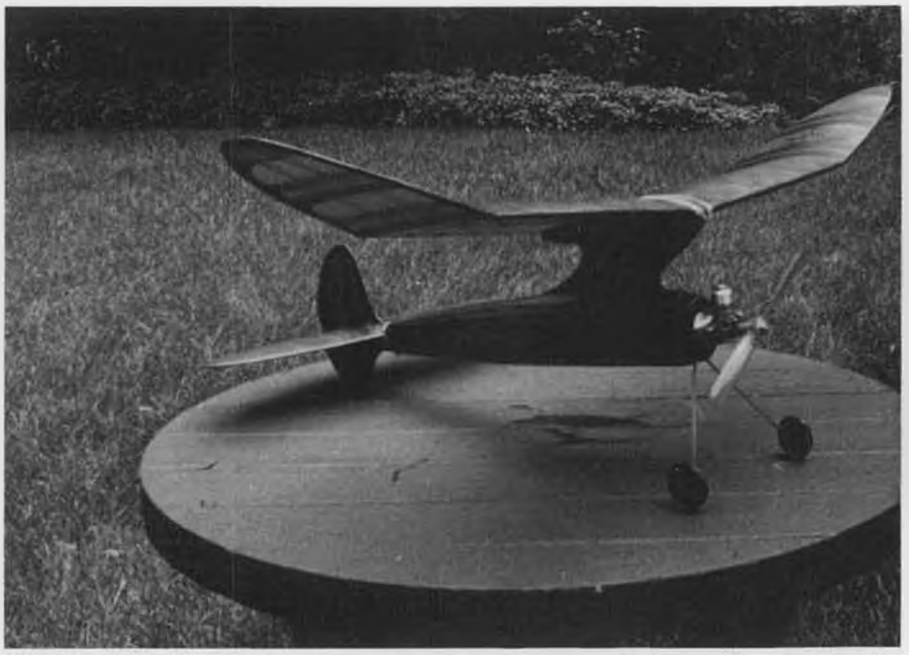
Sunday was another story, as the wind conditions deteriorated (got worse) with a considerable number of flyaways into the corn fields. An interesting story developed when Ed Aikman's 1/2A Ramrod flew into the same thermal being occupied by a full-size sailplane. The sailplane pilot reported he saw the model off his wingtip and noted the model rapidly outclimbed him. To date, the Holland Hornet-powered model has not been seen.

7. Bob Rother with .020-powered Foo 2-U-2 replica puts the whammy on his model. Matt Basta guards Bob's beer.

The cookout (which was a sellout last year) again attracted over 100 people to participate in smoked turkey, hamburgers, and the usual fixings designed to defeat any diet.

As can be seen in Photo No. 6, Guy Scott launches his winning Korda Wakefield in the stiff wind (blowing the wrong way). Retrieving was a real chore, and Guy was lucky to have Ritchie to retrieve his model. It is interesting to note this model was flown in the Large Cabin Rubber Event, which in some sense is a duplicate of the O/T

6. Guy Scott launches winning Korda Wakefield in stiff wind. Ritchie takes off for another chase in the cornfields.



8. A well-built Zipper A, silked and doped by Howard Robinson, SAM 39.

Wakefield Event as the same type of models were entered.

Looking around the field, Bud spotted Bob Rother putting the "whammy" on his 020-powered Foo 2-U-2 in Photo No. 7. His pal, Matt Basta, is all heart, as he is keeping Bob's beer from blowing away. A true buddy. . . haw!

Bud also wishes to thank trophy donors Gene Miller, Bill Brenchley (former SAM 21 member) along with anonymous H. L. glider donor (we know you Bob Larsh!). The cookout, headed up this year by Larry Willis, was so successful he has qualified as permanent cook. Also the Schmidt Beer distributor brought out a keg of Stroh's. These boys know how to live!

Let's take a quick look at the results to see what is winning in the Midwest.

R/C Texaco (7)

1. Buck Zehr	Lanzo Bomber/O.S. 75	2885
2. Bob Walter	Lanzo Stick/Saito 80	1809
3. Bill Crenshaw	Bomber/O.S. 60 4C	1565

R/C Class C Glow (6)

1. Bill Crenshaw	Raider/Picco 45	1017
2. Buck Zehr	Playboy/K&B 35	835

R/C Class A-B (8)

1. Bob Walter	Bomber/Forster 29	867
2. Buck Zehr	KGS/Torp. 29	816
3. Art White	Bomber/Torp. 29	813

R/C Class C Ignition (5)

1. Art White	Bomber/Hornet	1064
2. Bob Walter	Bomber/Forster 35	819
3. Buck Zehr	Sailplane/Sky Devil	716

R/C 1/2A Texaco

1. Bob Walter	Bomber	1235
2. Frank Roales	Playboy	1215
3. Bill Crenshaw	Record Breaker	802

FREE FLIGHT

Class A-B Cabin (11)

1. Bob Edelstein	Solong/Arden 19	342
2. Larry Willis	Cabin Ruler/OR 23	302
3. Hans Oschner	Coronet/OR 23	286

Class A/B Pylon (14)

1. Matt Basta	Zipper/Delong 30	335
2. Harry Murphy	Zipper/OR 29	189
3. Hans Oschner	O.O.S./OR 23	177

Class C Pylon (12)

1. Hans Oschner	Gas Champ/OR 60	342
2. Elmer Jordan	Sailplane	311
3. Bob Larsh	Wasp/Forster 305	292

020 Replica (22)

1. Bill Hale	Foo 2U2	352
2. Larry Willis	Kerswap	324
3. Lloyd Wood	Sailplane	265

Rubber Cabin, Large (13)

1. Guy Scott	Korda	480
2. George Batiuk	Lanzo	360
3. Anton Telford	Korda 37	329

Rubber Cabin, Small (13)

1. Roger Lane	Jabberwock	338
2. Anton Telford	unknown	258
3. Lloyd Wood	Stratosphere	230

Rubber Stick, Large (12)

1. Bud Brown	Lanzo	360
2. Bob Moulton	Lanzo	339
3. George Batiuk	Stickler	337

9. Ted Lewis with fine Wahl Brown-powered Red Zephyr; it flew right off the board!

Rubber Stick, Small (12)

1. Lewis Odun	Gollywock	341
2. Dan McEntee	Gollywock	225
3. Bob Moulton	Casano Champ	208

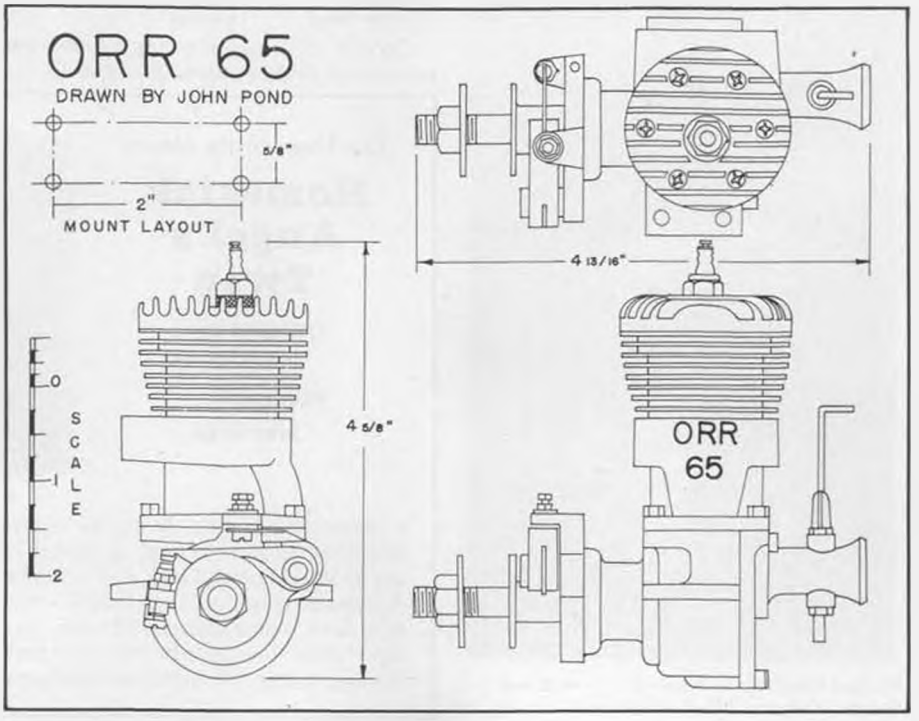
Wakefield (10)

1. Robert Moulton	Lanzo Duplex	221
2. Lloyd Wood	Hi-Ho	205
3. Bud Brown	Light	113

H. L. Glider (10)

1. Roger Lane	Berger	217

13. A dandy for 1/2A Texaco, the Commander from a Pharis Models kit.



10. A neat O.S. 30-powered Reginald Denny 'Dennyplane' R/C model built and flown by Hurst Bowers, AMA Curator. Photo:Schmitt.

11. Group of SAM 1 modelers who competed in the annual 1/2A Texaco Postal Contest for '87. See text for names. Photo: Ramsey.

12. Seen at the Kansas State Championships in 1937, George Allen holds the wreckage of his Brown Jr. powered original.

14. Well-made Carrol Krupp Bowden Winnder by Ford Lloyd, Melbourne, Australia. Lucky boys fly from the local airport.

15. Len Edelstein of South Africa with his fourth Valkyrie! What persistence!

2. Bob Larsh	Huguelot	193
3. George Batiuk	Huguelot	124

Closing off, it is interesting to note the amount of rubber events available to the free flighters. This should prove a real shot in the arm for F/F. The area lends itself ad-

Continued on page 96

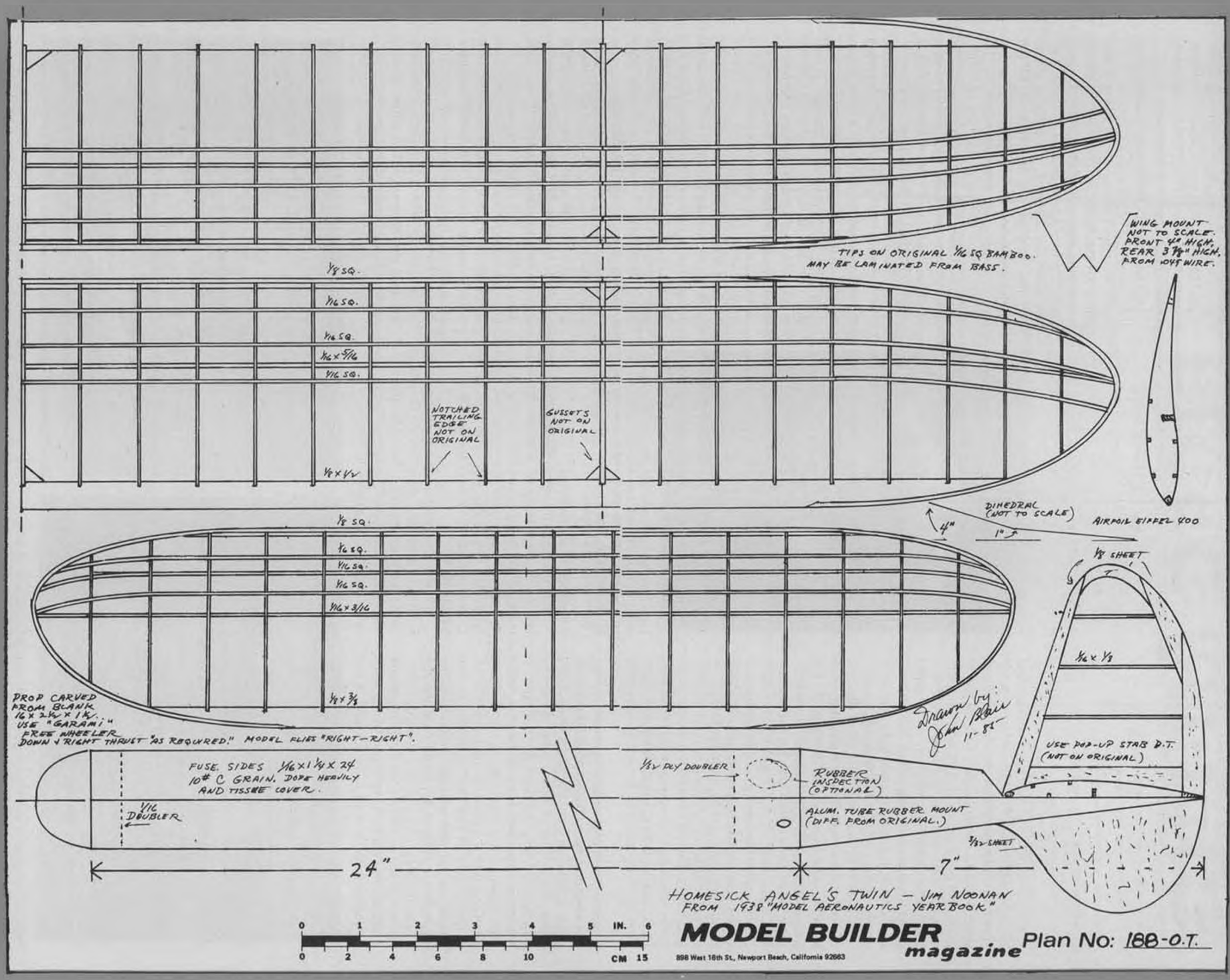
Old Timer of the Month

Homesick Angel's Twin

Designed by:
Jim Noonan

Plan by:
John Blair

• Homesick Angel's Twin, by noted designer/flier Jim Noonan, appeared in the 1938 edition of Frank Zaic's *Model Aeronautic Yearbook*. The Homesick Angel's Twin, with a span of 38 inches, was reported by Noonan to be a fast right turn climber, doing 12 minutes on 400 turns of the rubber. Subsequently, on only 260 turns, the Twin was lost in a thermal, attesting to its flying ability. John Blair, of Warne, North Carolina, has re-drawn the plan for the Twin that is presented here. The original used an Eiffel 400 airfoil, and was covered with red tissue. •


TIPS ON ORIGINAL 1/16 SQ BAMBOO. MAY BE LAMINATED FROM BASS.
WING MOUNT NOT TO SCALE. FRONT 4" HIGH. REAR 3 7/8" HIGH. FROM 10#T WIRE.
1/8 SQ.
1/16 SQ.
1/16 SQ.
1/16 x 5/16
1/16 SQ.
NOTCHED TRAILING EDGE NOT ON ORIGINAL
GUSSETS NOT ON ORIGINAL
1/8 x 1/2
1/8 SQ.
1/16 SQ.
1/16 SQ.
1/16 SQ.
1/16 x 3/16
1/8 x 3/8
DIHEDRAL (NOT TO SCALE)
4"
1"
AIRFOIL CLARK Y 400
1/8 SHEET
1/16 x 1/8
USE POP-UP STAB D.T. (NOT ON ORIGINAL)
DROP CARVED FROM BLANK 1/8 x 2 1/2 x 18. USE "GARAMI" FREE WHEELER DOWN + RIGHT THRUST "AS REQUIRED." MODEL FLIES "RIGHT-RIGHT".
Drawn by John Blair 11-85
FUSE. SIDES 1/16 x 1 3/4 x 24 10# C GRAIN. DOPE HEAVILY AND TISSUE COVER.
1/16 DOUBLER
1/32 PLY DOUBLER
RUBBER INSPECTION (OPTIONAL)
ALUM. TUBE RUBBER MOUNT (DIFF. FROM ORIGINAL.)
3/32 SHEET
24"
7"
HOMESICK ANGEL'S TWIN – JIM NOONAN
FROM 1938 "MODEL AERONAUTICS YEARBOOK"
0 1 2 3 4 5 IN. 6
0 2 4 6 8 10 CM 15
MODEL BUILDER magazine
898 West 16th St., Newport Beach, California 92663
Plan No: 188-O.T.

Simply Scale

By CLIFF TACIE

• Converse '87—You may have noticed that I didn't mention anything in my last column about the annual IMAA Festival at Converse, Indiana. I intentionally did not report on it, not because I didn't enjoy it, but because I knew that my counterpart, Steve Gray, was planning a column on it, and I didn't want to seem redundant. Well redundant or not, I also don't want to be remiss in commenting on such a noteworthy event.

Converse '87 was perhaps one of the best run events I have ever had the pleasure of attending. The hard work invested in the preparation for this fly-in was obvious from the moment you rolled into the parking lot. The areas set up for registration, safety check, and frequency control/impound were conveniently placed so as to facilitate rapid check-in in preparation for flying. Flying was closely supervised and controlled, and you could not have found a safer place to fly. If hitting a narrow runway is not your forte, not to worry, since there was open (and hard) concrete as far as the eye could see.

Some complaints were overheard during the weekend about the impound being too great a distance from the flight line. I don't agree. This distance didn't slow down the flying, since only five fliers were allowed in the air at one time anyway. From a safety standpoint, I felt much more comfortable knowing that if someone inadvertently left a transmitter in the "on" position in impound, it was far enough away from the flight line to prevent any significant interference. Besides, looking at a weighty cross-section of the modelers out there (myself included), the exercise received in the walk from the flight line to the impound is just what the doctor ordered!

Dick Watz got to show off the new Hurricane MK 11C from Aerodrome Models at the Four-stroke Rally. A nice performer, not too big at 62 inches, it flew up a storm on its Saito .80 four-stroke engine.

Suffice it to say that even though it was the last event my Cub (lost through my own fault) would see, I immensely enjoyed this fly-in and hope to be able to attend again next year. Great job, guys and gals of the Converse Cadets, IMAA Chapter 48.

SWITCHES

Tell me the truth. . . how many times have you seen the lines of an otherwise beautiful scale model scarred by the ugly head of a radio on/off switch mounted out in the open for everyone to see?

For all the work that most of us invest in our scale projects, we owe it to ourselves to spend just a little extra time to find a way to conceal that on/off switch in an area of the model that will not be so obvious, or may even be "invisible." It's not hard; it just takes a little imagination and ingenuity.

Let's take one of the simplest approaches first. Say we just want to place the switch actuator in an area of the model where it isn't going to be noticeable. The first thing to do is to mount the body of the switch securely inside the fuselage in an area which will allow whatever actuator you plan to use to exit the fuselage on the bottom of the model in an inobstrusive spot. This "actuator" is simply an extension link to the switch. Many different types are commercially available that will work very well for you, or you can make your own out of a piece of .045 music wire. Simply drill a small hole through the side of the bakelite switch lever. The switch end of the music wire is bent 90 degrees and inserted through the hole in the switch lever. It can be held in place by a small wheel collar, or if the bent portion is long enough, it will stay in place all by itself. The end of the music wire exiting the fuselage can have a small 90-degree bend in it to grab hold of, or you can leave it straight and install a small wheel collar on this end also. One of the best places to have the actuator exit the fuselage if you have a model with the landing gear attached to the fuselage is on the bottom of the model between the landing gear struts. It's almost invisible. Wherever your placement, be sure to mount your switch securely inside the fuselage.

This method is simple, and gives you a way to turn your receiver on and off without announcing to the world where your on/off switch is located. Still, the curious will be able to see the actuator easily if they look hard enough. The music wire actuator system can be expanded to provide almost invisible evidence of a switch if you attach the outside end of the wire to some protuberance on the model, such as, an antenna, step, or handle. These can be made to pull in and out, or, with a little extra ingenuity, linkages can be installed to allow twisting of the outside handle to actuate the switch.

Open cockpit models lend themselves

Second in scale at the Four-Stroke Rally was Dan Molino of Kokomo, Indiana, with his Sig Clipped-Wing Cub. A masterpiece of craftsmanship, it weighs 14 pounds, powered by O.S. 1.20 Twin.

The winner of an O.S. 1.60 Gemini Twin at the Four-Stroke Rally was Tom Barnes of Elizabethtown, Kentucky. His PA-22 is from Hobby Capitol plans, weighing 17 pounds, powered by Saito 1.20.

Here's an actuating on-off switch with what appears to be a control stick. A simple push-pull arm is connected to switch activator.

The simplest approach, is to mount the switch on the dummy cockpit floor.

well to hiding on/off switches. One of the simplest methods is to install the switch under the seat if you have a full cockpit. This way it is only necessary to reach in with a finger under the front of the seat. Another method used frequently is a modification of the music wire actuator discussed previously, but with just a small extension that may exit the instrument panel as a choke or carb heater knob. Yet another method is to find a way to hook it up to the control stick.

If you have a model of larger proportions that has opening doors or hatches, such as my SM-81, you can install the switch on a crossmember or bulkhead just inside the opening, and it's an easy matter of simply opening the door and reaching inside.

If you don't want to get carried away, and you have a stand-off type open cockpit model with just a high "floor" and pilot bust installed, simply mounting the switch from the inside out on the "floor" gives you easy access for actuation and gets it out of the way of peering eyes.

Whatever method you choose to use, at least make the little extra effort to do something. It's attention to little details like this that take a modeler out of the category of "balsa butcher" and make him a "craftsman."

HAMILTON HAWKS

What do you call a weekend of good friends, good fun, and good flying? Well, if that weekend happened to be September 26 and 27, and you happened to be in Hamilton, Ohio, I'd say you'd call it the Hamilton Hawks and O.S. Engines Fifth Annual Four-Cycle Rally!

Since its inception, I've had the pleasure of attending this fall rally of quiet four-strokers, and I've not yet been disappointed. The Hawks have managed to provide organization to the monumental task of letting 108 fliers thrust over 150 four-stroke-powered models into the air in the never-ending quest for fun and frolic. Only an investment in time and hard work can provide the preparation needed to bring such an event off successfully.

This year's rally continued the tradition for the Hawks. Rather than encourage "blood and guts" competition, the rally features several fun-fly-type events that qualify the flier for a chance at winning a brand new O.S. four-stroke engine. By participating in such events as Timed Flight, Spot Landing, and a simple "Mini Pattern" (a loop, a roll, and any kind of figure eight), your ticket is put in the event barrel, and the winner is determined by the luck of the draw on Sunday. Even if you didn't hit the spot in the Spot Landing event, but you made an attempt, your ticket was put in the "None At All" barrel for its own separate drawing. It results in fun for all and discourages the "professional" fun-fly competitors.

The scale event this year was once again based on AMA Sport Scale rules with the exception that the model need only demonstrate flight capability, not perform any type of a judged flight pattern. I had the pleasure of working with Mike Gretz and Dick Watz in static judging the models, and the competition was really tight for the top spots. With brand new O.S. four-stroke engines being awarded for first, second, and third, there was a lot at stake, and we made every attempt to perform the judging as fairly as possible.

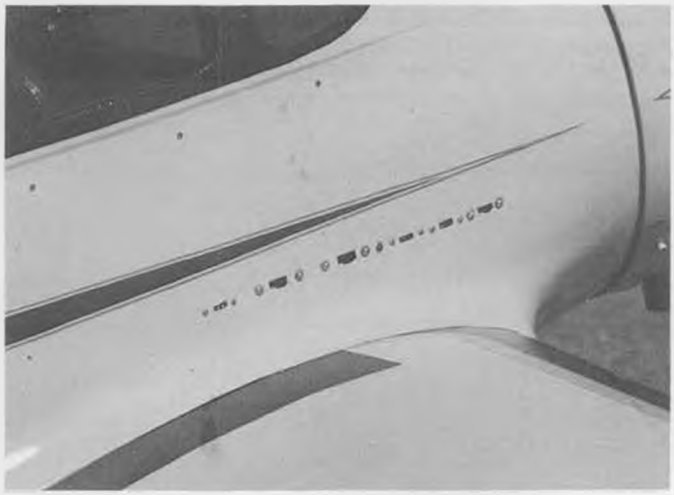
The big winner was Tom Barnes of Elizabethtown, Kentucky, with a beautiful PA-22 Piper Tri Pacer scratchbuilt from Hobby Capital Plans. A pretty model, Tom had some problems with his 1.20 Saito, but managed to put in enough of a flight to satisfy the contest officials that it was indeed airworthy.

A well-deserved second place in scale went to Dan Molino of Kokomo, Indiana. Dan's Clipped Wing Cub from the Sig kit is one of the most nicely crafted Cubs I've seen, and Dan is never hesitant to demonstrate its flying abilities.

The third place winner, barely nosing out Maxey Hester and his Space Walker, was Ron Pound of Terre Haute, Indiana, with a Fokker EIII scratchbuilt from John Lockwood plans. A big model with a 108-inch wingspan, the Fokker was flown several times over the weekend, demonstrating that wing-warping does work!

The winners were separated only by frac-

Continued on page 66



What not to do: this otherwise well-crafted model is diminished by the switches being mounted on the side of the model.

Can you find the switch? Surprise, it's the small step just below the door on this Citabria. A simple push-pull arm does the job. It's connected to an internally mounted switch.

ELECTRIC POWER

By MITCH POLING

• Politics and religion—never discuss them in a column! I include in this category things like downwind turns, little airplanes are hard to fly, tricycle gear is better, rudder-only flying is for experts, you have to learn with a four-channel radio, and a host of others. You know the songs and tunes! But, I am going to take the plunge after all, and talk about the "black wire syndrome," since other columns in *RCM* and in *Model Builder* have both mentioned the subject. My own qualifications are pretty good. I teach college chemistry and have a Ph.D. in chemistry. On the other hand, I haven't gone to the lab and done testing, so this discussion is still philosophical, in the grand tradition of the ancient Greek philosophers. After all, if we actually tested this, there would be nothing to write!

Anyhow, I have lots of battery packs that are very old, some are over ten years old, and they do indeed have the "black wire syndrome," that is, the negative wire corrodes and becomes black. The positive leads usually stay clean and uncorroded. The answer for the corrosion is pretty simple: the old cells leak and the electrolyte, potassium hydroxide, is quite corrosive. It proceeds to corrode the negative wire, and the copper becomes copper oxide, with some copper carbonate mixed in due to picking up some carbon dioxide from the air. This mixture will be black.

Okay, fine and good, but why should the other lead stay untouched? Why doesn't it turn black too? Well, besides the chemistry, we have to deal with electricity too, and the corrosive agent is the hydroxide part of the potassium hydroxide. The hydroxide has a minus one charge. This is important! Where are negative charges on a cell? They are at the negative end of the cell, and most of the time they are electrons, also with a minus one charge. However, the hydroxide is perfectly happy to follow the crowd, and so it does. After it leaks out of the cell, it flows down the outside of the cell to the negative end, then runs along the wire towards the positive end (negative charge is attracted to the plus end). On the way, it corrodes the negative wire.

The leak is at the cell seal, and that is at the plus end of the cell. So why doesn't the negative hydroxide just stay there nestled up nice and cozy next to the plus end? Why take the long way around? Much of it does stay at the plus end, and you see it as a black or green "crud," and some of this will corrode a little of the plus lead too, if the process has enough time. However, the plus end gets crowded, and the excess winds up taking the long way around. The long way around does have one problem, the negative hydroxide is moving to a negative end, and usually minus charge does not like to go to a minus end (like charges repel). What motivates it? One idea is capillary action, the plastic jacket and the cell side form a nice narrow channel that allows the liquid electrolyte to move by its attraction for surfaces (wetting or capillary attraction). If this is so, cells with no plastic jacket (bare metal) should be much less prone to black wire syndrome, ditto for cells that have a loosely fitting paper sleeve. Most of the bare cell packs I have are over five years old, and many of them are clean, no black wire. I have a Super Star power unit (motor and battery) that is thirteen years old. The Super Star (manufactured from 1971-74) power unit has bare cells, and did leak a lot, and both plus and minus leads show the black wire syndrome. This makes me think that the plastic jacket does help the electrolyte migrate to the negative end, without it, both leads corrode. In fact, the electrolyte managed to migrate all the way along both leads to the outside of the motor in the Super Star unit, and the motor case is heavily corroded. The leads, by the way, are metal straps, with no insulation. One theory mentioned in other columns was that the insulation caused the black wire. No insulation

John Balcom, winner with the longest flight(43 minutes) with a stock Electra. At right, John Mountjoy, winner of the All-Up, Last Down competition with his Astro Challenger.

Participants at the First Annual Winston-Salem Electric Meet, held this past summer.

Al Stott and his Heron: "Such a beautiful plane, everything Bill Winter said it was!"

here, so wire insulation is not the cause.

I do not want to have this as a forum for letters on the subject, so this will be the last mention of it. I did go into this much detail simply because in all the explanations I read, no one got down to basic chemistry or electricity. Enough said.

While on the subject of electricity, ESVs have been in several other columns lately, with some confusion resulting from the definition of ESV. An ESV is an expanded scale voltmeter, which means that the scale covers a small range of voltage but with much more accuracy. The easy way to do this is to add a zener diode with the banded end to plus in the positive voltmeter lead and use the zero to 1.5-volt scale. This range is best for our purposes of peak detecting. The zener serves to jump the scale to the voltage range we need, which is about 1.5 times the number of cells in the pack. A 6-cell pack will need a 9-volt zener, for example. If the zener turns out to be slightly too low, it can be shimmed upwards by adding a silicon diode (1N4148 is good) in series with the zener, again banded end to plus. This will shim up about .7 volts, this can be done with as many silicon diodes as you wish for even more shim. Once you have the range you need, the sensitivity of the 1.5-volt scale is about a hundredth of a volt, which is what you need to see peaks easily when doing a peak detecting charge. Radio Shack sells a very good 1.5-volt scale in the form of a battery tester, part 22-032, for $10.95. Use the low load 1.5-volt scale, 1 milliamp, mA, called the button-type on the meter selector.

So far so good, but the confusion arises when using a DVM (digital volt meter). A DVM by itself does not qualify as an ESV. It happens that the DVM can be used like an ESV for voltages up to 19.99 volts; after that, you must use the zener in the lead, just like for the analog meter. Why? The problem is that you must be able to see hundredths of a volt. Unless you have a 4-1/2-digit DVM, you will not see the hundredths past 19.99 volts, and you will have a hard time seeing the peak. The ordinary 3-1/2-digit DVM will switch to the 199.9-volt scale after passing

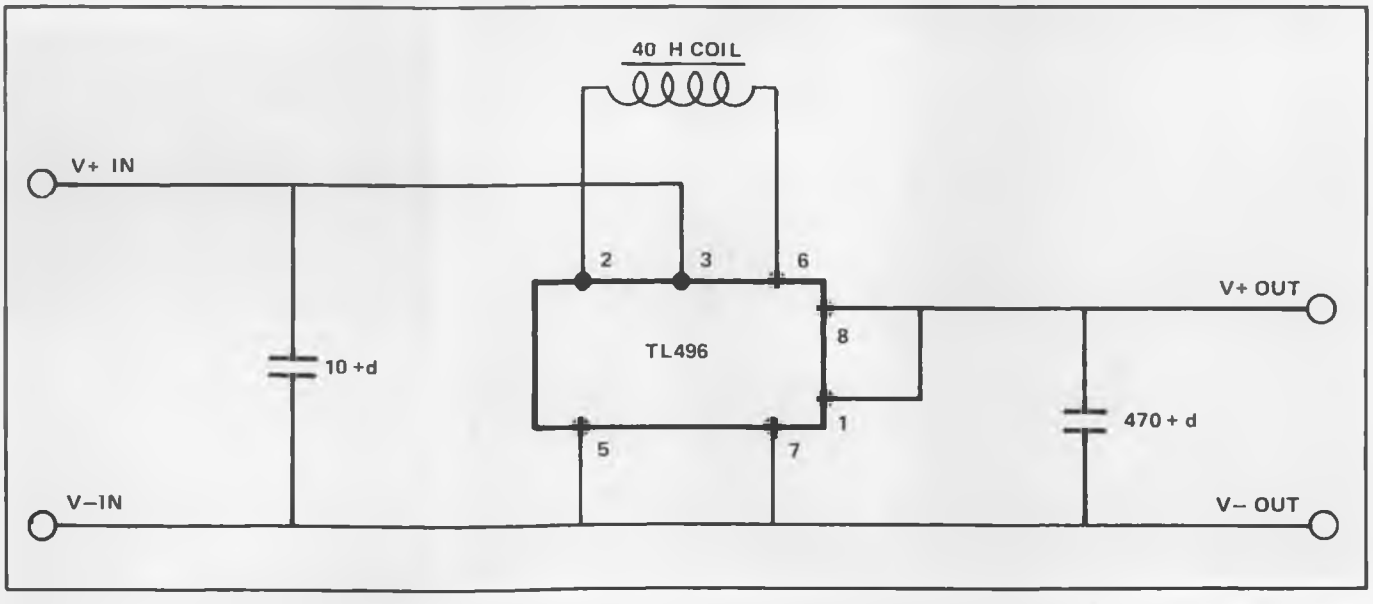
Don Siegle of Houston Sparks with his Astro Porterfield with Astro 40 cobalt motor, 20 Sanyo 800 batteries and Emco throttle.

Dr. Jean Duke of Houston Sparks with Astro Porterfield powered by an Astro 40 cobalt and 18 Sanyo batteries, and Geist throttle.

19.99 volts. A typical display value would then be something like 20.1 volts, not 20.10 volts, and the hundredths place is gone. So, put in the zener using the same 1.5 times the cell count rule as before, and you are in business again. In fact, you can even get thousandths place accuracy using the DVM and the zener, just use the 1.999 scale. Neat! So, yes, you can use a DVM as an ESV, and no, a DVM alone is not an ESV. The difference between the two is not important if you are charging ten cells or less, since the 19.99 scale will do. It does become important when the cell count goes above that, as when charging the Astro systems in the "15" range on up.

Another topic that is becoming important are the BEC circuits. These have become very popular in cars, and some are appearing in planes. In the past, I have told readers that I do not recommend using a BEC in planes. I still feel that way. BEC stands for "battery eliminator circuit," and all of them are simple voltage regulator circuits. Some of them have a cutoff circuit too, so that when the motor pack falls below a certain voltage, the motor is turned off. The major problem with most BEC circuits is that they cannot boost voltage. This means that if there is no automatic motor cutoff, you most surely will lose your plane, since the motor will drag the voltage below the four to five volts your radio needs; and since the radio is out of commission, you cannot turn it off! A vicious circle. If the BEC comes with a motor cutoff, theory says that you will probably be all right, and if any of you are flying successfully with a setup like this, let me know. In the real world, the BEC will be used in small planes, which usually use from four to six cells. These packs can easily drop below four volts very quickly at the end of the motor run. If the motor cutoff is fast and set at a good trigger point, all will be well. This does seem very "iffy" to me, and I would prefer to use a lightweight receiver pack instead and field charge it when necessary. There is a BEC that I would think would work all right, let's call it a BBBEC (stutter?), for "battery booster BEC." I do not know of any of these on the market. I think Jomar uses a battery booster circuit in their throttles to ensure reliable operation, but it does not power the receiver. Rod

Continued on page 80



Rod Cooper's voltage Booster. The 40 H coil is wound using an RM4 or RM5 core; resistance should be less than 0.15 ohms.

Byron's Big Show

By AL NOVOTNIK. . .This year's version of the Byron Originals' Big Show included a bigger "Striking Back" mock war, flight demonstrations by factory teams, and combined flying by prop fliers and jet jockeys.

• The label on the Byron Products says, Byron Original, no two other words could describe the extravaganza at Ida grove International Airport this past August, from the 11th of August through the 16th. Giant scale model builders had a time to remember from both the flying of their models and the spectacular "Striking Back" show.

The week of flying began on Wednesday morning. Each morning at 7:00 a.m. the Expo pancake breakfast was available. This alone was a great way to start off each day. This year, because the fan pilots and the prop pilots were both there at the same time, the flying time was allocated in two-hour periods and the time totalled each day. Over 250 pilots were on hand to demonstrate their flying skills and show their wide variety of models. The planes covered everything from early WWI models to present new experimental models like the new Byron kit, the soon-to-be-released "Sea Wind" amphibian that flies off both asphalt runway and water. The jets were the super-fast Byron kits and kits by Tom Cook and Bob Violett. Jet flight demos were flown by the Byron fliers; Tom Cook, Bob Violett, and Bob's daughter Patty, all of whom did an outstanding job of flying the beautiful Violett kits.

Winner of the spot landing contest was this VERY solid scale Mustang....

The site for the event has to be a modelers' dream site; a 600-foot asphalt runway and a barrier on one side of the runway to stop models from running into the pit area or hitting the pilots who are flying. The transmitter impound area was even computer-controlled. Each pilot had the proverbial pin for 15 minutes. Then it had to be returned. This was so everyone would have time to fly. It worked out very well. All planes were inspected for safety upon arrival in the tent ara. When passed, they were given an airworthy stamp. Over 450 flights were flown during the Expo, and this is not counting the many flights that are put on during the "Striking Back" show. Sure there were a few mishaps while flying, some of them comical while others were no laughing matter.

Pilots from all over the US and Canada were on hand, including Billy Hempel flying a huge P-51 Mustang. The model had a weight of 108 pounds, but was an excellent performer in Billy's hands. Maxey Hester had the prototype Spacewalker for the Sig 1/3-scale kit, a fine looking and excellent performer. Maxey has his powered with an O.S. four-cylinder four-cycle. I heard rumor that Maxey likes the model so much, he's building a full-scale one for himself. These were just a few of the models on hand, along with numerous Cubs, Super Cubs, Cap 20s, 21s, Pitts Eagles; you name it, it was probably at the field.

B-25 bomber in the air as big boom begins Byron's re-creation of the Pacific War Theater, complete with Japanese aircraft carrier, a 1/5-scale USS Hornet, PT boats, paratroopers, and more.

The Frank Gray and Jerry Pitzel Dago Red, a faithful re-creation of the Unlimited Air Racer.

There were always huge crowds in the manufacturer's booth area, with all types of merchandise available; kits, accessories, and magazines. While going through the two huge tents with the manufacturer displays you could move into another tent that had ongoing seminars that each lasted for approximately two hours. They covered a wide variety of subjects like foam finishing, C.D. ignition systems, radio operation and

Massive B-29, built of fiberglass, with a span of 28 feet weighs in at 383 pounds. Quadra-powered, it uses four four-bladed props, each 36 inches in diameter. It flew Friday, after Striking Back program.

Col. Bob Thacker prepares his F-4 for a flight demonstration. Both prop and fan fliers displayed their prowess in a combined showing.

maintenance, jet performance, and many others. These were all very informative and each subject drew a crowded tent.

Another tent was the Byron tent where all questions the modelers might have were answered by the very knowledgeable Byron personnel on hand. This tent was also used for the registration of the fliers. All the Byron models were on display.

The NASA Aeroway, a traveling exhibit unit telling the story of aeronautics, was on hand. Dale "Chris" Christensen, a retired U.S. Air Force pilot, was the lecturer.

Every day during the Aviation Expo show the Sky Dancers from Kissamee, Florida, put on a model demo with their fantastic flying. They have a large multi-engine model that takes sky divers up, and when the divers are released, they are flown by members of the Sky Dancer crew. These fellows travel all over the country with their models, a tough thing when you realize they have to do it on their own time (vacation) away from their jobs. They do precision flying with a pair of Byron F-15s, but a rather spectacular flying demo is done with a 40-powered plane that they call the Flying Machine. You have to see it to believe it. Plans and kits are available from the Sky Dancers.

Each day the Expo begins with sky divers; 15 of them in the air at one time. (A little side note, the jumpers were jumping during the day before the show also. You could even "rent a tandem jump" with an experienced jumper.)

Carrier with planes on deck is a model of the USS Hornet. Byron continues to outdo himself each year with this model extravaganza.

The skies were loaded with nostalgia with WWII warbirds on hand for flybys, and close looks at the runway; P-51s, Corsairs, Hellcats, B-25s, even a Grumman Avenger.

Dave Hoover (no relation to Bob), the pilot and builder of the "Coors Silver Bullet," put on a great display of aerobatic flying in the tiny jet. The fuselage length is only 12 feet; span, 16 feet; cockpit, 3 feet high; weight, 450 pounds; and flies at 285 mph. The plane is transportable and can be dismantled in 20 minutes. This is one of the smallest man-carrying jets flying today. One unique thing that Dave does is he narrates the show from the cockpit while he is flying.

At the flying field Dave tried his hand at model flying. Kenny Bryan, one of the Byron pilots, flew the Byron model of the BD5J Silver Bullet. The transmitter was handed to Dave when the plane was in the air, and the result was unbelievable; he flew it with no trouble. Dave says he never had a transmitter in his hands before, but he did a superb job of flying the model. On his second flight, Kenny told him how to roll, and the result was an unassisted roll.

When Dave finished his show with the full-scale jet, the Eagles took to the air. These three pilots, Tom Poberenzy, Charlie Hillard, and Gene Soucy all past national champions, and Charlie past world champion, fly the beautiful Christen Eagle Biplanes. They have been flying as a team for the past 17 years, starting out on the Red Devils in Pitts SI aircraft. Recently Tom, Gene, and Charlie purchased their own planes from Christen along with the change in ownership, the sponsorship changed also. They are now sponsored by Avemco Insurance Co. and Byron Originals. The close aerobatic flying is precision at its best. The team flies in airshows from coast to coast. If you can't get to Ida Grove to see them, look for them at an air show close to you. It's well worth it!

Last year at the "Striking Back" show, I, along with many others, thought it was just a spectacular event. How could you do anything better? Well, Byron did it better. Boy, did he!

What is the Pacific War Theater without

Continued on page 94

The Cloud Dancers took on the challenge of building a Bullet at the show in one day. They not only built it, but they flew it at the show!

Byron's 1/2-scale HMS Bounty static display model sits on man-made Lake LaJune.

R/C SOARING

By BILL FORREY

Tod Allan and his original design with E214 airfoil. He prefers the simplicity of avoiding camber changing wings.

• The Visalia Fall Soaring Festival is unlike any other West Coast soaring event for many reasons, and, judging by the numbers of people who look forward to attending year after year, it is probably the most popular so-called "contest" west of the Mississippi. Its popularity is a result of the host club's tradition of always giving those who come a first-class fun time, both on the flying field and off.

As a contestant you never know what to expect in the way of thermal duration tasks or landing zones. Historically, the landing zones have always been challenging and even frustrating at times, but always fair to all and never quite what you expect. This year's landing task was an inverted pyramid (base end away from you) with a flat top two feet wide pointed toward you. Down the middle of this pyramid was a two-foot wide runway. Points were awarded in such a way that if you were in the pyramid when your plane came to rest but outside the runway, you got 25 points. The runway was graduated in 50-, 75-, and 100-point sections each one successively smaller in area with the 100-point area being a two-foot square box two feet from the top of the pyramid. If you were wise, you would shoot for the 75-point rectangle rather than the 100-point square because a two-foot-or-more slide from the square would give you a big, fat zero for your efforts! It was tough but fun, and, yes, there were a lot of zeros!

As a spectator (wife, girlfriend, son, daughter, etc.) there always are plenty of friendly contestants and fellow spectators to hobnob with in the pit area. For many people this event is just as much a social gathering as anything else. Because so many come from so far away, friendships are renewed yearly, thus there is always plenty to talk about! This year the Forrey camp was a magnet for little kids as three-year-old Matt Forrey came with plenty of toys and a family-size play tent!

The Fall Soaring Festival also has a tradition of having a Saturday night on-field barbecue dinner and entertainment. In years past this has been chicken or steak with salad, baked beans, garlic bread, and free wine for the eats with belly dancers as after-dinner entertainment. This year it was steak again (and it was very tender and juicy!), but the belly dancers were replaced with a 17-piece jazz band from the College of the Sequoias. The band played before, during, and after dinner (about two hours) with most of the audience listening from the comfort of their respective camps. Tunes ranged from classical jazz to pop and movie themes. Many wives who I suspect didn't care much for the dancers liked the change, although a few guys were undoubtedly disappointed. At any rate, the applause was enthusiastic and the band was very well received; nice touch CVRC!

The equipment used this year to launch and retrieve gliders and winch lines was the same quality stuff as last year. I won't go into it too much this time because I covered it pretty well last year in the January 1986 issue, but I will say this, it is so very handy to have a flying field with in-ground 110-volt AC! This allows the winch batteries to be constantly at their peak without having to deal with noisy generators. It also allows the CVRC to have flood lights on the field for their nighttime entertainment and to have 110 for any PA systems (or whatever) for the contest.

For the benefit of any who might be wondering why, if this is such a big-to-do event, they haven't heard the Fall Soaring Festival (FSF) advertised or publicized beforehand, I offer this explanation. The FSF is so popular

Tim Renaud of Airtronics flew the new Image kit prototype for the first time at the FSF.

Aileron servo for the Image mounts to the root rib of the tip panel.

Open Spoiler bay gives access to the Image's aileron servo connector and extension cord.

Ed Holder blinks and poses for the camera while holding the Eclipse gear drive electric kit from Airtronics.

Glen Clifton and Ian Douglas with the Donzel two-meter. Parts are interchangable with Gnome 2M and Gemini MTS.

Tim Dolan's first contest. OD glider is based on a Sagitta fuselage and E205 wing.

Mike Walter and his modified Cumic. Had trouble with servo tape letting go inside wingtips. Note square holes.

Richard Burns and Tony Stark with the SST or TST. Partial kit is available.

Chris Pratt was very pleased with the flat glide ratio of his Selig 3014 section Cumic Plus.

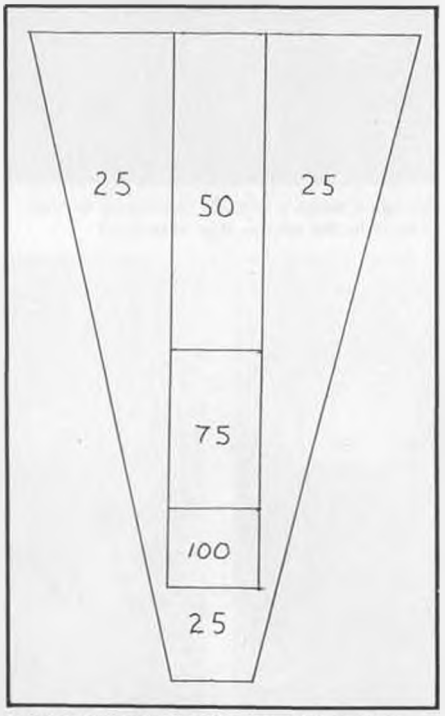
Keith Kindrick and his OD. He was very pleased with its thermalling ability.

they don't need to. In fact, if you aren't on their mailing list or know somebody who is, you may never hear of it beforehand. Attendance is by written invitation and reply with a 150-flier limit. There are probably dozens or even scores who are turned down every year because even though they were invited, they didn't reply quickly enough.

Two such fliers who were a little slow on the uptake managed to find two other fliers with letters of acceptance, who for whatever reason were unable to attend. They transferred the letters of acceptance and made the trek to Visalia. One of these surrogate fliers was a past sponsor of the event. Both came on the mandatory frequency of the invitation and both were turned away at the contest by the CD because there were already 151 fliers registered. I don't think this was a wise decision even though it was probably justified. What difference would two more fliers have made? Certainly less difference than antagonizing a sponsor!

WHAT WAS FLOWN AT THE FESTIVAL

This is the real "meat" of this report and the main reason why I run so many "contest reports" in this column. As you well recognize, it is when 151 (or whatever) like-minded people get together that ideas are exchanged and the hobby/sport of RC soaring advances. With about 50 or 60 percent of the fliers present either flying original designs or modifying kit designs, one expects to see at least some original thinking.



Scoring zones for landing pyramid used at the VFSF.

First on my list of interesting designs is the new kit prototype sailplane from Airtronics called the "Image." Tim Renaud designed and built the plane and flew it in the contest. In fact, it was still being trimmed out in the early flights of the contest; it was that new.

I first noticed the plane as I was walking past Tim's pit area on my way to a round one flight. It was the attractive fuselage shape that caught my eye, and at first I thought it might have been a Robbe Argo (a kit plane from Germany). A closer look nullified this idea, and I realized it was an OD. At this point I still didn't know that I was looking at an Airtronics airplane, so I passed it by with a mental note to come back for an interview when the pilot was nearby.

Later that day as I sat in my chair, I looked over at this model which was about 60 feet away and noticed that the wing wasn't as flat as I had first thought it to be. At that time I was in the middle of a project at home for a similarly shaped wing for my old Mirage, and this designer was obviously thinking along similar lines. My curiosity was again rekindled. This time I sought out the pilot who was still unknown to me.

As it turned out, Airtronics was testing fliers' reactions to the model as well as being present to enjoy the event. I believe Tim

1987 F3B team member Rich Spicer lands his Synergy in the 75-point rectangle of the runway/pyramid. Not as easy as it looks.

Nats winner in Unlimited Class, Tom Neilson, launches his Dodgson Windsong while Tom Brightbill times. Chris George works winch.

and Bob Renaud were pleased with the feedback they received on the Image prototype. It was heartily accepted by everyone that I talked to whenever the subject came up, that much I can say with confidence.

The ship's wing was 100 inches in span, but plans are to have the modeler decide whether he wants to build it that way or as an Unlimited Class glider. Kit materials would be provided for either version (as is the present Cumic Plus). The wing area is 915 square inches with a root chord of 10 inches and a tip chord of 7.25 inches. The ship's length from its nose to the end of its rudder is 50.5 inches.

The Image wing has a 36-inch, constant chord, flat center section with removable, 32-inch, tapered wing tips. There are about three or four degrees of dihedral under each tip panel (which was agreed may not be enough for spiral stability and will probably be increased), and there are ailerons to provide roll rate. As is becoming more prevalent in modern sailplane design, the Image has a straight trailing edge with sweptback leading edges on the tip panels.

The aileron servos are very cleverly mounted on the root ribs of the tip panels in such a way that the servo horns are inside the tip panels attached to straight pushrods to the knuckle-hinged aileron surfaces. When the panels are plugged together, the servos slide into rectangular holes in the outer ribs of the center panel. The spoiler bays which are outboard on the main panel are opened against their return springs, and the aileron servo leads are plugged into the extension leads in the wing. Tape up the wing; bolt it to the fuselage; plug in the 13 percent of wing area, all-flying horizontal stabs; secure the canopy; and you are ready to fly. Intelligent idea!

The airfoil for the Image prototype was a bit of an experiment. It seemed to work just fine. The section was based on the popular Eppler 205 as is found on the Cumic or Sagitta series of sailplanes. Tim modified it by adding an extra 1/16-inch of thickness to the bottom surface and by making the leading edge a little blunter. This would lower the wing's camber a little and in theory

Shawn Cordon's original two-meter Outlaw. The only 2M aileron ship at contest.

Gordon Poulson flew a stretched Gemini MTS and was very impressed with its performance.

Last year's top gun was off his game this year at thirty-first place.

Jim Lueken of Escondido was one of many flying Dynaflite Sensoars.

Ashley Osborne and the Saproquila. Parts of a Sagitta, Prodigy, and Aquila.

Bud Tolleson flew a 1-1/2-year-old Flamingo Contest which he loves. He's had four of 'em!

cause the plane to fly a little faster at the top end while giving it a more gentle stall at the bottom end. Thermaling ability would be nearly the same, as there would be the advantage of covering slightly more ground in search of thermals and once in them having a gentler handling wing. I didn't fly the model myself, or I might have been able to tell you if my hypothesis is correct. The airfoil looked like an Eppler 207.

If the rest of the testing program goes well for the Image, we might be seeing kits by next spring. Because of the balsa and plywood construction of the Image, prices are expected to be much less than a Cumic Plus. Look for details in future columns, and if you are a trade show visitor, look for the prototype at the IMS or Toledo.

Electric-powered sailplane buffs will be interested at the second Airtronics kit prototype that was at the FSF. It is being called the "Eclipse." Encouraged by the outstanding

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Second, Joe Wurts and his borrowed Zephyr 1300A.

Nationals Standard Class winner Dan Fink was a little off, finishing 117th with Pantera.

Marcel Scherer and Tony Meininger discovered that the V-tail on their Sagitta 600 made it easier to balance and fly.

George Gillburg and Vern Oldershaw with Vern's OD glider. Scratch-built from the ground up, even the computer-designed airfoil.

The Winner! Young Steve Clasen beat 150 old fogeys for top honors with his Camano.

Control Line

By MIKE HAZEL PHOTOS BY THE AUTHOR

• As you can see, the photographs this month are a little sparse. Here's a chance for you shutterbugs to receive a little fame and glory, as contributions in that department are greatly appreciated. We can use color or black and white prints and slides. Black and white is probably the best, but whatever your medium is, just make sure there are good contrasts and things look sharp. Also, if you write details on the back of the photo, do not stack multiples, as the ink tends to rub off on the one below.

One of the pictures has a display of various household consumer goods packaging, all of which are handy in the workshop or on the field. At various times it becomes necessary to put away your small parts so as not to lose them or for protection from damage. I personally don't use baby food jars for parts storage, but do use them exclusively for mixing up paint. There are no doubt many other containers you can find about your house, some of them are fun to empty out!

If you do any spray painting, please read on. For years I have applied epoxy paint to my models with an airbrush, generally not paying attention to the warnings about ventilation. After all, we don't want to stir up dust now, do we?

Over the last year, I have heard too many horror stories about modelers and professional painters alike who have had health problems because of accumulative toxic inhalation. That means breathing in the paint spray and fumes! Oh, sure, in the past I used one of those dust nuisance masks, but those are almost useless for protection against the airbrush atmosphere. The fact that I was usually just a bit nasal after painting should have told me something. Well, after hearing some of these painter war stories, it became clear that painting without adequate protection is just stupid.

One of the photos displays a painting respirator and its original packaging, which is the one I purchased. I just gave it the test, and I am sold. During the entire spraying operation, there was virtually no epoxy smell getting into my breathing system. If you can't smell it, then you have reduced the hazards many fold.

You can see the brand name in the photo, but there are most likely others on the market similar to it. This one cost under twenty dollars, which is cheap insurance. The instructions do warn against using this mask when spraying urethane or in areas where the concentrations of contaminants are very heavy.

One of the other photos displays one of my latest pride and joy pieces of equipment, namely an electronic digital scale. Please note that the engine being weighed is heavier than "6." The six is the last digit, as in 316 grams, but the camera did not pick up the angle properly on the LED. (My other shot shows a "31".)

The one I have measures single grams up to two Kg, and ounces in similar small increments. One handy feature that this unit has is a tare weight. This allows you to put something on the scale, zero it, and keep going. This is very useful getting the net weight of materials of resins.

Besides putting heavy engines on it, other useful purposes include the obvious one of checking out balsa weights, and also precision mixing of resins.

If you would like to obtain a unit like this, check with a restaurant wholesale supply house or a packaging specialty business. Warning, they are not cheap, as mine retails for three big bills; some are a bit more, and some are less. If you don't want to spend that much or just don't need a precision unit, a good quality spring scale can be purchased for about fifty bucks from the mentioned sources. Once you have a good scale in your tool collection, you will wonder how you did without.

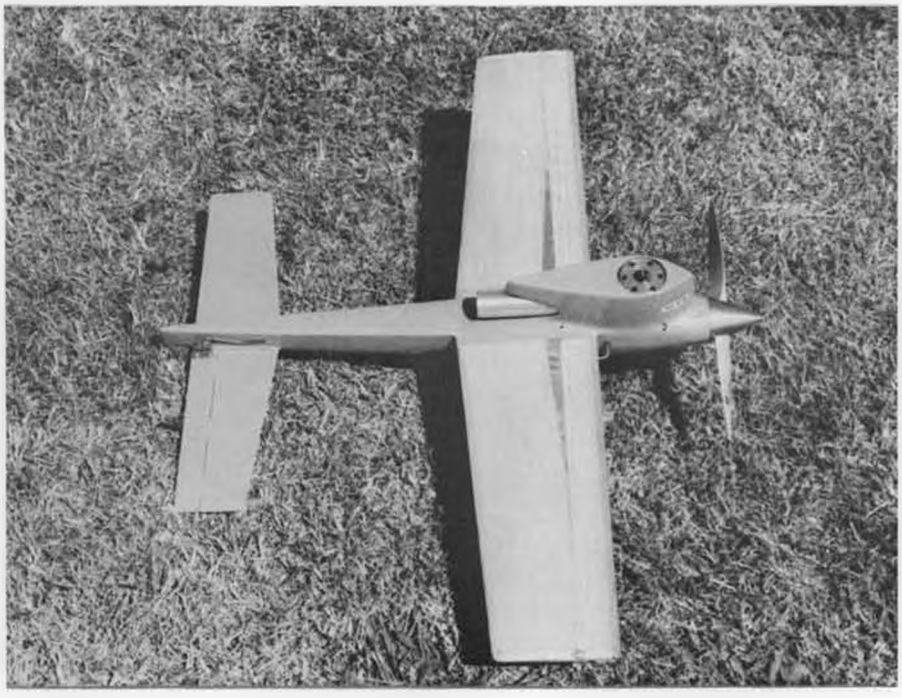
DOUBLE YOUR PLEASURE DEPARTMENT

The following piece is from *Flying Lines* newsletter, and authored by Orin Humphries, NW area competitor extraordinare, and all-around good guy:

"How many of you have heard things about multi-engined models like, 'If the inboard engine dies, you're dead'? Or, how about, 'You have to set the outboard engine rich so it will run out of fuel first'? These all come under the heading of Multi-Engine Myths.

"Let me present my credentials on the subject to those friends whom I haven't met just yet. I finished a Douglas A-26 Invader over sixteen years ago, and it by now has a trophy shelf full of dust collectors. That model taught me the ropes the hard way. By that I mean it had the apocryphal first flight crash, so very common to newcomers in scale, and the learning sessions with it that followed its repair 'made me what I am today' (talk to myself, limp, facial muscle tic).

"The first thing I learned was proper fore-and-aft CG location. This was a Japanese kit that was common in the mid-sixties, and like kits even today the designers knew how



Marty Higgs built this clean-looking Formula 40 Speed Ship. Power is from a K&B.

The camera picked up the last digit on the LED on this precision scale. See text for details.

to draw kits but didn't know squat about CG for CL flying. The plans showed a CG for R/C or FF. It was simply too far aft for good controllability. There was only one way to find this out, though. The nose popped up upon takeoff and the model did a wingover and collided with the third planet from the Sun. (I somehow didn't see it coming.) An old hand who was with me advised moving the CG forward until the nose didn't pop up on takeoff (determined by many careful taxi tests easing up to the point of taking off but setting it down before reaching six inches altitude). The myth, here, was the crashes always happen on the first flight. They don't with proper CG position. I recommend setting it around 15 to 18 percent of the root chord for the first flight (from the leading edge at the side of the fuselage heading aft, of course). You might ease it aft a teeny bit once familiar with it. I don't care what the plans say. And don't just suppose the CG's location might be okay. Unless you have measured it with a ruler and divided by the root chord to verify that it's in the range I have, don't come crying to me when it re-kits itself on its first one, pal!

"Before continuing with myths, let me add another critical point related to CG. There is a vertical position for the CG as well as horizontal that must be accounted for in your leadout guide location. Again, put some whiteout on the CG shown on the plans and find out for yourself. Fliers, designers, and kit manufacturers just don't know diddly about this. Leave the left wing uncovered until the last. Hang all the engines, tanks, wheels, all of the hardware, on the model and then suspend it from the leadouts. Looking at the model from in front toward the rear, it must be rolled slightly in the counterclockwise direction in order to have the proper attitude on the lines in flight. If not, it will be rolled in toward you in flight and you will have poor or nonexistent line tension (you'll get a tension headache of another kind, friend). While you are hanging it, look at it from the belly toward the top, as well. The leadout guide position must be such that the nose is slightly lower then the tail. This is called proper 'rake.'

"Once the leadout guide's position has been determined by hanging it, go ahead and cover the left wing.

"Back to myths. If your leadout guide is both low enough and aft enough, all the rest of the myths will never visit themselves upon you. How can they be myths if they really can happen, you ask? Novices believe that it simply is the basic nature of multi's. Are you familiar with the Spanish term, 'El toro poo-poo'? It's all in proper leadout guide positions, people.

"It's nice to start the outboard engine first so it will run out first in case the wind increases once you are airborne. This will give you good line tension. I remained airborne too long once and on this flight the inboard engine quit first. Scared? Me? One really ought to change his shorts now and then anyway. By forcing myself to stay cool, I piloted the craft to an uneventful landing five laps later. It flew fine on the outboard engine. And this has happened twice since then, no biggie. Bob Parker's (*another all-around good guy. mwh*) famed BF-110 actually took off on the outboard engine only at the 1971 Internats. No problem. Another guy had a Royal P-38 twin that had the inboard engine die from a lean needle in flight, and it had no problem staying up.

If you spray paint, you need one of these! Author has recently tried one on, and is sold on it.

"Don't use different pitch props or different needle valve settings to promote line tension 'in case the inboard engine quits.' With properly determined leadout guide location that's all counter productive and totally unnecessary. It hurts the model's performance.

"Listen to me, please. A properly rigged multi-engine model flies like a big single-engine one, period. Fini.

"Put the fuel tanks in each nacelle just like that nacelle was itself a single-engine model. You can't feed from a fuselage tank, as the inboard will starve in the air and the outboard will flood, even though they run fine on the ground.

"Just who propagate all these multi-engine myths you've heard spread as gospel? Single-engine pilots who have never tried it! There is nothing like the special sound of multi engines and seeing *two* oil streaks on the ground in the pit area."

Okay! Thanks for the enlightenment, Orin. Now I feel inspired to find a pair of engines and put them on a single plane, that is, *one* plane! Hey, how about some photos of multi-engine jobs from the readers? That would make an interesting group of pictures to look at.

Well, the column is just a little shorter than usual, folks. The author is getting ready to hotfoot it to another contest. If I do good, maybe you will hear about it! Until next month, keep your lines tight (and both engines running).

Mike Hazel, 1073 Windemere Drive NW, Salem, Oregon 97304. •

There are lots of handy containers to be found about the house for small parts storage.

Free Flight Scale

By FERNANDO RAMOS

• Remember the Jetex engines in the 50s and 60s? A new, improved version is available called the Jet-X. This new rocket-type of jet motor can be used for cars, boats, helicopters, and airplanes. The unit only weighs 10 grams and has a power run of about 20 seconds. It has enough power to fly models of 14 to 22-inch span, and the good part is that there are numerous plans for these motors in the old model magazines.

The Jet-X units get very hot and are only sold to adults; not for use by children or in fire hazard areas. Peck-Polymers handles these nifty little motors. Price for the Jet-X 50 Z engine and mounting clip is $10.95. A complete set with 10 fuel pellets, 10 gaskets and wick is $22.49. Extra fuel pack of 10 pellets is $8.95, 20 pellets is $18.00. Extra wick is $2.95; gaskets, 10 for $2.49 or 20 for $3.95. Peck also has a 50-page book on Jetex published in 1967, but has plans and information still useful today for $3.95. Peck's address is P. O. Box 2498, La Mesa, California 92044.

If you order direct from Peck-Polymers please include $2.00 for postage.

In December the Flightmasters are holding a special Jetex event for scale models. Mac McJunkin has been working very hard to make this a regular event. He has built several terrific jet models which can be powered by the Jet-X motor. On top of this, he has developed a very interesting Jet engine of his own using CO_2 as the propellant. It is clever in many ways. I will have a full report on this as testing moves along.

Last time I mentioned one of my pet peeves; the way some modelers treat wheel attachment. Another minor aggravation is the way modelers handle the "pilot" of their model. First off, I agree that open cockpit airplanes should definitely have a pilot, and with cabin-type airplanes, I don't think it matters, since pilots cannot be easily seen.

No doubt that the William Bros' pilot is the most common pilot available, and over the years they must have sold a zillion of them in the different scales available. However, too often it appears that most modelers prefer to paint these pilots with that same hypnotic, straight-ahead look in their eyes. As a pilot of full-size aircraft, I can tell you that if you flew like that in the real world, survival would be quite short!

Here are a few suggestions that may help along to make that pilot come alive. I want to preface my remarks by saying that I am *no* artist! My comments do not require any artistic skill to create the necessary illusion required to make your pilot look as though he knows what he is doing in the cockpit. Start off by getting yourself some water soluble paints. Floquil has a brand they call Poly-S, and like all their paint, it is outstanding in quality. If your local model shop doesn't carry them, go to an art supply store, I'm sure they can fix you up with what you need.

Jet-X, rocket-typeet motor of the 50s and 60s is back. Made in England by Powermax and sold by Peck-Polymers in the USA.

Start by painting the white of the eyes first. Next, place the pupils where you think they will enhance the look of the pilot. Stand back and see if you accomplished what you wanted. If not, take a damp cloth and remove the pupils and try again. Repeat the procedure until you are satisfied with the results, then finish painting the rest of the pilot.

Even though your pilot is going to be wearing goggles, the eyes can still be seen, so don't think you are off the hook!

The next few comments, in my opinion, will really enhance the appearance of the William Bros. pilot. The first thing I do is to cut the head off with a Zona saw. And then I glue it back on turning it slightly to one side. This alone can eliminate that hypnotic trance look. Next, I take some vinyl spackle which has been thinned with water so that it can be brushed like thick paint. I apply several coats of the material, particularly on the helmet and bust of the pilot. I make sure each coat is dry before applying another one. When the spackle has thoroughly dried, I'll take an Uber knife (What else?) and carve on the spackle some. Sandpaper can be used but should be done sparingly. An emery board works okay here as well. I usually like to give my pilots a nice thick mustache. I do this with the spackle and a very small spatula.

The pilot is then painted using good ol' Floquil paints. At this point, the guy is looking like he's ready to try out the cockpit. However, if you use any of the commercial paints that are flesh-colored, they usually leave a shine on the face like a teenager going through puberty! To eliminate this, you can use some India ink thinned in alcohol and the whole pilot given an even coat. This is then wiped off with a Kleenex. What this does is to create highlights as the ink gets into the "pores or cracks." You may want to experiment here, since you can definitely overdo this last procedure.

If you are reluctant to use India ink (By the way, this is an old trick used by the plastic model fraternity.), you can use a model railroad technique which is similar. Most of you have a jar with thinner that you wash out your paint brushes in. The residue that goes to the bottom of this jar is also perfect to "wash" the pilot in. A little experimenting on your part will undoubtedly give you the illusion you are looking for.

With the scores of plastic models, particularly the very large ones, plus the numerous toys out there with lifelike figures, keep a beady eye out for them. Many are suitable for our purposes. I recommend vacuum-

At the Flightmasters Annual meet, Dick Howard took Third with this Douglas O-46 Jumbo.

Grant Carson's Pilatus in Jumbo was high on scale points, low times resulted in a Second.

Warren Ruland built this Fifth-Place finishing Franklin Sport. Photos: B. Calomiris.

Tom Arnold took Second in Multi-Scale at the Flightmasters Annual. It's a Hughes XF-11.

First in Multi-Scale, Dick Howard and his beautiful F7F.

forming them, doing the front side then the back side. I use epoxy to join the two halves. Often it is difficult to get the two halves to mate properly. I don't worry about it. What I do is to put a bit more of five-minute epoxy just before it sets up. In other words, when it is at the gooey stage, put a little bit from the inside of the bust where the gaps are. Then I proceed with the spackle technique, etc.

Dick Howard has an interesting technique he used for small pilots as required on smaller size models. He vacuum-forms from an appropriate bust, but just the front side of half using the lids off a cottage cheese container! Yes, this material is dynamite for vacuum-forming. He then takes styrofoam, the kind that portable radios and small appliances are packed in, and whittles it enough so that it fits inside the front half of the body half just vacuum-formed. It is then glued in place where final carving and shaping is completed, then painted. The results are super, and the weight is minimal. You may wonder why Dick doesn't vacuum-form both halves. You can, but trying to join two halves like that on a small bust might be more trouble than its worth. It's up to you, of course, I'm just providing some ideas for you to consider.

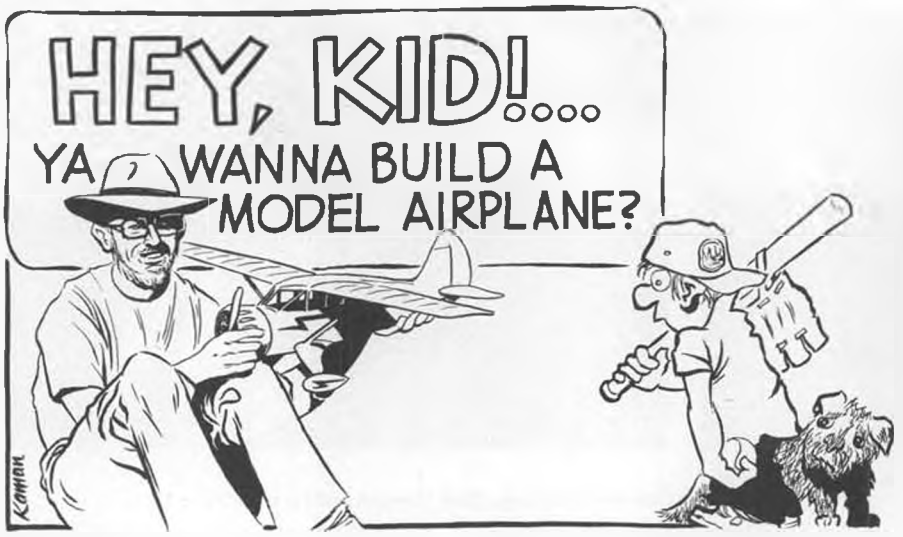
The British are coming! What, you say? *Aeromodeller* certainly needs no introduction, especially to the scale model fraternity. A few years ago *Aeromodeller* went to a full-size magazine, instead of the small size that it was for years. I bring this up since in recent years this magazine has really improved in my estimation. Each month, a friend of mine, Bill Dennis, has quite an outstanding article on F/F Scale. As many of you know, scale in Britain is alive and thriving. The magazine also features a full-size plan which can easily be removed from the magazine. Most recently, they have featured a DeHavilland Gypsy Moth, an Avro Avian, and a DeHavilland Hummingbird—all powered by the venerable D.C. Dart .035 diesel engine. Each is an outstanding plan. I would recommend subscribing to this fine publication. It costs about $35 a year, depending on the worth of the pound sterling. Subscriptions can be obtained through our AMA. Contact them for further details. •

Bob Schlosberg, from Scottsdale, Arizona, with his twice-size Peanut Andreason.

Bob Curry, Third Place in Multi-Scale with a North American B-25 bomber.

This Cranwell CLA-3 Jumbo Rubber took First Place for builder Mike Mulligan. Over two minute average for three best flights.

Dick Smith took Fifth with this Ryan M-1 Jumbo Scale finished in Fifth Place at the Flightmasters Annual, 1986.



Breathing moisture on flying surfaces helps to bend them in order to put in or take out warps. Adjustment tabs make the job easier.

By BILL WARNER

Illustrations by JIM KAMAN

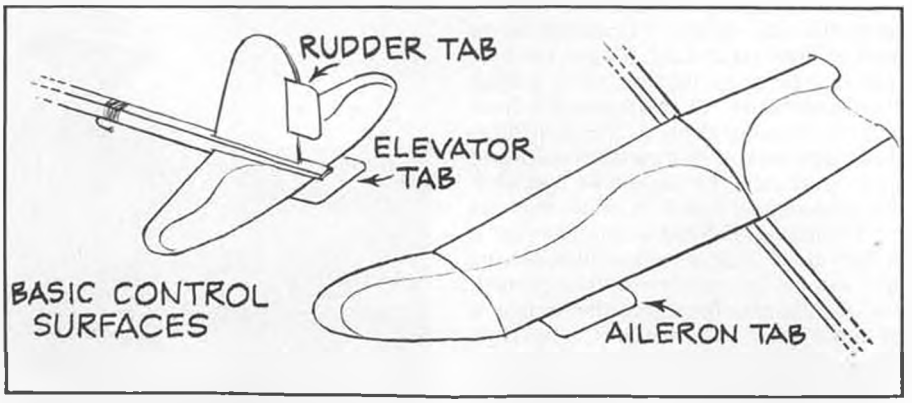
• Hope you still have our first two episodes in the last two magazines handy. It would be a good idea to reread 'em before you head for the field, just to refresh your memory. Now that you have your modified *B.A.R.F.* safe in its hangar (box) and your flying equipment in your "go" box, there's only one more thing you need, and that's someone to go flying with. The first reason is that to get to a field big enough, you may need someone with a car, and second, it's nice to have someone to hold the model while you wind it up!

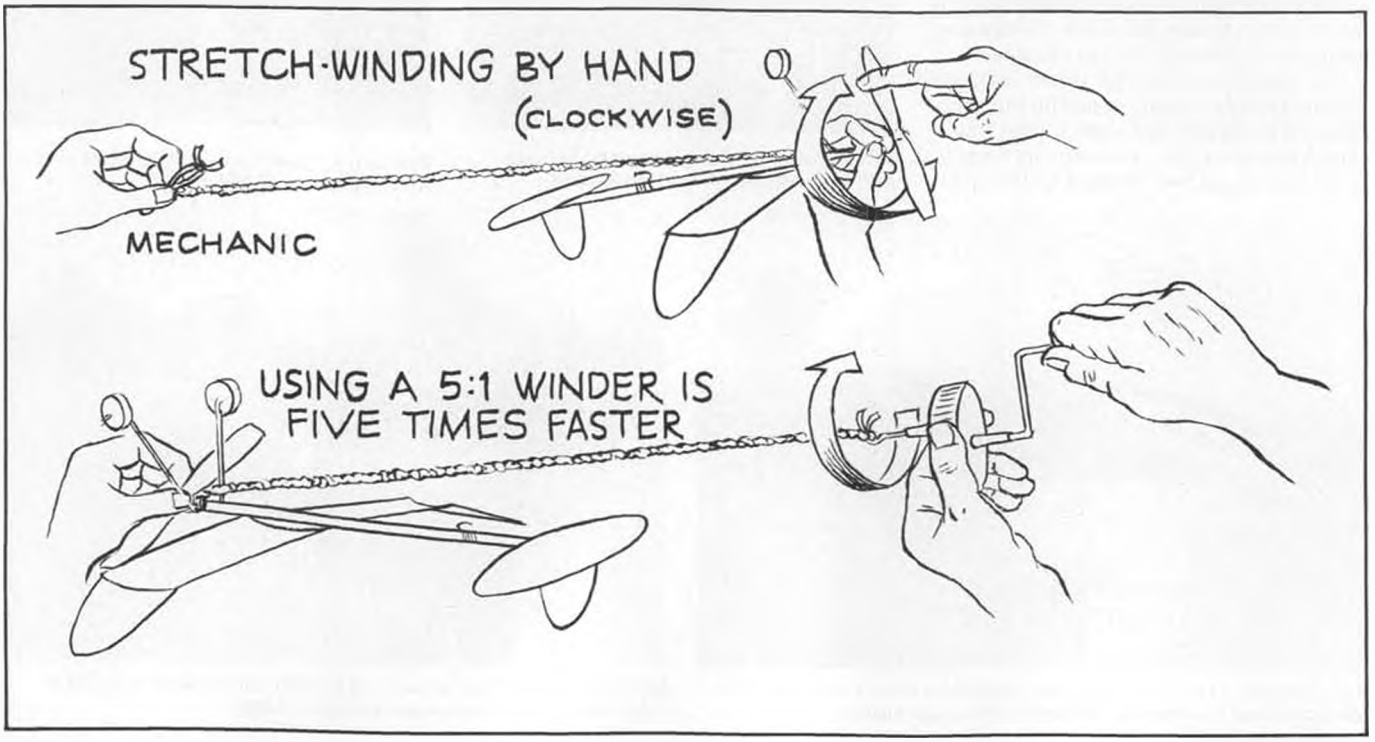
THE IDEAL PLACE TO FLY

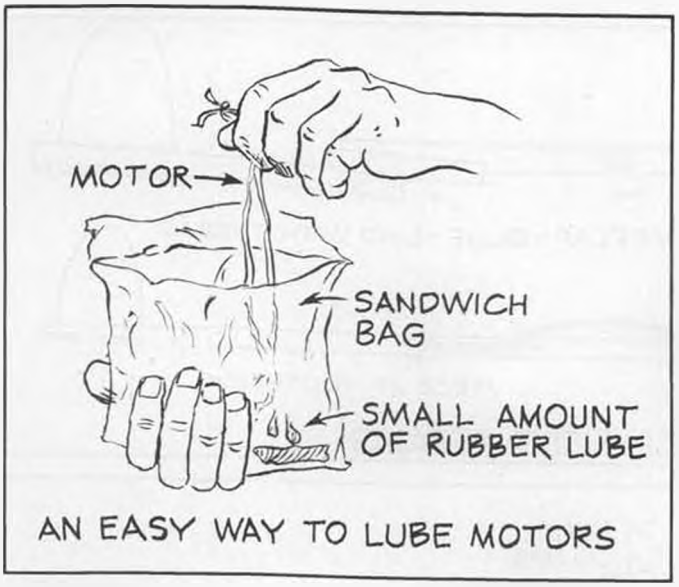
For testing, it would be perfect to have a field about the size of Chicago with no trees, buildings, or wind, with about eight inches of nice, soft green grass all over. If you are testing in a gym, it would be nice to have no roof rafters or lights hanging down, no baskets, ropes, or other junk on the sides, no drafts, with the ceiling about 300 feet high and all of this in a round building. These places exist, but usually only in our dreams. Therefore, come as close as you can to the ideal and let's go for it!

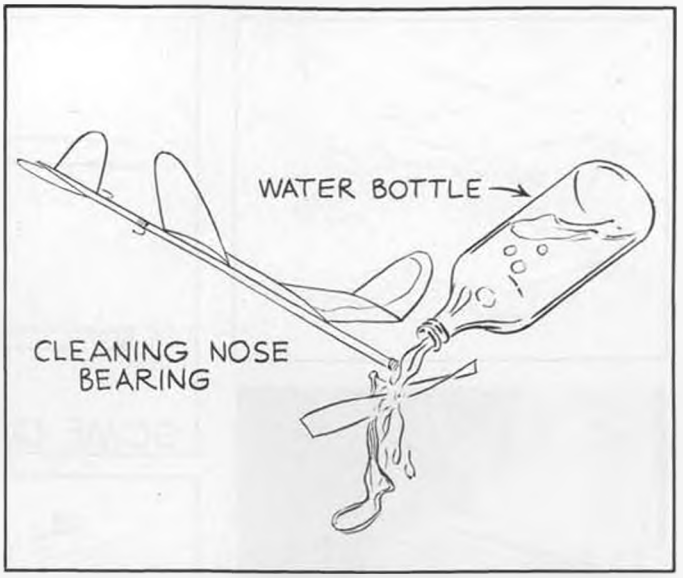
TIME TO FLY!

A quick eyeball check over the plane to make sure no warps sneaked back in between your preflight check at home and the field is a good idea. If any have crept back in, breathe on it heavily for about 20 seconds while twisting in the opposite direction until it stays where you want it. Now hang your longest and weakest rubber motor on the propeller hook. A drop of glue can be used on the wire to close the opening if you want. (Don't glue the rubber.) If you are using a winder, find the knot in the rudder and hook that end of your motor to the winder (you will want the knot as far back on the plane as possible so it won't go "Thump, thump, thump," as the motor runs down.









WINDING

If you have a winder, have your partner (who some people call a "stooge") hold the plane by the propeller end, thumb and first finger passing over the prop and pinching the rubber on the prop hook so that it can't climb off (in case you neglected the drop of glue). Have him or her hold it so the tail is out of the way so that the rubber, if it breaks, or you, if you get excited, will not break it accidentally. Stretch the motor out at least double its length and begin winding in a clockwise direction. Just in case you don't know which way this is, you will soon know. If nothing happens, you wound it the right way. If there is a fast "Brrrrrpppp!" sound, and your partner lets out a yip, you will know you were winding backwards and the freewheeling ratchet device built into the front of the prop just decided to release all those backwards knots. This is not good for the prop, so maybe you should inspect it before you try again.

For your first flight, using a 3/32-inch motor 16 inches long, you should try maybe 40 or 50 turns on your 5:1 winder (200 to 250 turns in the motor). You can increase that later if the model does not go anywhere.

Hand-launching technique: hold model as shown, launch gently with nose raised slightly. DO NOT THROW STRAIGHT UP!

Use less if you are starting with a shorter or with a 1/8-inch motor, as they will be more powerful. Start walking in toward the model when you have about half of the winds packed in, arriving at it just as you put in the last turn. Grab the rubber about a half inch from your winder's hook and back off on the winder until you have a nice loop to hook over the model's rear motor hook. This is where the knot should be. Be especially careful *to stay away from the tail* while you are hooking on the rubber! It is easy to get so occupied with doing one thing that you bump your tail feathers. They will either break off or rearrange your adjustments for you. Have your mechanic (sounds better than "stooge"; doesn't it?) put the winder back in the box immediately. If you don't step on it or lose it, it will be a great help on your *next* flight.

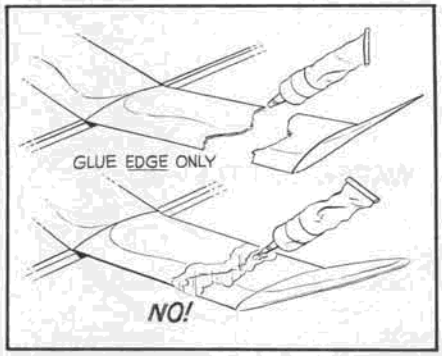
If you don't have a winder, you can still wind up those long motors, it just takes a little longer. Give the tail-end of the rubber motor, with the knot, to your partner or loop it over something solid to hold it while you hold your model by the white nose bearing, packing in the turns one at a time by turning the prop with your finger.

READY? EASY DOES IT. . .

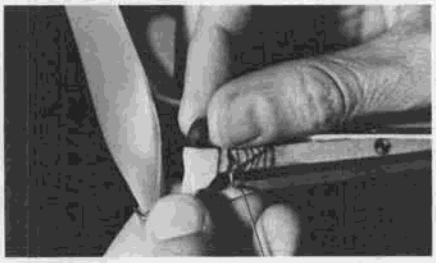
If you are outdoors over grass, hold the

Here Kris Samonas demonstrates the proper way to launch an ROG. Aim a little to the right, facing the wind, let prop start turning, then release your plane.

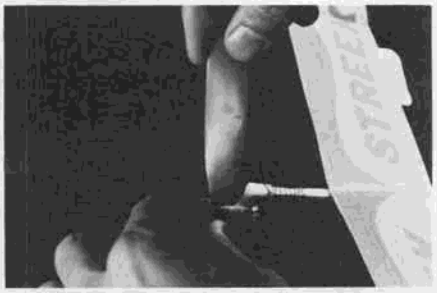
With proper ROG launch your plane should taxi away as it gains speed, then lift off into the air.



Add a small ball of clay to tail to bring CG aft (rearward) and increase angle of attack, sending the model climbing. Use too much clay, and the model will stall or loop.



Adding clay to nose will cure stalls and looping by moving CG forward, reducing the angle of attack.

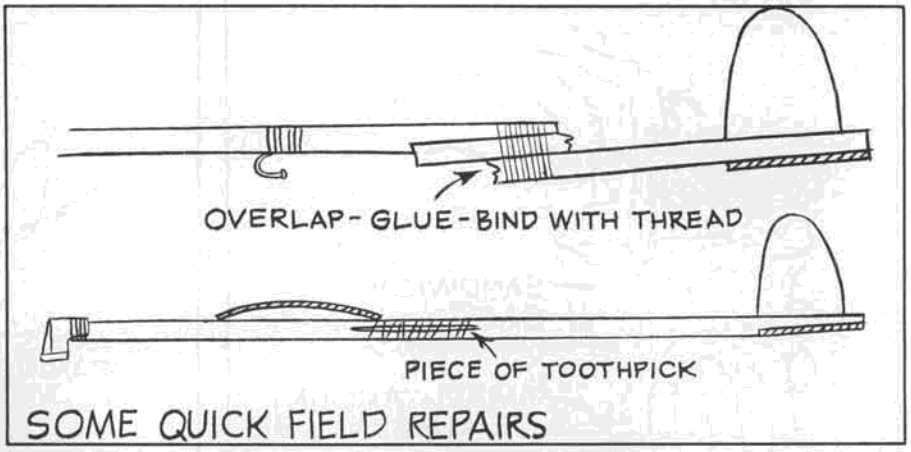


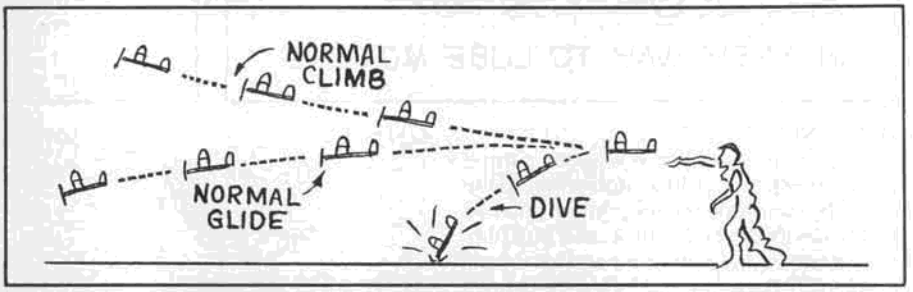
Twisting prop blades into higher pitch gives less power, but a longer motor run.

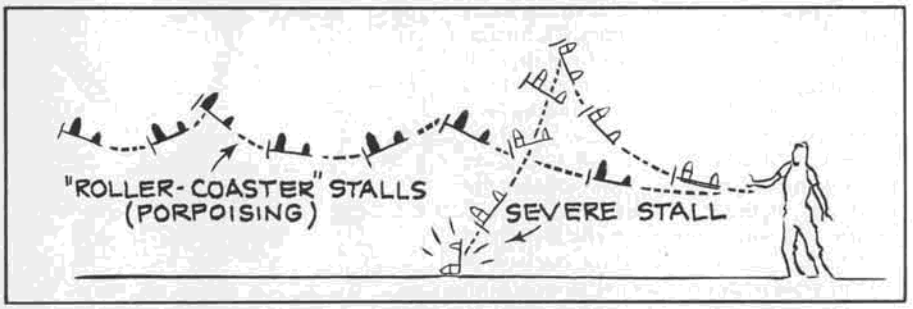
model with your thumb and first finger *under the wing* at the CG with your right hand, while holding the tip of the prop with your left hand. (Reverse this for southpaws.) Aim the nose up just a tiny bit, and let the prop start a second before you give it a *gentle* toss. *Never* throw it or aim it straight up. Level and easy does it.

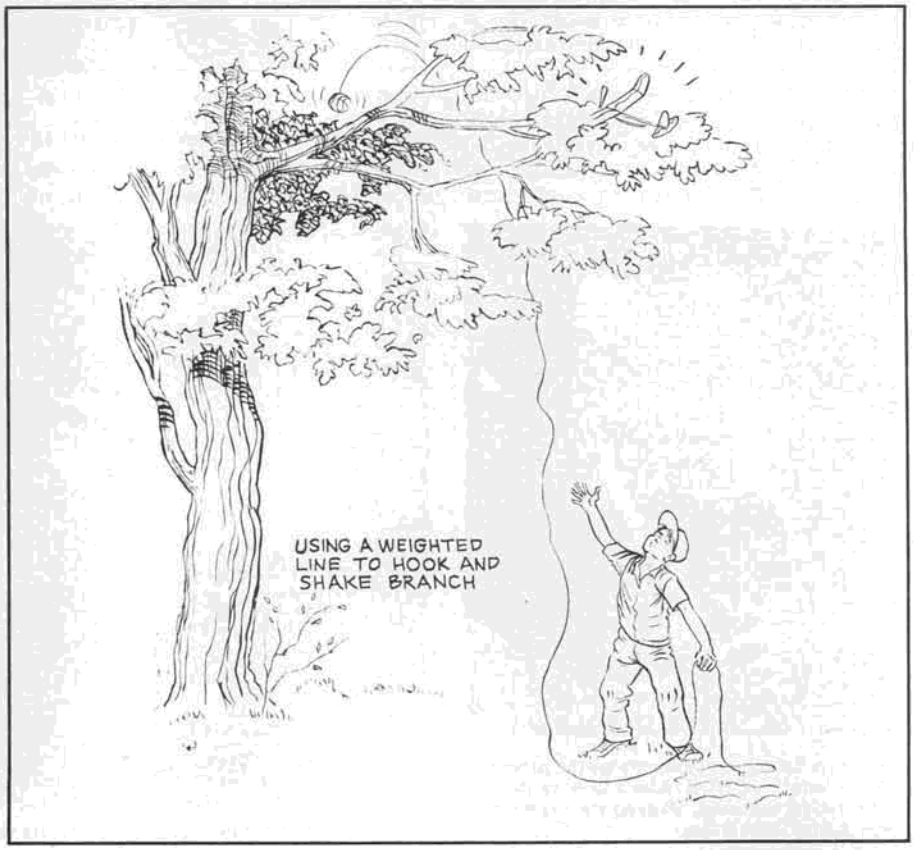
THE SCIENTIFIC METHOD

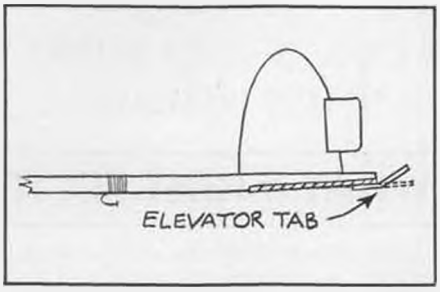
When a scientist performs an experiment, he/she has to be a *good observer*! You cannot figure out what happened unless you saw what happened and remember it long enough to do something about it. I've asked kids what happened when they come up with an aeroplane that won't fly and had them tell me, ". . . it went up and down." Oh really? The picture that comes to mind is that of a yo-yo. If the flier said, "The nose went up and then fell towards the

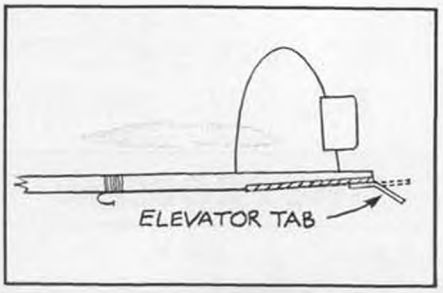


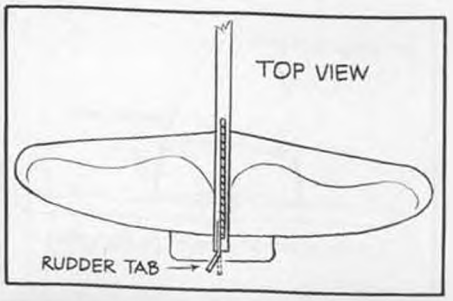


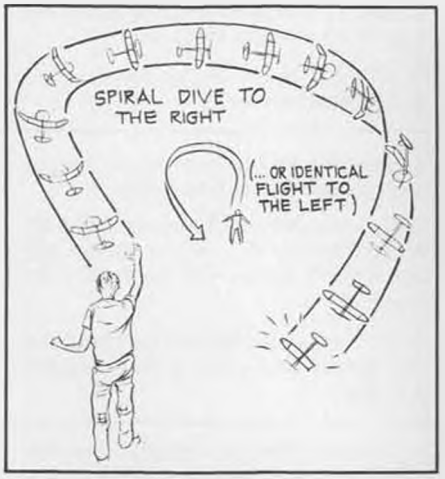


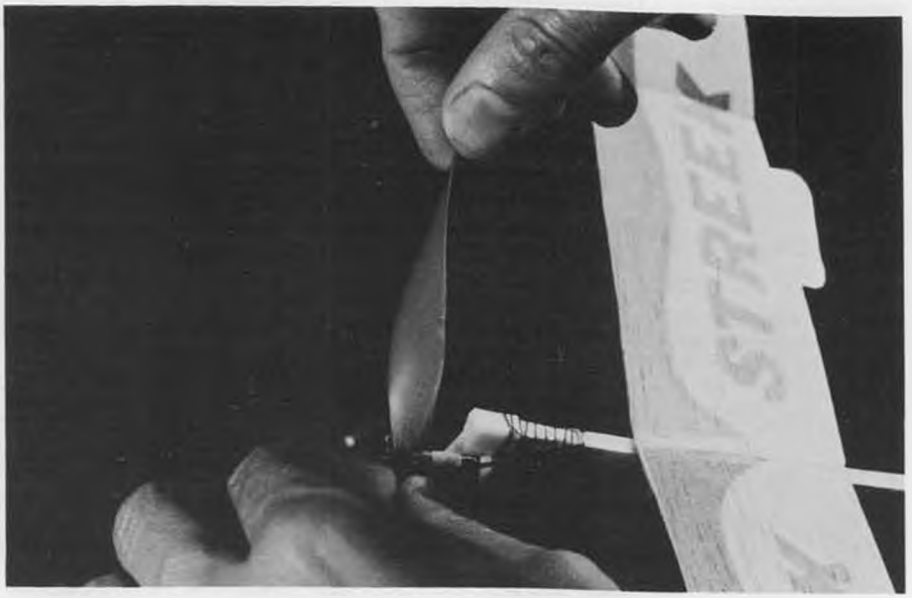




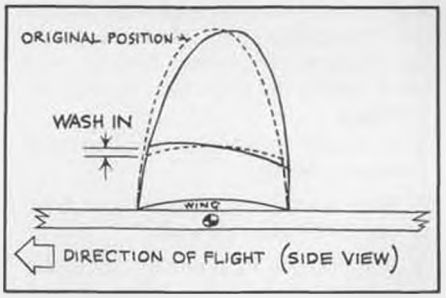


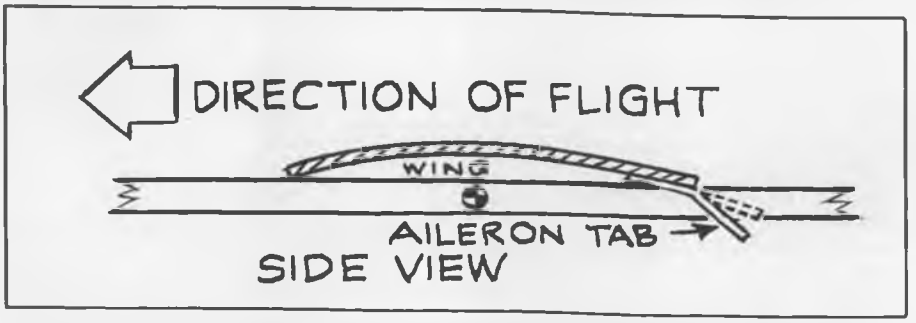


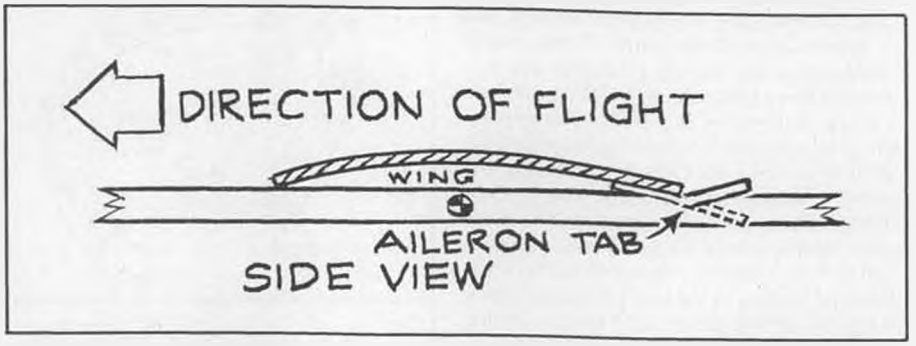




Twisting prop blades into lower pitch gives more power, but runs out the winds sooner.



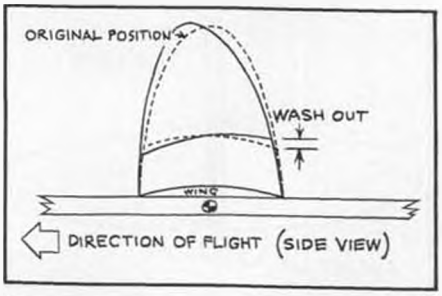


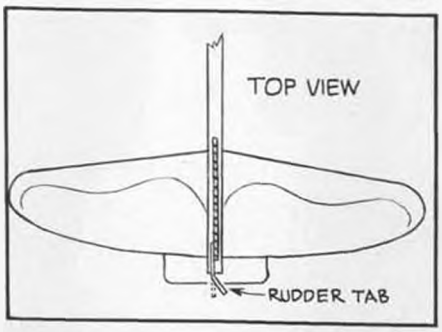


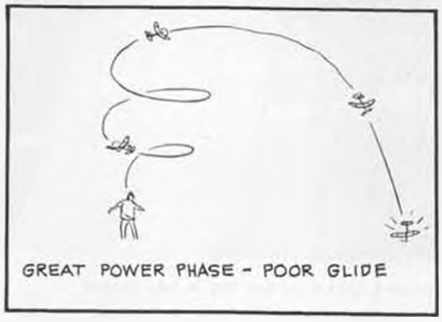
ground," I might have diagnosed a *stall*, perhaps caused by too hard a launch, a heavy tail, or too much "up" elevator. Whether your model veered off to the left or to the right makes a *world* of difference as to what you do to correct it! Check the trouble-shooting chart and see if you can find exactly what your model did, and then make a correction. It is a good idea to only change *one adjustment* at a time, so you will know what made the difference. *Never wind the model up fully until it is flying nicely*, as a model which crashes at high speed with a fully-wound motor will often become very, very short. Some have been known to return themselves to kit form. One thing to remember is that your model will probably not fly well on the first few flights. It's the little adjustments and changes you make intelligently (called "trimming-out") that will make it fly.

SO WHAT DOES A GOOD FLIGHT LOOK LIKE?

Well, I like a model that does left-hand circles about 20 paces wide, with no stall or dive in the glide when the power runs out. Left turn is the normal way that the model wants to roll (opposite the prop rotation direction), and it kills a little of the lift when the model is rotating hard left under the beginning-of-the-flight power burst. You can always take the prop shaft part of the plastic nose bearing and tweak it a bit to the right if you want a wider left-hand circle and more climb. The left rudder adjustment (about .050 inches) makes you want to go left, while the wash-in of about .075 inches in the L.H. wing panel keeps the left wing up in the turn. The nose block has a bit of right thrust built in when you get it. On indoor models, launch on the side of the floor, allowing the model to go into its left circle without hitting a wall. On a gym floor or on a hard surface outdoors, you can R.O.G. (rise-off-ground) if you built the version with landing gear. To do this, hold the model with the thumb and first finger just behind the wing from the top. Let the prop start, and then let go of the model. If there is a wind blowing, it is a good idea to aim the model not directly into the wind, but a little to the right, and be sure and let the prop run just a little longer before you let go of the model. The reason for this is the torque of twisting effect of the prop and the beginning of the prop run being so strong that it







may turn your model too much left, letting the wind get under your right wingtip, turning your plane upside down. A good R.O.G. will look very realistic, with the model going into a nice, smooth left-hand spiral upstairs to cuddle the cumulus.

FIXING THE PROBLEMS WITH TAB ADJUSTMENTS

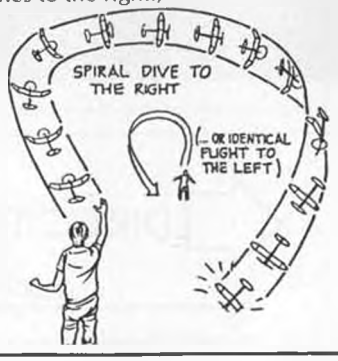
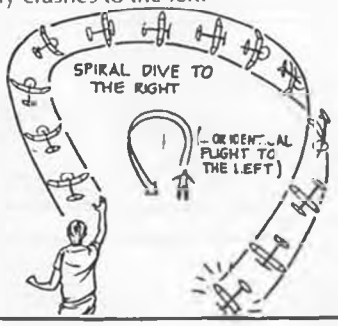
As I mentioned earlier, being a *good observer* is the most important thing there is when it comes to making a plane fly well. First, recognize a *dive* for what it is; it starts *down* as soon as it leaves your hand. A *stall* is made up of *three* parts: 1) the model climbs a bit too steeply or zooms up; 2) it slows down a bit as the air breaks away from the top of the wing due to its too-steep angle of attack; and 3) the nose falls toward the ground (a dive). As it drops earthward, the angle of attack decreases, the model starts flying again, and then repeats the three steps again, sort of like a roller coaster. A *spiral dive* happens when the plane starts *banking* (rolling to the side by dropping one wing tip or the other) and keeps turning toward the ground until it crashes. You have to note whether it is a spiral dive to the *right* or to the *left*. NOTE: when we say "right" or "left," we are pretending there is a pilot in the plane, and it is to the *pilot's* right or left.

HOW FAR IS "A LITTLE"?

A little for one person is a lot for somebody else. To give you a better idea of how far an adjustment needs to be bent, I decided to use some common items to help you. A credit card is about .030 (thirty

Continued on page 82

TROUBLE SHOOTING CHART—NO WIND BLOWING, MODEL LAUNCH NORMAL

THE PROBLEM	WHAT MIGHT FIX IT
1. Model dives straight in. 	1. Bend the trailing edge of the stab or the elevator tab up .030 inches. 2. Add a bit of modeling clay about the size of 1/2 a pea to the tail. 3. As a last resort, reglue the wing 1/2 inch farther forward.
2. Model stalls. (Nose first goes up, hesitates slightly, then drops to a dive. Roller-coaster.) 	1. Bend the trailing edge of the stab or the elevator down .030 inches. 2. If the model wasn't turning, bend the rear of the rudder or the rudder tab about .030 inches left (as seen from rear). 3. Try a bit of modeling clay about the size of a pea on the nose as far forward as it will go.
3. Spiral dive to the right. (Model raises its left wing—pilot's left—and finally crashes to the right.) 	1. Hold model at arms length. Close one eye and see if wings are warped. The right wing should be untwisted, but the left should have about .070 inches wash-in. If too much wash-in, breathe on it and twist in opposite direction. Recheck. 2. Bend rear of rudder or tab about .030 inches to the *left*. 3. Bend the trailing edge of the stab *up* about .050 inches (or a tab). 4. Add about a 1/2 a pea of clay to the tail. 5. Bend right aileron tab down .050 inches and left tab up .070 inches.
4. Spiral dive to the left. (Model raises its right wing—pilot's right—and finally crashes to the left. 	1. Hold model at arm's length. Close one eye and see if the wings are warped. The left wing should have about .070 inches wash-in. If not enough wash-in, breathe on it and twist leading edge higher. 2. Bend rear of rudder or tab about .050 inches to the *right*. 3. Bend the trailing edge of the stab or elevator up about .050 inches. 4. Add about 1/2 a pea of modeling clay to the tail. 5. Bend left aileron tab down .050 inches and right tab up .070 inches.
5. Model refuses to fly left, even though you try everything.	1. Go with the flow. Fly right. Why fight it? You may have built it as a RH model without knowing it.
6. The model flies great until it runs out of power, then it dives, stalls, or goes straight. 	1. Remember that the rubber spinning the prop makes the plane roll left. When the motor runs down, this force is missing. Try adjusting the model so that it glides well, and then play with the prop shaft part of the nose bearing. Twisting it a little right will open up a too-tight left turn, a little left will turn a straight climb into a left circle, etc.

Eaves Cougar

By PERRY PETERSON. . .Here's a swell-flying Peanut model of a homebuilt plane from the 50s. Outdoors it won a trophy at the AMA Nats.

• In 1958 Leonard and Rita Eaves, of Oklahoma City, completed construction of their beautiful Cougar home-built two-place aircraft which they called "Chigger." The cowl on their bright red Cougar was more streamlined than most of the other Cougars built during that time. Mr. Eaves accomplished this by moving the induction system to the rear of the 85 hp engine.

The appearance of this plane is a welcome change from the dozens of square flat-nosed Cougars usually found at most peanut scale contests.

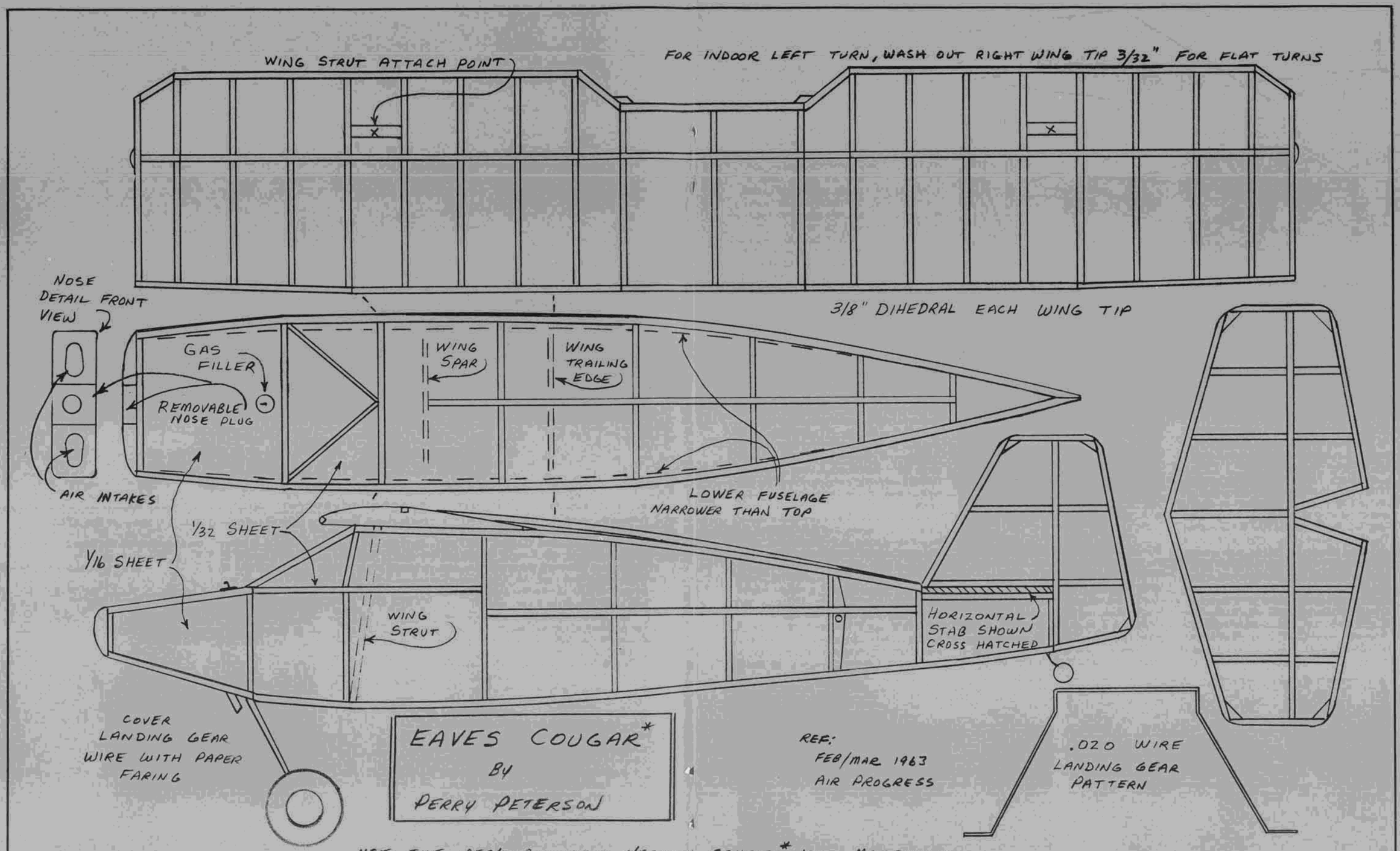
During the spring of 1981, while looking for an easy-to-build GF (guaranteed flyer) for upcoming Nebraska Freeflighters contests, I came across a color picture of a Chigger. One look was all I needed. Although I drew up the plans right then, construction was delayed due to the preparation for my daughter Teri's wedding which was scheduled for the same day as our next contest.

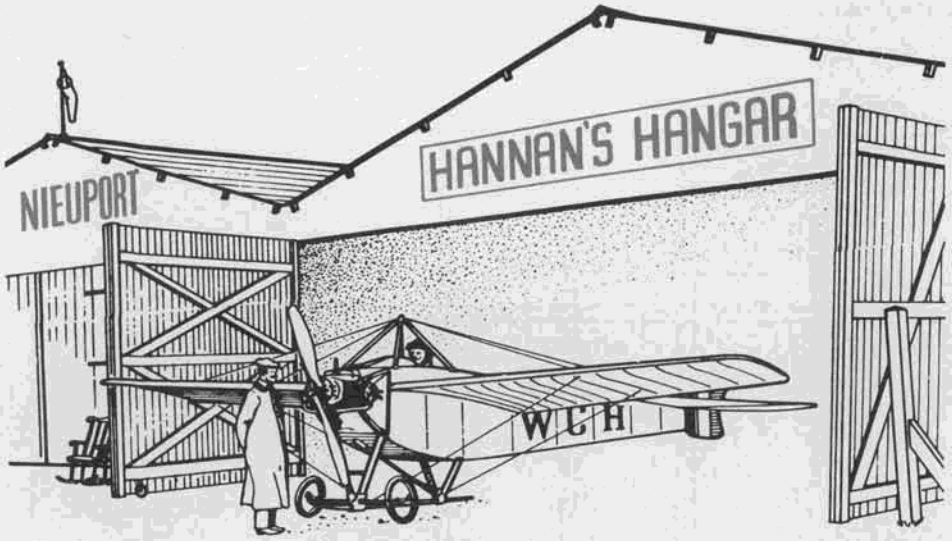
Construction was completed the night before the contest. I arrived at the National Guard Armory as soon as it opened the next morning. After putting up three test flights, I called for a timer, put up three official flights, and the rushed off to the church in time for the wedding. That night CD Bob Willey called to say my little red Cougar had garnered a trophy. Since then it has rewarded me with many other awards including a NATS trophy (second place Outdoor Peanut).

The model still flies well even though I don't take it out much any more. It is no longer possible for me to travel around to contests like I did there for a short while. At the time these photos were taken the plane

Continued on page 68

This simple model took a second place plaque at the AMA Nats, in outdoor peanut competition. Construction is not difficult on this model of a homebuilt, and you can convert a Peck-Polymers kit to arrive at the Eaves Cougar if you so desire.


WING STRUT ATTACH POINT
FOR INDOOR LEFT TURN, WASH OUT RIGHT WING TIP 3/32" FOR FLAT TURNS
3/8" DIHEDRAL EACH WING TIP
NOSE DETAIL FRONT VIEW
GAS FILLER
REMOVABLE NOSE PLUG
WING SPAR
WING TRAILING EDGE
AIR INTAKES
LOWER FUSELAGE NARROWER THAN TOP
1/32 SHEET
1/16 SHEET
WING STRUT
HORIZONTAL STAB SHOWN CROSS HATCHED
COVER LANDING GEAR WIRE WITH PAPER FARING
.020 WIRE LANDING GEAR PATTERN
EAVES COUGAR*
BY
PERRY PETERSON
REF:
FEB/MAR 1963
AIR PROGRESS
USE THE PECK-POLYMERS NESMITH COUGER* KIT MATERIALS
FOR A QUICK, EASY CONVERSION.
*INTENTIONAL SPELLING VARIANT



"This taper(wing) stuff is just a lot of expensive construction for nothing"

• Nope, our lead-in line this month is not a quote from a Fike or Lacey model builder, but from Glenn Curtiss, as mentioned in the recent Wright brothers book.

WILBUR AND ORVILLE

This important new biography was authored by Fred Howard, a former aeronautics librarian in the Library of Congress. Fred was a member of the group which edited the Wilbur and Orville Wright papers published some years ago. As anyone who has waded through those two thick volumes will agree, it was rewarding, however slow going.

Although Fred's publication, nearly fifteen years in preparation, is about an inch and a half thick, it is written in such a refreshing way that even a non-aviation-oriented reader should find it fascinating. There have been many other publications about the Wrights, of course, each presenting a different viewpoint, inevitable biased by each author's personal opinions regarding the cast of characters. And, although Fred Howard professes that he is "beholden to no particular person or organization," he is, after all human, and therefore subject to drawing his own conclusions regarding certain personalities. Howard has correlated many obscure fragments of information and

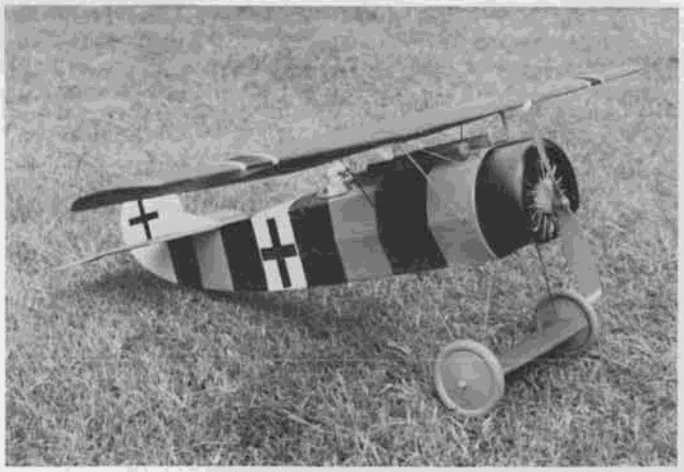
The new Wakefield Champion, Bob White, preparing his model. Photo: E. Fillon.

presented them in an entertaining as well as educational manner, with many touching insights about the Wrights, their family, employees, and rivals. For example, a very young Grover Loening, hoping to gain employment with the Wrights during 1909, is tossed a rag and told to sop up the oil beneath an engine. Since the rag was not equal to the quantity of the spill, Grover resorted to using his own handkerchief!

When Wilbur tired of the many photographers in his way during his European demonstrations, he simply put them to work creatively, having them hoist the 1,400 pounds of ballast employed to catapult his aircraft during takeoff! Later, when sister Katharine and brother Orville joined Wilbur in France, they were regarded "as exotic and extraordinary as the Wright Flyer." Still, Wilbur was the favorite of the press, possibly because of his hawklike features which seemed so appropriate for a "birdman." While the French aviators dressed in dashing clothes, Wilbur did his flying in a suit and necktie, sometimes augmented with a black motorcycling jacket. By contrast: '. . .Orville looked every bit as debonair as if he were in the retinue of some royal family come to see Wilbur fly, but at thirty-seven he was no longer as attractive to women as when he had strummed his guitar at Katharine's parties for her schoolgirl friends. Wilbur, at forty-one, on the other hand, had retained the gaunt hungry look, as if starved for affection, that women found irresistible.'

Author Howard manages to thoroughly dispel the "simple bicycle mechanics" images suggested by certain earlier biographers. For instance, consider this description of Orville: ". . .he was vehement on the evils of advertising and scoffed at the flying-saucer fad. He did not believe in insurance for his car, home, or life, and carried none himself. Having had a sweet tooth since childhood, he was against his dentist's antisugar campaign, insisting that he had fewer cavities when he ate a lot of candy."

And, if you think that political intrigue, creative accounting, and fund-juggling are recent developments in Washington, D.C., this book should set matters straight. Consider that back during 1907 when the U.S. War Department was (finally!) becoming interested in purchasing a Wright aircraft for $25,000, the Board of Ordinance and Fortification told Wilbur that they had only $10,000 to apply toward the machine. A special appropriation for the difference would require an act of Congress, they explained. In the end, however, the Board



Electric-powered Fokker D VIII by Lindsey Smith employs his lightweight custom-made scale model accessories as described in text.

Master modeler Doug McHard, of England, with his delightful Megow Stinson. Photo: Moulton.

Lubomir Koutny's rubber-powered S.M. 92 won the Czech contest with flight durations of 93 seconds and 162 seconds.

Cessna Comet by Larry Kruse was the winner of the '87 Nats Scale Gas class. Powered by a Telco CO_2 engine, the 22-inch span model weighs in at a trifling 59 grams.

managed to assure the discouraged Wilbur that the entire $25,000 would be forthcoming "by drawing on an emergency fund left over from the Spanish-American War." Some things never change. . . .

In summary, in spite of a few reservations (how can any author be *totally* free of bias?), this may be the single most revealing book available about the Wrights. Priced at $24.95 and published by Alfred A. Knopf, *Wilbur and Orville* should be available through most book stores.

MORE BOOK NOTES

The tireless Ray Rimell has published two more World War I aviation books. The first, *James McCudden, V.C.*, was authored by Alex Revell, and features informative text, over fifty photographs plus outstanding color paintings by Brian Knight and Ray Rimell. The aircraft illustrated, an S.E.5, Bristol Scout D, and Sopwith Pup would serve as ideal proof-of-color documentation for modelers.

The second book, of similar format, is titled *Georges Guynemer*, and is written by Dennis Hylands and concerns the exploits and aircraft of the famous French aviator. Color renditions presented include a Nieuport 17, Spad XII, and seldom-seen Nieuport 10 VA. For information regarding these and other high-quality publications and scale drawings, send four Post Office International Reply Coupons to: Albatros Productions, Ltd., 10, Long View, Chiltern Park Estate, Berkhamsted, Herts., HP4 1BY, England. Please tell 'em *Model Builder* sent you.

THOUGHTS FOR THE DAY

"One does not improve a machine by building another one, but by studying the causes of the shortcomings and suppressing them." Rene Dornd, French gyroplane engineer, as quoted by Georges Chaulet.

George Myers, of Lancaster, Pennsylvania, shares this anonymous quotation: "The more complex the technological idea, the more simpleminded the opposition."

". . .exceptional planes are built by exceptional people." Jack Cox, Editor-in-Chief, *Sport Aviation*. And, from the same magazine, Gregory J. Anderson reminds us of the three "Fs" of aviation: Freedom, Flight, and Friendship.

ANOTHER ANNIVERSARY

Dr. Morton Grosser reports that the 10th anniversary of the man-powered Gossamer Condor Kremer Prize-winning flight was celebrated during August. Forty-four people attended, including "participants, wives, children, and new girlfriends." Wasn't that a fast ten years?

CO_2 COMMENTS

Butch Hadland, of England, says he thinks that the performance of CO_2-powered indoor models deteriorates as more people arrive, attributing it to changes in humidity. One wonders if the CO_2 humans exhale may have anything to do with it?

Earl Brightbill, of Georgia, has encountered difficulties obtaining CO_2 engines. According to Bob Peck, of Peck-Polymers, Brown Juniors are temporarily out-of-production; however, he reports British Telco engines in stock as of September.

WE GOOFED

In our previous mention of Ken Sykora's Oldtimer Model Supply, we somehow slipped up on the address. It *should* be P. O. Box 7334, Van Nuys, California 91409. Send Ken a dollar for his intriguing catalog of "good olde days" model supplies, such as Japanese tissue, balsa propeller blanks, wheels, and hundreds of model plans.

FISH BAIT?

Jake Larson, of Pinellas Park, Florida, sent this most unusual report: "One of my friends lost a Peanut Aeronca C-3 to some kind of fish! He had made the model with pontoons, and, of course, it didn't land well on grass or dirt. We went to a nearby pond and it didn't land worth a hoot there either. The pontoons would dig in and flip the "Air-

Quarter-scale R/C Trident joined-wing model by Harry Apoian. Docile flyer. Photo: Paetz.

Full-size Pitcairn PCA-2 Autogiro and crew during filming of a new Walt Disney movie. See text for details. Photo: George Townson.

the INSIDERS

INDOOR FLYING REPORT

By DAVE "VTO" LINSTRUM

• You may find it odd to see a notice for an "outside" contest in this indoor column. There is good reason—your "Insiders" scribe will be out in the San Diego sun on January 17, along with members of the innovative San Diego Orbiteers club, running a Fiesta F/F meet. We will have our models proxy-flown by members of the Orbiteers—and you can too! Look for the details in the notice and enter today. Note that you can send proxy entries from California by finding someone who will attend and giving them your model to fly—providing they are willing to tote it and fly it, of course. Other entries should be sent prepaid by the carrier of your choice to John Oldenkamp, to arrive no later than January 10. We hope to see a lot of you enter this festival of free flight, showcasing two popular events; P-30 rubber and PeeWee 30 gas. *Free flight forever!*

OBSCURE AIRCRAFT

Last month we addressed the need for more unusual and perhaps obscure scale designs to fight off the anathema of Fikes and Laceys. We promise you some real weirdos in the future (such as, the Tefft "Molecule" homebuilt and the truly bizarre WWI Breda-Pensuti Triplane from 1919) but for now check out the sleek silver German CL-3 built by Butch Hadland of England. This parasol monoplane should be a great flier as it is clean and has a decent size wing. Butch is really into scale research—but he has flown plenty of Fikes and Laceys as well! We would welcome your suggestions for "Obscure Aircraft" worth trying for indoor flying scale (rubber, CO_2, or electric) so do some digging and send your candidates to Dave VTO Linstrum, 4057 San Luis, Sarasota, Florida 33580.

HINTS OF THE MONTH

We cheated you a bit by omitting this from a column last fall, so in the holiday spirit we will give you a "twofer" this month. Both hints come from the Miami Indoor Aircraft Model Association (MIAMA) and are personally guaranteed by Doc Martin, the Doyen of MIAMA. For up-to-date news, subscribe to the club newsletter, *Hangar Pilot*. Send $10 to Doc Martin, 2180 Tigertail, Miami, Florida 33133. He will put you in the pipeline for indoor news.

Our first HOTM deals with how to win those tests of endurance and winding strategy, the FAC Mass Launch. Doc wins these regularly and his secret is simple—if you use a red plastic North Pacific prop or a homebuilt cottage cheese or soda bottle blade prop. Doc simply pinches in a bit *less* pitch on the blades with each flight. Since you must use the same motor for every flight (you are out if it breaks), this method allows for the motor fatigue that is inevitable. Doc recently won FAC Mass Launch at MacDill AFB Tampa with his red "Cessna AW" in five rounds—and that is tough on a flyer and a rubber motor!

HOTM Two is also for rubber scale fliers. Normal green soap or other liquid rubber lubes tend to splatter on fuselages when first used, leaving unsightly spots on your beautiful scale finish. To counter this, the MIAMA club for the past several years has been using "Armor-All" vinyl protectant spray. This is available where car care products are sold. Spray it on your motors—it will disappear into the surface but does give good lubrication. Try it. If you have any suggestions for new HOTM subjects, write us at the address given above.

HOW THE INDOOR BUG BIT ME

If you are reading this, the indoor bug has either bitten and infected you with an interest in indoor flying or it is hovering above you, ready to bite. As a means of networking and sharing experiences, I invite readers to tell us how the bug bit them, getting them started on the indoor flying scene.

To start this feature right, I will reveal how I got bitten. In the late forties, I read in *MAN* and *Air Trails* about the exploits of famous indoor fliers at the AMA Nats and of world records set by Merrick "Pete" Andrews at the Lakehurst, New Jersey, hangar. Pete was the first indoor flier to break the magic 30-minute barrier; a real achievement. I was intrigued by all this, but the main indoor activity seemed to be on the East and West Coast, and I was in Omaha. I simply had no one to teach-me about how to build and

P-FLIGHT FIESTA SDO '88!

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Sarasota, Florida 33580
Proxy model ship prepaid to:
John Oldenkamp San Diego Orbiteers
3331 Adams Ave.
San Diego, California 92116
Proxy entries must arrive by 1/8/87

MIAMA clubster and Florida State Champ Rich McEntee with his truly bizarre 10 gram twinfin Bostonian.

German CL-3 from the twenties as researched and built by scale maestro Butch Hadland of England. Seen at Cardington Airship shed north of London.

trim.

Some help came from Frank Zaic and his yearbooks (he got me started in outdoor F/F with a little rubber job in the 1941 Book of Knowledge), but it was not until I found some of Lew Gitlow's microfilm and balsa in a local hobby shop (it is now available by mail order—see ads in *MB*) that we built our first microfilm model. It was patterned after a design published by Andrews and was crude to say the least. I flew it in the living room for tests and later at the auditorium of a local university. The best I could get out of it was a couple of minutes, as it was dreadfully heavy and I knew nothing about rubber or props.

It was several years later that I discovered that supplies and advice were available in person from Walter Erbach, then a professor in ME at the University of Nebraska in Lincoln (a mere 60 miles away, much closer than Lakehurst or Santa Ana, California). I trekked to Lincoln and learned a lot from Walter and his son Dave, both experts. However, due to Army and university commitments of my own, I dropped indoor for a while.

The indoor bug is a persistent one; he bit again after I graduated, and I got my advice by mail order from Charlie Sotich of the renowned Chicago Aeronuts Club. Founded by indoor great Carl Goldberg, this club regularly held indoor meets in Illinois. Charlie kindly shared his experiences and those of his clubmates with me. I even got to fly with him when he came to meets in East St. Louis.

The bug dug in deep in 1978, when I attended my first Indoor World Champs at Cardington, England. Since then I have reported on IWC at West Baden, Indiana, and Cardington again in 1986. Perhaps I will see the IWC again at the fabulous "Mini-Dome" in Johnson City, Tennessee. Until you have seen the fliers from some 20 nations flying F1D microfilm models that weigh only a gram and do over 40 minutes, you haven't experienced indoor!

I welcome *your* stories on "How the Indoor Bug Bit Me." If possible, send them in typed, double-spaced on 8-1/2 by 11 paper, but I will accept them in any legible form. Stories from overseas are also welcome. Let us hear from you.

21ST ANNIVERSARY OF THE NFFS SYMPOSIUM

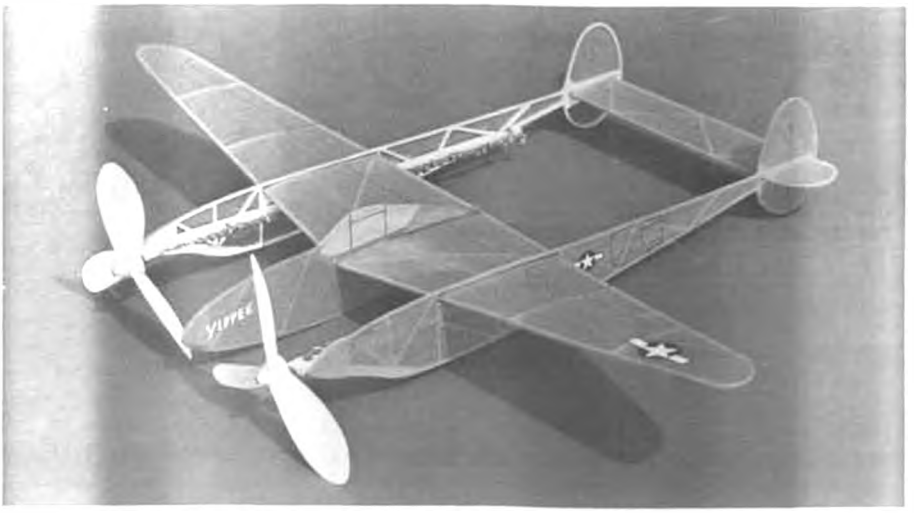
The National Free Flight Society, for the 21st Symposium Report, is accepting nominations for the following:

1. NFFS 10 Models of the Year (1988). Send to: Jon Zeisloft, 5411 W. October Way, W. Valley City, Utah 84120; (801)964-8633.

2. NFFS Free Flight Hall of Fame (1988). Send to: Anthony J. Italiano, 1655 Revere Drive, Brookfield, Wisconsin 53005; (414)782-6256.

Also, a call for papers for the 1988 Symposium. Please make your intentions known along with an overall outline to: NFFS Symposium Report, Hermann Andresen, Editor, 738 E. Palmaire, Phoenix, Arizona; (602)997-8759.

Have your information in by January 31, 1988, at the very latest! Thank you for your assistance. Anthony J. Italiano, NFFS President. •



Dick Howard, Lake Havasu City, used to fly the P-38, so he couldn't resist building this profile from Tom Winter plans in the 'Winding Stooge.'

Tampa's Dick Obarski uses vision-aid to repair his Second Place EZB at '87 U.S. Indoor Champs.

Your Insiders columnist with Condesner paper-covered EZB at MacDill AFB in Tampa. Design is Jim Richmond's record-setter, Kokomo Bomber. Note unusual braced wing.

Free Flight

By BOB STALICK

• Bob White finally won the Wakefield Cup. No one deserved it more, nor tried harder for a longer period of time. According to Sal Fruciano, who was there for the big do at Chatelelion, France, on August 13 through 17, 1987, "Bob White beat the best!"

An Australian commented at the end of the meet banquet, "Most popular Wakefield win ever." Americans, including me, in tears at the end.

The Chinese were awesome, but only a Pole was in the seven-minute round with Bob. It was over in 12 seconds. Rozycki (the Pole) launched first, but it was immediately evident that he was down on power. Bob launched into his standard pattern immediately after, clocked 4:55 to win by an even two minutes.

The Chinese made detail photos of White's model, which has been published many times and has no automatic features. We all got to drink from the Wakefield Cup at the banquet. Russian Wake fliers seemed to falter at the end. I am convinced that Bob's superior rubber made a big difference.

Exotic front ends, delayed launch, variable pitch, etc. no longer patented features. A good number of modelers in that club, but mechanical failures were common. A close look at the Polish unit qualifies it as Swiss Watch, and just as sensitive to proper care. Bob certainly proved that it can be done "without."

I know that full coverage of the event will be covered elsewhere in the model press, but nowhere will Bob White's win be more celebrated than within the FAI free flight fraternity here in the good old USA. It's too bad that Bob's late wife Toni was not there for his historic moment of triumph, as she had been on so many occasions and so many near misses in the past . . . then again, maybe she was!

JANUARY MYSTERY MODEL

Okay. No more Mr. Nice Guy! Here you are, you old timer free flight freaks. This one is just for you. It came out first in 1947 in a rather obscure publication. The ship has a 245 square inch wing and shows a .19 ignition engine for power. The designer is very well-known among modelers who have been reading the national model press for any length of time. So, you think you know, huh? Okay, send your best guess directly to Bill Northrop *c/o Model Builder* magazine. Do not send to anyone other than Bill. First one with the correct answer stands to win a one-year free subscription to this here all-purpose magazine.

A quartet of junior hand-launch glider fliers. From left, Mike Grell, Dustin Grell, Randy Grell, and John Miller. An upcoming bunch of free flighters. John won First and Dustin Second at the recent Willamette Modelers Club-sponsored Silents Please free flight meet. Photo:Stalick.

NATIONAL FREE FLIGHT SOCIETY

NFFS

DEDICATED TO THE INTEREST OF FREE FLIGHT AEROMODELING

Anthony J. Italiano
1655 Revere Drive
Brookfield, WI 53005

August 25, 1987

Subject: FREES NOTICE

"21st" ANNIVERSARY OF THE NFFS SYMPOSIUM

The National Free Flight Society is accepting nominations for the following:

10 MODELS OF THE YEAR - (1988)

Send to: Jon Driskoll
5411 W. October Way
W. Valley City, Utah 84120
(801) 964-8633

FREE FLIGHT HALL OF FAME (1988)

Send to: Anthony J. Italiano
1655 Revere Drive
Brookfield, WI 53005
(414) 782-6256

Also, a call for papers for the 1988 Symposium. Please make your intentions known along with an overall outline to:

Hermann Andresen
708 E. Palmaire
Phoenix, AZ
(602) 997-8759

Have your information in by December 31, 1987, at the very latest!

Thank you for your assistance.

A J Italiano

Anthony J. Italiano
NFFS President

AFFILIATED WITH THE ACADEMY OF MODEL AERONAUTICS

Nominations are now being accepted for the NFFS 10 Best, and FF Hall of Fame. Get yours in the mail now!

JANUARY DARNED GOOD AIRFOIL—THE GRANT G-10

Here is another in the series of C.H. Grant airfoils. This one is patterned after the Goldberg "modern" style free flight gas sections. It uses a large section leading edge and is designed so that the trailing edge can be pinned flat on the building board during construction. It can be used wherever the early Goldberg airfoils; e.g., the G-5, G-6, or perhaps even the later G-610b, would be otherwise used. Stab section should be a lifting surface such as an eight or nine-percent Clark Y. Probably the best use would be for those fellows who are actually building an Old Timer or Antique Gas Model and who are interested in replicating the section that may be blurred on the plans. Why? Well, why not?

JANUARY THREE-VIEW—GIL MORRIS' "TWO TIMER"

Following an FAI trend set by Bob White's well-deserved Wakefield Cup win, I thought that this month's three-view should feature a ship that looks like a future winner. This three-view and article was first carried in the Nor'Westers' Newsletter for September 1987. For subscriptions to the *Nor-'Wester*, Contact Jon Putnam, 20214 S.W. 70th, Tualatin, Oregon 97229. Six dollars gets you a year's worth.

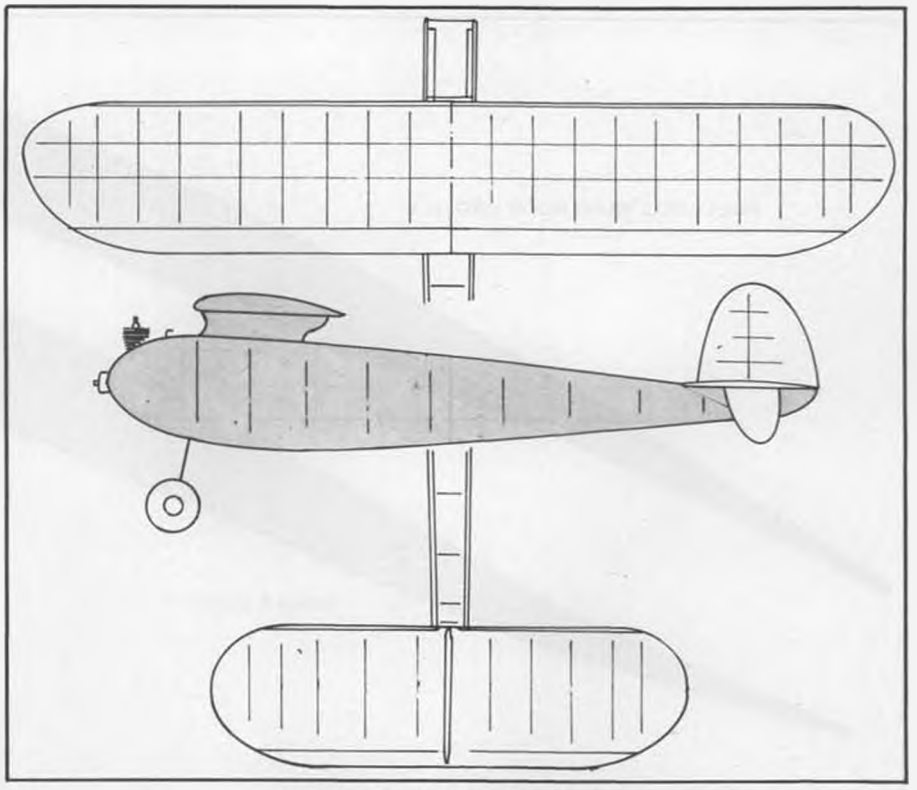
Jon writes, "In February of this year I wrote Gil Morris, designer of Toothpicks and Matchsticks, both phenomenally successful AMA Gas designs. I asked him if he would be willing to share some of his ideas with us on design and flying. I suggested that members of the Nor'Westers would send him a list of questions and asked if he would respond to them. Gil generously and

graciously agreed. Many of the questions were based on Gil's recent FAI flapper design, so he wrote the following article, appending to it answers to our other questions."

"Question: Flapper airfoils? Recent information from R/C glider fliers who have experimented with a flapped airfoil indicated that the airfoil performed better in a glide unflapped than flapped. The airfoil used was a Quabec; used a two-percent camber, eight-percent thickness, flapped approximately twenty percent of the chord. Can you comment on the airfoil you use on your flapper? Specifically, what airfoil are you using? Is it flat-bottomed or undercambered? What percentage of the chord and span do you flap? Do you carry the flap past the polyhedral break? And what have your own findings been concerning the glide efficiency of flapped vs. unflapped wings? Also, are you familiar with the Quabec airfoil and the findings of the glider fliers using it?

"Question: Flapper consistency? Many people have experimented with flappers but few have managed to overcome the problem of flight consistency when compared with a fixed airfoil design. Most of these problems seem to be connected with the complexity of the mechanisms needed to make the wing flap. How have you gone about dealing with the mechanical problems of the linkages required on a flapper? Have you found it easier to hold the flap up and release it into a down position or to push it into a down position? How are you controlling the time? Have you experienced any problems with wing flutter due to structure associated with a multi-piece wing or flutter caused by the actual flaps?

"Question: Transition between power and glide on a flapper? Do you use a bunt system? What is the sequence of events in terms of when you flap the wings, kill the engine, activate stab and rudder, and DT. Have you found it crucial where in this sequence the wing gets flapped?

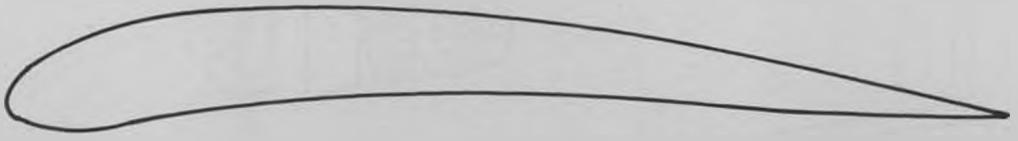


JANUARY MYSTERY MODEL

Bob Watson won the Midwestern States Champs at Bong Field despite 25-27 mph winds with his version of A-Pearl, powered by a K&B .19.

Vic Cunnyngham Sr., left, and Cunnyngham Jr. at the Lincoln Nats. This is the original 1/2A Galaxie that Vic Sr. won the '68 Nats with at Olathe, Kansas. Photo: Fries.

DGA of the Month – GRANT G10



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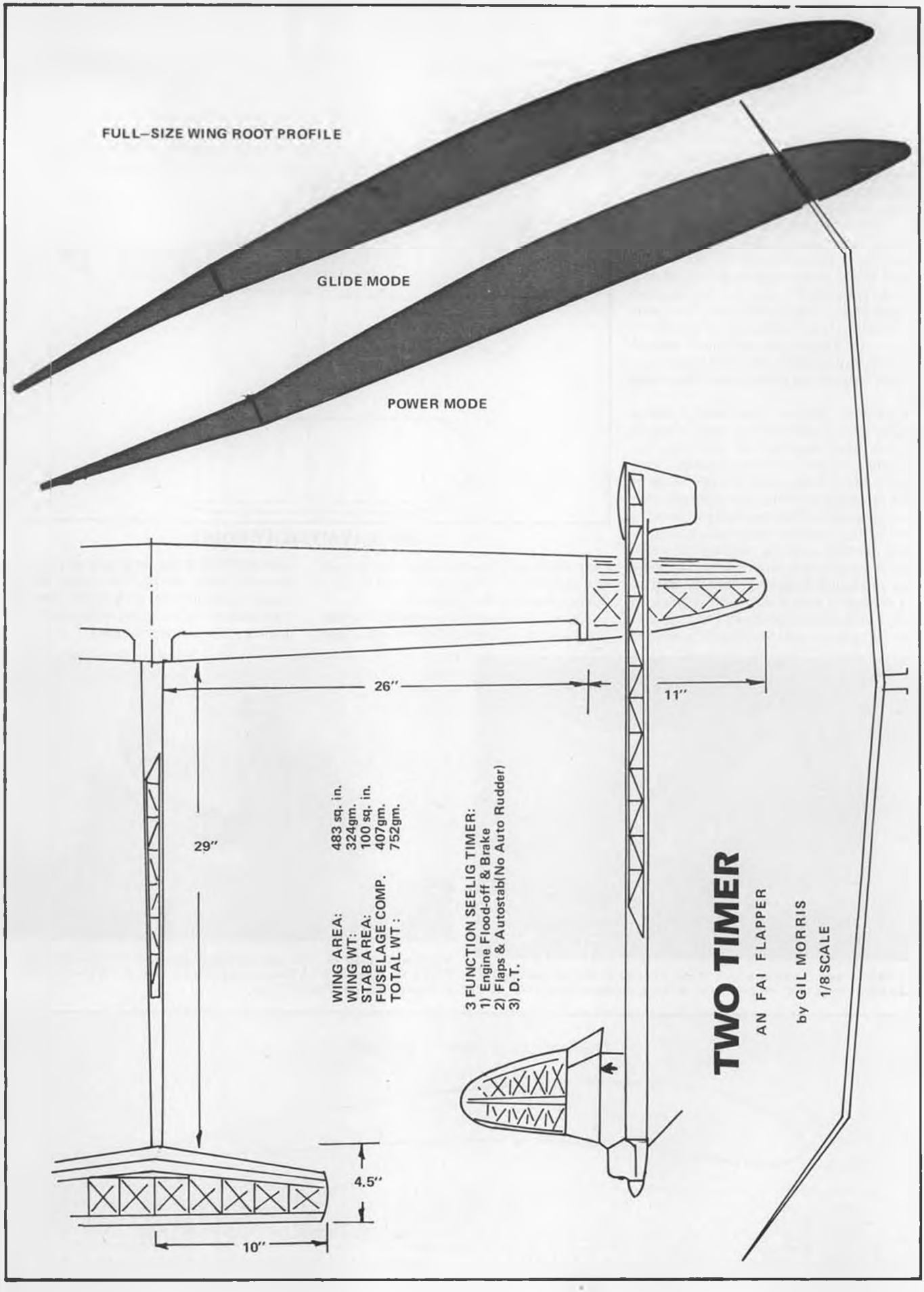
UPR	0	2.8	4.05	5.74	7.0	7.96	9.1	9.7	–	10.0	9.93	9.25	7.9	6.25	4.35	2.65	1.1	0
LWR	0	-0.95	-1.25	-1.49	-1.5	-1.4	-0.65	0.3	–	1.08	1.55	1.76	1.42	0.8	0.4	0.1	0.05	0


FULL–SIZE WING ROOT PROFILE
GLIDE MODE
POWER MODE
26"
11"
29"
4.5"
10"
WING AREA: 483 sq. in.
WING WT: 324gm.
STAB AREA: 100 sq. in.
FUSELAGE COMP. 407gm.
TOTAL WT : 752gm.
3 FUNCTION SEELIG TIMER:
1) Engine Flood-off & Brake
2) Flaps & Autostab(No Auto Rudder)
3) D.T.
TWO TIMER
AN FAI FLAPPER
by GIL MORRIS
1/8 SCALE

"Answer: One of the great thrills of modeling is designing your own airplane with the hope that it will be the best. Hope springs eternal! Anyway, in the past year or so the F1C flapper, Two Timer, has been my number one challenge.

"The idea of a wing with a variable airfoil is not new by any means. Bill Gieskieng did it in the early seventies. Ken Phair did it in the early eighties. The North Koreans flew flappers at the 1985 FAI World Championships. And yet there have been no persistent big wins with this concept, although the North Koreans came close. Nonetheless, it may well be the power design of the future for these reasons:

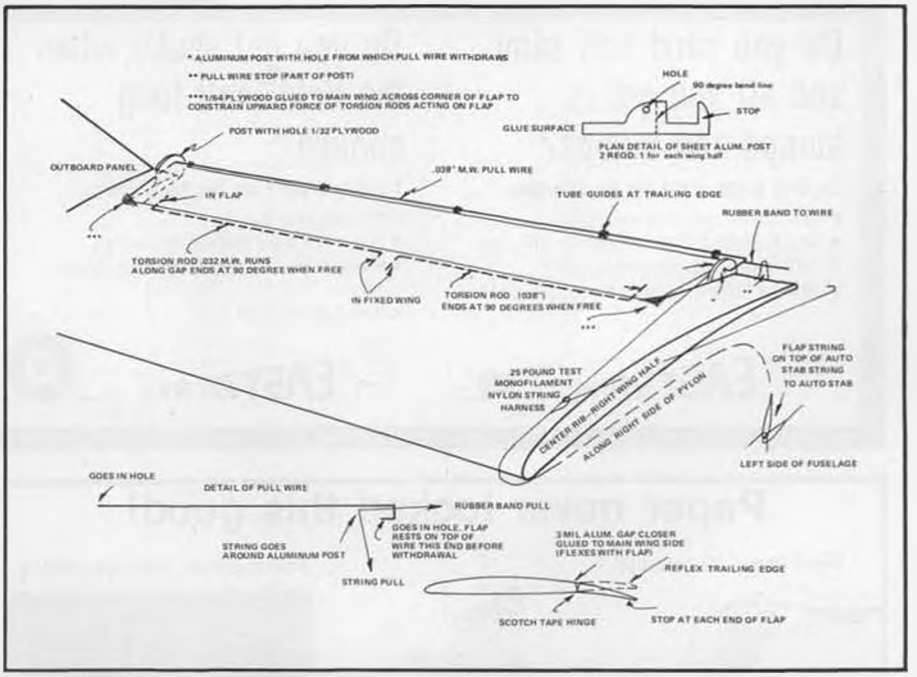
"1. You can select the best possible glide airfoil without compromising for lost drag in the climb.

"2. The biggest surprise is the consistency of the climb pattern, contrary to the pioneer's experience of sometimes erratic power patterns. The reflex trailing edge along with the absolute flap control is the secret. (See three-view for airfoil in both configurations.)

"3. You can flap one side up more than the other to get the power pattern you desire without affecting the glide.

"4. It's not as difficult to build as you might imagine.

"Usually you can associate flaps with trailing edge surfaces that lower as for landing on full-scale aircraft. The purpose in power models is different—flaps never go down, just up. A full-scale soaring glider, for example, has a lower sink rate with flaps in normal position (airfoil uninterrupted for best lift-to-drag ratio) than in down positions (airfoil broken down for reduced velocity). My intention for the use of flaps was exactly the reverse of this: the airfoil breaks up for increased velocity in the climb and in normal position for best lift-to-drag ratio in the glide. The surprise side benefit is that the reflexed trailing edge keeps the position of the center of pressure fixed under power so that regardless of when you are flying, in morning dense cool air or at midday in thin, hot air, the power pattern is as on rails. The reflexed airfoil power pattern acts as a symmetrical airfoil! What other power model sports this feature? This was unexpected but very welcomed since it seems as though conventional F1C models are in need of constant attention to trim, not because of drift in the surfaces but because of change in the air density. But in order for this to work, the flaps must be fixed at both ends under power (see detail sketch).



Gil Morris, designer of Toothpicks and Matchsticks, two very successful AMA Gas designs, created this sketch of his most recent FAI flapper design.

"I have had about 50 flights with Two Timer without a glitch in the flap mechanism. I did have a glitch in the timer on my first flight upon arriving at Taft just before the 1986 FAI Finals. The malfunction was associated with a timer arm to which I had made an improper change, and it didn't release. The malfunction had nothing to do with the flaps. It could have happened just as easily to one of my other models. Two Timer has been repaired and is once again like new.

"Two Timer's flight pattern is much like that of my other F1C models—slight right twist in the climb and an open left glide. It lays out at the top of the power turn without loss of altitude. The flaps and auto stab actuate about two seconds after simultaneous flood off and brake. Three timer functions serve nicely—no need for auto rudder or a bunt. Because the flaps add so much

Bruce Kimball with his NFFS Model of the Year, the Climbmax hand-launch glider. Bruce is one of the best HL glider fliers in the U.S. Photo: Sexton.

Bill Darkow readies an unusual Nostalgia Ship, the Wing Ding by Hank Cole, from an issue of Flying Models. Ship is powered by a Cox Baby Bee. Bill claims ship flies better with balsa ailerons. Photo: Stalick.

Al Borer has returned to the Northwest and to free flight. Al showed up at the NW FF Championships with this Phil Hainer-designed Hand Launch Glider with a 24-inch span. Al just about threw his arm out....

decalage when they return from the reflexed position, it is necessary to simultaneously lower the trailing edge of the stab .040 inch. This auto stab motion is the opposite to that of conventional F1C models. Now, I will try to answer some of your questions.

"Question: FAI philosophy? Why, in an age of FAI designs seemingly dominated by aluminum-skinned wings, boron, Kevlar, and carbon fibre reinforced structures, do you continue to use built-up surfaces that must inherently flex more under power, be less slippery, and be less consistent to trim and fly than the current high-tech F1C model? or must they? Is your design philosophy totally connected to your belief in the importance of light tail surfaces and keeping the mass produced by the engine close to the CG? Can you comment on the lure of high-tech for high-tech's sake in FAI events vs. what you perceive as the actual need for these materials? Do you use materials such as carbon fibre to stress any of the components of your airplanes? Lastly, would you say that you are basically taking a successful AMA Gas design philosophy and applying it to FAI? What changes have you made in your AMA philosophy as a result of competing in F1C?

"Answer: No holds barred. I do whatever produces the best results regardless of popular notions. Carbon fibers in high-stress areas are a lifesaver. Used in low stress areas it doesn't make too much sense if balsa, which is lighter than the epoxy-fibre composite, will serve the purpose. FAI models are no exception—light tail ends and short nose moments make trimming a lot easier. It's just that blunt noses don't look sleek like long, missle-like front ends of jet aircraft where the thrust isn't even in the nose.

"Performance of F1C models has been moving up rapidly in just the past couple of years. Much of it has come from incredibly powerful new engines. Team member Bob Sifleet is getting 1.1 bhp from his previous best engine, both measured on the same dynamometer. If there are any old timers reading this, a 1940 vintage ignition engine of the same displacement developed about .04 bhp, and you thought that it was a screamer.

"Question: Thermal sensors? Harry Murphy published some of your comments on flying using a thermal sensor. Can you comment on how you use it? Do you essentially fly religiously by what it tells you or do you use it only as an aid to your own, natural abilities to pick air? Do you find the trend towards more and more electronic gadgets in free flight a healthy trend, an over-complication of a pure art form, or simply progress?

"Answer: The new digital temperature detectors work and are best used in conjunction with other thermal sensors; streamers and bubble machines. I generally watch the temperature. Upon a rise, I start watching the streamers and bubbles, and launch when all three are in agreement. The hazard is to wait too long, particularly if it is windy, for this agreement. Usually, the temperature rises a couple of degrees and things get serious when the temperature change is rapid, such that the indicator jumps two or three tenths of a degree at a time. Launch at the high plateau where the temperature remains steady for a short period. Avoid launching when the temperature is decreasing. Then, it's probably too late. In windy conditions, launch on a lull in the wind. The lull is probably caused by a thermal passing through. I expect thermal sensing to be outlawed in a couple of years.

"Question: Folding props? Have you had any experience using folding props on your F1C designs? If so, did you find them to be an asset? What problems, if any, did you encounter with them and what rewards did

they have?

"Answer: I personally think that folding props on power models should be outlawed. An FAI prop turning at 28,000 rpm has a centrifugal force of about 250 pounds acting on the tiny hinge pin holding each blade. The liability is too great. Those fliers using them, for the most part, do so not to improve performance but to eliminate broken props. F1C models, in general, are very sensitive to even indiscernible prop differences, and a broken prop in the middle of a contest can be catastrophic.

"Question: The five-minute early morning round? Do you have any feeling concerning the use of an unlimited timeout on the current three-minute early morning round in F1C? Would such a change in the F1C rules tend to favor designs such as yours that can ride light air better?

"Answer: This should present no problem if you and your model are ready and wide awake at this early hour. More likely a mistake will get you; for example, a short engine run, an overrun, not grooving, or Dting short. Traditionally, this is a fifteen-minute round and there is little recovery time from mistakes. I am for the five-minute early morning max, and I would endorse a six-minute if the field would permit. I figure that Two Timer has the potential for eight minutes; two times the previous four-minute max in the early round and thus, the name.

"Question: Do you have any last words?

"Answer: 1/2A, in my opinion, is the best event of all. If you can master it, you can master any of them including FAI. Get good at 1/2A and there's nothing you can't do."

I would like to express my thanks to the Nor'Westers, to Gil Morris, and especially to Jon Putnam for the above article.

AN UNCONTESTED TRUTH

"Forecasting is very difficult—especially if it is about the future."

THE NATIONAL FREE FLIGHT SOCIETY SYMPOSIUM—YEAR 21

Here is your big chance to make a name for yourself in the Free Flight world. Elsewhere in this column you will find a notice telling you how and when to become a participant in the upcoming 1988 NFFS Symposium. Time is fleeting, however, as the time to let your wishes be known is fleeting.

ANOTHER UNCONTESTED TRUTH

"It would be a swell world if everybody was as pleasant as the fellow who is trying to skin you."

P-FLIGHT FIESTA

The plans are in the works! Dave Linstrum, fellow columnist for *Model Builder*, is teaming up with John Oldenkamp to sponsor a Pee Wee 30 and P-30 event to be held on January 17, 1988, in San Diego. Details are in Dave's column, but if you have never flown in a postal meet, this would be a good one for your first time. The Orbiteer members will be the proxy fliers, and, speaking as a participant in the July 4 Pee Wee 30 event, the Orbiteers are a good group of fliers. So, send them your ship.

AN UPDATE ON PEE WEE 30

Fellow NW modeler and Pee Wee 30 flier, Ross Thompson, did some checking on the standard Pee Wee engine and the plastic backplate "Helicopter" version. Ross's comparison showed that the "helicopter" version had a substantially smaller diameter venturi. He was able to remove the needle valve assembly, which is a pressure fit, and drill out the venturi a bit. Even so, not enough plastic material is there to drill it out enough to equal the diameter of the standard Pee Wee. It might be something you would want to try. It's been my experience that the "helicopter" version puts out power on a par with the standard version anyhow. Drilling out the venturi might help the power a bit, so give it a try if you have one of these little gems.

A GOOD NEW YEAR TO ALL

I think this is the 14th time that I have wished all of my readers a happy new year. I really mean it. For those who have thermals during this time of the year, catch one for me. •

Simply Scale. . *Continued from page35*

tions of a point this year, which is to be expected when only the static points count toward a final score. Steve Hill-Harris, Director of the scale event, indicated that the format may be changed somewhat next year and put more in perspective of the remainder of the Rally. Whatever happens, it's still great to see nice scale models taking advantage of the quiet power offered by today's four-stroke engines.

My thanks to the Hamilton Hawks for a weekend of deep blue, crystal clear skies

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accented by the refreshing breath of the cool early fall air, and the beautiful sight and sound of four-stroke models "doing their thing"! I loved it.

'Til next time. . . Keep It Scale and Simple!

Cliff Tacie, 49404 Michelle Ann Dr., Mt Clemens, MI 48045 •

Peanut. . . . *Continued from page 53*

was starting to show some of the wear and tear of the 130 flights it has logged. I'll always be proud of it. It has been an excellent campaigner, flying in competition at eight different indoor flying sites in five cities including the legendary West Baden, Indiana, site.

This could be an easy Peck Polymers kit conversion, so I will not be giving you construction details. Those of you who may need detailed construction information will probably start out with the fine Peck kit anyway. Now, after that cop-out, let's get into flying.

My model was built for an indoor contest and, since it turned out heavy (12-1/2 grams), was trimmed to fly to the left to keep from flying through the ceiling, with all the power required to keep a heavy model up for a respectable amount of duration. If you build light enough, a right pattern will probably be fine. I have found that my heavy models gain too much height when flown to the right indoors.

I kept the left wing warp free. The right wing started with 1/16 of an inch of washout which increased on its own to more like 1/8 of an inch. The flat left wing and washed out (training edge higher than the leading edge at the wing tip) right wing keeps the plane turning in nice flat circles. The only time it banks to the left is during the first three of four seconds of the power burst.

The amount of power your Cougar requires will depend on many things including the brand and condition of your rubber. Where you live will also make a difference. Your local relative humidity and height above sea level can also be factors to determine the amount of rubber needed.

For flying indoors, I used one loop of 3/32 FAI rubber 18 to 24 inches long. The exact length was determined at the flying site by testing. After the length was selected, just enough winds were used to get the model to almost scrape the ceiling.

This is a model that should reward you with many fine flights, many favorable comments, and hopefully many contest awards. Best of all it will be as easy as building from the very excellent Peck Polymers kit. •

Choppers. . . . *Continued from page 11*

move one point without creating some related movement somewhere else. With four points on the swashplate connected to the aileron and elevator servos, the Scout uses a system where *both* of those servos are on tilting servo trays; so that collective pitch is controlled by moving all four points simultaneously. You can add a kicker to

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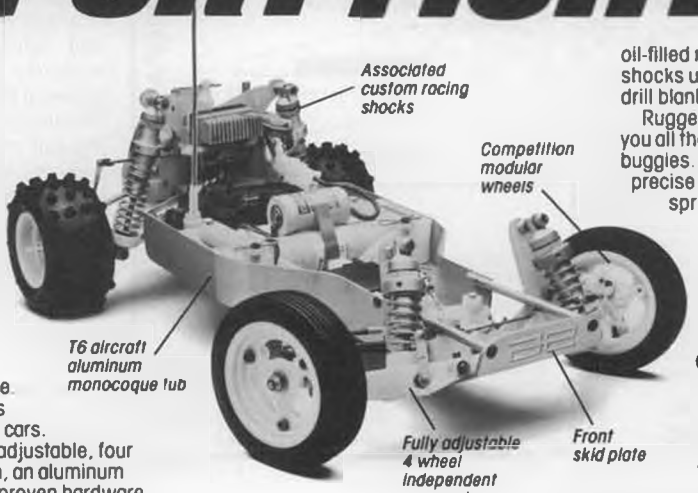

oil-filled racing shocks. These custom shocks use machined alloy cylinders and drill blank shafts for silky smooth action.

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that. *The collective servo also tilts!* Instead of the servo arm on the collective servo moving while the servo remains stationary, the servo arm is anchored to the frame while the servo itself moves. That moving servo is connected to the aileron and elevator servo, so that with all three servos in line, they create a perfect linear movement that is transmitted to the four bellcranks. In turn, those bellcranks are at perfect right angles to the swashplate. This perfect geometric movement—actually a series of parallelograms—insures a uniform control response with no differential movement or cross-controlling.

SOME OTHER FEATURES

The autorotation system is not a clutch *per se*, but a very interesting looking mechanical system utilizing tiny rollers traveling on inclined planes. I've never seen anything like it, but the truth is that I don't think that those one-way bearings we use in a lot of autorotation clutches were really designed to withstand the strain we put them under.

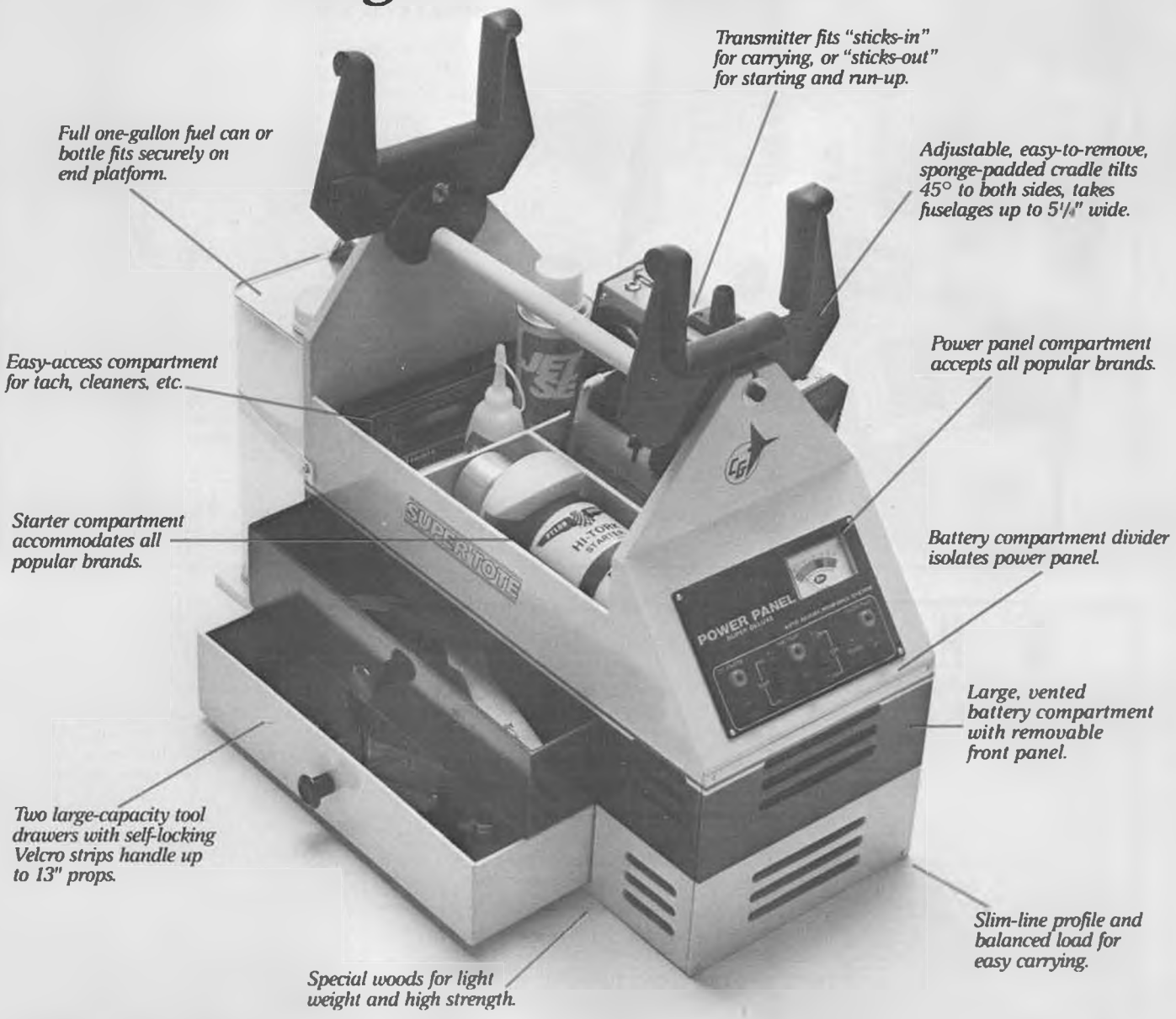
I like the landing gear system which uses a reinforced plastic strut, with a unique system of attaching the skids. The tail rotor gearbox likewise has undergone some changes which have made it more compact and, whether intentionally or not, *more scale like*. Nobody has said it, but with a rotor head designed to adapt instantly to multiblade rotor systems; a more realistic looking tail rotor gear box; and substantially reduced overall weight over past models; I am beginning to strongly suspect that this helicopter was designed to become the heart of a whole new range of scale fuselages. How about it, Robbe Modellsport? Am I right?

THE JUNIOR

Mark also brought with him and demonstrated the Junior 50, a condensed version of the Scout designed for 45 to 50 engines. That size helicopter has some special advantages. Since it is essentially a pared down 60-size chopper, there are many parts that it will interchange with, in this case, the Scout and Champion. Still, it is smaller and lighter than the Scout, and therefore a little quieter, more economical, easier to transport, and easier to maneuver in a more confined space. Though the Scout 50 retains many of the features of its big brother, there are some major design changes that have contributed to its compactness and lightweight. The pictures tell the story.

The start shaft is located to the rear of the mainshaft, and the fuel tank has been moved ahead of the engine. The main gear and autorotation clutch are different, too.

Only an experienced kit designer could bring you a field box that's engineered this well.



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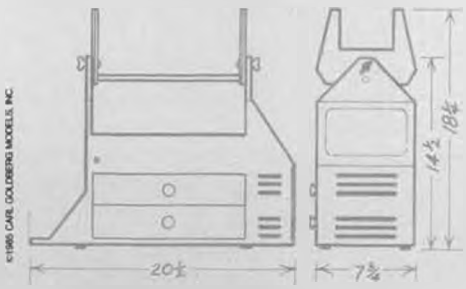

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Some alterations to the cabin place the battery all the way to the front for better weight distribution. The bottom line is that proper balance is obtained with no artificial addition of weight. Thrust bearings have been eliminated from the head in the interests of saving weight and reducing cost, but you can add them back if you so desire.

The quality and innovation present in the Scout has been largely duplicated in this machine. It is reflected in its performance which is embarrassingly close to that of the Scout—at a fraction of the price. I think they're going to sell a ton of these. •

Big Birds. . . *Continued from page 13*

dian Heritage Series."

And this one-man operation of Joe Murray's turns out some mighty fine scale kits that include: a 7-foot, 7-1/2-pound Norseman; a 7-foot, 7-1/2-pound J-2 Cub; an 8-foot, 10-pound Beaver; and an 8-foot, 13-pound Otter.

All of his birds look *good* and, according to the many guys who've written, fly exceptionally well. Joe doesn't believe in lead sleds, so all you'll need for power are either 60 or 94 strokers, except for the Cub, which only requires a Saito 45.

Mr. Murray also kits a six-foot semi-scale Beaver, Otter, and Norseman and has two different sized floats and skis available so that you can really get maximum enjoyment from your bird.

NAVY COLORS

Once again the guys and gals at Hobbypoxy have come up with more military color formulas, and these are U.S. Navy identification colors for aircraft of the 1930s. Their reference was from *U.S. Naval Fighters 1922 to 1980s.*

"From the mid-1930s, each aircraft carrier was assigned an identifying color. This color was painted on the tail surfaces of every plane based on the carrier. The carrier colors were: CV-2 Lexington, Lemon Yellow (FS 13655); CV-3 Saratoga, White (FS 17875); CV-4 Ranger, Willow Green (FS 14817); CV-5 Yorktown, Insignia Red (FS 11136); CV-6 Enterprise, True Blue (FS 15102); and CV-7 Wasp, Black (FS 17038).

"The new formulas are for Lemon Yellow and Willow Green. The formulas for True Blue, Insignia Red, and (Insignia) White were originally published in 1984 and are available by writing to Hobbypoxy Products, Pettit Paint Co., Inc., 36 Pine Street, Rockaway, New Jersey 07866. Black is a stock Hobbypoxy color.

"FS 13655 Lemon Yellow: three parts H49 Cub Yellow, two parts H47 Bright Yellow, one part H10 White, two drops H33 Stinson Green per three ounces of above mixed colors.

"FS 14817 Willow Green: ten parts H47 Bright Yellow, three parts H49 Cub Yellow, two parts H24 Dark Blue.

"All identification colors were glossy. Use Hobbypoxy H02 Gloss or H06 Quick Spray Hardeners when mixing these colors."

FIELD FOOD

The Radio Control Flying Club of British Columbia's newsletter, *Glib Gliches*, has been featuring recipes for field food these past months, and since I tried a few and

found that they were *delicious*, I thought I'd pass 'em on every month or so.

Farm Cakes:

Preheat oven to 350 degrees, grease two muffin tins.

Sift together: 3 cups flour, 2 cups sugar, 2 tsp. baking soda, 1/2 cup good quality cocoa (the cheap stuff makes the cakes look green), and then add 2/3 cup veg. oil, 2 cups water, 2 tsp. vanilla, and 2 tbsp. cider vinegar.

Beat at medium speed for three minutes.

To make filling: cream 8 ounces of cream cheese in a large bowl with a wooden spoon; add 1/3 cup sugar, 1 egg, pinch of salt, and beat until smooth. Then fold in 1 cup of chocolate chips.

Pour cake into muffin cups, filling each 2/3 full. Spoon about 1 tbsp. of filling into center of each cake. Bake 20 to 25 minutes or until center springs back when lightly touched.

Serve warm or at room temperature.

This recipe by Gay Combes is worth the effort and will make even a bad day at the flying field seem better.

THOUGHT OF THE MONTH

According to the Brazoria County Modelers Association, Kentucky is shaped like a 1953 Plymouth Cranbrook after a head-on collision.

Al Alman, 16501-4th Avenue Court East, Spanaway, Washington 98387; (206)535-1549. Best wishes for the holiday, and don't forget that **Safety Is No Accident!** •

Fan Fly. . . . *Continued from page 25*

Southeast Model Products at 14325-60th Street North, Clearwater, Florida 34620; (813)530-5155. Mike flew the Sea Vixen on Saturday afternoon exhibiting the model's realistic flight characteristics. Unfortunately, Mike had difficulty in extending the landing gear at the end of the flight. He tried some high G maneuvers in an effort to shake the gear loose, but he may have exceeded the model's limit as the aircraft rolled inverted, the nose tucked under, and it "augured in." I hope Mike decides to build a second Sea Vixen, since the design was so well executed and it makes a very dramatic model.

David Hudson of Grand Prairie, Texas, brought his newly completed F-8 Crusader. David designed and built the Crusader from scratch. The model features a variable incidence wing, flaperons, and scale retracts with functioning gear doors. The Crusader has not flown yet, and David is concerned that the wing loading may be excessive on this model. However, he hopes to continue development of the design, and possible fabricate a lighter airframe at a larger scale thereby lowering the wing loading. This looks like another promising ducted-fan design.

The contest director, Ed Couch, found time to display two highly attractive scale models. The first was a Byron A-4 in Australian Air Force colors, which Ed has been flying for several years. Even though the A-4 carries an extensive amount of detail, it flies quickly and is highly maneuverable. Ed also had a landing gear problem but managed to land the A-4 smoothly on a nose

gear, a left main gear, and a right drop tank. Ed's second model, which was not quite complete, was a Republic F-84F Thunderjet. This model was fabricated from Lynn McCauley's plans and fiberglass molds. It will be powered by a Byron-fan, and it looks like it will be an outstanding performer.

Butch Stickles from Fort Worth, Texas, displayed his huge Concorde. I have watched this model progress toward completion for the past four years. The Concorde will be powered by four Dynamax fans and will weigh more than 50 pounds when it is flown. If successful, the model will truly be a milestone in ducted-fan technology. I am really anxious to see this one lift off.

One of modeling's true gentlemen, Bob Thacker, arrived with his Byron Kfir. The Kfir is now powered by an O.S. 77 driving a Hurricane Fan. Bob told me that the new fan spins at 20,200 rpm and produces a noticeable performance increase over the Byro-fan. I watched Bob fly the Kfir on several occasions during the weekend, and I agree that it performed well; however, I have seen Ronnie Kemp's Kfir fly equally as well with a standard Byro-fan. It would be interesting to compare the Hurricane Fan installation to the Byron-fan installation under controlled conditions. At this point, all I can say is that they both produce thrust levels adequate to fly large 14-pound scale jets.

Bob Thacker introduced me to Steve Korney, the designer and manufacturer of the Hurricane Fan. Steve showed me some of his production units, which are clearly well-made. Steve is offering several fan units in diameters ranging from 4 inches to 6-1/4 inches in densities ranging from 4 blades to 8 blades. Even the fan blade pitch can be altered during the manufacturing process. This means that jet modelers now have a source of customized fans that can be tailored to specific applications. Information on the Hurricane Fan system can be obtained from Steve Korney at 14835 Halcourt Avenue, Norwalk, California 90650; (213)864-8891.

Rich Uravitch, author of the "Jet Blast" column in *Model Airplane News* brought the best looking Jet Hanger Hobbies F-86 I have ever seen. Rich achieved a remarkable finish by applying chrome MonoKote in individual panels. He then burnished each panel with fine sandpaper or steel wool to achieve the slight variations in polish and texture that are found on full-sized natural aluminum aircraft. He then added simulated rivets with a dressmaker's pattern wheel by making uniformly spaced indentations along each panel line. Rich's F-86 carried the highly colorful markings of the Colorado Air National Guard Minutemen which included a bright red fin and upper fuselage. The overall effect was worthy of a museum model.

Several Northrop F-20 Tigersharks appeared from the Crestline kit designed by Gary Mueller. Dave Thompson of Plano, Texas, displayed a superbly finished F-20 in the red and white Paris Air Show demonstration scheme. This model was nearly complete, and, judging from the other Crestline F-20s I've seen, it should be an excellent performer. Dave also brought one of his veteran Canadair Tutors painted in Snowbird colors. The Tutor has proven to be a very docile scale model. It is powered by a Byro-fan/O.S. 77 combination with very forgiving flying characteristics.

Another veteran design that has been seen at many jet fly-ins is the Sterner Engineering P-80. Tom Perry flew his attractive red P-80 in Kansas Air National Guard marking, and Jim Howard of Palacois, Texas, displayed a flawless version in Air Force Alaskan markings. This model was modified to provide for a Dynamax fan installation which eliminates the cheater hole. Scale split flaps and wingtip drop tanks were also featured.

Ron Ables of Lewisville, Texas, completed his Byron F-15 only days before the Fan-Fly. Ron wisely chose to test-fly the model on Saturday evening after the spectators had cleared the field. I missed the test flight; however, it must have gone well because Ron flew the big jet several times on Sunday before a large crowd. The Byron F-15 is an impressive model, and when Ron took to the air, all other activity at the field ceased.

The event concluded on Sunday with the presentation of several awards. Mike Kulczyk's DeHavilland Sea Vixen was the well-deserved choice for the Technical Achievement Award. Phil Oestricker, the Chief Test Pilot for General Dynamics (he made the first F-16 test flight), awarded a plaque for the best General Dynamics model at the event. The winner was Karl Hibbs of the

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Skyriders Demonstration Team for his performance with a Byron F-16.

Hannan. . . . *Continued from page 57*

knocker" over. He tried twice to make it take-off, to no avail. On the third try, something hit the right pontoon, knocked the plane three to four inches out of the water and upside down, when it was hit again on the left wingtip. The pontoon was crushed and torn almost off, and the wingtip mashed and torn. Neither of us saw what actually struck the plane, only a flurry of water, but the pontoon and wingtip damage seemed to indicate a mouth larger than a snake; i.e., about 2-1/2 inches of pontoon was crushed and the entire wingtip crushed and hanging on only by tissue.

At any rate, we got out of there and went for a beer. (We were sadder Budwiser, I guess. . . .)

MORE WATER MODELS

The testing of aerodynamic theories with hydrodynamic models has been discussed previously in this column. The practice is an ancient one, both in this country and others. Thanks to Bill Kincheloe, of Magalia, California, we have an account of such activities which took place in Russia during the 1908-1910 era. Constantine Nikolayevitck Neklutin (called "Neck" for short) was the son of a nobleman and had attended engineering school before becoming interested in aviation. Fascinated by reports of flight, he corresponded with several Frenchmen, including the Voisin brothers. From this and studying books, he learned that stability and control were the primary problems to be solved, and he began devising ways to test his ideas avoiding risk to pilots and without spending thousands of rubles.

Like Maxim and Santos-Dumont, he concluded that tethered testing was a logical approach, and decided upon an ingenious scheme in the form of a trough roughly eight feet wide, five feet deep, and three hundred feet long. A corps of serfs dug the trench and equipped it with rails on either side, plus towpaths for horses. A Kiev machinist made a trolly to ride the rails and to carry testing instruments, and controls were devised, operating through the lift/drag mount of the model. Then, with a horse and a serf on either side, the trolley would be pulled along, dragging the model through the water. Imagine sitting on the trolley recording test-data while shouting at the two horse-drivers to adjust speed! The serfs were not allowed to ride, of course—they walked or ran alongside the horses.

Neck's knowledge of stability and control progressed steadily through the use of the models and cumbersome test apparatus. Unfortunately, the onset of war stopped his experiments, and he claimed no great originality or contributions to aviation, leaving such honors to his countrymen Seversky and Sikorsky. He was also quick to acknowledge the important aerodynamic discoveries by Karman of Hungary and Prandtl of Germany.

Our thanks to Bill Kincheloe for sharing this account, part of a forthcoming publication dealing with the fancies, fun, and foibles of Bill's 40-year career as a technologist.

FEATHERWEIGHT ACCESSORIES

Linsey and Jane Smith, of England, now offer a range of vacuum-formed scale model parts including wheels, radial engines, and pilots. The unusual pilots are formed from acetate, are very light in weight, and may be painted to suit individual applications. The Smiths will also undertake vacuum-forming of special parts to order, and have even produced miniature representations of themselves for use in flying scale models.

A couple of Post Office International Reply Coupons will bring a complete price list from: Small Scale Custom Services, The Red House, Oxborough, Kings Lynn, Norfolk PE33 9PS, England. Linsey and Jane are also interested in contacting U.S. market outlets.

NFFS NEWS

Tony Italiano, President of the National Free Flight Society, is soliciting nominations to the NFFS Hall of Fame, 10 Models of the Year and papers for the 1988 Symposium. Deadline for all of these is December 31, 1987.

Tony has also announced that the magnificent Johnson City Dome has been rented for an entire week, and will be the site of the largest indoor model ex-

travaganza ever held in the United States. Start building now! For more details on any of these topics, contact Tony at: 1655 Revere Drive, Brookfield, Wisconsin 53005.

AUTOGIROS ARISE AGAIN!

Genial George Townson, former flier of full-size Autogiros and recently the restorer of the Pitcairn PCA-2 Miss Champion for Stephen Pitcairn, son of the original builder, reports a rebirth in interest for the "flying windmills."

In addition to appearing in comic books and a cartoon, a recent crossword puzzle contained the following, "four letters across" clue: "Copter kin." The answer, of course, was "Giro."

WATCH FOR IT!

A sure boost for Autogiro publicity will be the release of a new Walt Disney film entitled "The New Adventures of Pippi Longstockings." The director is Ken Annakin, who also directed "Those Magnificent Men in Their Flying Machines," surely one of the best aviation films ever produced. In the new Disney film, Steve Pitcairn performs the flying sequences in his Miss Champion Autogiro, specially equipped with "Come Fly With Jake" markings on the fuselage sides, and dangling a rope-ladder for the daring rescue scene.

LAST VOYAGE

The final journey of the Rutan/Yeager Voyager round-the-world flyer has been successfully completed. Trucked from Mojave to Oshkosh, Wisconsin, for a triumphant display during the Experimental Aircraft Association convention, the craft was

next transported to the Paul Garber Facility of the National Air and Space Museum. There it will await display and dedication in December, on the first anniversary of the epic flight. Wasn't that a fast year?

RUTAN ON MODELS

Burt Rutan, Voyager's designer, spoke during the AMA Nationals about the importance of models in his life. He commented that he may return to model building, pointing out that full-size aircraft are "fraught with product liability problems. . ."

SIGN-OFF

Blame the Solvang, Oregon, newsletter for this one:

"Do you know why seagulls live by the sea?"

"Because if they lived by the bay, they would be called Bay-gulls!" Boo! Hisssss! •

Robin. . . . . . *Continued from page 26*

described as 1/10 scale. While it is definitely a scale-like airplane—no "Ugly Stik" here—my research did not uncover a full-size version, though if one is actually made, it should be a winner on looks alone. The '850" sports exactly that amount of millimeters in wingspan—33.4 inches, that is! Its length is 21.6 inches, with a flying weight of 21.22 ounces, using the Futaba FP-4NL/33H R/C system, which includes such interesting components as a 1.1-ounce four-channel receiver and .65-ounce servos. A separate report will include more details on this fantastic little radio.

With the Robin 850, Kyosho brings you a system; a completely built model requiring only minor assembly, a matched motor/6V 450 mAh Ni-Cd battery/12VDC charger, adhesive-backed decorative markings, and all miscellaneous small items required to complete the model and install the radio system. Even the wing-holding rubber bands are included—in this case, good quality white ones whose color will not clash with the basic white color of the model.

The Robin 850 radio system (a two-channel system is required to operate ailerons and elevator) gets its electric power from the main drive battery. Included is a small electronic module, termed an "Auto Cutoff Relay," which drops the six volts of the drive battery for the receiver and servos and senses the battery voltage, automatically cutting the motor while about ten minutes of radio battery life still remain, thus effectively preventing a simultaneous loss of motor and radio control.

Construction is "ARC;" Almost Ready to Charge! With the exception of the wing, which is of conventional D-tube balsa built-up film-covered construction, the rest of this bird (Well, it *is* a Robin!) is precisely and neatly molded of lightweight plastic, a process referred to by Kyosho as "LSS" Light, Strong, and Seamless. There is little airframe construction required, consisting of joining the two wing halves together, and

bolting on the tail assembly. The usual alignment requirements must be followed here. Most of the assembly time required before the little 850 is ready for flight will be spent on the installation of the radio equipment and related items such as control horns, pushrods, etc. Incidentally, all of those necessary accessories are included in the kit.

The motor drops into a molded carrier which must be screwed onto the already installed plywood firewall. It is secured in place with a metal clip with a rubber band around the whole assembly for added security. I chose to substitute a nylon tie strap for the latter. Not only is it stronger, but it looks better! The prop is held in place by a hex-shaped adapter which fits over the motor shaft, being secured in place by a small set screw. It is a good idea, in all such cases, to make a trial fit and to tighten the set screw so that it will make an impression on the shaft, remove the assembly, and file a small flat on the shaft at the point on which the screw bears.

The prop furnished has a 6-1/8-inch diameter by 3-inch pitch, seemingly a good match for the Lemans AP-29 motor furnished. Dimensions of said motor are 1-1/8 inches by 2 inches. The prop is especially made for the adapter/spinner used, having a hex-shaped cavity on the rear that fits over the adapter. Since this is not a standard hobby shop item, I recommend that you also order a couple of spare props at the same time you order your Robin. They are Part No. BR-09; available in pairs. Barring a complete loss of altitude, airspeed, and ideas all at the same time, there are no other spares that I recommend you obtain, though individual replacement parts, including wings and fuselages, are listed in the spares section of the instruction manual.

Which brings us to the instruction manual—in one word: complete! The only thing that might cause you a slow down is the use of metric hardware throughout, which most of us cannot identify quite as readily as we can #4, #6, etc. nuts and bolts. However, the problem is minor—someone somewhere recognized this reluctance of ours to accept things metric and has furnished a full-size drawing of each piece referred to by dimension. I found that by the end of the project I could quite readily identify a 3 x 15mm screw or a 4mm washer by sight. There is one more metric consideration. A number of holes have to be drilled here and there, all indicated in the instructions in millimeters. Since few of us will have drills of the proper type available, the following numbered sizes can be substituted for the millimeter sizes given: 2mm = #47; 3mm = #32, 4mm = #22.

Other than a reminder to use Loctite or a similar product in the assembly of the machine screw wheel axles to the sheet aluminum main gear, I have no other assembly hints for you.

The power package furnished with the Robin 850 includes the AP-29 motor, five-cell 450 mAh battery and a 12-volt DC input timer-operated charger. Break-in of the motor, consisting of running one charge on the ground, is recommended and detailed in the manual. I did notice that some slight improvement in operation did occur for the next few flights. I would assume this is due to the brushes seating better on the armature and the bushings loosening up and realigning themselves.

The battery charger is a basic mechanical timer unit, nothing sophisticated, but which under proper use will do an acceptable job of reviving the drive battery. The instructions direct you to charge a fully depleted battery for 15 minutes. The "fully depleted" part is important, as charging partially charged cells at this high rate for that period of time will definitely lead to overcharging. Translate that to mean lessened battery capacity and shortened life!

Let's see now what the battery and charger are doing! The first step is to check the actual capacity of the battery. This I did by charging it at its C/10 rate; 45 mils, for 12 hours. Next, I discharged it on my Ace R/C Digipace, which gave me a figure of 530 milliamps. Though this figure is higher than the rated capacity of the battery, it is not unusual to see such values for good quality cells.

Then, with a steady 12 volts at the input of the Kyosho charger, I charged the battery for the required 15 minutes. Again testing the capacity on the Digipace, I came up with an average figure of 390 milliamps, indicating an average charge rate of just over 1.5 amps. Increasing the charge time to 20 minutes, the 15-minute maximum with a 5-minute rest and an additional 5-minute charge, then gave me consistent discharges of just over 500 milliamps.

Though the use of the charger according to the instructions does result in some undercharging, in such cases a little less is better than a little too much. Though the method described does get you closer to a 100-percent charge, a much better method is the use of an automatic cutoff charger, such as the Lambda Quick Charger also available from Kyosho/Great Planes.

Many of the Ni-Cd chargers made for R/C cars may also be used, but be sure that yours is one of those with an adjustable rate, such as the Novak Electronics "Peak" or "Peak Plus" chargers, and set it at the 1.5-amp rate used by Kyosho. Most of the nonadjustable chargers do so at rates that are probably too high for these little cells to accept too many times.

In the air the Robin 850 will not set any altitude, distance, or endurance records for

you—nor are any claims made to that effect. Nevertheless, for the relatively short time that the charge is effective, it is definitely fun flying. The little bird flies with authority, with only those compromises required between stability and maneuverability. The manual states a flying time of from two to four minutes; I have found the average to be about two and a half minutes when charged as directed. Increasing the charge time as described did extend the time closer to the four-minute mark.

Since there is no rudder, and therefore no control while on ground, a hand-launch is definitely called for. As in the case of all low-wingers, it can be a little tricky—the best way is a two-handed launch with one hand in front of the gear and the other midway back on the fuselage. Nose down, a good shove, and the little Robin is on its way!

There is a noticeable slowing down of the motor as cutoff is approached, in which case it is best to stay downwind in position for an approach, as a landing will soon be necessary.

The Petit Robin 850 is not a trainer, and no claims are made to that effect by either Great Planes or Kyosho. I mention it here only because I have found a large number of the uninitiated, when they first become interested in flying R/C, also believe that a smaller airplane is easier to fly, and the good looks of the Robin would certainly attract such persons. For those of you who have mastered the basics of R/C flight, the Robin can be a fast and full-of-fun entry into electric flight and will be good for a lot of short but challenging and satisfying flying.•

Jake. . . . . . *Continued from page 7*

service. You apparently failed to notice the new polystyrene meat extender used in airline meals, and you obviously paid no attention to the Kevlar reinforced air sick bags with Velcro closures. Other recent advances include a three-dollar fee for a headset that plays elevator music, and a sharp reduction in all that annoying legroom. My favorite piece of progress, however, is the opportunity nowadays to buy my five-dollar gin and tonic from somebody named Gary who needs a shave.

Jake

* * *

Dear Jake:
What's a compression strut?
Ancil in Eagle Rock

Dear Ancil:
It's a dance that was popular during the Great Compression of the early 1930s.

Jake

* * *

Dear Jake:
I read that radiation from the Chernobyl accident is expected to distort the Earth's electromagnetic field. Will this cause interference with our radio sets?
Worried in Woods Hole

Dear Worried:
There is little danger of interference problems due to atmospheric flux field distortions caused by Chernobyl radiation. Electrical storm activity is ten times more disruptive than background radiation, and thunderstorms don't bother R/C aircraft (unless the pilot gets hit by lightning). There is a very real danger, however, of transmitter meltdown if a radioactive Latvian stands next to you while you fly. So for the next twelve years, as a precautionary measure, whenever you go up to the board and take your frequency clip, always be sure to check the immediate area for glowing Northern Europeans.

Jake

Electric . . . . . *Continued from page 37*

Cooper in the *Electronics and Wireless World* magazine, May 1985, shows a battery booster circuit which will produce

seven volts from 1.25 volts, using the Texas Instruments TL496 switching regulator IC, as shown in the schematic. The values are pretty hefty! Anyhow, if any of you have any info on battery booster circuits suitable for our radios, I would be very interested. If you know of any commercially available ones, I would be quite pleased to pass the information on to the readers.

I have been getting letters on where to find electric items, and now two new suppliers are available. Charlie's R/C Goodies, 13400-30 Saticoy St., North Hollywood, California 91605, phone (818)764-1490, has an excellent catalog; a dollar will get you one. It has a section with info on electrics, and very good prices on everything from Astro to VL. I have purchased several radios from Charlie's in the past; their service is excellent. Airmen's Supply Co., P.O. Box 1593, Norfolk, Nebraska 68701, has a nice little catalog for a dollar. They have lots of scale free flight and some R/C. They feature the Easybuilt electric kits from Canada. One of these, Steve Gray's "Beaver," was featured as a construction article in *Model Builder*. The reports from readers is that these kits are very good and fly well. The R/C series includes the Stinson, Taylorcraft, Beaver, and Fairchild Ranger. I know the Beaver flies well as a float plane, I'm sure the others will too. Enjoy! Another supplier I have mentioned before is CS Flight Systems, 31 Perry St., Middleboro, Massachusetts 02346; phone (617)947-2805. They feature good prices and a wide range of products, so send your dollar for their catalog too! These companies will solve your "Nobody sells electric stuff here" blues!

John Mountjoy sent photos of the first annual electric fly in August in Winston-Salem in North Carolina. Eleven fliers registered, a good turnout for the first time. The weather was 90 degrees and calm. The longest flight was by Chuck Balcom using a stock Electra (Goldberg kit), and John won all up last down with his Astro Challenger with an Astro cobalt 15 and 10 cells. There was a good variety of planes; an Astro Challenger (15 cobalt), five Electras (four stock, one 05 cobalt), a Powerhouse with a Robbe 50 GSE geared (18 cells), a 035 cobalt glider, and the DSC Prophet 941 (Astro 15 geared, 12 cell). Everyone had a good time!

The Houston SPARKS also had a fun-fly this year in Houston, Texas, and along with the flyer describing the fun-fly, Ken Martin sent a couple of beautiful photos of local planes and fliers. Don Siegle and Dr. Jean Duke both fly the Astro Porterfield; take a look at how different the planes look with the different paint schemes! Don's plane uses the Astro 40 cobalt motor with 20 Sanyo 800 cells and an EMCO throttle; Jean's uses the Astro 40 cobalt with 18, 800 Sanyo cells and a Geist throttle. Thanks, Ken, for the photos! I am flying a scratch-built Ace 4-40 with 17 subC cells with the Astro cobalt 40 and the Jomar SC-4 throttle. To put it briefly, I love that 40 motor! In fact, I have the older model; the new one has adjustable timing. It should be even better! If you have been flying R/C for some time, are used to gas planes, and like lots of power, get an Astro cobalt 40 for your first plane. I

like it very much on direct drive. Yes, it costs as much as a good four-cycle 40. Of course it does, the quality and time involved in making it is about the same. If you want to save money, buy three of the offroad six packs for the flight battery or, better yet, order from Charlie's or CS for savings. I recommend any plane designed for four-cycle 40s, the Quickie 500 planes, or the Stik-type planes. You should come out about six pounds, this will give you good performance. Be sure not to take shortcuts on wiring, use the Jomar or SR wire, Sermos, spade lug, or Adams connectors, and use double pole toggle switches using poles in parallel if you use a toggle. A 30-amp plastic fuse is a good idea to protect the throttle and the plane. So there you go, and you can mix it up at the field and nobody will notice your plane is an electric unless you happen to fly alone! As many of us know, life gets better after 40; make it electric! Till next time! •

Engines. . . . . *Continued from page 27*

Italian contest and won first place. If you (would) like to get one of these Super Tigres, I'll be glad to swap a brand new one. . . ." The letter came from Guiseppe Gottorelli in Italy.

I mounted Evan's G-19 and put on a heavy Yoshioka 11.3 by 8.2 prop (heaviest I had) and put a leather glove on my right starting hand. In 15 seconds it was running at 7200. 11 7-1/2 Master Airscrew (and no glove) read 7550 rpm, and the engine was a pure delight. I wasn't going to strain this loan anywhere near the rated 15,500. The G-19 has a vertical bypass or transfer port up the left and right side of the cylinder. The exhaust ports are cut into the front and rear of the cylinder. As the exhaust exits the two ports, it is diverted left and right by a cast-in-place divider much like those under the rockets at Cape Kennedy that deflect cooling water and steam out from under the launches. The exhausts come out in front of and behind the transfer ports, yields four exhaust outlets, and this pattern was used on earlier ST engines.

The G-20 and all subsequent engines use today's side exhaust layout for gasses leaving the cylinder. The rear center of the crankcase has a big removable screw to drain out fuel from a severely flooded engine. Cylinder head has four hold-down bolts like today's X-40. The G-19 is delightfully insensitive on compression screw settings. Most diesels start and run within a 90-degree turn of the screw. The engine could have the screw set a half turn either side of optimum with little change. Oddly, the needle valve is *not* ground round; it has 11 flat surfaces that form a point. The prop driver is keyed with a standard square piece of steel to the prop shaft.

The G-19 was made in two versions; typo A was diesel, and typo B was glow. B was an ounce lighter. Data sheet shows the G-19 produced .45 hp at 15,500 rpm. The following G-20 was rated at 16,500, and the G-21 was rated at 17,500. So you can see Mr. Garafoli was building high-performance engines in the fifties. Some were rated as high as 28,000 rpm back then. It's the Super Tigre G-21 that the Soviets chose to *exactly copy* and sold under the name "Kometa MD-5," and they've also exactly copied other Super Tigres in manufacture but not in excellence of performance.

The first line of the Super Tigre instruction sheets from those days said, "Abbiate la massima cura del motore in Vostro possesso e seguite attentamenti i consigli dati, per evitare delusioni e perdite de tempo." It's still good advice today. It means: take care of your engine and follow carefully our suggestions/instructions to avoid disappointments and waste of time.

RATINGS

Design = 9 points. Manufacturing excellence = 10 points (all fits are superb). Performance = 10 points. This was a near-perfect engine in the late 1940s. Today's value = $60 to $75. For Evan's G-19 Super Tigre. •

Hey Kid!. . . . . *Continued from page 52*

thousandths) of an inch thick. This is my idea of a "little." A dime is about .050 inches (a little more), and a nickel is about .075 inches thick (a lot). Of course, you'll be guessing, but at least you'll be in the ball park, instead of just trying to read my mind.

Dives can be fixed by increasing the angle of attack either by bending in some "up"

elevator, or by breathing heavily on the stabilizer and bending the rear or trailing edge up a little. This is where your ability to tell a dive from the dive after a stall comes into play, because if you try "up" elevator to correct the dive that results from a stall, you'll make the next stall even *worse*, and get another dive! One of the challenges of flying free-flight is to be able to solve these kinds of problems, and you feel pretty great when you finally have it flying well! Take the trouble-shooting chart with you to the flying field to help you over the rough spots.

If you haven't added the aileron, elevator, and rudder trim tabs, you'll be breathing on balsa and twisting a lot to deflect the air in the right directions. You'll have to check those balsa twists after every flight, though, as balsa has a habit of going back to its original position. Steaming is more permanent.

CHANGING THE CG

If you built your model and balanced it correctly before adding the wing, no changes in the center of gravity should be necessary. However, sometimes differences in motor weights when you add a longer motor may require a little nose-weight to re-balance the model. Sometimes a model which refuses to climb can be coaxed into doing so by making the tail just a wee bit heavier. Modeling clay is ideal for adding weight, and it does not take much. *Never* add weight to *both* the nose and tail, as that does nothing to adjust the balance but just makes the model heavier. Sometimes adding just a little clay to one wing tip or the other may help a model turn, but this should only be tried after all other methods have failed. Again, adding weight to both wingtips just cancels out the effect you are trying to achieve.

SOME FINAL NOTES

Try not to re-fly bad flights. Do something different on the flight following a bad flight. Oil the propeller bearing every few flights to keep dry plastic from rubbing on dry plastic. The rubber motor gets "tired" when being wound fully and should be changed now and then. If it's nicked or torn, it should be thrown out, but a motor which has gotten stretched will recuperate with a half-hour's rest. Keep rubber in a container that keeps out air and light, both of which ruin rubber. Re-lube the rubber motor when it feels dry. You can run a dry motor, but you will not be able to pack in as many winds, and it will tear easily. The only advantage of a dry motor is that sand does not stick to it as easily! If you get grit all over your motor, change it, or expect it to break soon. It can be washed off and re-lubed if you have water handy. If you get dirt into the nose bearing and the prop feels funny when you turn it, better wash that off with water *without getting any on the wings and tail*. Water is the enemy of sheet balsa, it gives you warps (unless you pin the wet part to a flat board and let it dry for a day or two).

I suggest that you don't risk your life for your model, much as you love it. Running in front of cars when your plane is flying over a street is a maneuver that can land you in the hospital, and climbing trees can have the same result. Throwing things at it to dislodge it is okay, if no one is standing underneath to get beaned by what you threw up

at it. Some guys use a fish line with a weight on the end to throw over a branch and then yank on the line to shake the model out.

Some of you may wonder why we make our B.A.R.F. fly in circles. After you see it fly, you'll know why. If it went straight, it would leave most flying fields, and certainly would not do well inside a gym! Also, by circling, you can keep it inside a "thermal," or rising bubble of warm air caused by the sun heating the ground. Birds in thermals do not have to move their wings to stay up or climb, as the air around them is going up faster than they are gliding down. Your model can do the same thing. Losing your first model up and out of sight can be a real thrill!

INDOOR FLYING

If you will be flying in a gym, you might want to spend some time with sandpaper making your model as light as possible, or even making a new one out of lighter balsa from your hobby dealer (*Sig* "very light" contest balsa is good). If your model is light enough, you will be able to use lighter rubber, such as 1/16-inch instead of 3/32-inch. If you use heavier rubber, you can cut its power down to get long runs by making longer loops, by twisting the prop blades into higher pitch (so you will see more blade when looking at it from the side; more air resistance will make it turn slower). Twisting the blades to low pitch (less air resistance as seen from the side) will make the prop spin faster and give more power, but with a shorter run. This is useful if your 1/16 motor is not quite powerful enough to get you to the ceiling. I have over two-minute flights in regular gyms with *Sleek Streeks* by experimenting with different motors and prop pitches.

Outdoors your flight possibilities are unlimited. Walt Mooney once saw a Sleek Streek fly by a glider he was piloting at 7,000 feet! Some people have been known to put their phone number on their models when they start flying that well.

REPAIRS

I hope you don't need any, but it's a good idea to have your tube of glue handy. If your wing or tail parts are cracked, *do not* smear glue on the top or bottom of the wing. It will warp your model when it dries and shrinks up. Break off the cracked portion and spread cement on the *edge* where it broke. Do the same for the place it broke away from, wiping off the excess after you put it back together. The only glue which remains should be what is in the joint.

If the fuselage snaps, generally just gluing the parts back together is not strong enough. Gluing a sliver of balsa or toothpick on each side and wrapping the lot with thread and rubbing glue into the thread will help, but adds weight. Sometimes you can just make an overlap joint by putting one part over the other for a little ways, gluing and thread wrapping. Crude, but it may last until you get home to fix it right.

Next month we are going to begin what is called "stick and tissue" building, with a model called the *Peck R.O.G.* You might want to pick up a couple before then. You might also want to see if you can find a building board that you can easily shove pins into. *Celotex* wallboard is ideal (1/2-inch thick), but it comes in four- by eight-foot sheets. Maybe you can go in on a sheet with a couple of friends. You can cut it up with a pocket knife right there at the lumber yard so it will fit in the family car. A really flat side of cardboard box (the double-thickness ones are great if you can find one)

is the next-best thing. You'll need some pins also, the kind they call "silk pins" at a sewing counter do nicely. Until next month, happy landings!

A special order sheet of all the materials we will be using in this beginners' series is available from Peck Polymers/Beginners, P. O. Box 2498, La Mesa, California 92044; phone, (619)448-1818. They stock Sleek Streeks, rubber, cement, winders, kits, and materials. A large self-addressed, stamped envelope will get you the special price list for this series. •

R/C Soaring. . *Continued from page 43*

success of the Goldberg Electra, Airtronics has decided to go the idea one better. The Eclipse will be a six- or seven-cell model with gear drive (as opposed to the Electra's direct drive). The motors will be similar in design (i.e., Mabuchi 540/550 types), but the addition of a gear box will make the Eclipse's climb-outs, much less lethargic than DD types.

Stylistically, the Eclipse is a little reminiscent of the Olympic 650 with a few significant changes. Although the wing is a three-panel job like the little Oly, it has a bit more area (660) and a 76-inch span. The wing has tapered tip panels and straight trailing edges. The horizontal stab is, I believe, bigger than the Oly's, and it has a different shape (as does the vertical). The overall length of the plane from spinner to rudder is 42.75 inches. Ready to fly, the Eclipse weighs 37 ounces with three small servos and a seven-cell, 800-mAh power pack.

The kit will come in two versions: a deluxe version with motor, 3:1 gearbox, folding prop,. spinner, and switch harness; and a standard kit without these items. Both will have the same complete hardware packages for the plane (i.e., pushrods, horns, etc.).

Structurally the Eclipse will be very Oly-like with an open structure wing with plug-in tip panels. The spar in the main panels will be 1/4-square spruce spar caps with I-beam shear webbing, and the tip panels will be 1/8 by 1/4 spruce webbed out four rib bays. Plans will indicate built-in washout for tip-stall-resistant flying.

The first kit run is tentatively planned for this February. Likewise look for this design at upcoming trade shows.

With these two "earthshaking" (a common Southern California saying these days) discoveries behind us, let's move on.

Ian Douglas and Glen Clifton of the SWSA and ISS clubs of Southern California flew a sharp little two-meter design called the "Donzel" (in medieval times this was the knight's assistant who helped him put on armor and get on his horse). Its main claim to fame is the rather unusual choice of airfoils, namely the Selig 3010 which was designed to be a hand-launch glider section for use at very low Reynolds numbers (see August 1985 column for details). Ian is very happy with this Selig airfoil and has used it several times with success on small gliders.

Ian flew the Donzel to the highest place for a two-meter class ship. In the overall standings he was 18th.

The Donzel was designed for guys of both above-mentioned clubs who had flown Gnome 2-meters and had possibly crunched to death their fuselages. The Gnome 2M wing will fit right on this

WRAM SHOW '88

SAME LOCATION AS LAST YEAR! YONKERS RACEWAY

For 1988 we will once again present our RC Plane, Car and Boat Show at the Yonkers Raceway — with unlimited parking. It's our 20th annual show and it's sure to be the biggest ever!

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

ADVANCED TICKET SALES

Save time, order your tickets now — send check or money order made payable to WRAM, Inc. (allow 3 weeks for check clearance) and self-addressed stamped envelope to:
Ed Alexis, 21 Pamela Road, Peekskill, N.Y. 10566

One day Ticket — $5.00
Two day Ticket — $8.00
under 12 yrs. — $1.00 each day

STATIC COMPETITION

All models must be operable and RC controlled.

Trophies and/or prizes to be awarded. VCR's to be awarded in two categories: "Best-in-Show" flying and "Best-in-Show" non-flying. Top of the line RC Systems for 1st place in each category. Trophies for all other winners.

- WWI
- POST WWI (Military)
- POST WWI (Non-Military)
- PATTERN
- GIANT SCALE*
- OLD TIMERS
- JUNIOR EVENTS
- SPORT
- GLIDERS
- HELICOPTERS
- SCALE RC BOATS, (Military)
- SCALE RC BOATS, (Non-Military)
- RACING R/C BOATS
- STAND-OFF SCALE
- RC CARS 1/12" scale
- RC CARS 1/10" scale
- RC CARS 1/8" scale and larger
- BEST-IN-SHOW

*Entries may be limited due to space availability

To obtain pre-registration Static Competition forms, write: (include self-addressed stamped envelope) Allen Reinhardt, 2 Douglas Drive, Pleasantville, N.Y. 10570

Judging takes place Sunday afternoon.

Entries accepted until 12 Noon Sunday.

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

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

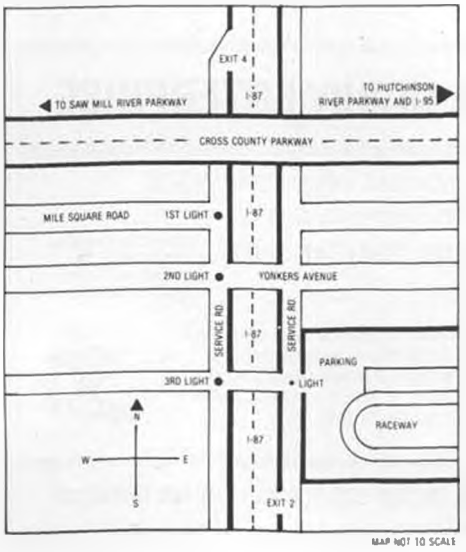
SWAP SHOP

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

SPECIAL NOTE

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

For further information, write (enclose self-addressed, stamped envelope) or call: Jerry Judge, 1 Nancy Road, Brewster, N.Y. 10509, 914-279-2717.



WESTCHESTER RADIO AEROMODELERS, INC.

February 27/28

10 A.M. to 6 P.M.

DIRECTIONS

The Yonkers Raceway is located in Southern Westchester County along the Eastern or Northbound side of the New York State Thruway. (I-87)

FROM THE NORTH:
I-87 South to Exit 4. Service road to 3rd traffic light. Turn left (over Thruway) to enter parking area.

FROM THE SOUTH:
I-87 North to Exit 2. At 1st traffic light turn right to enter parking area.

fuselage. For those guys who might have also had a broken Gemini MTS laying around with stabs in good shape, the fin geometry was designed to accept Gemini stabs, as the pin size and spacing are the same.

The structure of the Donzel wing is easily capable of withstanding 12-volt zoom launches. It has 1/8 by 3/8 spruce spar caps and balsa shear webbing with D-tube sheeting from root to tip. The wing is one-piece and bolts to the fuselage the same as the Gnome wing. The all-flying horizontal stabilizer structure is just like the Airtronics Aquila; i.e., tapered 1/16 balsa sheeting over diagonal 1/8-inch ribs.

The two Donzel wing center panels are each 20.25 by 8.75 inches, and the tips are each 17.5 inches long tapering from 8.75 to 6.75 inches. The trailing edge is (again) a straight line from tip to tip. Overall length for the Donzel is 43 inches including a 1/4-chord to 1/4-chord tail moment 27 inches long.

Ian is planning on producing partial kits to club members only, but anyone interested in the design is welcome to the plans and rib profiles if they mail off $5.00 to: Ian Douglas, 912 Syracuse, Claremont, California 91711. His phone number for any questions is (714) 621-2522.

Tod Allan of Lancaster (Mojave Desert), California, created a very interesting and beautiful original design based on an Eppler 214 airfoil. Evidently impressed with the performance of such designs as the Dodgson Windsong, Tod picked this airfoil for his thermal duration effort (which has no name), and even though it doesn't have camber changing ability, Tod is very happy with its performance. He actually prefers the simplicity of fixed camber wings for thermal duration contests. Back home he has a set of 12-foot wings which do have camber changing ability.

It spans 100 inches and carries 860 square inches of area for an 11-ounce wing loading. The root chord is 11 inches, and the wing tapers to seven inches at the tip. Those spoilers which you see in the picture fully extended are Multiplex brand double-bladed types. They are very effective at bringing down the long, flat glide path to a controllable spot-landing descent.

Structurally, the no-name glider has foam core wings with Dave Brown wet lay-up carbon fiber spars that taper from two inches at the root to one inch at the tip. One-sixteenth balsa sheeting is applied over the foam core panels as per Windsong technique. Airtronics 401 micro servos are buried in the wings for aileron control.

Tod's flying buddy, Mike Walter (also of Lancaster), flew a Cumic Plus with ailerons. This is an optional configuration which is shown on the kit plans. Mike made his ship with a 104-inch wing which is just a little bigger than the original 98-inch Cumic design by one rib bay per side. The all-up weight of Mike's aileron Cumic is 70 ounces, which over the 940 square-inch wing yields a 10.5-ounce wing loading. When asked why he made it an aileron ship, he replied, "Peer pressure made me do it." He flies in the Mojave Desert where the wind almost always blows 20 mph or more and where ailerons are an advantage in low-level approaches and landings.

Mike says that he extended the 1/16 plywood shear webbing on both sides of the spar caps out to the spoilers for added strength. He also added a brass tube to the wooden wing locator pin for added strength in this area. The stock center dihedral is kept (7.5 degrees) and provides adequate spiral stability in thermal turns for good handling characteristics.

Chris Pratt of San Jose, California, was also present with a modified Cumic Plus. His was really modified! He went so far as to change the airfoil to a Selig 3014 (no, I haven't run this one yet!). It spanned 107 inches and weighed something around four pounds. His comment on the ship's performance was that it had an "incredibly flat glide ratio."

Chris used an Airtronics MD7SP radio system for its mixing abilities. The flat center section featured flaps (on the spoiler stick) with the elevator compensation feature to help keep the nose pointed down while descending. The ailerons were used as spoilerons (actually flaperons in reverse throw) also with pitch compensation. He uses the rudder/aileron coupling switch to couple and uncouple rudder function to the ailerons. Independent rudder proved handy to have while launching.

Chris was new to the glider and really needed more practice with it to be accurate

in his landings.

Another flier who was seen using his Airtronics MD7SP radio in a flap/aileron ship was Tim Dolan of Folsom, California. He scratch built a 100-inch contest ship based on a Sagitta fuselage. This year's FSF was his first-ever contest, and considering he placed 108th against 151 experienced fliers he did well! Tim used the flap/elevator mixer to compensate for the pitch change caused by flap deflection. He also used the coupled rudder function of the MD7SP transmitter.

Tim's model used the popular Eppler 205 section and was really pleased with its performance. The wing loading was a moderate 11.3 ounces per square foot of wing area. The 100-inch wings tapered from 9.875 inches at the root to 7.5 at the tip for an area of 870 square inches, which means the model weighed 68 ounces judging from the wing loading.

Yours truly also flew the MD7SP radio in a Gnome 3-Meter which had this flap/elevator mixing. This 1220 square-inch poly ship also had spoilers and the spoiler/elevator mixing, but spoilers were not used to avoid the added complexity on landing approach. My first flights on this ship were at this contest, and, without any prior practice, I managed what I consider a respectable 32nd place. The flap/elevator mixing sure makes landing approaches easier!

Keith Kindrick of the Pasadena Soaring Society flew a new design finished just two weeks prior to the FSF. He named it "Hyperlaun." Unique about the Hyperlaun is the airfoil chosen, the Eppler 195. Keith says, "It makes a better floater than the Eppler 205." Because he is one of R/C soaring's better contest fliers, and because I've flown the E195 myself, I would have to say I agree. Why it isn't more popular in thermal soaring is probably due to the fact that it isn't a near-flat-bottom section as is the E205. In fact, the E195 is what is called a "semi-symmetrical" section.

Keith's Hyperlaun was designed from the ground up as a new ship. He made a mold to produce his own fiberglass fuselage and, once everything was in place, poured foam mix down the tailboom to make it uncrushable and stiff. The wing's structure is conventional, and the wing planform is the same as a Pierce Paragon except that the wings are nearly flat for aileron control. The span is therefore 120 inches, and the area is 1050 square inches. The weight of the finished model is 70 ounces for a 9.5-ounce wing loading. Keith says every control surface has its own servo and the only mixing he uses is rudder and aileron coupling. The flaps deflect a full 90 degrees and are 25-percent of the center section's root chord. Keith took sixth place, so his landings were better than the vast majority of the fliers there (50, 75, 50, 50, 25, 50, not one missed landing).

Tony Meininger of Pasadena, California, flew a very interesting variation of the Airtronics Sagitta 600 kit; a V-tail! It came about after a Swiss friend of Tony's had an accident with his ship and broke the tail off in a landing. It had always been a difficult model to balance correctly due to its short nose moment and lack of space for nose weight, so the idea to convert it to a lighter V-tail was one way to solve the perplexing problem. Marcel Scherer, a Swiss exchange student at PCC and former Swiss Slope Soaring Champion, was the modeler who did the redesign work. The resulting Sagitta 600 flies even better than the original did.

Another very interesting OD sailplane at the FSF this year was designed and built by Vern Oldershaw and flown by George Gillburg. The guys hail from the Southern San Joaquin Soaring Society (Bakersfield, California). Their ship, although unnamed, was really beautiful and graceful to see in flight with its 122-inch, 11.5: aspect ratio polyhedral wings and T-tail. Vern not only designed the sailplane but also designed the airfoil using the Davis airfoil formula. It is 8.9-percent thick with 2.7-percent camber and a little reflex in the trailing edge. (I have the coordinates.)

The structure of Vern's sailplane was impressive. It was conventional D-tube with spruce spar caps, but the rib spacing looked like about two inches. That's a lot of ribs spread over a constantly tapered 122-inch wing of 1291 square inches! The fuselage is a composite structure made from a carbon fiber reinforced fiberglass pod front section and a rolled plywood tail boom filled with urethane foam for stiffness. The flying weight is 77 ounces for an 8.6-ounce wing loading.

One last design before we go. . .Tony Stark of Pasadena designed a pod-and-boomer which he calls STT or TST (I forget

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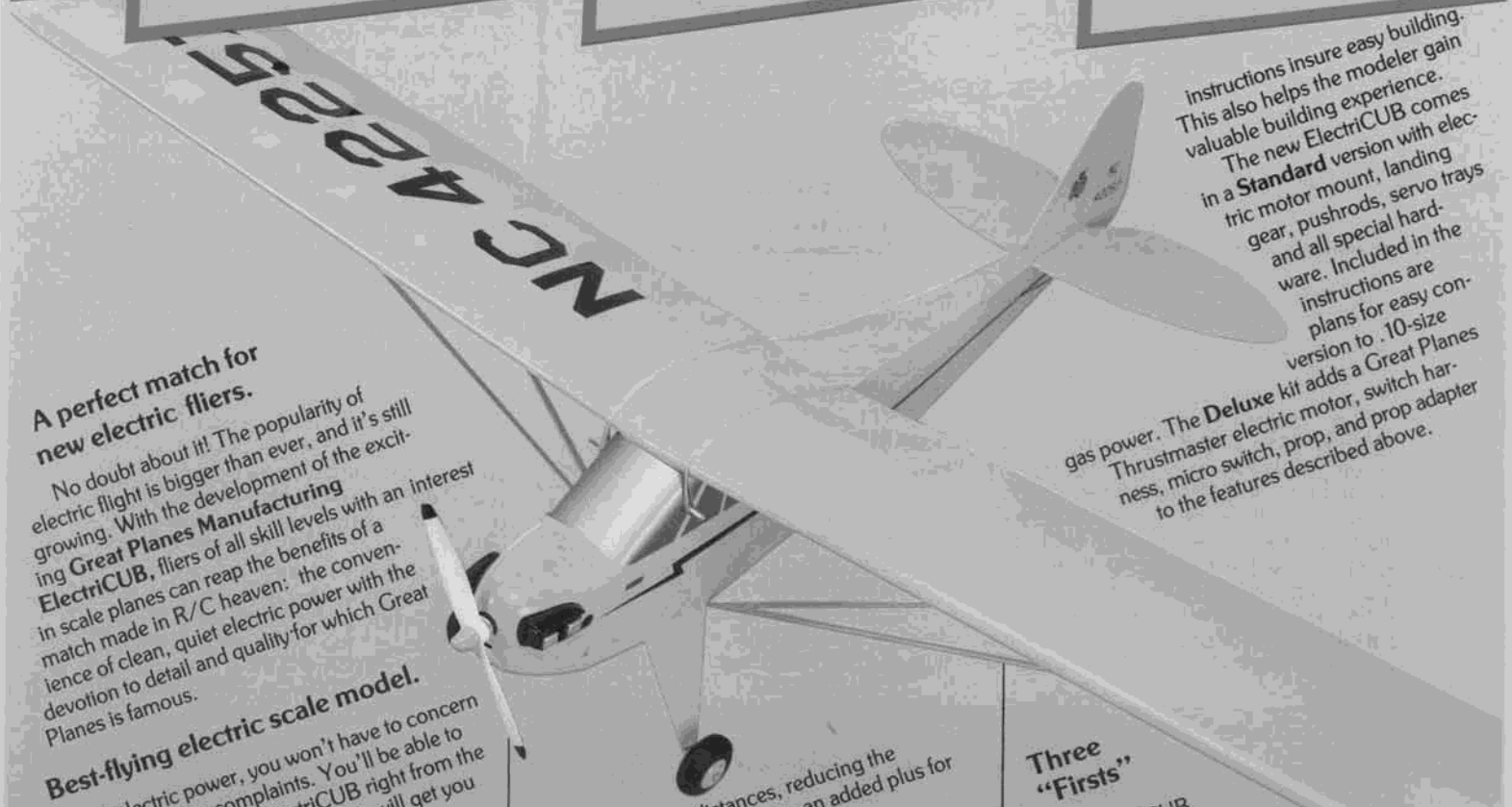

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No doubt about it! The popularity of electric flight is bigger than ever, and it's still growing. With the development of the exciting **Great Planes Manufacturing ElectriCUB**, fliers of all skill levels with an interest in scale planes can reap the benefits of a match made in R/C heaven: the convenience of clean, quiet electric power with the devotion to detail and quality for which Great Planes is famous.

Best-flying electric scale model.

With electric power, you won't have to concern yourself with noise complaints. You'll be able to concentrate on flying the ElectriCUB right from the start. Slow take-off and landing speeds will get you off the ground quickly and allow you to make smooth landings. In the air, the 59" span ElectriCUB's stable flight characteristics let you gain confidence as you gain experience. An excellent power-to-size ratio permits the pilot who's accustomed to gas power make an easy transition to electric power. Its distinctive shape makes it easy to see at long distances, reducing the chance of pilot disorientation—an added plus for the novice!

A complete modeling experience.

With top-notch, die and machine-cut balsa and plywood, the ElectriCUB is specially designed with plenty of durability to withstand rough handling. The interlocking fuselage simplifies construction, and Great Planes' step-by-step, illustrated instructions insure easy building. This also helps the modeler gain valuable building experience.

The new ElectriCUB comes in a **Standard** version with electric motor mount, landing gear, pushrods, servo trays and all special hardware. Included in the instructions are plans for easy conversion to .10-size gas power. The **Deluxe** kit adds a Great Planes Thrustmaster electric motor, switch harness, micro switch, prop, and prop adapter to the features described above.

Three "Firsts"

The ElectriCUB is the first electric-powered model ever produced by Great Planes. For the modeling community, it's the first electric-powered Cub. And for you, the beginning electric flier who's looking for a smooth flying plane with classic scale looks, the exciting, electrifying ElectriCUB should be your first electric-powered airplane!

Scale

Electric

Flight

Send for your FREE copy of Great Planes Model Manufacturing Catalog today!

which) and which was flown by Richard Burns also of Pasadena. This ship with its molded F/G pod and F/G fishing rod boom is actually a partial kit offering by the designer. You can get plans, molded clear canopy, molded pod fuselage, and tail boom for $75. Contact Tony Stark at 2001 E Galbreth Rd., Pasadena, California 91104, or call him at (818) 794-4828 for details.

Of course, there were scores of interesting sailplanes at Visalia which for lack of space cannot be mentioned here. Many were modifications of existing kits, a few more were combinations of several different kit parts in one ship, and all were fun to watch fly. The most popular kit design at the meet was the good-old Pierce Paragon in different forms. Here the most common mod was to put Phillips entry on the lower surface of the wing for better penetration. The second most popular kit was either the Cumic Plus or Windsong.

Steve Clasen won the contest flying (I am told) a Dodgson Camano. Joe Wurts took second with an aileron Zephyr 1300, and good-old "lets have some fun" Fredy Weaver was third with his Cumic Plus. Steve Clasen's dad Brad took fourth flying a Windsong. Randy Bratrud took fifth.

The trophies this year were quite nice. They were wall plaques made from some type of urethane varnish coated burls. The top three even had clocks in them!

Well, that's all the time, space, and energy I have for this month, so I'm going to end it right here.

Next month we'll try to get back to some of the regular features of this column like the airfoil of the month, contest corner, etc., but for now just go out and hook a thermal and have fun. Okay?

Bill Forrey, 5815 E. La Palma #281, Anaheim Hills, California 92807, (714)777-4514. I prefer phone calls to letters. •

Electronics. . . *Continued from page 28*

as a way of paying back for some of the enjoyment I have had out of the hobby for many years, I really don't have the time to spend on things that are merely a whim with someone.

My first thought was to put a price on things, in the belief that most people will pay only for what they need. But I immediately discarded the idea—I think of you as my friends, whom I have asked favors of before and will again when the occasion arises. And I certainly don't want it thought that I am running a get-rich-quick scheme here, though if you have an idea that'll get both of us to Brazil I'm willing to listen! After much deliberation, I believe I have come up with a solution that should not offend anyone, and benefit us all!

With each request for copies of anything, I will also accept from you a donation to the AMA Building Fund! You can determine the amount—a check for a buck or two, made out to AMA, can be easily slipped in with your request. If you've got to have 13 model plans, you ought to spring for at least a cubic yard of concrete! Unless I have to later on down the line, I am not going to set a price per sheet or anything like that.

There is one exception to the rule, however. Those of you overseas, will still not have to send in even the SASE, as I know that you cannot get US stamps and will have the same problem with dollars. I have been there and know full well how hard it can be to obtain materials and information.

I hope this meets with *your* approval. The idea is not to keep needed information from anyone, merely to remind those few that need it that at times, a little discretion is in order. I will even accept any belated donations!

While on the subject of copies, copyright laws prevent me from sending copies of current material from magazines or books that are still available, and even some that are not. This even includes *my* material here in *MB*, as strange as it may seem, once I have been paid for it and it is published, it is no longer mine.

RECOMMENDED READING

I know that there is a lot of interest in the new frequency plan, and in the design and availability of equipment that will allow us to coexist under it. Recently, a couple of excellent articles appeared in AMA's *Model Aviation* magazine that are well worth your attention, and I would like to point them out. You may have missed them, being buried as they were in the back and not indexed as such in the table of contents.

Make your first flight successful, easy and fun!

Never touched a radio control transmitter? Don't worry. You can successfully fly the Cox E-Z Bee your first time in the air! Uncomplicated single-channel control, superior aerodynamics and the dependable Cox .049 Babe Bee engine make your E-Z Bee the easiest radio control airplane to fly.

Unique 'up elevator' with every rudder movement enables your E-Z Bee to maintain altitude while executing turns. As a result your E-Z Bee will climb hundreds of feet under power. The light weight construction and lofty 55" wing span keep the E-Z Bee gliding gracefully long after the engine stops running.

As you gain more skill your E-Z Bee advances with you. Just add a second servo and reinstall the existing second push rod for completely independent elevator control.

Make sure your first flight is successful, easy and fun! Ask your local hobby store for the Cox E-Z Bee.

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Santa Ana, CA 92705

I am referring to Fred Marks' two-piece "AMA Guidelines for Narrow-Band Operation of 72-75 MHz Radio Control Equipment," which appeared in the September and October issues. You will find them in the AMA News section of each issue.

Part B in the October issue deals with the technical specification necessary for a receiver to meet the required criteria. This is especially interesting, because the volume of misinformation that has appeared on the subject now rivals that of similar erroneous material written about Ni-Cd batteries. The proper measurement of receiver quality involves highly complex testing procedures; shielded enclosures, carefully measured signal inputs, display and recording equipment—things not readily available to the average R/Cer. You cannot accurately and with any degree of reliability determine a receiver's capabilities while watching a servo wiggle as you walk of 10 paces to one side with one transmitter and 20 paces to the other with a second transmitter, all the time in an environment that is known to be saturated with signals of all types and strengths. Such tests may be of some value in comparing one receiver to another—at that time and place and under those conditions, but should not be accepted as accurate enough to brand any one receiver as capable of meeting any set specifications.

In his usual clear and concise way, Fred explains what the terms associated with system testing mean, and how the specified values have been arrived at, without once inventing any new phraseology not already common to VHF receiver technology. It is not exactly second-grade stuff—the subject, by its very natures, can and is complicated. However, if you have a few of the basics, go back and read these articles, I promise you will find them enlightening.

MORE OF THESE NEW FREQUENCIES

Along with their growing pains type of problems will be upon us before you know. Along with the loss of the "White and . . ." original 72 MHz frequencies and the opening up of yet more frequencies with channel numbers assigned for identification purposes, we are to get a new flag system. I am happy to report that by the time you read this, flags of the approved type will be available from a number of our suppliers.

Amongst the radio manufacturer/importers, Ace R/C, Airtronics, and Futaba have informed me that by this time all systems being shipped will be provided with a new flag on the system channel and that separate flags will be available for those systems purchased earlier. Additionally, Du-Bro Products has also announced a channel identification system to comply with the new regulations.

As seen in the accompanying sketches, courtesy of Ace R/C and Du-Bro, the new system consists of a ribbon at the top, with the channel numbers, black on white, prominently displayed under it. The top mounted ribbons will differ on the 72 and 75 MHz bands. For the former, it will be in red, with the words, '72MHz Aircraft Use Only" printed on it; the latter will be yellow with the words, '75MHz Surface Use Only." Those of us using 50 MHz will use a black streamer, as I understand it, without any lettering, as holders of the appropriate Ham licenses are not restricted as to the type of vehicle being controlled.

Part of the idea behind the program is to get us to start thinking of channels only, and not frequency, as obviously "12" is much easier to remember than "72.030" and less liable to create confusion on the flight line. And, of course, there is nothing that says you cannot use an Ace flag system on your Airtronics transmitter, or an Airtronics flag on your Futaba. Or one by Du-Bro on any of them! The idea is to get one on, regardless of the source, so that you can be legal. And *safe*! Speaking of safe, even with the correct flag on your transmitter and with the frequency control device in use at your field attached, it is still a good idea to let out with a loud and clear FIFTY-FOUR, or whatever channel you are using, just prior to turning on!

ALL THIS NEW EQUIPMENT

. . . and new rules, of course, bring up the subject of what to do with old equipment. Not everyone has been heard from on the matter, but Ace R/C has. Just recently it announced its policy in regards to some of the equipment it has been selling for close to 30 years, and how it is affected by the rules changes.

Those of you still enjoying pulse equipment will also have to get legal, and you can with the help of Ace R/C. Your Pulse Commanders can be put on the new channels, 38 to 56, at a cost of $10.00 for the transmitter and $12.50 for the receiver.

As for older Ace proportional equipment,

the first important fact is that as of October 1987, Ace will no longer service equipment on the old frequencies, which to make the matter clear, includes 72 MHz frequencies .080, .160, .240, .320, .400, .960, and 75.640. It will also no longer sell crystals or systems on these frequencies. This move will no doubt be criticized by a few unknowing or uncaring individuals here and there, but the fact is that these frequencies are no longer legal as you read this. Ace R/C's decision is a necessary one, and I want to commend Tom Runge and crew for making it.

As for the rest of the equipment, which includes Pro-Line, conversions are available to the upper band channels 38 to 56. Updates of Silver Seven equipment for operation on the lower narrow band transmission channels 12 to 34 can be made at a cost of $15, plus the cost of the necessary frequency change. Silver Seven receivers can be converted to and used on the lower frequency channels until 1991, or the new Model 91 receiver can be added at this time.

Ace R/C does not recommend that the Digital Commander receiver be converted to any of the new channels and offers a liberal trade-in deal to upgrade to a Silver Seven receiver, either in kit form or fully assembled and tested. Contact Ace R/C directly for the current costs of these and the other services mentioned. Better yet, get a catalog which tells it all; it is only $2.

NARROW BAND AND NON-NARROW BAND EQUIPMENT

This equipment, for which Channels 12 to 34 for the former and 38 to 56 for the latter have been assigned, will be further identified by a silver or gold placard. This little stick-on, shown here in neither gold or silver, is part of a transmitter certification program placed into effect by the R/C Manufacturers Association and the AMA. The intent is to keep compatible equipment grouped together—the bottom line being to prevent interference from one R/Cer to another.

Unlike the actual frequency assignments, this separation and identification of channels is not part of the Federal Law under which we all fly. Instead, it is a plan formed by knowledgeable and interested parties so that we at the flying field can coexist without raining airplanes on top of each other. Would you believe, not all of the manufacturer/importers are going along with the program, so it is going to be up to you, and to *you* to help police and enforce this plan, for the benefit of all of us. There is more harm from using a non-narrow band transmitter down on the narrow band channel portion of the band than vice-versa, and that specifically has to be watched for. If you purchase a system on a lower channel and it is not "stickered" as shown, you should contact the manufacturer/importer and inquire as to why he is not complying with the industry standards, and if, in fact, the equipment is technically qualified.

Having been around at the time of the birth of R/C modeling, I remember the days when everyone in the hobby and industry were friends and we shared it all; the successes as well as the failures. I guess in a way, it is a sign of growth and progress that at this late day there is the violent name-calling type of competition that exists in some branches of the hobby, and that some companies are taking a used car salesman approach—sell the sucker something and get him out of here—to marketing their products. To me, it speaks of a lack of quality, in the people and the product. I for one will be looking for stickers and other signs that indicate whether or not a particular manufacturer/importer is keeping up with approved plans and showing concern for my needs and my airplanes. In their absence, I will be buying something else. Caveat Emptor! •

Counter. . . . *Continued from page 9*

lot bust kits, including two sizes of jet pilot busts, along with a barnstormer/sportster bust in 1/8 scale, just perfect for .40-sized airplanes. The easy to finish pilots are made of vinyl latex and weigh less than a half-ounce. Painting and assembly instructions come with each pilot. See your dealer, or send $1.00 for a complete catalog to: DGA Designs, 135 E. Main St., Phelps, New York 14532.

* * *

From Campbell's Custom Kits, Box 5996, Lake Worth, Florida 33461-0181, comes the T-Bird, Russ Hansen's famous 1/2A Free Flight gas model. This FF kit is legal for Nostalgia Gas events, and also can handle the competition in AMA events. The T-Bird kit features machine-cut ribs, Japanese tissue, and select balsa, plywood, and spruce. The T-Bird kit is available at your hobby shop, or direct from Campbell's for $19.95 plus $2.50 for shipping.

* * *

Great Planes Model Distributors is importing the new Super Tigre G-49 engine, a sport engine for the beginner, or sport flier. The Super Tigre uses a nickel-plated, lapped piston for excellent compression without a ring. The Super Tigre G-49 also has Schnuerle porting and new swing-style mufflers that allow the exhaust to exit at any angle. See your nearest hobby dealer for a close look at the new Super Tigre G-49 engine.

* * *

Circus Hobbies has announced the availability of the Black 10S and Black 10FS high-performance main rotor heads for the Kalt helicopter. Designed to give years of outstanding performance, the Black rotor heads use ball bearings throughout; the 10S (See-Saw) is perfect for the hot dog flier who requires total precision while performing aerobatics, and the 10FS (Flapping and See-Saw) is suited for the FAI competitor with its extremely smooth, precise hovering abilities. For more information, contact Circus Hobbies, 3132 S. Highland Dr., Las Vegas, Nevada 89109.

* * *

Aerodrome Models presents the first in a line of small size, great-flying aircraft, the Baby Pacer. With a 50-inch wingspan, the Baby Pacer weighs only 2.5 to 3 pounds, and flies with a 15 to 40 FS or 19 to 25 two-stroke engine. The kit includes hand cut selected balsa and basswood, pre-formed landing gear, and tail wheel wire. For more information on this fine kit, contact Aerodrome Models, 2623 S. Miller Rd., Saginaw, Michigan 48603. •

Byron's. . . . . . *Continued from page 39*

the Pacific Ocean or ships? Evidently that's what Byron asked himself following the '86 season. Since then over 600 cubic yards of concrete have been poured and finished to become a facsimile of the Pacific Ocean complete with a 1/5-scale USS Hornet aircraft carrier, complete with its flight deck full of aircraft, operating radar antenna, etc.

The show begins with two scale PT boats patrolling the bay. Then from behind the high mountains, the Zeros start to appear, being launched from yet another scale carrier.

The P-51s and Corsairs take to the air with their bombs and rockets the sky in full of fighters, bombing, and attacking the Zeros. The big 1/5-scale C-47 complete with a full load of paratroopers takes off. Now the P-47s get airborne with the C-47 and get into the hunt. The sky is full of action with the jumpers making their jumps. B-25s lift off ready for their bombing runs on the Jap Carrier. Along with all the bombs and rockets there is plenty of ground fire supplied by "Big Ben." A specially designed rapid-fire flak gun that launches the equivalent of a quarter stick of dynamite 200 to 300 feet in the air.

There are even two 40-percent scale M-4 Sherman tanks, powered by 17 hp engines.

The PT boats attack the carrier and fire torpedoes along with the air attack. Direct hits on the carrier start the carrier burning, and the sky is full of black smoke. The action turns to the oil refinery. The refinery is hit many times by the bombers and fighters. With a victory in sight, the National Anthem plays and the six marines climb atop Iwo Jima and plant the American flag. With this taking place, the fighters and B-25 fly

PICK YOUR PLEASURE...

KILLER VEE RC06

RELAXING PERFORMANCE...

The Bumble Vee is the perfect small field airplane. Stable enough for a beginner to fly, yet capable of rudder and elevator aerobatics in experienced hands, the Bumble Vee is a refreshing change from the run of the mill sport plane.

Using either an .049 or .05 electric motor, a simple two channel radio with a mechanical mixer, and basic construction, the Bumble Vee requires a minimum of your money or time. But the fun you can have flying your Bumble Vee makes it the best entertainment value around.

PERFORMANCE PLUS...

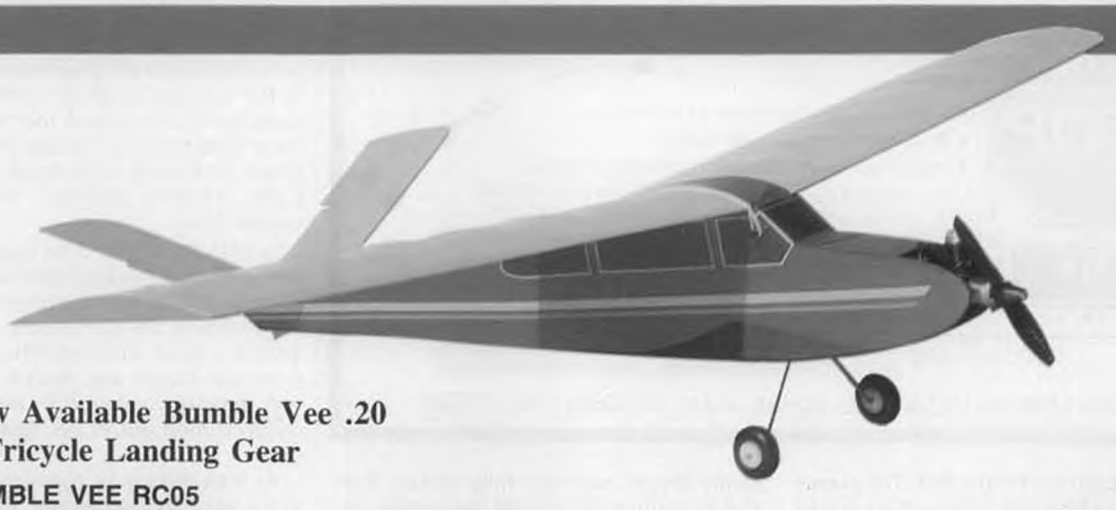
From its streamlined nose to its drag reducing V-tail, the Killer Vee is an all out sport pattern performer. Able to do inside and outside loops, easily maintain inverted flight, and string rolls endlessly across the sky, the Killer Vee will excite you every flight.

Just as impressive as the Killer Vee's performance is the fact that it will do it all with an electric motor! So now you can enjoy high performance flying with quiet dependable electric power. The Killer Vee truly delivers performance plus!

BIG KIT VALUE...

The Killer Vee and Bumble Vee pack the quality of our larger kits into smaller and more economical packages. All the wood is still hand selected and carefully machined. Hardware packages are still filled with top quality accessories. And of course full size plans and photo illustrated instructions make building a pleasure.

Both kits give you a choice of glow or electric power and include all the parts and instructions for either version. So whatever you pleasure, pick one of G.M. Precision's "Vees" and have a ball.



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above and go into a victory roll. The planes return to their base and Striking Back is over for another year.

The plans for the next show are already in the making. It is Byron's dream that Byron International becomes the "Oshkosh of Model Aviation." Knowing Byron, the dream is soon scheduled for reality.

Remember the dates, August 10 through August 14, mark your calendar now.

After the Striking Back show on Friday, the crowds witnessed a spectacular sight. Kenny Bryant, with the help of Ken Bunt and Byron himself, started the engines on the huge B-29. This model, constructed of fiberglass, has a span of 28 feet, it turns four four-bladed 36-inch diameter props driven through specially constructed prop drive units and electric starting system. The flying weight of the model is 383 pounds.

The model with all engines running was taxied down to the end of the 600-foot runway. Turned and headed down the runway with its four big Quadras humming and flaps partially down. In about 400 feet the big model was airborne. To see this in the air is some sight. The landing was just as spectacular as the takeoff.

Kenny Bryant does all the flying of the aircraft. Ken Bunt with a second transmitter handles the brakes, and a third transmitter is used to start the engines, each having its own on-board starter. Kenny is to be congratulated on his ability to fly this big R/C model. And Byron Godberson is to be congratulated for yet another spectacular show. Next year, plan on being here yourself. •

Plug Sparks. . . *Continued from page 32*

mirably to this form of flying.

CARTOON TIME

We didn't get much reaction on the last cartoon we ran (maybe too small?) but undeterred, we will again feature another on the antics of Pond as delineated by Joe Bickinella.

The 1/5-scale Sopwith Triplane is quite a handful, hence, this writer has decided to convert it to R/C four-channel. Should be more fun!

ENGINE OF THE MONTH

For this month's subject, the "Orr 65," we are again indebted to Robert McClelland, Secretary-Treasurer of the MECA for the kind loan of his engine to produce the drawings that help identify these old engines.

The Orr 65 was one of the postwar racing engines that appeared within a year of the cessation of hostilities. The first advertisement appeared in *Model Airplane News*, October 1946, followed by an ad in *Air Trails* in the November 1946 issue. These were about all the ads that appeared, as the Orr people were in some very tough company.

The California manufacturers, who were specializing in racing engines, were dominating the field of racing whether it be airplane, race car, or speed boat. Names like Hornet, McCoy, Hassad, and Atwood were taking out full-page ads as compared to the 1/2-page ad of Orr. Before the West completely dominated the racing scene, there were many racing engines on the East Coast, such as, Bungay, Bond, Ball, and locally, Howler engines were terrific competition.

In 1946 the demand for engines was still strong, but the modeler now had his choice of a plethora of speed engines. One of the big problems the Orr people ran into was getting a good distributorship. About this time, distributors and dealers were getting very heavily loaded with engines, some which turned out to be "dead" merchandise.

As it turned out, it was simply a case of those established engine manufacturers having the facilities and particularly the backing of money to survive the tough competition. This writer can name dozens that went down the tubes, such as, Ken, Atomic, Blue Streak, and Cave Cobra, all outstanding engines that were unable to keep up with the constant improvements.

The Orr 65 engine was produced by Orr Engines, Inc., 425 South Grand Ave., Lansing, Michigan, initially priced at $35. This

seems to be the standard price as established by Hornet and McCoy. One simply could not sell an engine that had not established themselves nationally for more money. Hence, more of a squeeze ensued as the profit on McCoy and Hornet engines was based on large production figures.

The Orr 65 engine featured a compression ratio of 12.5 to 1 with about the smallest crankcase of all racing engines. One of the claims made by the manufacturer was that the engine ran on high octane gasoline. This engine also was provided with a unique ball bearing rotary disk valve, an innovation not found in other rotary disk engines.

The whole engine appears to have weight reduction in mind, as the sand cast parts were sized to minimum, looking somewhat smaller than the standard 60 racing engines. With a total weight of 13-1/2 ounces (this compared favorably to the Hornet and McCoy engines at 17 ounces), the Orr people were also aiming at the airplane trade.

The Orr engine featured aluminum sand cast parts throughout with the exception of the connecting rod made of 24ST with oilite bronze bearings. The cylinder, bolted to the crankcase, was provided with a meehanite iron liner. The aluminum alloy piston came fitted with two rings to minimize blow-by and insure a high compression.

The Orr engine had a square bore and stoke of .937 inches giving a displacement of .647 cubic inches. The manufacturer claimed a rating of .85 horsepower at 13,500 rpm. However, propeller figures of size, shape, and pitch were not available. The manufacturer stated the engine had been run for a four-hour duration at full speed with no apparent failure or falling off in power. Truly impressive figures.

As noted before, with such a selection of engines being available at the beginning of 1947, there were only so many purchasers with many sticking to the tried and true manufacturers. Another very promising engine went out of business. They didn't lack for company, as many others suffered the same fate.

40 YEARS AGO, I WAS . . .

Received several photos from Howard L. Robinson, 11 Sherwood Drive, Shelly, Ohio 44875, from which we have culled and present Photo No. 8 showing a Baby Zipper. Howard says he built this model back in the late thirties, covered it with silk, and used an Atom 09 for power. He goes on to say:

"Won many contests after WWII. I flew it with an Albon diesel (English .049). Then I added to the firewall and installed a Wasp .049. After all these years, I finally lost it in a corn field (1987). Two grandchildren spent eight hours hunting in the field with no success. Corn in Ohio is very thick and this year quite tall due to plenty of rain and warm growing weather.

"I have joined SAM 39 and also reactivated my membership in AMA. The best they could do to get back my old number of 802 was to issue me number 80201.

"After spending considerable time in racing large boats, I am back into modeling with the grandchildren. I used to fly with the members of the old Shelly Balsa Buzzards and competed with the Cleveland Balsa Butchers, Lanzo, Korda, Reich, Elgin, et al.

"I have retired several times, first as Corporation President, and the second time as a Professor at an Ohio college. They say that old age is just mind over matter, but I say if you don't mind, it really doesn't matter."

1988 SAM CHAMPS

Hard on the heels of the report of the SAM 57 Variety O/T Contest, I finally received an announcement of the 1988 SAM Champs to be staged by SAM 57. Don Sachtjen, R.R. 5, Box 56B, Bloomfield, Indiana 47424; (812)384-3102, will be the man to contact for further information.

As it stands now, the MECA group will lead off with a "Grando" collectogether on July 18. This will then be followed by four days of flying, July 19 through July 22. The schedule of events will look like this:

July 19: F/F 30 Sec. Antique, F/F 020 Replica, F/F Pre-1937 Wakefield, F/F Compressed Air, F/F Twin Pusher, F/F Nostalgia (4-5 events), R/C 1/2-A Texaco, R/C Texaco, and the Bean Feed this night!

July 20: F/F Class C Pylon, F/F Class A Fuselage, F/F Small Rubber Stick, F/F Large Rubber Cabin, F/F Slag Engine, F/F Gas Scale, R/C Class A Ignition, R/C Class C Ignition, and R/C Class B Glow.

July 21: F/F Class A Pylon, F/F Class B Fuselage, F/F Small Rubber Cabin, F/F Large Rubber Stick, F/F Ohlsson 19-23 Cabin, R/C

MB File: SOW H2 D1

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(Required by 39 U.S.C. 3685)

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F. Copies not distributed		
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G. Total (Sum of E and F—should equal net press run shown in A)	110,848	150,340

I certify that the statements made by the above are correct and complete. Anita Northrop, General Manager

Class C Glow, R/C Class A Glow, and R/C Electric 05.

July 22: F/F Class B Pylon, F/F Class C Fuselage, F/F H.L. Glider, F/F Rubber Scale, F/F Commercial Rubber, R/C Class B Ignition, R/C Pure Antique, R/C Antique, and the SAM Banquet this night!

FIELD PROBLEM?

We don't have one out here, says Jimmy L. Brown, 940 Shady Grove Road, Hot Springs, Arkansas 71910. Jim sez he is not interested in the big 12- to 18-pound bombs that cause so much noise. He finds their .049 to .15 engines seem to be welcome out in the country.

The big thing is to fly like we hunt; i.e., knock on the front door, ask permission to use the property owner's field. You tell him or her that we will re-nail any loose strands of fencing. For that reason, we carry a small hammer and pliers combination with about 50 cents worth of staples. Does this ever make points!

There are about twelve places we can fly and know the hobby dealer has benefited by the flying action. Jim says if you were raised on a farm like he was, you would know about courtesy, caring about fence lines, and their property. This attitude will get you the red carpet treatment every time! Food for thought, men!

READERS WRITE

We built up quite a backlog of photos during the time I have been gone to the Australian SAM Champs, MAAA Nats at Waikerie, S.A., the USA SAM Champs at Seguin AFB, and the AMA Nationals at Lincoln, Nebraska. Time to do a little catching up.

Ted Lewis of 10 Winslow Road, Chelmsford, Massachusetts 01824, sent in two good photos of his Red Zephyr. We have picked the Photo No. 9 showing Ted with his second Red Zephyr. Ted built his first one 50 years ago, so Ted regards this as a sort of fiftieth anniversary.

Unfortunately, sez Ted, I don't have any original Brown Jr. engines so I have used a Herb Wahl reproduction. The model was flown for the first time at the SAM 7 Memorial Day weekend contest. The model flew great (didn't win) but best of all, the Wahl Brown reproduction engine started and ran flawlessly.

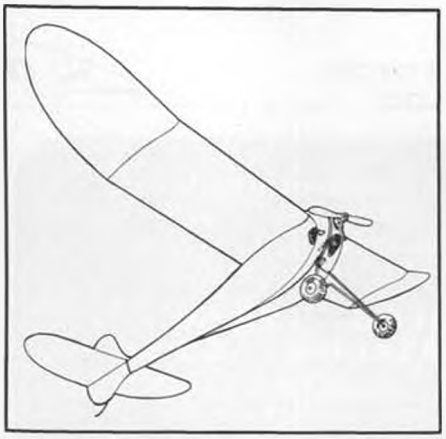
Thomas J. Schmitt, 11014 Marcliff Road,

PLANS CATALOG

ILLUSTRATED LISTING OF MODEL BUILDER PLANS

Continuation of our complete Full-Size Plans List, with an illustration of each model listed.

See the regular Full Size Plans advertisement for ordering instructions and special sales.



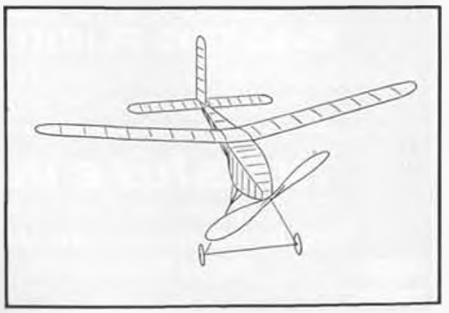
No. 673-OT ALBATROSS $7.50
Class C gas ship designed by George Reich. Redrawn by Phil Berhardt.

No. 7731 L.I.A.H.O. $5.00
Trike geared pusher R/C sport plane for Cox .049. Different! By Bob Janiger.

No. 7732 SQUARE CAT $5.00
Easy building profile carrier C/L for .36 engines. No gimmicks. By John James.

No. 773-OT LANZO 8' GAS MODEL $10.00
Chet Lanzo's famous "Record Breaker." Two large plan sheets. By Phil Bernhardt.

No. 8731 FOKKER D-VI $7.50
WW I biplane fighter at 2"=1' scale for R/C and .40 engines. By Philip C. Foster.



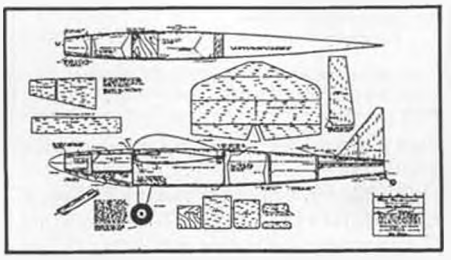
No. 873-OT 1931 RUBBER MODEL $5.00
Record setting 1931 fuselage rubber job Span 38". New plans by Phil Bernhardt.

No. 9731 QUARTER MIDGET P-40 $5.00
Easily built R/C model of famous fighter for racing, sport, stunt. By Jack Sheeks.

No. 9732 FAlman 7 $5.00
Small but potent power ship for .09 eng. Simple, inexpensive. By Bob Stalick

No. 9733 POU DU CIEL $3.00
Cute little all-balsa semi-scale model of famous homebuilt. CO_2. By Dan Walton.

No. 973-OT SPOOK 48 $7.50
Well-known gull wing design qualifies for Antique Old Timers. By Snyder & Muir.



No. 10731 SUPER DOUBLER $6.00
Shoulder wing, pylon racerish sport R/C for .35 to .40 engines. By Brad Shepherd

No. 10732 SCALE EDO FLOATS $3.00
Scale floats for Lanzo Puss Moth or your favorite ship - 22" long. By Hal Cover.

Rockville, Maryland 20852, sends in a most interesting photo (No. 10) of Hurst Bowers with a R/C Dennyplane powered with an O.S. 30.

Hurst Bowers, now the Curator at the AMA Museum in Reston, Virginia, will be remembered for the line of scale model kits he produced in partnership with Herb Clukey.

Although Hurst has left "Scale Line," Herb has continued to produce kits of this excellent line of "School Yard" R/C Flying Scale models. For more information, drop a line to Herb Clukey, P. O. Box 2136, Fairfax, Virginia 22031. He has some 1/2A old timers available!

SAM 1

Our next letter came from David L. Ramsey, 1165 So. Williams, Denver, Colorado 80210, submitting Photo No. 11 showing the SAM 1 group that participated in the 1987 1/2A Texaco Postal meet. This assortment of old geezers (maybe a young one or two) lines up as follows:

Front row: Wally Leiper, Les Payne, Jack Warkins (C.D.), and T. Edwards. Standing (back row) is J. Lang, K. Brueggeman, A. Grosheider, and M. Fields.

Sam 1 is as its name indicates, one of the pioneer SAM Chapters. They are enjoying a tremendous renaissance, thanks in no little part to the beautiful field in the background.

READERS WRITE (again!)

Russell Culp of 3634 Montclair Road, Cameron Park, California 95682, writes to give this columnist the address of the "missing" Winnie Davis of Big Gull Fame. Winnie can be reached at 9401 E. 37th St., Kansas City, Missouri 64133.

Russ also encloses Photo No. 12 of George Allen, member of the Topeka "Aeroknotz." The picture was taken at the same time Winnie was photographed at the Kansas Strato Championships in 1937 at Topeka Municipal airport.

Sad to say, George was a navigator for United Airlines and was killed when his plane was shot down on December 8, 1941, by the Japanese. Russ also goes on to say several other members of the model club were either pilots or navigators who also lost their lives over the South Pacific. It wasn't all R&R in those days!

FREE PLUG DEPARTMENT

One of the smaller modeling industries is Robin Pharis, the successor to Ray Van de Walker (deceased) line of Raven Models which was a spinoff of Competition Models run jointly by Sal Taibi and Van de Walker.

Pharis has also taken over the simple Potent line of rubber models willed to Robin by Charles Werle at his death. I received Photo No. 13 of the Commando which makes into an excellent sport flyer or for the competition, a good 1/2A Texaco model.

For a complete brochure, write to Pharis Models, 713 Figueroa St., Folsom, California 95630. A complete range of models from rubber to gas-powered are offered. Call him at (916)985-3569.

HELP!

Just a short notice to say that Hal Cullens (formerly of Marysville, California) is hurting badly for prospective members in his area. Hal is located at 4407 Heath Drive, Baker, Louisiana 70714. Hal is a real diehard O/T R/C enthusiast and is looking for people to come out and enjoy the fun with him!

SAM AUSTRALIA

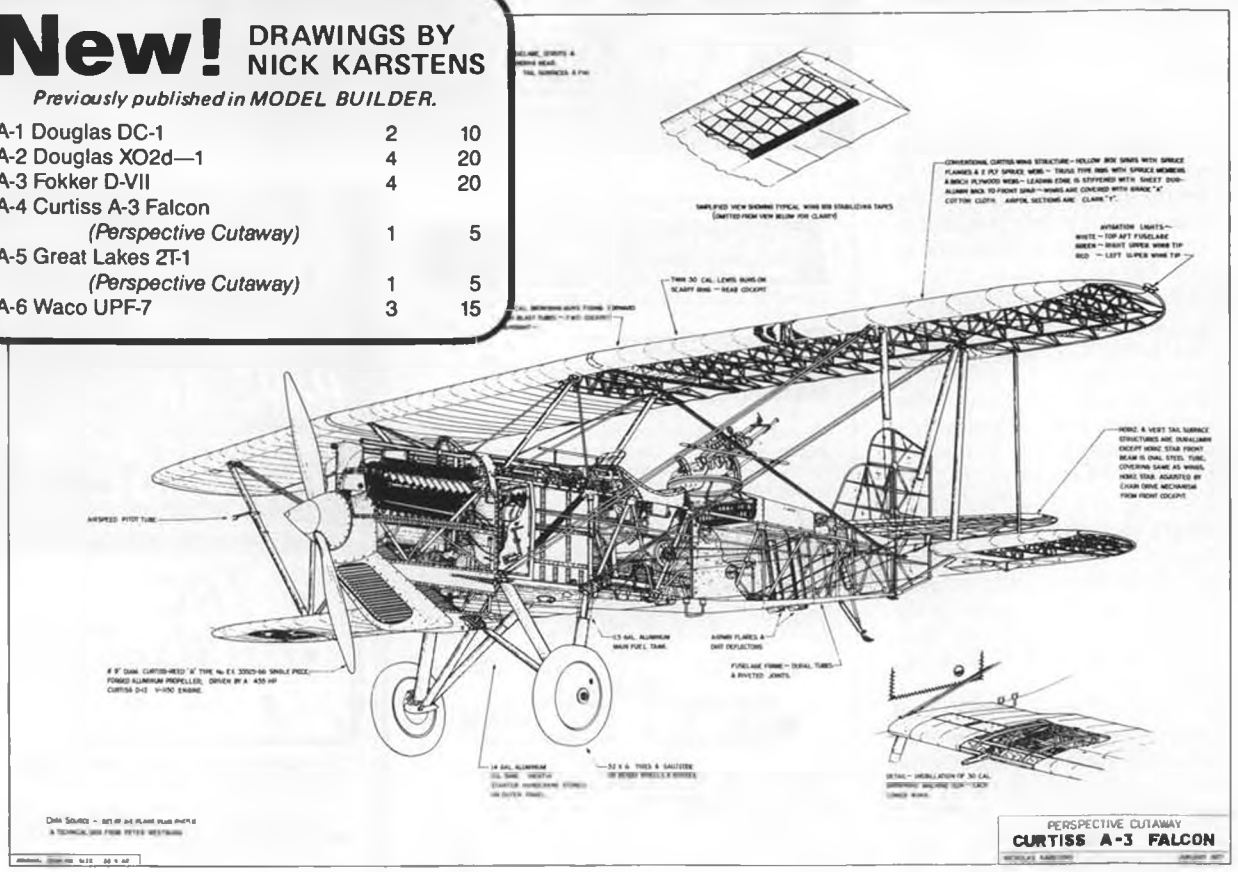
Received an interesting letter from Bruce Abell, former newsletter editor of the Australian SAM *Duration Times* publication. Bruce reports his club, NACA (Northern

Peter Westburg's
SCALE VIEWS

New! DRAWINGS BY NICK KARSTENS

Previously published in MODEL BUILDER.

KA-1 Douglas DC-1	2	10
KA-2 Douglas XO2d—1	4	20
KA-3 Fokker D-VII	4	20
KA-4 Curtiss A-3 Falcon *(Perspective Cutaway)*	1	5
KA-5 Great Lakes 2T-1 *(Perspective Cutaway)*	1	5
KA-6 Waco UPF-7	3	15



SUPER-ACCURATE AIRCRAFT DRAWINGS. USE FOR SCALE DOCUMENTATION AND/OR FOR DEVELOPING MODEL CONSTRUCTION PLANS. ALL DRAWINGS ARE 28 x 40 INCHES BORDER- TO-BORDER, AND ARE SCALED AS LISTED BELOW.

1/24 scale: ½" = 1 ft.	Sht	$
WE-18 Douglas O-35/B-71	5	
WE-23 Douglas XO-36-XB-7	1	5
1/12th scale: 1" = 1 ft		
WE-2 Boeing F4B-4/-3	4	20
WE-3 Boeing P-12E	3	15
WE-4 Curtiss A-8 Shrike	3	15
WE-7 Curtiss Gulfhawk 1A	2	10
WE-8 Curtiss N2C-2 Fledgling	4	20
WE-9 Curtiss O-1B/A-3 Falcon	3	15
WE-10 Curtiss P-1B Hawk	3	15
WE-12 Curtiss XP/YP-23	3	15
WE-13 Curtiss SBC-4 Helldiver		
WE-14 Czech Avia B-534	2	10
WE-15 Davis D-1K	2	10
WE-16 Douglas O-25C	3	15
WE-17 Douglas O-31A/O-31B	3	15
WE-19 Douglas O-38/O-38B		
WE-20 Douglas O-43A	3	15
WE-21 Douglas O-31C/Y10-43		
WE-22 Douglas O-46A	3	15
WE-24 Fokker D-17	3	15
WE-25 General Western Meteor	1	5
WE-28 Grumman F2F-1	3	15
WE-29 Grumman F3F-2	3	15
WE-34 Stearman 4E Mailplane	2	10
WE-36 Travel Air 2000	2	10
WE-37 Waco ATO Taperwing	2	10
1/10 scale 1.2" = 1 ft.	**Shts**	**$**
WE-1 Berliner/Joyce P-16	4	20
WE-5 Curtiss BFC-2 Goshawk	4	20
WE-6 Curtiss F9C-2 Sparrowhawk	4	20
WE-11 Curtiss P-6E Hawk	4	20
WE-24 Fiat CR-32	3	15
WE-26 Great Lakes Trainer	4	20
WE-30 Hawker Fury Mk I	4	20
WE-31 Hawker High Speed Fury	3	15
WE-32 Hawker Persian Fury	3	15
WE-33 Monocoupe 90A	2	10
WE-35 Swedish Sparmann P-1	2	10

ORDERING INSTRUCTIONS

Price includes 3rd or 4th Class mail. For Airmail or First Class in U.S., add 25% of total order. For Overseas Airmail (includes Canada and Mexico), add 50% of total order. Remit by International Money Order or U.S. funds drawn on a U.S. bank for overseas orders. Master Card or Visa orders add 5%, include card number, expiration date, and signature. Send payment to

MODEL BUILDER, 898 W. 16th St., Newport Beach, California 92663. Phone (714) 645-8830

CALIFORNIA RESIDENTS ADD 6% SALES TAX

AD INDEX

CLASSIFIED ADS

IMPORTANT INSTRUCTIONS: Non-commercial (personal items) rate is 25 cents per word, with a minimum of $3.00. Commercial rate is 40 cents per word, with a minimum of $5.00. No advertising agency discounts allowed. Name and address free, phone number counts as two words, abbreviations count as whole words and will be spelled out. All ads are payable with order, and may be for any consecutive insertion period specified. Send ad payment to: MODEL BUILDER, Classified Ads, 898 W. 16th, Newport Beach, CA 92663.

TORQUE STANDS: MEASURE engine horsepower .049 to .60 or .15 to 1.2. Precision machined from bar stock, adjustable engine mount, $250 or $325. For Kavan twin, O.S FT-240 and similar radial mount engines measure up to 5 horsepower at 8,000 rpm $625. Postpaid U.S.A. Armstrong Research & Technology, 2123 4th Avenue North, Irondale, Alabama 35210.

SCALE DOCUMENTATION: PLAN ENLARGING. Photo packs, three views, drawings for 1600 aircraft. Super Scale R/C plans for Giant, Sport. 43 page catalog $3.00. Scale Plans and Photo Service, 3209 Madison Ave., Greensboro, N.C. 27403. (919) 292-5239.

WANTED: Ignition model airplane engines and model race cars made before 1950. Jim Clem, 1201 E. 10, P.O. Box 524, Sand Springs, OK 74063; (918) 245-3649.

STRIPPED GLOW PLUG THREADS REPAIRED with stainless steel Heli-coils. 2-stroke heads $7.50. 4-stroke heads $10.00 postpaid. Send head only. C.F. Lee Mfg. Co., 7215 Foothill Blvd., Tujunga, California 91042.

WANTED: Model of Martin China Clipper in plastic or wood. (509) 547-5980. R Ellison, 8413 W. Adams, Pasco, WA 99301.

DISCOURAGED BEGINNERS, send $1.00 plus stamp for Ease-Of-Flying Ratings of over 25 popular R/C trainers J Waterman, 3818 Deerfield Dr., San Antonio, Texas 78218.

NEW Gull-Wing BULLDOG, GEE BEE "Z", R-1, R-2, MONOCOUPE Clip-Wing, CULVER, BREWSTER, etc. Most accurate, updated plans available. Illustrated Catalog $2.00 & LSASE. Vern Clements, 308 Palo Alto Dr., Caldwell, Idaho 83605

MAGAZINES/BOOKS: Aviation, Model (1929/1980). Lists $1.75 & LSASE. V. Clements, 308 Palo Alto Dr., Caldwell, Idaho 83605.

BUILDING BOARDS. Flat, Warp Resistant, 3/8" Pinnable Surface, 16"W, 48"L. Free Brochure. Limestone Enterprises, Box 586-MB, Athens, Alabama 35611.

TODD RESEARCH, specializing in technical information for hobbyist, inventors, tinkers, etc. Write: Ron Todd, 14 South Penobscot St., Orono, Maine 04473.

WANTED: Polish Fighter PZL1, Sterling U/C. Scale Model C7; complete kit. Kay C. Yarborough, 5967 Fox Hill Ln., Dallas, Texas 75232

$1 BRINGS LATEST CATALOG of scale reference and model books, accessories, aero rubber stamps and more. Send today. You'll be happy you did! Hannan's Runway, Dept. MB, P.O. Box A, Escondido, California 92027.

PEANUTS & PISTACHIOS II. Photos & Plans Promoting Patience & Pleasure Producing Petite Planes! $4.95 plus $1.50 P & H. Bill Hannan, Box A, Escondido, California 92025.

ENGINES: IGNITION, GLOW. Collectors, runners, used, new. Sell, trade, buy. SASE for list. R.L. Eirman, 504 Las Posas, Ridgecrest, California 93555. (619) 375-5537.

SCALE DRAWINGS AND PHOTOGRAPHS — Flying wings, Autogiros, Ducted Fans, One of a kind and others. Catalog $2.00 from Unique Aircraft; 8106 Teesdale Ave., N. Hollywood, California 91605.

1930s MODEL SHOP! Sawed prop blanks, WWI/Balloon/Streamline balsa wheels, Hinoki wood, color nitrate, sticks, tissue, bobbins, prop hinges, bamboo, old Scale/Contest plans, and more! Illustrated mail order catalog: $2. Oldtimer Model Supply, P.O. Box 7334, Van Nuys, California 91409.

Area Contest Aeromodelers) held an annual rally but suffered in attendance because of the numerous contests for old timers in and around Sydney, N.S.W.

Although Bruce lives in Cessnock, N.S.W., he finds that the Sydney boys are reluctant to travel the 120 miles for a day's flying with the NACA group. (Does this sound familiar in California!)

Bruce sent in Photo No. 14 showing Ford Lloyd with a nice flying Bowden International Winner designed by Carrol Krupp. Ford, in a personal interview, reports that the Krupp model is a delightful R/C O/T model to fly. Note the muffler, men! Helps

save model flying fields!

Abell also has the same complaint as modelers seem to have; trying to sort out the complicated rules put up by these very people in an attempt to handicap the hot shots. About the only way you can encourage the newcomer is to put up events (special?) that allow him to compete with a chance of winning.

SOUTH AFRICA

If there ever was an award for outright persistence, then I would nominate Len Edelstein as "Hero of the Year." According to Stan Masters, P. O. Box 52253, Saxonwood, Johannesburg, South Africa 2132, Photo No. 15 shows Len with his fourth Valkyrie. Did you get that, the fourth!

This columnist has run photos of Len before showing the various models built. The late Jack Abbott submitted a photo of Len's first Valkyrie which was subsequently published in this column, April 1983 issue.

Shortly thereafter in October 1984, a photo of Edelstein appeared showing his second Valkyrie replacing the one that had crashed badly. The cause of the crashes appears to be weak wings as his third folded in practically the same way as his first and second.

According to Masters, each plane has been built exactly to plan. Modifications to strengthen the wing structure have been made to overcome the weakness in joining the halves. Spruce has been used instead of the 1/8 square balsa spars, fully boxed with lightweight plywood to give a good foundation for the 1/8 aluminum tongues epoxied in the one wing half. The latest idea is where the plywood box has now been incorporated in both halves, and secured with nylon bolts.

The net result has been a series of very successful flights with Valkyrie No. 4. The wing folding problem appears to be licked. Interestingly enough, the wing and stabilizer are covered with clear MonoKote with blue trim to show the classic construction of a Valkyrie wing.

The four-cycle, .60-size engine used to power the model appears to be more than enough to fly well. A three-channel Futaba radio is employed for rudder, elevator, and motor control. Stan says when the model hovers in the sky (a remarkable slow gliding design), it is a sight to behold! Let's hope this one lasts!

THE WRAP-UP

Received a note from Jim Reynolds informing me that Kelso Barnet passed on recently. The San Antonio boys (SAM 1836) are going to miss this spark plug!

Not to take any limelight from the upcoming SAM Champs at Lawrenceville, but keep yourself open for June 19 through 22 at Reno, Nevada, for the 1989 *International* SAM Champs. Best fields yet! •

NEW ORDERING INSTRUCTIONS

U.S. orders, including APO and FPO, add 20% of total order for shipping and handling. Overseas orders (includes Canada and Mexico) add 50% of total order. Remit payment by International Money Order or U.S. funds, drawn on U.S. bank. Please, no cash or C.O.D.'s. Mastercard or Visa include card number, expiration date, and signature. Add 5% to credit card orders. California residents add 6% sales tax.

No. 5872 ERLA 5A $4.00
Jumbo rubber scale German lightplane. Span over 36 inches. By Walt Mooney.

No. 587-O.T. STRUCK'S 'JENNY' $3.00
From Henry Struck's 1/2-in. scale Trail Blazer series in late '30's Flying Aces.

No. 4871 LASER 200 $7.00
Winner of '86 Polish Nats in C/L Stunt. Wing cores available. By Piotr Zawada.

No. 4872 NAKAJIMA 50 $5.00
Sleek WW-II low wing Japanese Navy recon, 24" rubber scale. Ted Schreyer.

No. 487-O.T. STINSON TRAINER $4.00
Rare 20-inch span rubber scale model from '37 M.A.N. By Davidson/Appel.

No. 3871A WHATHEHELL
No. 3871B NECROMANCER $6.00
A pair of quick-building 1/2A flying wing R/C designs. By Bruce Tharpe.

No. 387-O.T. FLOUNDER $6.00
Second Place 1940 Nats Class A Senior winner, "cabin." By Pinky Fruchtman.

No. 2871 SWEETY $6.00
Low cost and easily built 035 electric R/C sailplane for single ch. Bruce Gray.

No. 287-O.T. SKY CHIEF $6.00
A 1936 cabin gas model kitted by Ideal in 1937. Span 61". By Steve Kowalik.

No. 1871 BIG APPRENTICE $15.00
Enlarged version of Bill Northrop's popular R/C trainer, 4/S 60. Bob Benjamin.

No. 187-O.T. FOOTE'S WESTNR $7.00
Big contest-winning Class C pylon, has unusual fuselage design. By Don Foote.

No. 12861 SIERRA TRAINER $7.00
Tailless R/C trainer for .20 eng., 3-4 ch. Foam wing cores avail. By Bill Evans.

No. 1286-O.T. AERONCA T'NDM $6.00
Scale gas free flight, span 49", from Feb 1942 *Air Trails*. By Ronnie Albert.

No. 11861 FOOTROT FLIER $4.00
Delightful 020 electric, rudder-only from New Zealand. 35-1/2-inch span. J. Reid.

No. 11862 11cc TUNNEL BOAT $15.00
A fast 36" tunnel boat design for 11 cc outboard motor power. Jerry Dunlap.

No. 1186 O.T. BEBE SPECIAL $6.00
A 36-inch span rubber free flight capable of 2-minute flights. Alan Orthof.

No. 10861 ELECTRIC PORTER $6.00
R/C Pilatus Turbo Porter scaled to 65" span, for 05 and up. By Steve Gray.

No. 10862 PLAGIARIST WAKE $5.00
Simple to build, but very competitive. Best ideas combined, by Bob Isaacks.

No. 1086-O.T. C-RAIDER $6.00
Very "Gladiator"-like Class C contest winner. M. LaTorre & M. Schoenbrun.

No. 9861 CHOCTAW WARRIOR $12.00
Tail-dragger pattern ship for slow aerobatics, .60 and up. Johnny Litchenburg.

No. 9862 MIDWEST ESQUIRE $10.00
Famous R/C Aircraft Series No. 6. Most built rudder-only trainer, for 10-15 eng.

No. 986-O.T. THE REQUEST $6.00
Cabin-type Class A/B high climber from Sept. '41 Air Trails. By Frank Ehling.

No. 8861 VINDICATOR $7.50
Hi-tech, Cobalt 15-powered aerobatic electric. 'Glass fuse avail. Les Adams.

No. 886-O.T. SNUFFY VI $5.00
Sharp pod/boomish pylon Cl. A/B gas, 50" span, '40-41 design by Bob Toft.

No. 7861 VIKING $4.00
Sleek swept, tapered foam wing 2-ch. R/C for TD .049. By Mike Saponara.

No. 7862 GUARDIAN MK 8 & 9 $5.00
Latest versions of top C/L Profile Navy Carrier. Contest proven. By Bill Melton.

No. 786-C.P. MEGOW SPITFIRE $5.00
A 50-inch span Golden Era classic rubber scale. All ribs and formers shown.

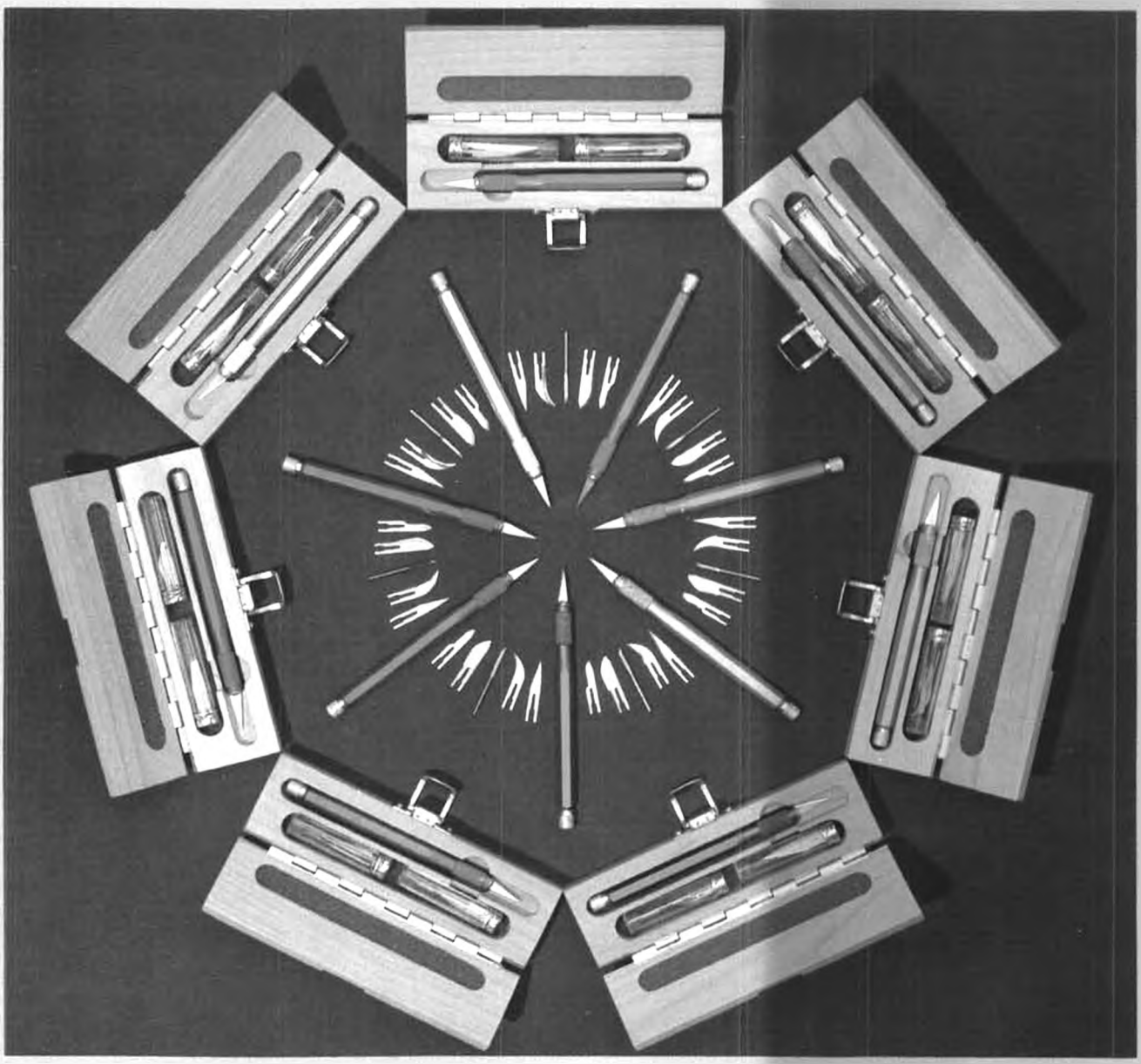
No. 786-O.T. KORDA D/T $4.00
Slightly larger version of Korda's 1939 Wakefield winner, with early type D/T.

No. 6861 BUMBLEBEE $11.75
R/C Sport Scale model of an unusual Czech cropduster, 60-90. L. Mikulasko.

No. 6861 R/C GLIDER WINCH $4.00
Developed as standard for the 2-Meter World Cup, it's great for all. Buddy Fox.

No. 868-O.T. SUPER ZOMBY 'A' $5.00
Fast climb & floating glide made it one of best '41 designs. By Leon Shulman.

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



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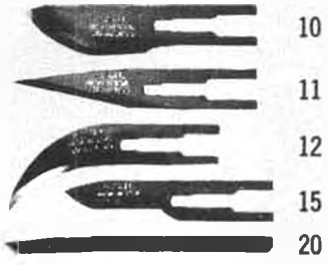

Available in seven satin anodized handle colors: silver, blue, red, green, gold, black, & violet. Complete set in fitted hardwood case, includes uber Skiver, together with two vials containing four No. 11, and one each of Nos. 10, 12, 15, and 20 . . . . . $16.95
Individual handles (specify color) $6.95
Vial of 6 blades (No. 10, 11, or 15) $4.00
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(Far left) 6NLK/FM 6 channels of Conquest performance with dual rates, S148 servos and FM. 6NLK/AM also available.

5NLP/PCM brings contest features like Pulse Code Modulation and dual rates to sport flyers.

4NL/AM Aircraft system can be specified with S33 micro servos and R4H micro receiver for sailplane use.

Outrageous

MRC-Tamiya's LUNCH BOX

Who else but Tamiya could design a classic 1/12 scale Dodge van and put it atop monster tires a full 4.5″ in diameter and 2.7″ wide? And who but Tamiya could style it so that it begs to be customized, and comes ready for you to do the body work?

You can paint this baby anyway you'd like, and modify it by adding wild windows, radical spoilers and so much more. Add the already chrome-plated front and rear bumpers and exhaust mufflers onto its rugged body and you're set to impress.

Now, once you've got the right look, look underneath. You'll find a front independent suspension. On each end, 5″ high coil springs buffer the blows of off-road. And a 540-type motor turns out torque to drive the monster tires over and around the bumps, bogs and boulevards, throttled by a 3-step forward and reverse speed control.

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