MODEL BUILDER

ICD 08545

JULY 1983

$2.50

volume 13, number 138

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BYRON ORIGINALS

A product of Midwest Industries, Inc. Ida Grove, Iowa. 51445 Ph. 712-364-3165

FULLY AEROBATIC ¼ SCALE

CAP 21

Dean Copeland and Byron Originals winning CAP 21

1982 NATS WINNER

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- Exclusive plug-in wings/aileron linkage
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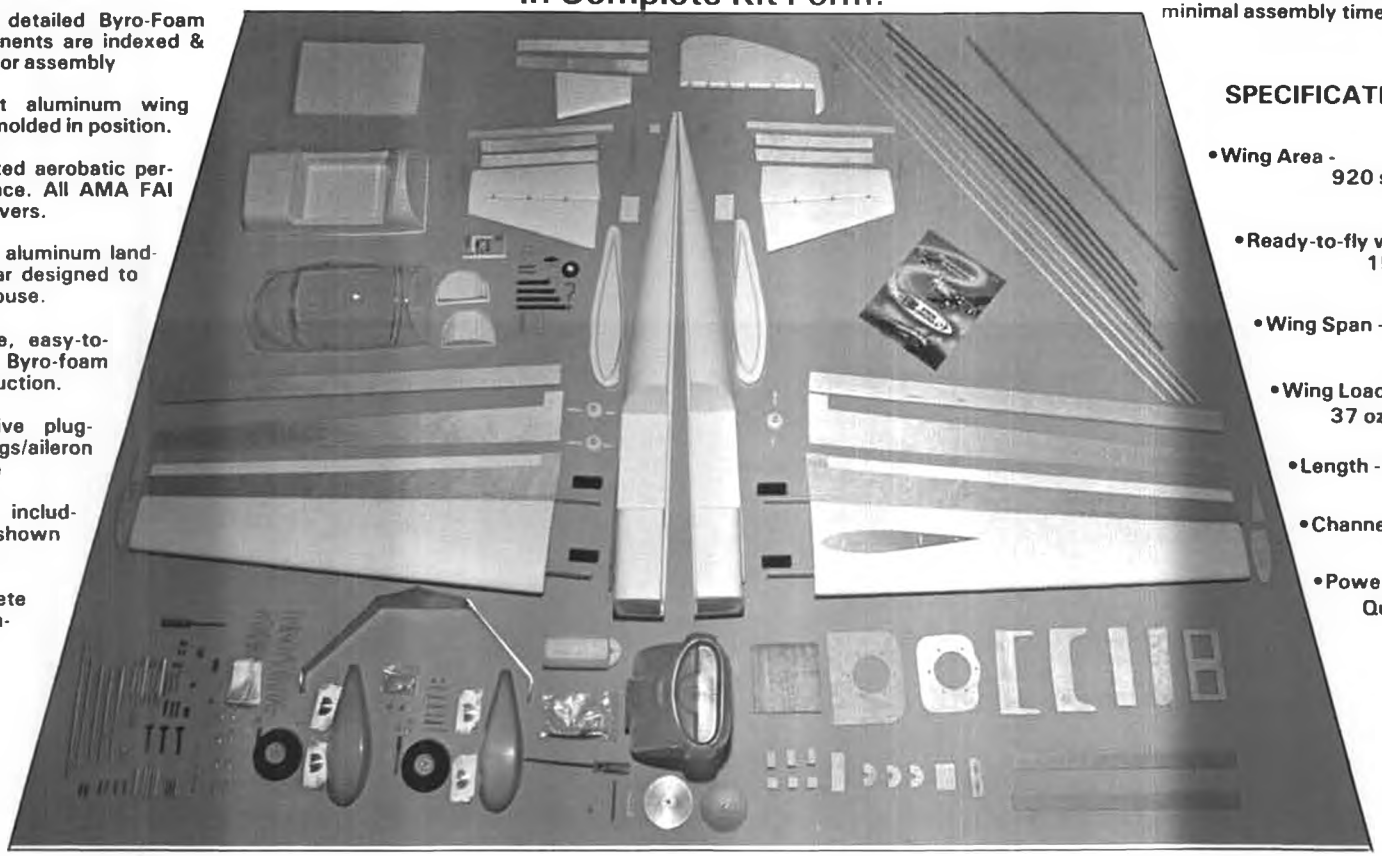

SPECIFICATIONS

- Wing Area - 920 sq. in.
- Ready-to-fly wt. - 15 lbs.
- Wing Span - 80"
- Wing Loading - 37 oz. psf.
- Length - 65"
- Channels - 4
- Power - Quadra

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SCALE VIEWS

CONSTRUCTION

Cover: The subjects featured in Bob Benjamin's painting this month are Fred Ludtke and his Monocoupe 90A. Fred learned to fly as an Aviation Cadet in the late Beverly Howard's Air Force Contract Flying School. In 1959, he began a two-year restoration on a "basket case" Monocoupe and Warner radial engine. After many hours of practicing aerobatics, he began performing at air shows during his summer vacations from work. A school teacher by trade, he has now flown air shows in the 43-year old Monocoupe for 19 years, and has become the dean of Northwest air show pilots.

MODEL BUILDER (ISSN 0194 7079) is published monthly by RCMB INC., 621 West 19th St., Box 10335, Costa Mesa, California 92627-0132. Phone (714) 645-8830.

Subscriptions: $25.00 per year. $47.00 for two years. Single copies $2.50. Subscriptions outside the US (except APO & FPO) $32.00 for one year only. All payments must be in US funds, drawn on a US bank.

Change of address notices must be received six weeks before date of issue that new address takes effect. Send old address with new; old label preferred. Post Office will not forward copies unless you pay extra postage. Duplicate issues cannot be sent.

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The Super Chip is one of the Kwik-Bilt™ series, which speed construction through use of a foam wing and plastic fuselage halves which are mounted on a central balsa profile.

SUPER CHIPMUNK WINS

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1ST, 2ND, 3RD and 5TH Unlimited Monoplane 1981 Sig IMAC Championships
2ND, 4TH and 5TH Advanced Monoplane 1981 Sig IMAC Championships
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1ST and 3RD Unlimited Monoplane 1980 Sig IMAC Championships

RC SUPER CHIPMUNK

KIT KBRC-1

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ENGINE: .61
WING SPAN: 64"

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WING SPAN: 51"
ENGINE: .60

THE SKYBOLT HAS BEEN A WINNER AT ALL EIGHT SIG IMAC CHAMPIONSHIPS

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1st Place Advanced and Unlimited Biplane 1980 Sig IMAC Championships

KIT RC-30

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KIT KBRC-4

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1ST Sportsman Monoplane 1981 Sig IMAC Championships

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CESSNA 150

$99.95

WING SPAN: 65"
ENGINE: .50 - .60

SMITH MINIPLANE

TOP WING SPAN: 44"
ENGINE: .40 - .45

KIT RC-38 **$72.50**

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ENGINE: .60

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PH: 615-482-2900
NASHVILLE
The Toy Mart
113 Graylynn Drive
PH: 615-883-1648
TEXAS
ABILENE
The Hobby Center
Westgate Mall
ARLINGTON
The Hobby Hub
903 A Pioneer Parkway West
AUSTIN
J & J Hobbies
610 Kennelon Dr.
CORPUS CHRISTI
Leisure Time Hobbies
1326 Airline
DENTON
Yellowbird Hobbies
117 W. Hickory
EL PASO
Hall's Hobby Shop
No. 57 Sunrise Center
PH: 915-755-1914
FORT WORTH
Hobby Stop
400 C. Seminary Dr. E
PH: 817 334-0197
FORT WORTH
Mott's Hobby Shop
7241 Grapevine Highway
PH: 817-281-0921
HOUSTON
Clear Lake Models
117 Camino S. Shopping Ctr
PH: 713-488-6315
HURST
Roy's Toys (For Big Boys)
1309 Norwood
SULPHUR SPRINGS
Miller's Hobbies
624 Bellview St
UTAH
OREM
Miniature Aircraft Prod
811 W. 400 N
PROVO
The Model Shop
42 W. 300 N
VERMONT
NORTH FERRISBURG
Yandow's House of R/C
Route 7
SWANTON
The Hobby Shop
RFD 1 Rt. 7
PH 802-524-2715
VIRGINIA
ANNANDALE
Model Masters, Inc
6920 Braddock Rd.
RICHMOND
The Hobby Center
1709 Willow Lawn Dr.

VIRGINIA BEACH
Hobby Craft Centers
#1 967 Providence Sq. s/c
#2 62 Princess Ann s/c
WASHINGTON
BELLEVUE
R/C Model Shop
14020 N.E. 21st St.
PH 747-9914
BELLINGHAM
Hobby Hive (Graham's)
111 E. Magnolia St.
KENT
Kent Hobby
1313 W. Meeker
PUYALLUP
Fairgrove Model Supply
10611 136th St. East
PH 845-7675
SEATTLE
Webster Supply Co
17818 Aurora Ave. N.
TACOMA
Bill's Hobby Town
14914 Pacific Ave
PH 206-531-8111
WALLA WALLA
Harley's R/C
Route 1, Box 277A
PH 509-529-2618
WEST VIRGINIA
CHARLESTON
Fountain Hobby Center
200 W. Washington St.
WISCONSIN
GALESVILLE
R/C Unlimited
825 Park Drive
PH: 608-582-2853
MARSHFIELD
Mid Wisconsin Hobby Center
Northway Mall
503 E. Ives St.
MENOMONIE
True Value Hardware
1512 9th Street
L Mart Shopping Ctr
MILWAUKEE
Casanova's Hobby
1423 S. Muskego Ave.
PH 414-672-2700
WAUSAU
Pope's Hobby Land
640 South 3rd Ave
CANADA
BAWLF, ALBERTA
B & P Transport Ltd
Box 6
PH 373-3953
CALGARY, ALBERTA
Hobby World Canada
Box 968 Stn M
CALGARY, ALBERTA
P.M.S. Hobby Craft
Calgary North Hill Centre
WINNIPEG, MANITOBA
Cellar Dweller Hobby, Ltd
1354 Main St
PH: 589-2037
WINNIPEG, MANITOBA
Gooch's Hobbies
646 Portage Ave.
ST. JOHN'S, NFLD
Capitol Hobby Centre, Ltd
6 Freshwater Road
DUNDAS, ONTARIO
Skycraft Hobbies Inc
139 York Road
SCARBOROUGH, ONTARIO
Toronto R/C Hobby
1869 Lawrence Ave. E
PH: 416-755-1766
WILLOWDALE, ONTARIO
Keith's Hobby Shop
5205 Yonge St.
PH: 222-4721
ARVIDA, QUEBEC
LeModele Radiot Enr
118 Mathieu CP 341
PH: 418-548-2136
HAUTERIVE, QUEBEC
Le Centre Du Modeleste
Allard 1223 Lestrat
MONTREAL, QUEBEC
Can Air Hobbies
5850 Gouin Blvd. Ouest
PH: 514 332-3565
ST. GEORGES, QUEBEC
Le Mur du Son
1050 157 Rue
PH: 418 228-1374
SASKATOON, SASKATCH
Collins' Aero Craft
238 First Ave. North
PH: 652-4775
YORKTON, SASKATCH
Radio Control Hobbies
39 Betts Ave
AUSTRALIA
BRISBANE, QUEENSLAND
Underwood 4119
The Hobby Warehouse
30 Kingston Road
COLUMBIA, S. AMERICA
Aeromoda Ida Britannia Ltda
Apartado (P.O. Box) 52530
Bogota 2, Columbia
PH: 212 7309
ENGLAND
LONDON, N7 6NP
Henry J. Nichols & Son Ltd
308 Holloway Road
ISRAEL
REHOVOT
Tsahey Rehovot
70 Derech Yavne
NEW ZEALAND
INVERCARGILL
Model Shop
55 Arcade Dee St
PH: 89439
SWEDEN
S-871 02 HARNOSAND
Modell Produkter
Box 2060
VENEZUELA
CARACAS 1070-A
Hobby World C.A. (Dist.)
Apartado Postal 75054
PH: (02) 34 33 02

THE HOBBY DEALERS LISTED ABOVE HAVE IN STOCK OR CAN OBTAIN ANY SIG PRODUCTS.

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

from Bill Northrop's workbench . . .

T.O.C. '84

Preliminary rules have been issued for the Eighth International Tournament of Champions, scheduled to take place in Las Vegas, Nevada, Nov. 7-11 (very appropriate dates for Las Vegas!), 1984. Although the contest will be basically the same as it was in 1982, there have been some significant changes that should further enhance the program. According to a recent conversation with T.O.C. Contest Director, Phil Kraft, there has been no overwhelming objection to any of the proposed changes, so they are very likely to remain in effect.

The most notable (and most exciting to this old biplane lover) change is in the aircraft specifications. To encourage a greater variety in aircraft types, scores of contestants using biplanes will be increased by a factor of 10 percent! The minimum wing area for bipes has been increased to 1500 sq. in. (1100 for monoplanes) to prevent these aircraft from becoming too small, and out of scale with their monoplane competitors.

The flight programs also show some changes. The Known Compulsory Program will probably be the 1984 IAC Unlimited Compulsory Known. To add some spice, and to avoid the relatively easy (for T.O.C. fliers) situation in 1982, a different Unknown Compulsory Program will be used for each round! The Free Program criteria will be the same as last time, except that the number of maneuvers allowed to add up to the total "K" factor will be reduced.

Finally, a four-minute (plus or minus five seconds) Free Program will be flown by all contestants. The low "K" factor of this program will not significantly affect a contestant's total performance, but it should be exciting, as "anything goes" in maneuver selection. This is a "show off" or "barn burner" event, which should be a lot of fun for both the contestants and the spectators. This program is scored, not by the maneuver, but individually on originality, versatility, harmony and rhythm, and execution. It also calls for precision timing, as the contestant's total score will be reduced by 30 points for each second that his flight time exceeds four minutes, five seconds, or is short of three minutes, fifty-five seconds. The contestant's caller announces the start and finish of the program.

For 1984, the schedule of flying will also be revised. In the past, all flights for a given day were the same program. If a contestant had one bad day because of equipment problems, he was out of the running. In '84, each day's schedule will be a mixture of programs . . . if you miss the Unknown Compulsory one day, you can catch it on the next, etc.

Selection of contestants for the T.O.C. is done very carefully, and the system has some changes for 1984. There will be ten from the U.S.A. and ten selected internationally. Qualifiers from the U.S. will remain as before; based on their performance at the '83 Nationals in Masters Class and the '83 Team Selection Finals (Master Tournament).

Five of the ten International contestants will be invited at the discretion of the contest management. This change has been made "to permit the invitation of contestants who may not have competed in FAI contest selection procedures, yet have proven their qualification for the T.O.C. by past performance, effort, and current interest."

Bet you thought we weren't going to mention it . . . $125,000 . . . yes, the prize money is greater than ever. Hanno . . . er . . . the winner will take home $30,000, and down through tenth place, the amounts will be $15,000, 10,000, 6,500, 6,000, 5,500, 5,000, 4,500, 4,000, and 3,500. Eleventh through twentieth will earn $3,000 each. However. . .

It is possible to fatten the purse for any position by $5,000 in 1984, by entering the best model, based on appearance workmanship, and fidelity to scale! Although T.O.C. entries have always shown the results of the pride the contestants have in their models, this incentive is sure to make the majority of them even better. Let's hope the organizers remember to ask the contestants to bring adequate scale documentation. In scale judging, documentation is almost as important as the model itself, and when even the lowest flight scoring contestant could earn a total of $8,000, scale judging takes on a whole new significance!

It'll be interesting to see how many contestants go for the biplane bonus. Ten percent is kinda hard to turn down. We'll probably see some Pitts and Eagles, but most likely they'll be scratch built to save weight and make strategic use of the allowed 10% variation from scale (skinnier fuselage, longer tail moment, etc. . . . not too much though, remember the five-grand best model prize).

Maybe not so well known, but we'd go for Ernst Udet's "Flamingo", a light airplane with narrow fuselage; equal-span, swept wings; low drag, uncowled seven-cylinder engine; simple landing gear with unpanted, thin wheels; and a proven full-scale aerobatic winner. (MB Plan No. 10801 is for a 40-size version by Roland Baltes.)

Biplanes have never fared well in contests against monoplanes, and consequently have not been selected or developed by the expert fliers, who prefer winning to flying something pretty or nostalgic. But now . . . things may be a little different. If the T.O.C. wanted something to add more spice for contestants and spectators . . . and for this old biplane lover, it couldn't have come up with a better choice.

THINGS TO DO

The Radio Control Club of Detroit and the Michigan Whirlybirds will hold their first Annual Helicopter "Round-Up" and Fun Fly on July 17, 1983, at the R.C.C.D. field, north of Mt. Clemens, Michigan. All 'copter fliers from novice to expert are welcome; all will get a chance to fly! AMA membership and F.C.C. license required.

There will be skill testing contests on all levels, flying demonstrations, prizes and ribbons for all who enter ($5.00 entry fee), hot and cold drinks and food available. Call Prop Shop Hobbies (313) 757-7160 for more information.

★ ★ ★

The Kitchener-Waterloo Flying Dutchmen Radio Control Club Inc. (pause for breath) will conduct its 14th annual Scale Rally at Kiwanis Centennial Park, Kitchener, Ontario, Canada, on Saturday and Sunday, September 10 and 11, 1983, from 0900 to 1730 each day. No registeration fees, no prizes, free parking *and* refreshments, picnic area and camping, flying and static displays. Finished or incomplete, all scale models are welcome. Manufacturers' booths welcome, muffler rule *enforced*, MAAC (AMA) membership and F.C.C. or D.O.C. license required, spectators charged $3.00 per car (Hmmm . . . wonder if you could throw a scale kit in the car . . . incomplete model . . . and get in free?)

For more info on this prestigious affair, contact Steve Gray, Chmn., 61 Halifax Dr., Kitchener, Ontario N2B 2Y4, phone (519) 743-6808.

ROBERTS FIELD REMEMBERED

F.E. Donahoo, of Decatur, Alabama, added the following note to his order for Pete Westburg's drawings of the Curtiss O-1B/A-3 Falcon.

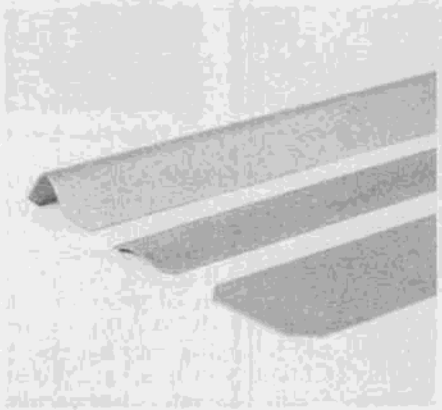
"The 106 Observation Sqdn. was at Roberts Field when I was a boy and helped mechanics work on them. I badly wanted to build a model, and this will be the chance I have looked for. I had no idea of how to obtain plans until the April issue of **Model Builder**.

"I often wonder what happened to the planes and men I worked with; Capt.

Continued on page 104

OVER THE COUNTER

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



D.G. Products Perma Grit sanding tools.

• "The Black Baron is at it again!" says the news release. Coverite announces to the modeling world two new products, an epoxy primer, and a new Micafilm color.

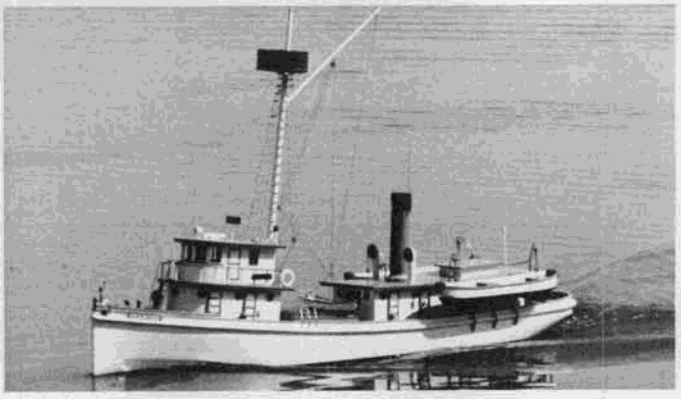
The light gray epoxy primer comes in a 13-ounce aerosol can, is premixed, and easy to sand. This primer can be used on raw wood, fabric (like Coverite), fiberglass, or ABS plastic. However, like most aerosol paints, it is not compatible with polystryrene foams. As it is an epoxy paint, it has excellent adhesion properties, and resists masking tape lift-off.

The new Coverite Micafilm color is perfect for any aircraft requiring a metallic finish. If you don't like that plastic look, you'll love the new Aluminum Micafilm. It should be perfect for fighter planes like the P-51, modern jets, airliners, and scale vintage aircraft where portions of the plane are made of metal. At less than half of the weight of ordinary films, Micafilm is seven times stronger as measured in the Elmendorff Test. So whether you're covering a tiny model or a giant scale model, Aluminum Micafilm has the strength and weight properties you may need.

Both the epoxy primer, and the Aluminum Micafilm are available at your local hobby shop. For more information regarding these or other Coverite products, write or call Coverite at 420 Baby-

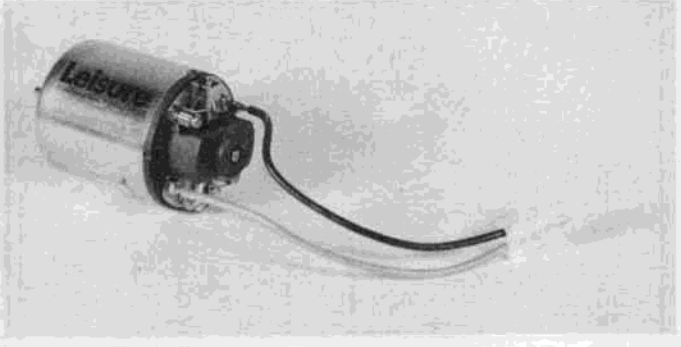
Coverite's Black Baron Primer.

Futaba FP-FC1 Audible Flight Checker.

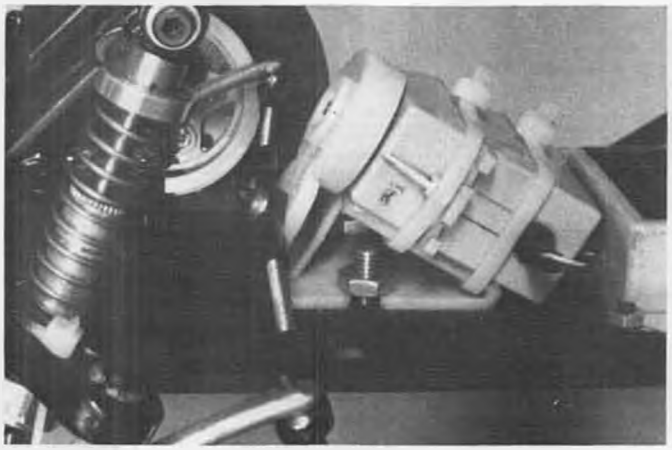


Francis Smith's Ship Yard Bunker Boat (as featured in *Model Builder*).

Satellite City Hot Tips applicators.



Leisure Electronics car and boat motors.



Kimbrough Products servo Gear Saver and Steering Servo Mount.

Top Flite's soon to be released Antares sailplane.

lon Road, Horsham, PA 19044, (215) 672-6720.

★ ★ ★

Futuba has come up with a nifty little gadget which should be of interest to all. It's called the FP-FC1 Audible Flight Checker (or FC1 for short). The FC1's purpose in life is to make sure you have sufficient battery voltage at all times so that you can fly, drive, or pilot your airplane, car, or boat safely, without risking loss of control.

The FC1 is basically an alarm. It sounds off a piercing, high frequency buzz anytime your receiver/servo battery's voltage drops below 4.3v (for Ni-Cds, 4.6v for AA dry cells). So what you want to do before you take off is work several channels simultaneously . . . this will put a load on the battery and drop the voltage. If the battery is too weak to be safe, the alarm will sound. You could save yourself a lot of grief (not to mention money) by staying on the ground, or recharging your battery.

The FC1 also serves as a "homing device" for lost aircraft . . . or an idiot warning . . . when the receiver is switched on and the transmitter isn't. This can help you find that airplane you just lost in the bushes, or save you from a very embarrassing crash.

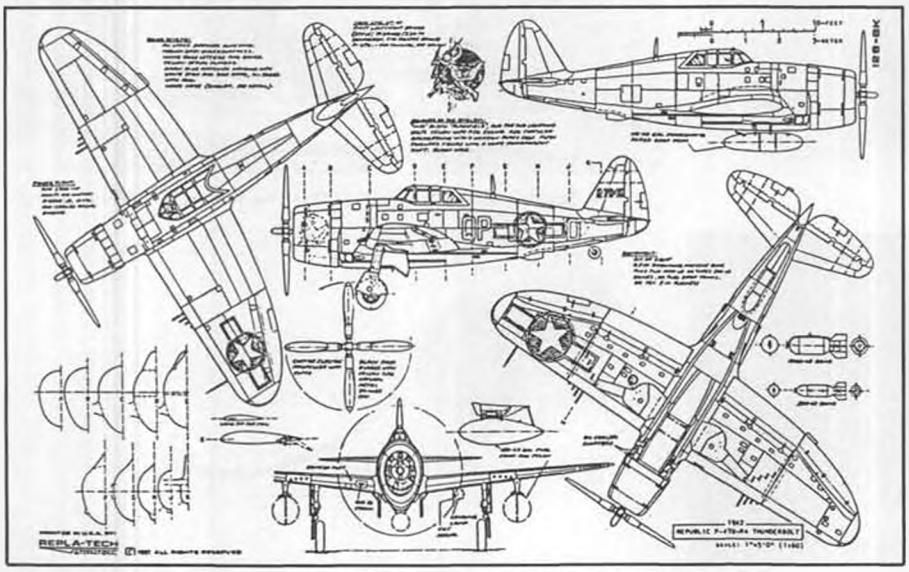
For more details contact Futuba, 555 West Victoria Street, Compton, CA 90220.

★ ★ ★

For those of us who wish to identify ourselves with checks bearing the images of famous WW-II aircraft, Identity Check Printers (Box 149-D, Park

Identity Check Printers B-29 check.

Vito Tomeo Models 1/6-scale P-47 in either razor back or bubble canopy versions.



Repla-Tech International plans, drawings, and scale documentation catalogs.

Davis Diesel Development Fox .15 conversion.

Maxon Magnifiers for better vision.

Wolff Pack Thrush sport plane for .25 to .45 engines.

Wolff Pack Shrike, high wing version of Thrush.

Ridge, IL 60068, [312] 992-0882) can provide us with a pretty wide selection. The newest warbirds from ICP are the B-29 Super Fortress (pictured here), and the P-38 Lightning. Other images offered are: P-51, F4U Corsair, Avenger, Wildcat, AT-6, and B-25. The new B-29 check is a photograph of the last flying B-29, the Confederate Air Force's *Fifi*, and the P-38 is a photo of Bill Ross famous Lightning.

Other series of checks include The Golden Age of Aviation, US Commercial Airliners, and personalized "Plane Checks" with your own N number!

★ ★ ★

K&S Engineering, 6617 West 59th Street, Chicago, IL 60638 has a wide range of professional standard grinding points, cutting wheels, and two sizes of mandrels (quills) for the cutting wheels. The points are top quality grinding and deburring tools made for a wide range of operations. The cutting wheels are both heavily reinforced with woven glass fiber to prevent shattering, and are ideal for cutting a wide range of materials.

All of these points and cutting wheel mandrels are sized to fit most portable power tools. No workshop is complete without a set.

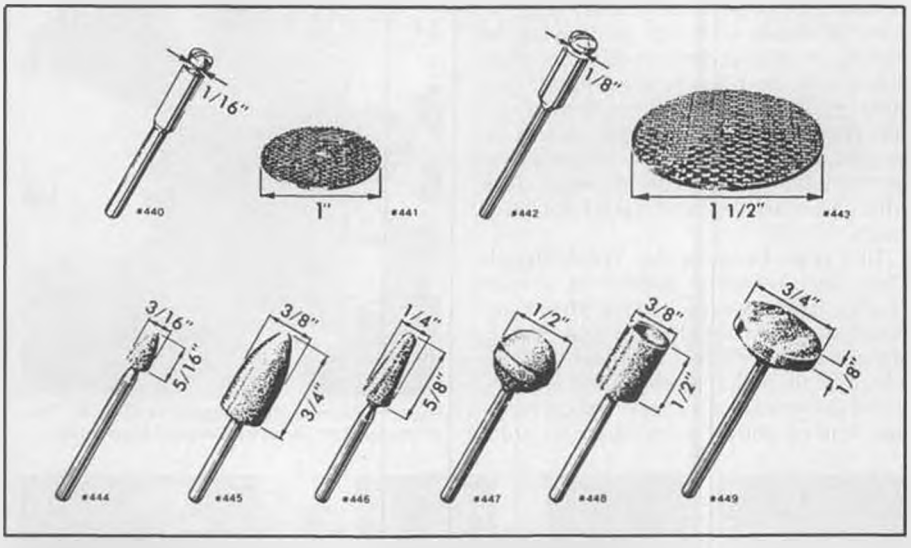
★ ★ ★

Davis Diesel Development, Inc., announced their latest conversion kit for the Fox .15 PB/BB Schneurle engine. If you own one of these engines, and are considering a conversion to diesel power with it, this is the way to go.

After conversion, the Fox .15 PB/BB will turn an 8x4 prop at 14,000 rpm, a 9x4 prop at 10,000 rpm, or a 10x4 prop at 8,500 rpm. This engine easily idles at well below 3,000 rpm. Fuel consumption rates between six and ten minutes per ounce of diesel fuel . . . just the thing for that .20 to .25 size trainer or Sunday flier.

Also pictured is the new carburetor adapter for those who wish to change carbs or convert C/L engines to R/C use.

Continued on page 100



K&S Engineering grinding points, cutting wheels, and mandrels.

H&N Electronics Ack-U-Tach/Pulse.

Dick Hanson Models 1/4-scale C.A.P. 21.

Indoor Model Supply Miniature Scale Aircraft kits.

The HB 21 Grand Prix cylinder can be rotated to accommodate the the installation; right side, left side, or directly aft.

Not the Contempo Magnums, these .91, 1.82, and 2.73 cu. in. 4-cycle engines come from England. Beautifully made.

R/C WORLD TOLEDO WHO?

By BILL NORTHROP

• This writer has been going to the Toledo Weak Signals Annual Radio Control Exposition every year since 1962. In the early years, we (a few of us from the Delaware R/C gang) stayed at the Howard Johnson Motel near the Maumee exit of the Ohio Turnpike, or at the Toledo Express Airport Motel. Later, when the show first moved to the present location, the Toledo Sports Arena, we shifted to the grand old Commodore Perry, with its famous perpetual shrimp bowl. When the Perry closed (what a pity!), we moved over to Summit Street and the Holiday Inn.

In all those years of journeying to Toledo, it was at first frustrating, then humorous, and finally traditional, that after carefully making confirmed reservations at one of these hotels or motels, you could just about count on getting a blank stare from the desk clerk when you arrived and asked for your room.

This year, because the Weak Signals Club had recently shifted its annual Friday night party to the Sheraton Westgate, we decided to stay there. However, this time I called well in advance to make reservations and insisted on receiving a confirmation number. And by golly, I wasn't disappointed. Walking up to the front desk, I said, "Reservation for Northrop, five days, Wednesday through Sunday nights, and

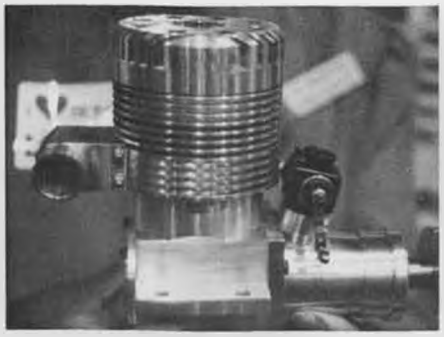
There will be a limited run of 1,000 Super Cyclone engines, plus spares available soon. See text for more information. The original box will also be duplicated!

Roper Falcon quite a bargain at $55.00. One of the earliest industrial/model conversions.

OPS "Super .60" is rated at 2-1/3 HP at 17,000 RPM, with FAI (no nitro) fuel. A five intake port engine.

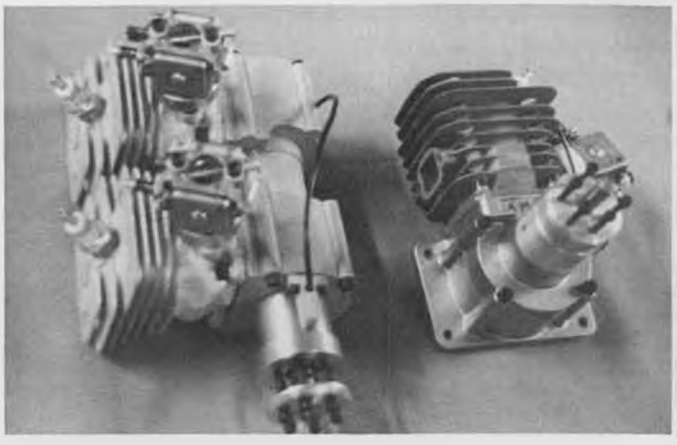
RJL is reintroducing the Testors .19 and .40 engines for control line, and with throttle, for R/C.

An OPS cutaway 3.5cc engine, showing design and construction details. Note porting.

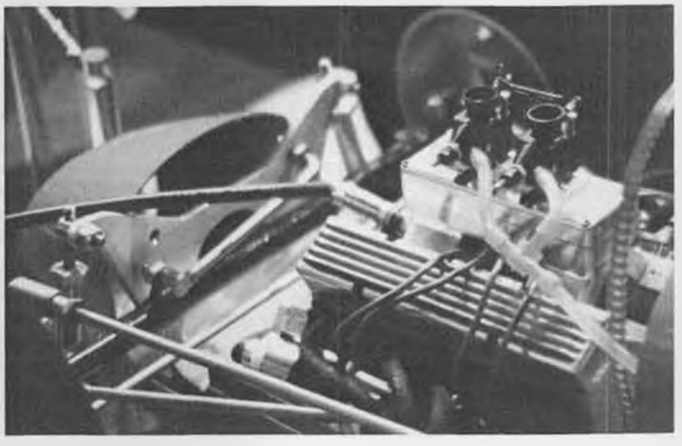


Nice looking 1.2 cu. in. bar stock engine for $250, weighs 2-1/2 lbs. D.M. Model Eng.

Horizontal opposed 6-cylinder, 3.6 cu. in. engine by Lou Ross.



Aero Modell Technik's single and twin-cylinder ignition engines. Use one amp battery for four-hour running time. 3.6 and 7.2 cu. in.



Gary Conley's V-8 looks right at home in the Pacesetter 1/4-scale sprint car. Running engine is always a big attraction . . . vroom!

here's my confirmation number."

The desk clerk came through beautifully, "Who?"

The poor gal was completely mystified as I broke into fits of laughter and complimented her on the excellent delivery. No doubt expecting the usual burst of indignation, this was too much, and she called for help. The guy who came in from the back room looked a little too pompous, so I wiped off the smile, put on the stern look and said, "Here's my confirmation, gimme my room!"

Without saying anything, he plunked down a blank registration form, placed a pen by it, and started shuffling papers.

"Does this mean you found my reservation?" I asked, without picking up the pen.

"No sir, but something must have gone wrong at the central reservation office," was the reply, "We'll give you a room."

I signed in, feeling that my weekend in Toledo was proceeding in normal fashion.

But it wasn't. Anita had already decided to remain in California, as we had two helpers coming from Cleveland who would help in the booth throughout the weekend. Thursday afternoon we learned they weren't coming! And Al Novotnik, our ad rep, was arriving Friday afternoon and leaving Saturday at the end of the day. Guess who ended up staying in the booth most of the weekend and seeing almost none of the show!

Anyway, that explains the title of this article. It's "Toledo Who?", not "Toledo, OH!"

Quarter scale doesn't have to be big! Ken Willard proves it with his Stits 'Sky Baby'. Profile figure is scale size.

USS Aaron Ward was "Best of Show". A boat model has won 'Best' for the last three years.Close-up detail is amazing.

Boats almost have an unfair advantage in competing against planes for Best of Show, with so much detail available. True masterpieces!

Engineering prototype by Bill Hinnant for Mallory Models P-38. A magnificent model and beautifully constructed.

Sharp little 1/4-scale midget race car for 3.5cc engines. T&D Fiberglass to produce bodies.

The above sad tale is a way of explaining why you won't find a detailed, booth-by-booth report of the show, or an endless array of product photos, as we had last year. Oh well . . . upward an onward.

An economics analyst would be hard put to explain the Toledo show in terms of today's money-tight situation. Perhaps they would have to say that the reason at least part of the nation's population is not buying homes, cars, appliances, clothing, etc., etc., is that they're saving their money for model airplane equipment! Most every exhibitor who also offered "show specials" was sold out by Saturday afternoon!

Of course, there were many who just came to look, and to daydream, but that has always been the case. The problem now is that the show has literally grown too big. Particularly on Friday and Saturday, a typical booth had a solid row of people along the table. Behind them was a second row of people, craning their necks to look between the heads and shoulders of the first row. A third row behind these consisted of people trying to move to the next position, or trying to squeeze in for a view of said booth. Adding to the confusion, that third row had people trying to move in *at least* two directions! You could stand in one spot for 30 seconds to a minute *just waiting to take a step!*

The bleak outlook to the overcrowded situation is that relief is at least three to four years away. According to show co-director Bob Hisey, the new Toledo Sports Arena complex, to be built closer to town, and which will offer almost double the floor space (the present is around 65,000 sq. ft.), is that far away from completion. As of now, it has not even been started.

If someone was to ask, "What was new at Toledo?" my answer would have to be that it was the year of the engine. Countless new engines were on display; many four-cycle types and chainsaw or ground-up big ignition types, and some new ones in the .21 to .61 glow range. The only small engine series to fill the gap if the Cox people don't get back on the stick, is G-Mark, from Cannon. RJL is reintroducing several of the Testors engines in the .19 and .40 sizes, and of course, HB continues to bring in new and more powerful mid-size engines with their typical fine workmanship. That's HB. But there is also HP, and this line of engines continues to be available through Midwest Model Supply, along with the Irvine engines produced by Ron Irvine of England. Other engines appear in some of the photos.

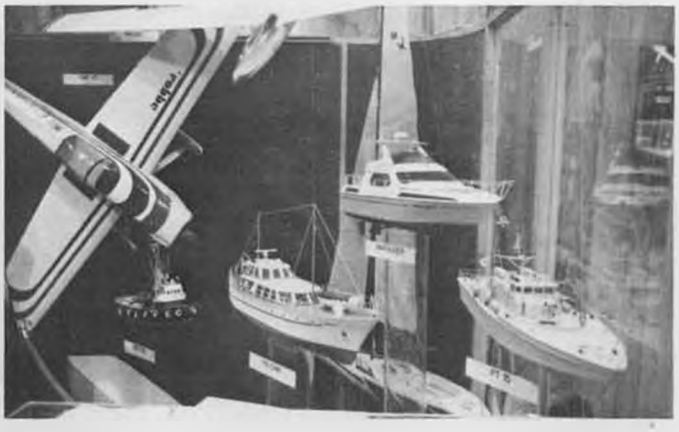
For the old-timers, the Super-Cyclone, GR Series, single ignition engine is being remanufactured by Larry Jenno of J&J Model Accessories, 2020-3 Lomita Blvd., Lomita, CA 90717, phone is (213) 534-3401. The reason we're giving the detailed poop is that only 1000 engines will be built. Price is $189.50, less $10 if coil and condenser are not required. Engines are run tested and guaranteed to perform as well as the originals. Tom Morrison, Box 10658, Phoenix, AZ 85064, is assisting Larry in the marketing of this great engine.

"Tower from Air Force Saber . . . I don't wanta seem too fussy or anything, but just what exactly is the minimum altitude spread in your normal holding pattern?"

Causing quite a stir among modelers and manufacturers was the appearance of Robbe Model Sport, of West Germany. Reported to be the world's largest model company, Robbe (the Germans pronounce it "Robe-Eh", but in the U.S.,

Future kit from Top Flite will be this multi-task sailplane designed by Scott Christensen. Name is "Antares".

This F-86 ducted fan uses scale intake, no big hole in the bottom. To be kitted by Bob Violett. Contact him for details.



Some of the sport and scale aircraft and boats on display at the colorful Robbe Model Sport booths. All of these will be available shortly in the U.S.A.

The wild and crazy "Wild Willie" off-road car from MRC/Tamiya. A bucket of fun!

The beauty of Dave Gierke's finish on this Ed Keck aerobatic design is difficult to depict.

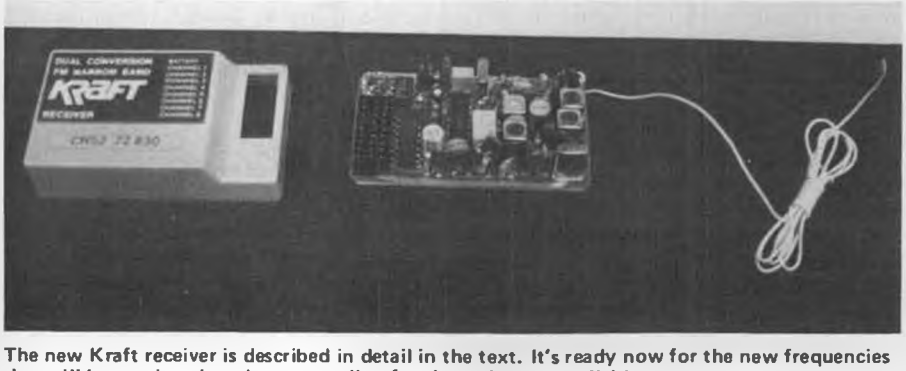
most everyone will continue to say "Rob-ee") has set up U.S. headquarters in Plainsboro, New Jersey. Frank Heinrich, a confessed "Americanophile" has moved to the U.S., and is General Manager. The company is a division of the huge Schwartzhaupt Corp., a German pharmaceutical firm. George Donat is president of the U.S. division, also located in Plainsboro.

Robbe is pledged to strong support of dealers, and is carefully selecting distributors throughout the U.S. who will provide the best overall service to its dealer customers. For the U.S. market, Robbe is concentrating on its vast line of highly prefabricated airplane and boat kits, along with related electronic and mechanical accessories. The U.S. catalog, done with the typical West German four-color photographic illustrations that are so eye-catching, shows an outstanding line of R/C sailplanes, powered aircraft, sailing yachts, and power boats. Largest glider is a semi-scale ASW-19 spanning 3130mm (123-1/4 inches). The semi-scale SF 36 low wing powered glider spans 118 inches, and is designed for the use of a four-cycle 40 engine with on-board starter for on-and-off thermal hunting. A giant scale Cap 21 for gear reduction or two-inch ignition engine, is the featured power model. The 50-800 class Pirol sailing yacht should be very competitive with its high aspect ratio sails (mast height is almost 87 inches), and the all electric powered boats range from a 19-inch racing boat up to a highly detailed ocean-going salvage tug that is 41 inches overall. Accessories include mechanical

Display of wheels and accessories from CB Associates. All aimed toward giant models.

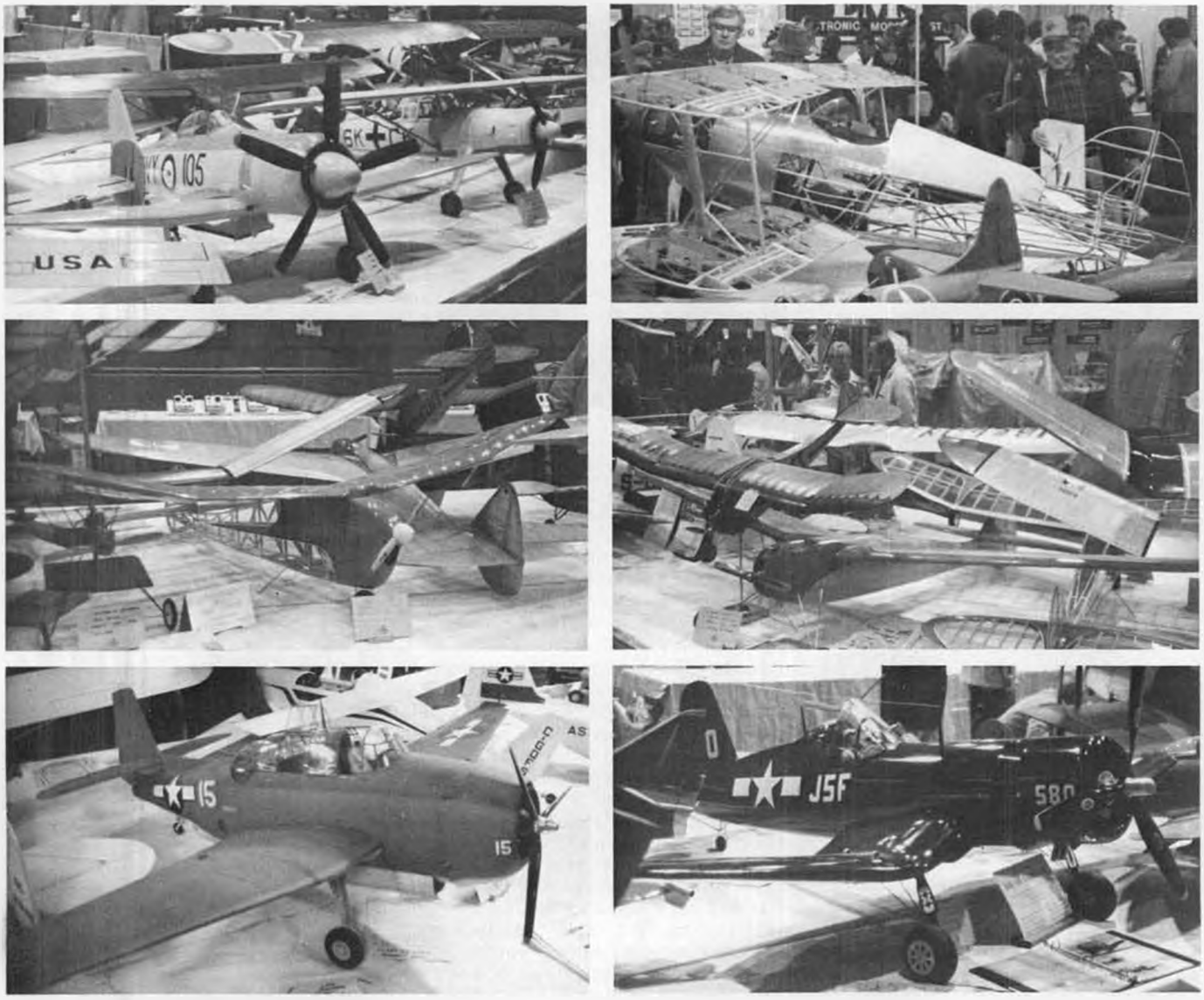
electrical switches that mount on servos; electronic sound effect units for sirens, foghorns, diesel engine running, horns, etc.; geared electric motors for boats and aircraft; electric outboards; engine mounts; reduction drive systems, and other miscellaneous items. Watch for all of this stuff coming to your dealers very soon.

The next kit to come from Top Flite was not on display in the TF booth. Scott



The new Kraft receiver is described in detail in the text. It's ready now for the new frequencies that will be coming along later, as well as for those that are available now.

The Formula 1-40's on display convinced many that it's a viable new class of racer.



Just some of the many models on display. Because of the short time available to the photographer for taking pictures, we could not stop to gather caption information.

Christensen has designed a Standard Class, multi-task glider called the "Antares," which was seen in the glider portion of the static model display area. His, and another Antares built by a friend (sorry, didn't get the name) took second and first place respectively, in the sailplane division. The V- (almost no) dihedral wing has a completely busy trailing edge, made up of flaps and ailerons . . . all horns on top, away from snagging grass, weeds, and etc.

The big hit from MRC this season is the "Wild Willy" off-road charicature car. With a tread as wide as its wheelbase is long, it's almost as maneuverable as an aircraft, and should be buckets of fun for every member of the family.

Pacer Technology has come up with some additional cyanoacrylate related products. Those who use foam in constructing models will love the latest spray-bottle liquid, Z-Foam Primer which protects foam long enough to glue it with Zap-A-Gap. Applying wing skins should now be an instant snap. The other new item is a slower formula (relatively slow, that is), Slo-Zap, which gives you a few moments to slide things into place before it grabs.

Didn't get a chance to check out the new super-deluxe high priced Futaba radio, but understand the best part of it is a new pulse coding system that makes it real bullet-proof where interference is concerned. Given not more than *equal signal strength* from another radio on the same frequency, you just might not get shot down.

Kraft was showing a new "Super Receiver" KPR 8FD, which can be used now on the new channels, and after 1991 on the 20 KHz channels. It features narrow band, dual conversion, FM, image and inter-modulation product immunity, is voltage regulated, antenna length is not critical, and it has one microvolt sensitivity.

Well, folks, believe it or not, that's about all we were able to see at Toledo, except for the many modelers who stopped by our booth to chat. As usual, we brought a large supply of Uber Skiver knife products, and sold almost all of it. It's a shame that dealers are hesitant to take on this line. Yes, they're a little more expensive than X-Acto, but once the modelers try them, they're total enthusiasts. Some even brought their friends by the booth and did their own selling job. I just sat back and listened. The best feature is the surgical stainless steel blade itself. For Monokoting there's nothing better. With any carbon steel blade; single edge razor, X-Acto, or what have you, after about three or four long trimming cuts, the edge begins to break down and the blade snags in the Monokote and makes jagged, unsightly cuts. Using the Uber Skiver (No. 11 works best), you can go on and on with the same blade. About the only thing that can shorten its life is a chance encounter with a metal object or some hard epoxy. Even then, the blade can be dressed up on a fine honing stone and leather strop, and you're back in business. . . Er, forget that last sentence. Just buy more blades!

If your local model builder dealer doesn't carry Uber products, get on his case. You'll both be happy if he carries them.

End of commercial. . . •

Maxie Hester holds the King Kobra and Hazel Sig-Hester shows off the historic Astro Hog, both new kits just being released by Sig Mfg. Co. This their first public showing.

Contest Director Burnis Fields, left, checks out Jon Falkner's Blue Angel.

SIG®

Third Annual Sig Memorial

By DIANE BEARD

• The Third Annual Glen Sigafoose Memorial Pattern Meet took place on March 19 and 20, 1983, in Jacksonville, Florida. This annual meet is put on by the Gateway R/C Club in cooperation with the City of Jacksonville Recreation Department, and is directed by Burnis Fields, long-time modeler and hobby shop owner.

Friday, March 18, was the beginning of a very busy weekend. Because of two days of rain prior to the contest, Friday was also a day for sweeping away the puddles and getting the markings on the runways. Contestants were already showing up at the field to get in a few warm-up/orientation flights before the 0800 starting time on Saturday. Even spectators were converging from all directions and establishing their campsites for the weekend.

Two complete rounds were flown on Saturday. Masters Class flew the FAI schedule. Leading pylon flier and ducted fan specialist, Bob Violett, showed that he also knows his way around aerobatics, staying right in there with world class aerobatic fliers Steve Helms and Ron Chidgey. And Patty Violett is now flying in the Advanced Class!

Judging was rated as highly consistent. The judges had six weeks of training sessions before they were put on the flight line.

Continued on page 104

Jim DeFauw took Third in Advanced class with his Tiporare, in Dave Brown markings.

As always, it's the gals who really run the contest. (l to r) Ellen Blocker, Judy Manges, and Diane Beard, who supplied contest info.

Rolf Schimmer flew in expert, using his Benito Bertolani Komet. Rolf is formerly from South Africa.

Curtis Bishop flew this Rhett Miller designed Compensator.

Preston Blake, Gainesville, FL., placed Second in Novice. "T-tail" is his score sheet.

Another score sheet "T-tail" on Ken Collett's Tiporare. Placed Third in Sportsman.

This table display of engines and race cars is typical of what you see at MECA "Collectogethers".

Mixed in with the older engines are a few relatively new ones . . . O.S. Max boxes in the background are an example.

FUEL LINES

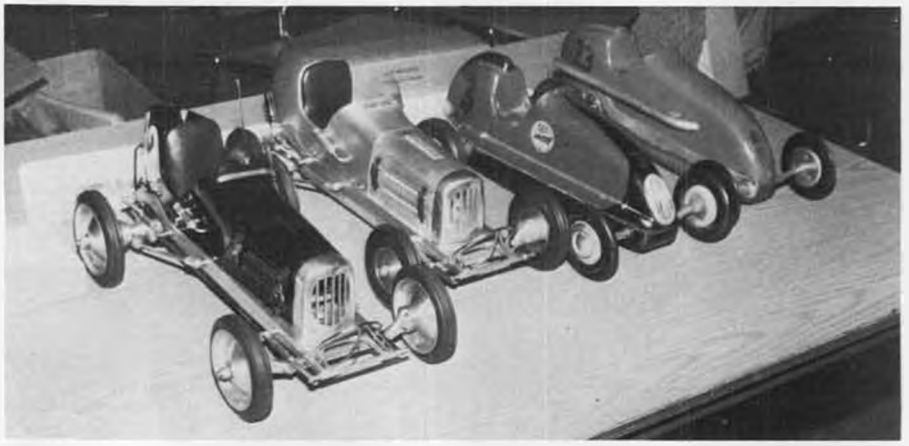
JOE KLAUSE
P. O. Box 2699
Laguna Hills, CA 92653

• Have you ever taken anything for granted? You might have. . . We probably both have, such as the engines we buy are supposed to run. Today, they invariably do, but there was a time that any bet on it was pretty chancy. Need I only mention the GHQ. OK, excepting that one, in the '30s and '40s, many a modeler was frustrated by what was often referred to as a cantankerous engine. Not only the engine, but also the coil, condenser, points, spark plug, and ignition batteries.

Today, there are a considerable number of gentlemen, and a few ladies, who wax nostalgic over those "good old engines." Before proceeding further, let's recognize that probably a bunch of modelers younger than I will immediately think, "Yeah, and they're all turkeys." Maybe so, or maybe we are all turkeys, and it's only a matter of degree. If you still think "old time engine" buffs can't really hack it in today's world, then take a look at the first photograph of some guys seated around a lot of collector engines.

On the left is Ron Schorr, Nats Formula I Pylon winner in 1978. Next, Dave Shadel, certainly one of the top pylon racers to date. For example, in 1982, Dave won the AMA Nats, the NMPRA National Points Championship, and the prestigious NMPRA Championship race. The first guy ever to do it all in the same year! What's the point of all this? Well, these guys are also model engine collectors. They are active members of MECA (Model Engine Collectors Association). So, I guess all engine collectors really aren't turkeys in the common vernacu-

Continued on page 66

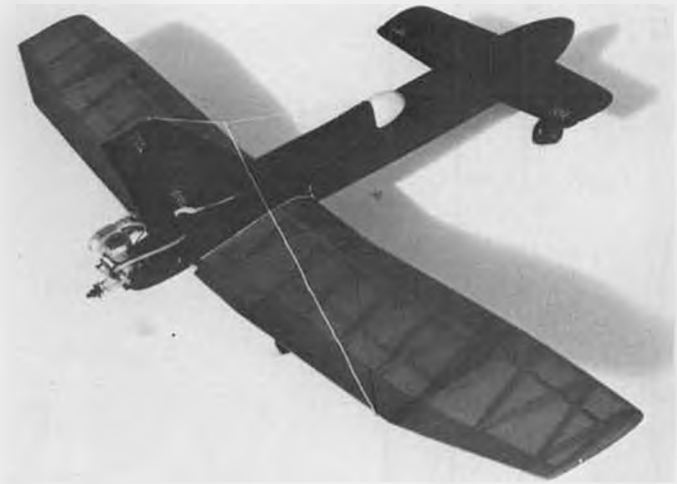


In the '40s, tether cars were the big thing. Whether or not racing cars in circles turns you on, you've got to admit they're intriguing.

Dave Brodsky of San Jose, California is all smiles . . . perhaps because he is one of the few who own a Morton M-5 (visible in photo).

No question about it, this is a real honest to goodness Feeney 4-cycle (circa '41). Would you believe $1500 for one in this shape?

Dave Shadel (pictured) and Ron Schorr, both "top drawer" Formula 1 pylon fliers were present at the MECA meet *as collectors!*



No, that's not a taildragger with its fin and rudder on the wrong end, it's a canard by the name of Epi-Sue, and it flies just fine the way it is, bass-ackwards. Robust construction and stable flying characteristics are the main features of this sport plane.

EPI-SUE

By DOMINIC APIKOS . . . If you're tired of flying the same old sport plane week after week, then maybe you should give this unusual *backwards* airplane a try . . . but be prepared to answer some dumb questions!

• Just about as far back as I can remember, those crazy "wing-in-the-back" airplanes have held a particular fascination for me. In 30 years of model building, I have made many models of this unusual configuration, from hand-launch gliders through free flight models, and now R/C. This unique system (*canard* is the technical name) deserves a lot more consideration than the occasional model which appears on the scene. After all, if you will recall, the Wright Brothers' rig was a canard!

The XB-70, the Japanese Shinden, the Curtiss XP-55 Ascender, the Vari-Eze, and the Swedish Viggen were all canards. Not to mention Cecil Paoli, a pioneer of model aviation fame, with the "Paoli Racer" . . . again a canard.

So, with a sincere desire to rekindle a well-deserved rebirth of a nearly forgotten concept, I present EPI-SUE . . . a contemporary descendent of noble ancestry and heritage!

The airplane described in this article began as a 1/2A free flight model that flew surprisingly well directly from the drawing board. EPI-SUE (Greek for *backwards*) evolved from that free flight model, and, like its ancestor, it is an extremely stable aircraft. The design was based on criteria which I've tried to incorporate in all my models:

1) It must *look* like an airplane (unusual, OK; but not unreal).

2) The construction technique must be simple, but rugged (in my case, an absolute necessity!).

3) The design must be inherently warp free.

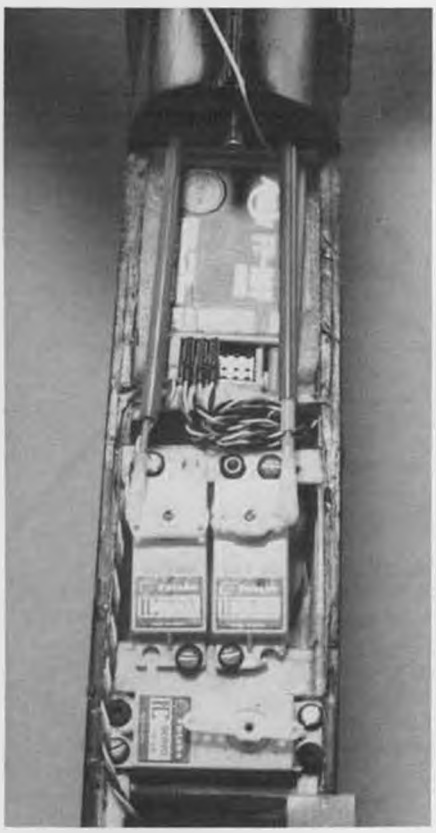
As you proceed with construction, I think you will agree that these rules were followed faithfully.

THE WING

Almost everybody likes building the wing the least, but this one is so different that it will almost be fun. Start by tracing all ribs onto 3/32 sheet balsa. Cut the ribs out, and sand them to shape. The wing will be built in five separate sections. I'll describe the center section assembly first, as the rest proceeds essentially the same way:

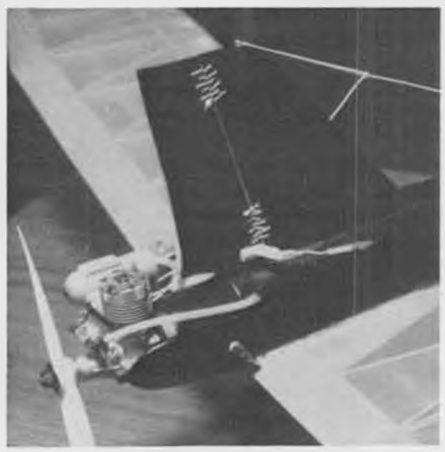
1) On the plan, pin down a 3/16 square strip of balsa along the back edge

Continued on page 67

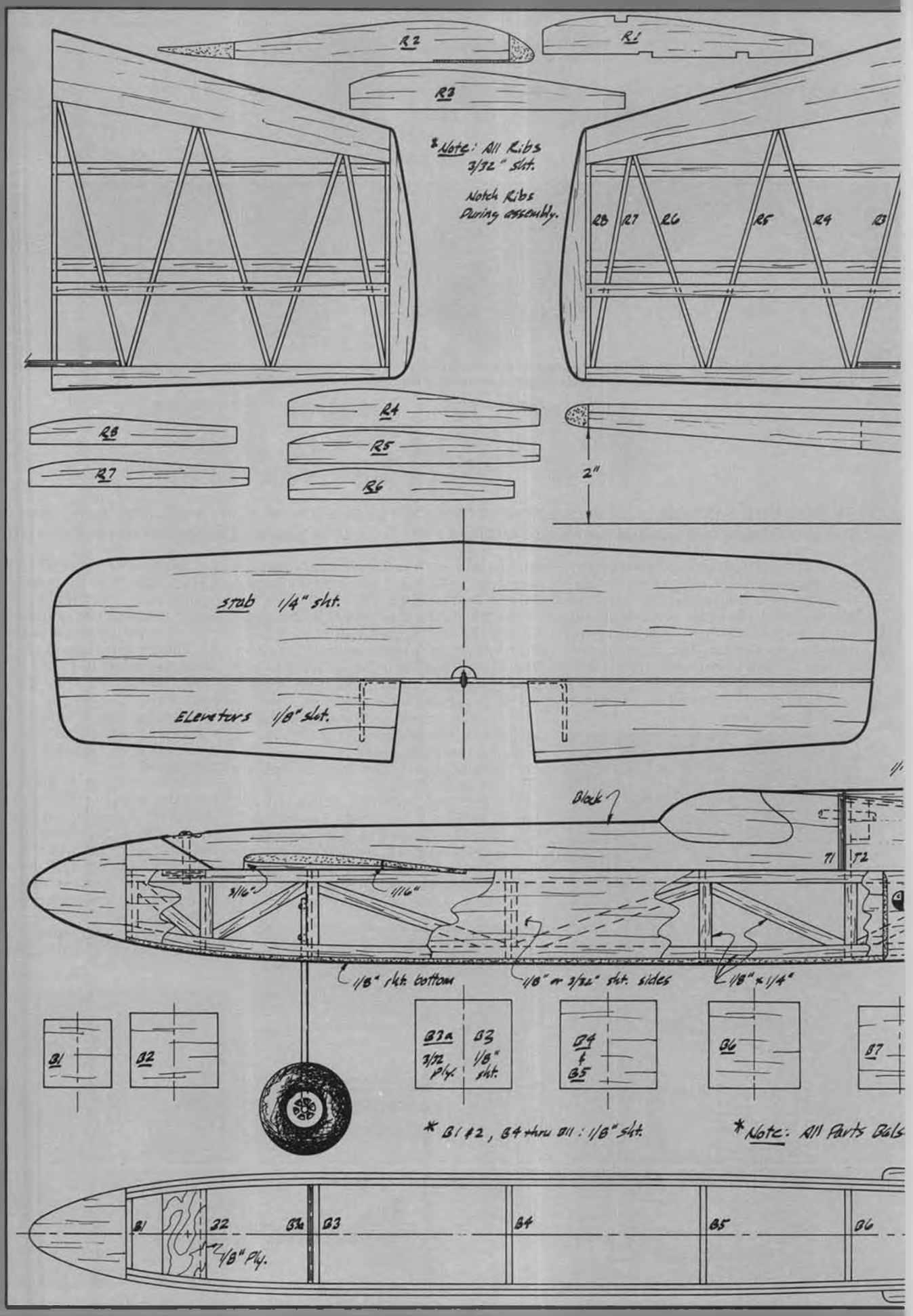


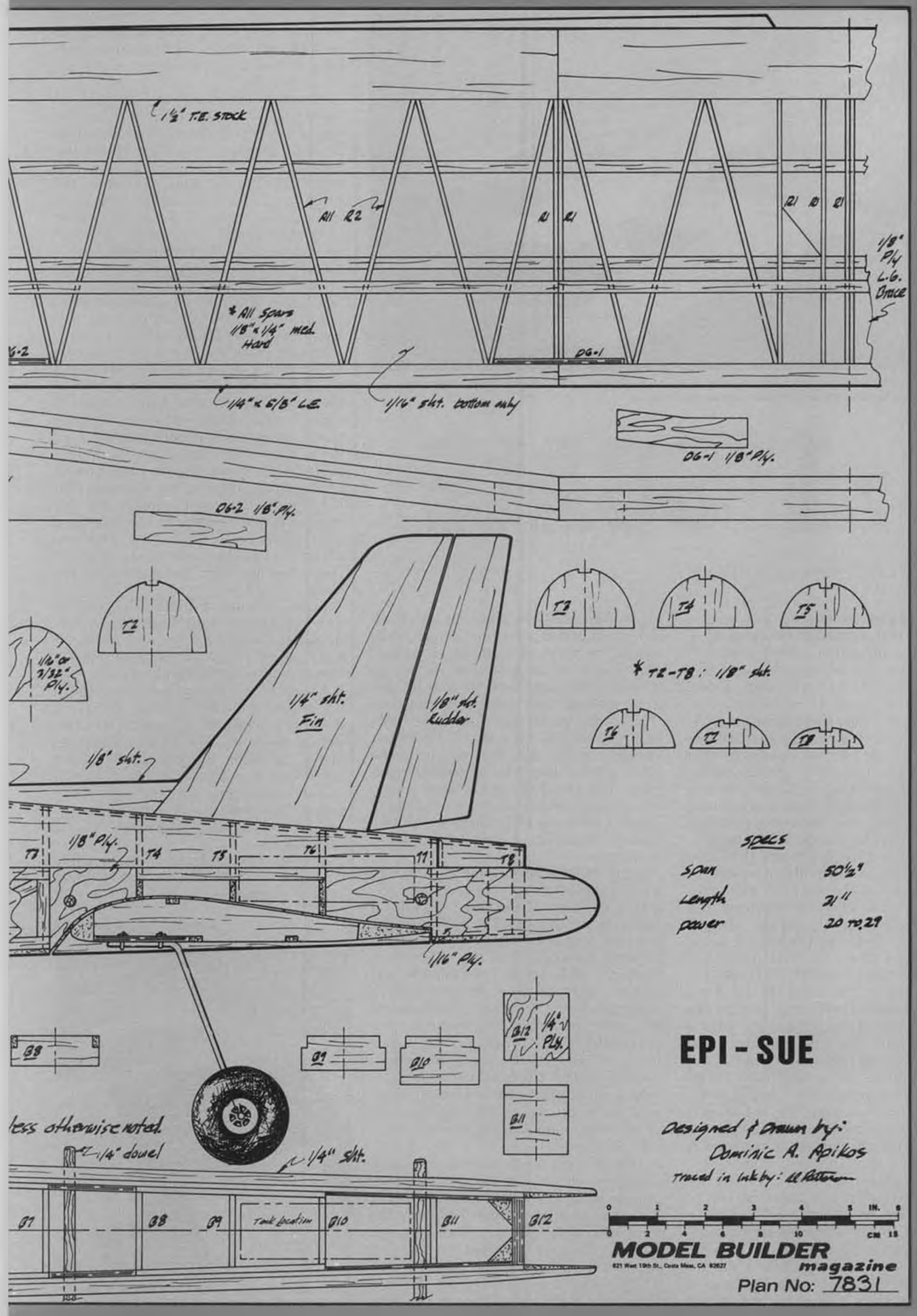
Neat and compact radio installation. Futaba receiver and FP-S16 servos are visible.

Epi-Sue designer and author, Dominic Apikos checks out the controls prior to flight.



Recommended engine sizes are .20 to .29. Old-style stitch hinges work well, are inexpensive.


R2
R1
R3
*Note: All Ribs 3/32" slot.
Notch Ribs During assembly.
R8 R7 R6 R5 R4 R3
R4
R8
R5
R7
R6
2"
stab 1/4" slot.
Elevators 1/8" slot.
Block
3/16"
1/16"
1/8" slot. bottom
1/8" or 3/32" slot. sides
1/8" x 1/4"
B1
B2
B3a 3/32 ply.
B3 1/8" slot.
B4 & B5
B6
B7
* B1 & 2, B4 thru B11 : 1/8" slot.
*Note: All Parts Bals
B1 B2 B3a B3 B4 B5 B6
1/8" Ply.


1/2" T.E. STOCK
All R2
* All Spars 1/8" x 1/4" med. Hard
1/8" Ply L.G. Brace
1/4" x 6/8" L.E.
1/16" sht. bottom only
D6-1 1/8" Ply.
D6-2 1/8" Ply.
T2
T3
T4
T5
* T2-T8 : 1/8" sht.
T6
T7
T8
1/4" sht. Fin
1/8" sht. Rudder
1/8" sht.
1/8" Ply.
1/16" Ply.
B8
B9
B10
B12
1/4" Ply.
B11
1/4" dowel
1/4" sht.
B7
B8
B9
Tank location
B10
B11
B12
Specs
Span 50 1/2"
Length 21"
Power 20 to 29
EPI-SUE
Designed & Drawn by: Dominic A. Apikos
Traced in Inkby: [illegible]
MODEL BUILDER magazine
621 West 19th St., Costa Mesa, CA 92627
Plan No: 7831

Bob Underwood's FAI Team SNS-7 Sorrell Hiperbipe. Weight is 10-1/2 lbs, span 59 inches, Kraft engine, flaperons are full span and on both wings.

1 TO 1 SCALE

By BOB UNDERWOOD

• It has been something just over a decade since I started building scale models. I realize that a time period of that amount makes me somewhat of a newcomer in the fraternity, but in spite of that fact, I have often encountered the question, "Why do you build them?" I must say that on a number of occasions I have pondered that concern. Our society is not geared at present to the concept of spending inordinate amounts of time, energy, and money producing something that can be mass-produced with even better results. Why, then?

There are many reasons that one might suggest to the mildy interested, or even the casual observer, for the devotion of time and effort to this wonderful hobby-sport of scale modeling. There is a wonderful tingle which fills the being of a person when he steps back and views his finished model. To be able to point to that creation and say that it is a product of your own hands produces a euphoria that a snap-together, plastic world cannot produce. I suspect that you might not have noticed, but as our world of things, especially those things that we have purchased "full-grown", expands, we become less intimately involved with them. We become another expert thrower in a throwaway world.

There is a fear that inhabits our "scale" world. It is that constant terror of crashing. To entrust this product of time and effort to the whims of fate is more than many modelers can stand. A recent conversation with a modeler indicates the magnitude of this terror. In this case, the model which crashed was a first effort. This accident caused the individual to question whether it was really worth the time and energy. I wanted very much to suggest that we *all* go through the same feelings that he was experiencing, and that he should continue. My effort was perhaps half-hearted, for I sensed that if he felt as strongly as he did, that maybe some other pursuit might be of greater interest to him. Many of us have been able to develop a certain amount of *detachment* concerning the models we build. I feel this is almost a necessity in order to continue.

I find that the development portion of a scale subject which comes *before* the actual building is the most significant factor in my reasons for building. The gradual accumulation of data, and the growing conception of the subject as a "being", with its own personality and history, is fascinating. As you pursue your documentation, you come across not only the factual information that surrounds the aircraft, but the little items of "gossip" that have followed it through its life. The information unfolds into a biography with a central figure and an orbiting cast of supporting characters, in many cases each with *their* own little story to tell.

This process of research will often bring you in contact with many other people whom you would not ordinarily have become acquainted with in the normal course of your life. Through scale modeling, I have had the pleasure of coming in contact with "full-scale" people like Steve Whittman, Harold Krier, and a host of other people who have carved a niche in the history of aviation. While my contact with these people may have been fleeting, they have shaped in some manner, my life as I know it today.

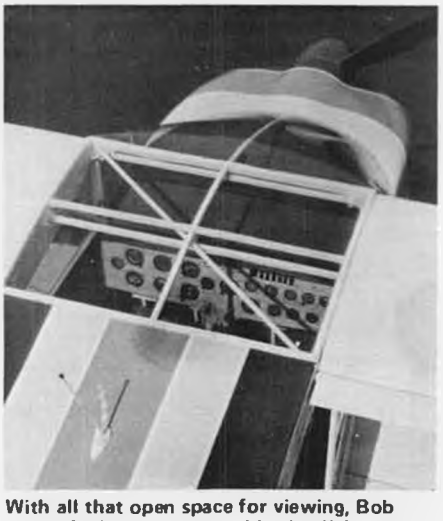
Certainly for many, the greatest reward which comes from this hobby-sport is the recognition and appreciation of your product by others. I am not speaking of the trophies or plaques that might adorn your walls, but rather the questions and admiration that your latest scale subject might evoke. I have always felt that it is a sincere honor when someone asks if they might take a picture of my model and/or me. What greater form of compliment can there be? Yes, I realize that I speak of vanity, but in all honesty, can any of us say that we are not tempted by such treatment?

People tease me about my choice of rather obscure or unorthodox subjects. I usually relate to them that I choose those subjects because I don't want to show up at a contest with the same thing that someone else is entering. Or, I tell them that I like to keep the judges fooled with something they have never seen before. The fact is, however, that the most important reason for my choices is that I enjoy the conversations which develop as a result of questions about the aircraft. I love to stand by the spectators and field the questions they have.

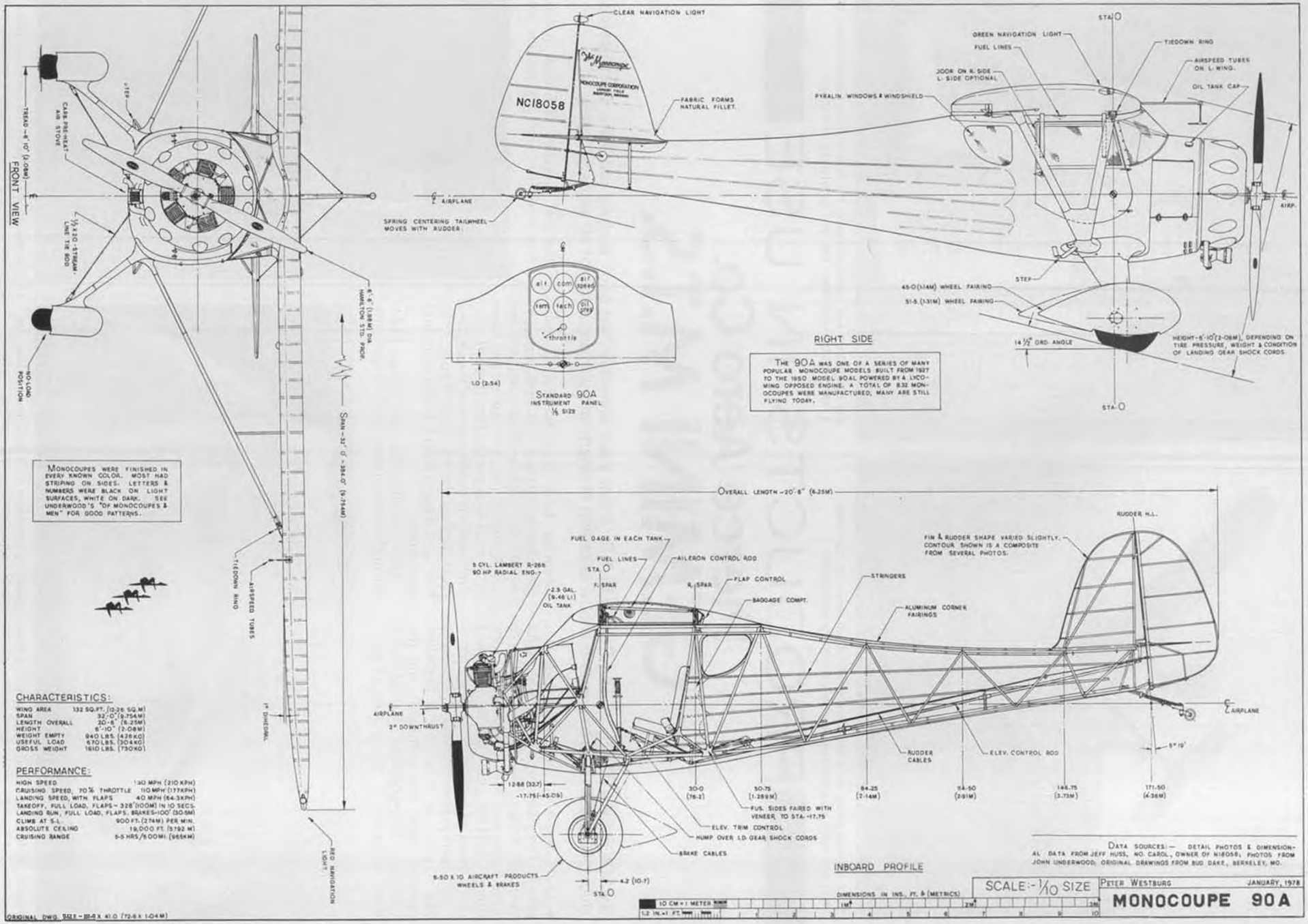
I owe so much to this hobby-sport in general, and to scale modeling in particular, for what it has done for my life. It has formed a base of common interest for my entire family for almost 10 years. It has taken me to foreign lands, and it has provided me with a means of having my entire family work together in interesting projects. The most important factor has been the people that have passed my way. I know that I run a great risk in mentioning any, if I don't mention all, but I find it impossible to pass up some, and equally impossible to list them all.

The Wischers, Bob and Dolly, in reality started it all when Bob was the reigning World Champion, and the AMA sent

Continued on page 64

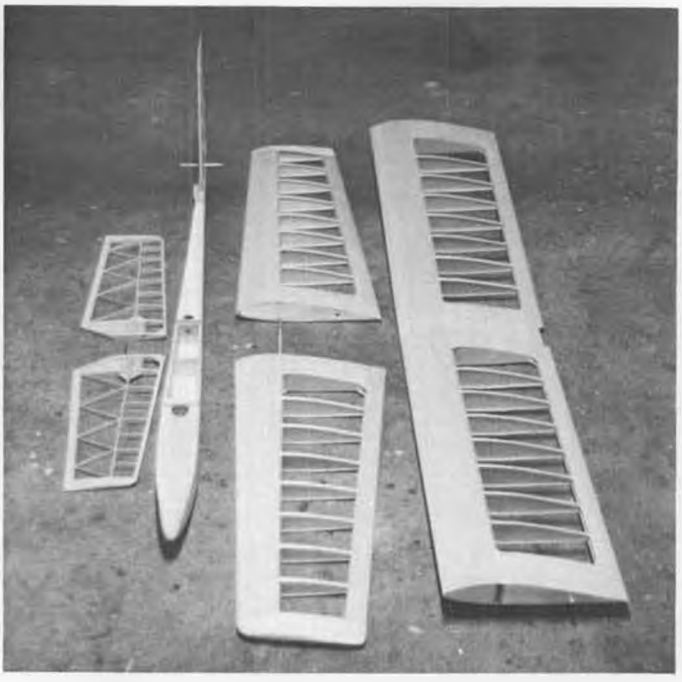


With all that open space for viewing, Bob couldn't skimp on any cabin details!



To order full size prints of this drawing, see ad on page 87.

Mike Charles poses with the Gemini M.T.S. showing its top view. High tail volumes yield excellent handling characteristics.



All framed up and ready to cover, the Pierce Aero Gemini looks like a standard thermal ship. The *M.T.S.* tells the real story!

PRODUCT$ IN U$E

Pierce Aero Co.

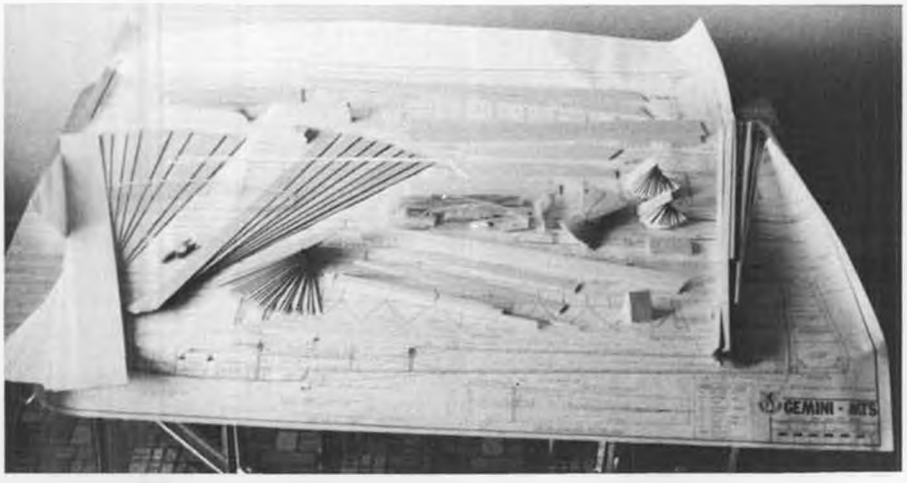
GEMINI M.T.S.

By MIKE CHARLES . . . The Gemini M.T.S. *is not* your everyday "gas bag" thermal sailplane. Its 15 percent thick MB-253515 airfoil gives this bird excellent strength and performance for all kinds of flying.

• The Gemini MTS (multiple task sailplane) is the latest in a line of successful sailplane designs by Ed Slobod of Pierce Aero Company, 9626 Jellico Ave., Northridge, CA 91325, and is the result of over three years of testing by its designer.

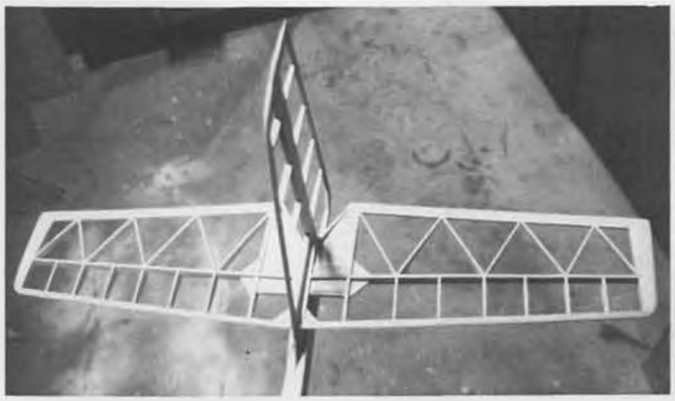
Our past experience with Pierce Aero kits has led us to expect a premium product from this company, and the Gemini is no exception. Packed inside the 3-1/2 x 6 x 37 box is a set of plans (showing both wing halves), a complete hardware pack, pushrods, canopy, instruction book, and some of the finest quality balsa, ply, and spruce we have ever seen in a production line off-the-shelf kit. Our examination of the shaped parts showed them to be well done, fuzz free, and a good match to the plans and each other.

After reading the instruction book through several times, and studying the plans and sketches provided to familiarize ourselves with the various parts



The kit includes all wood, hardware, and plans needed to construct a Gemini (minus glues and covering, of course). All shaped parts are precision cut and sanded, no die cutting.

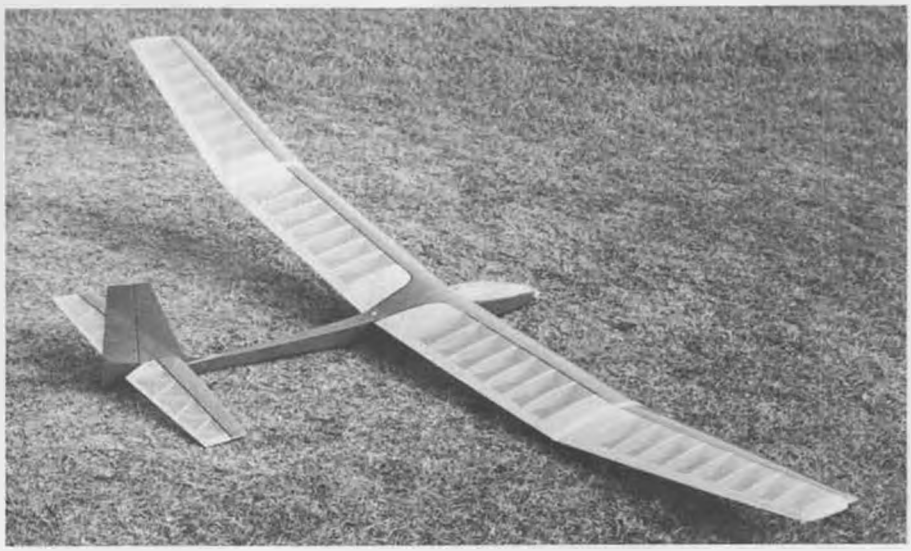
The assembled frame of the Gemini shows super strong D-tube wing, light tail structure.



The all-moving horizontal stab features 1/2-inch thick airfoil, built-up spar, diagonal ribs, thick pivot tubes. This stab can take lots of abuse!

The author chose nylon bellcrank over 1/16 ply 'crank provided in the kit. Wide pivot tube, aerodynamically balanced stab are flutter-proof.

The author considers this the best tow hook design he's seen. Hook never gets bumped.



Here is the second Gemini referred to in the article, this one belonging to Bob Gerbin of Placentia, California. From a distance, the Gemini resembles the Pierce Aero Paragon.

locations, we started construction following the suggested building sequence which begins with the wing. If you have ever seen a Gemini, you probably will have noticed its main feature is the 15 percent thick, semi-symmetrical airfoil. You might also be, as we were at this point, somewhat skeptical of its flying ability. Be assured at this time, that if you press on and build the Gemini, you will be rewarded.

The old saying about a *flat and true* building board holds doubly true for the Gemini wing because warps are harder to detect in the semi-symmetrical wing. We took a little extra time here to make sure everything was straight. This is very important when adding the final piece of sheeting on the leading edge, as this completes the D tube, and the wing becomes extremely strong, rigid, and warp resistant. This means that if you build in a warp at this stage, you will have a hard time removing it later, so be careful.

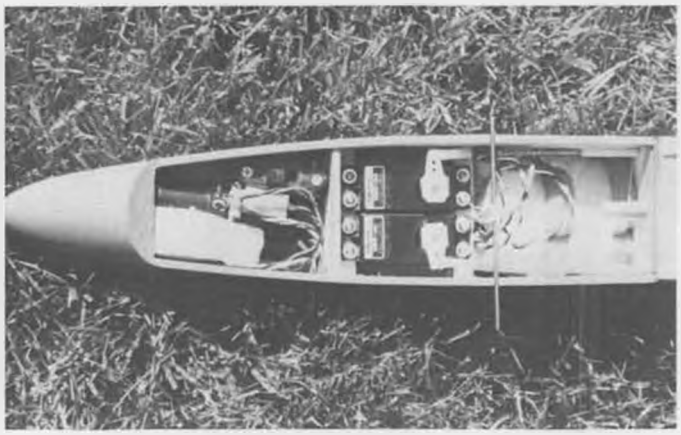
Don't be tempted to leave out the wrapping around the tip joiner blades and receiver boxes, as this is a very high stress area. I used dacron 1/2A control line which is easily obtained at any hobby shop, and is very strong. Cotton thread *should not* be used for this, as it is just not strong enough.

The rest of the wing construction was much like most of the other sailplane kits on the market today, with the usual center section sheeting, capstrips, tip blocks, etc.

While the glue was drying on the wing, we skipped ahead to the fuselage. The Gemini fuselage hides under its normal looking exterior some very novel construction engineering. A few hints, in addition to the suggested

Continued on page 70

Okay, so water ballast is impractical in the Gemini. At least it has an unobstructed ballast box capable of holding *four pounds of lead!*



Radio installation details. It's tight in there, but everything fits, including a 500 ma battery pack. Wire retains canopy hold-down bands.

Larry Pettyjohn launches Benny James' Paragon in the Mojave Desert during the semi-annual Desert Dash put on by the SFVSF. Mike Bame works the winch for Benny as he guides the aircraft from the back seat of the convertible. Benny is an AMA Junior declared and open distance record holder . . . a good backseat flier!

R/C SOARING

By BILL FORREY PHOTOS BY THE AUTHOR

• Has it ever happened to you? There you are, sitting comfortably in your little folding lawn chair, transmitter resting on your right thigh, your right thumb and index finger lazily working the control stick, and your favorite thermal sailplane is slowly circling up to cloud base . . . when the thought strikes you, "I wonder just how far I could fly this thing from that altitude?"

It's my guess that *every* R/C sailplane flier has had that thought cross his mind at one time or another. It's also my guess that a significant number of those pilots have been intrigued to the point of doing something about it . . . like jumping into the back of a friend's pickup truck and having him follow the glider down the road.

The curiosity, the challenge of setting a distance goal, the trial of one's flying skills, and the sheer adventure of doing something new and daring, often combine forces to get the best of us. We give in to the idea of leaving the security and comfort of the home field to conquer the unknown . . . both within us and around us. These driving desires are frequently difficult to satisfy, and more often than not, lead to peculiar undertakings; like building 14-foot wingspan, specialty sailplanes that have tremendous glide ratios and sink rates that defy gravity; like buying airborne transmitting devices which send whistling undulations into the eardrums of anyone within 50 feet of the transistor radio receiver; like purchasing Monokote in 25-foot rolls; and like trading in the old Chevy for a new hatchback or convertible. These things DO HAPPEN, my friend! Be forewarned!

WHAT IS CROSS-COUNTRY SOARING?

The subject of cross-country soaring would take up all the space in a good-sized book if one were to try and do it justice. What I'd like to do here is give a brief overview of it, then report one or two aspects in a little more depth.

There are four main types of cross-country soaring: American style competition, British style competition, record setting, and fun flying. American style competitions usually fall into one of the following events: closed circuit courses such as the famous Great Race in Illinois; goal and return courses such as the Desert Dash put on each spring and fall by the San Fernando Valley Silent Flyers in the Mojave Desert of California; "crash-and-dash" type goal and return contests with multiple relaunch provisions such as the Santa Maria Soaring Society's annual cross-country race near Taft, California; and finally, cross-

The Ubiquitous Goose . . . nicknamed "Punk Goose" by owner/flier Blaine Rawdon who uses it for thermal, slope, cross-country, F3B

If you should decide to follow an errant sailplane literally *across country*, beware of the soft sand of desert washes . . . carry extra water!

Blaine Rawdon (a.k.a. Blaine *Beron*-Rawdon) demonstrates line retrieval in 100-degree heat.

Jerry Krainock ends a 14.76 mi. declared goal flight. Gemini "Parts" 2-m, 7 AMA records!

Mike Bame launches John Quinn's Mirage into desert wind. Sunroof cars are tough on pilot.

country goal contests which tend to be back-up events for other types of courses when the wind is blowing hard. All American style cross-country competitions involve cars, and hopefully, back-country roads with little traffic. Courses generally are laid out over flat, open terrain with a minimum of turns and obstacles.

British style cross-country soaring is done primarily over sloping terrain, as it does not involve much thermaling. The course is set up around the natural geography of the slope, and is sometimes quite intricate in general layout. Contestants launch by hand, enter a starting gate, and fly around the course which is marked by flags . . . all the while giving chase to the model *on foot*. The course twists and turns, and sometimes goes far behind the slope's face where there is minimal lift. Sounds interesting, doesn't it? Well, there's more. Along the course there are points where the contestant must perform aerobatic maneuvers in front of a judge who scores each maneuver. This score is figured into the total score. British cross-country has all the speed of a slope race, beauty of an aerobatic contest, and the physical exercise of cross-country running. (The British also do a lot of hand towing . . . which makes soaring over there a literal *sport!*)

Record setting is the ultimate challenge in cross-country flying. As the AMA distance records for R/C sailplanes get longer and longer, there is bound to be less and less interest in this form of soaring, but as it stands now, there are enough records on the books that are "breakable" to stimulate a few more seasons of limited activity. Of course, *club records* are a whole different story, as most clubs have either short or non-existent cross-country records. I think that this is where most of the record-setting activity is going to take place. Perhaps the NSS could keep track of state records as a further way to stimulate this form of competition.

Perhaps the best way to enjoy cross-country flying is to just go out to the desert (or the plains, or the farmlands), set up the old winch and have fun flying with a group of like-minded soaring types. Without the pressure of competition, you can do what you like and enjoy yourself. Many fliers work on their LSF distance goals, while others just thermal fly and enjoy the sunshine and wildflowers.

WHAT TO FLY

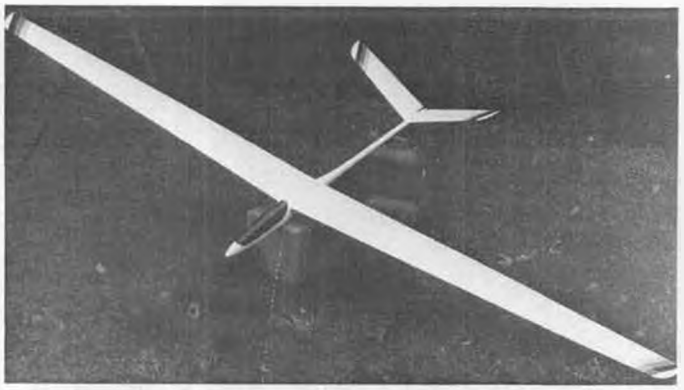
It's possible to fly just about anything

US F3B Team patches, pins, and decals are now available for contributions. See text for details.

National Geological Survey maps are essential for accurate measurement of distance record flights. Jerry Krainock and Ed Slobod, center.

Mike Bame turns into 15 to 20 mph desert wind with his 2-meter Illusion after making 7-1/2 mi. goal flight in the Desert Dash.

Wayne Selway of Aeronautics, Inc. poses with the new, limited edition, two-meter Askant. Should be very competitive in multi-task events.



Wilshire Model Center is marketing this high performance 129-inch span, V-tail sailplane called the Rowing Merlin. High quality throughout.

cross-country. Your two-meter thermal ship will do the job under the right conditions. However, there are better ways to go.

Unless you are going for the Standard or Two-meter Class AMA record, you're better off flying an Unlimited Class ship for the obvious reasons of improved performance and visibility. A high aspect ratio 100-incher (or your typical two-meter) tends to get rather hard to see in a short time. Besides, you want the most miles for your hard-earned thermal altitude, and big airplanes are the only way to get them.

Here are some basic, and very general design parameters for Unlimited Class cross-country sailplanes:

DESIGN PARAMETERS FOR CROSS-COUNTRY SAILPLANES

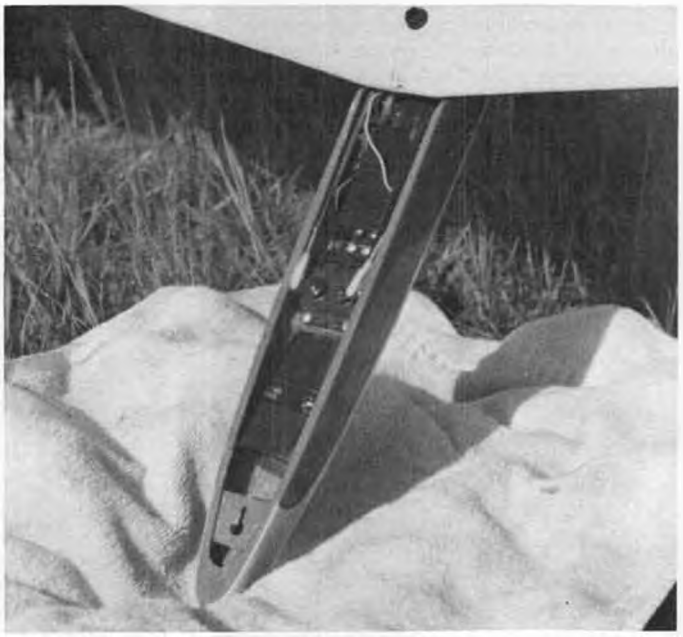
First, lets keep in mind a few important points that are frequently overlooked by those who are not very experienced in this form of R/C flying. When thermaling at very high altitudes (2,500 feet or higher) wings, and especially horizontal stabs, become so small that the human eye (20/20 vision) has a very difficult time seeing them. When you can manage a glimpse of the wing, you will see a speck that is very long compared to its width; in fact you will think that it has grown a point or two in aspect ratio. What is important to keep in mind here is that wings and stabs with narrow chords can't be flown as high as wings with wide chords, because you can't *safely control* what you are having a hard time *seeing*. A sailplane that can't fly as high as another will have to thermal more often to cover the same distance. Guess which is more time efficient.

Another point to keep in mind is wing loading. The FAI has established that the "maximum flying mass (of an R/C sailplane is) 5 Kg" (page 107, section 1.4,

Continued on page 71

Dennis Cook's prototype Askant in flight. Production models do not have this much sweep in the wings. Ship is fully aerobatic, and very fast! Eppler 374 section, foam wings.

Dennis Cook, also of Aeronautics, Inc., shows us a prototype 69-inch Askant, which he flys regularly over the slopes of Costa Mesa, CA.



Radio installation details. Yes, everything fits! The receiver shown is a very large, modular Airtronics unit, yet it fits nicely.

The electric powered, free flight Truant is a perfect model for beginners.

The IBA Lectro is a new sport glider/flier for 05 to 075 systems. It comes ready-to-fly less radio and power systems. Top quality.

ELECTRIC POWER

By MITCH POLING

• Save August 20 and 21 on your contest calendar for the Fourth Annual (how time flies!) KRC Electric Fly in Hatfield, Pennsylvania. It is the biggest and best electric event on the East Coast. It is a fun-fly, with awards for the best looking plane, the longest flight time, the most aerobatic flight, and a surprise event. There is on-field charging available (the best quality electrons!), as well as nearby camping, seminars, static displays, and best of all, the Electric Fly Clinic *(Don't take this name literally! wrf).*

At the Electric Fly Clinic you can have your *electric plane* checked out, its problems caught and solved, and get the latest and the best information on "how to" in electrics. This is a chance to meet fellow electric fliers, or if you are a beginner, a chance to get the best possible start. I know the effect that such get-togethers have on me . . . I get new ideas, and become generally reinspired. I recommend it highly.

The planes alone are well worth the visit. Last year there was a four-motor Constellation on display, and even an electric helicopter.

Here's a hint for the duration event: try the Electricus or the Ultra Mk IV (plans from **Model Builder**, Nos. 3831 and 1841 respectively, each $5.75) with seven cells and an Astro Challenger 05 (cobalt) or a Leisure LT50 competition wind. From what I've seen of them, they will place high.

For more information, and a handy map, contact John Hickey, 1624 Maple Ave., Hatfield, PA 19440.

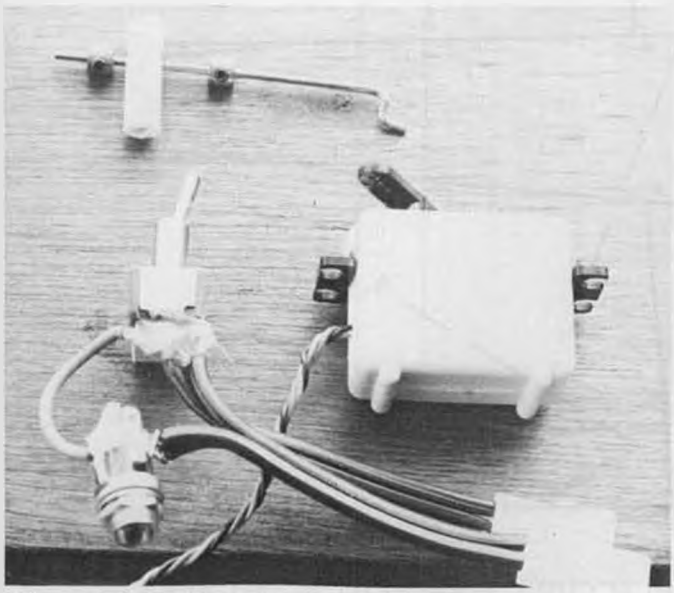
ELECTRIC FREE FLIGHT

Speaking of inspiration from electric get-togethers, I saw the neatest little free flight model at the Astro '83 Champs. It was the Truant, designed by Jim McDermoth, and available as a plan (No. 366) from *Model Aviation.* Kim and Cynde Waddell had a blast flying theirs, and nicknamed it the "McDermavolt" after the designer. I could see why they wanted to give him the credit, as it has the most delightful climb and glide of any sport free flight model that I have ever seen, with the possible exception of the Mattel Superstar.

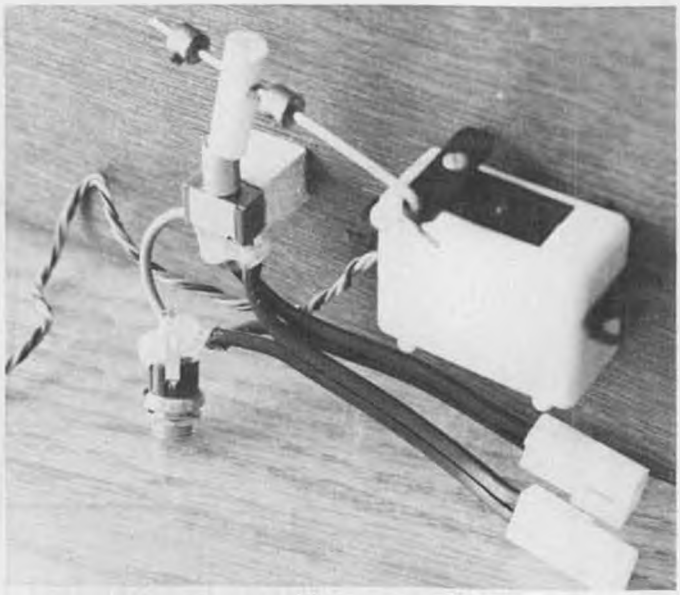
I think Jim must have named it the

Continued on page 77

Leisure Electronics' new LT-50 Gear Motor Output ratios are 2.5:1, 3:1, and 3.6:1.



This on-off system is one way to control electric motors without buying expensive speed controllers. See text for details.



Assembled on-off system. Definitely not your "high zoot" solution to the problem . . . but it works!

Pattern Flying

By DICK HANSON

• This month we will attempt to answer a few questions we have received concerning the trimming of pattern birds. However, we must start by issuing a disclaimer: If your model has sloppy servos, that is, the servos won't move the control surfaces when the trim levers are shifted approximately 1/16-inch either way, you are probably not going to notice the difference made by subtle changes in alignments.

QUESTION NO. 1

How do you correct a model which is overly pitch sensitive (i.e. difficult to hold at a fixed altitude)?

With the radio "on," grasp the elevator(s) and push up and down gently. The servo should fight back a little, but not move the elevator to a different centering. Servo slop is a common problem that is usually due to worn gears, case, etc. replace the worn parts or buy a zero-backlash type servo.

Using a TX strap, or preferably a tray, trim the model for hands-off flying at full throttle. If the model still refuses to hold a level setting (allowing for fuel burn-off, of course), you probably have a basic airframe problem. Here are a few things to check:

A) *Bad hinging:* loose, uneven, or sticky. Seal the hinge line with tape. Replace hinges which are out of alignment or sticky.

B) *Poorly shaped elevator:* thicker than stab at hinge line, and very thin and flexible at ends or at trailing edge. If you have a dual rate radio, changing to lower rate will help your pitch sensitivity problem, *but* this is only effective if the problem is really *you* shaking the stick, which is not an impossible situation. Rebuild the elevators.

C) *Thrust line location:* Some model designs have a thrust line location which leads to power on/off trim sensitivity. Typically, a very low thrust line aggravates the problem. Add down thrust a little at a time, and the problem should tame down.

QUESTION NO. 2

The model flies in a slight skid, and constantly drifts to one side unless aileron and rudder trim are added. What is the likely cause?

First, measure the plane for basic alignment. See sketch. List all errors in alignment, and take note of any flight trim settings. If, *for instance*, the model measures perfectly straight and square, but requires left aileron up-trim to prevent a drift to the right, the problem may be due to more up-trim in the right elevator half than the left half. This creates more drag on the right side of the tail and tries to make the model realign its center of drag. The situation is due to the inseparable relationship of lift and drag . . . that is, if a surface lifts more, it drags more. In the case stated, the lift is "reversed" on the elevator because the force required is down, not up, but the example holds true.

Next, compare all surfaces for variations which could cause the skidding, such as improper alignment at hinge lines, or a blunt leading edge on one side of the wing or stab vs. a sharp leading edge on the other side.

Look for improper alignment of exhaust pipe and tuned pipe. This one is very elusive, and you may just have to try shifting it around. (Sorry.)

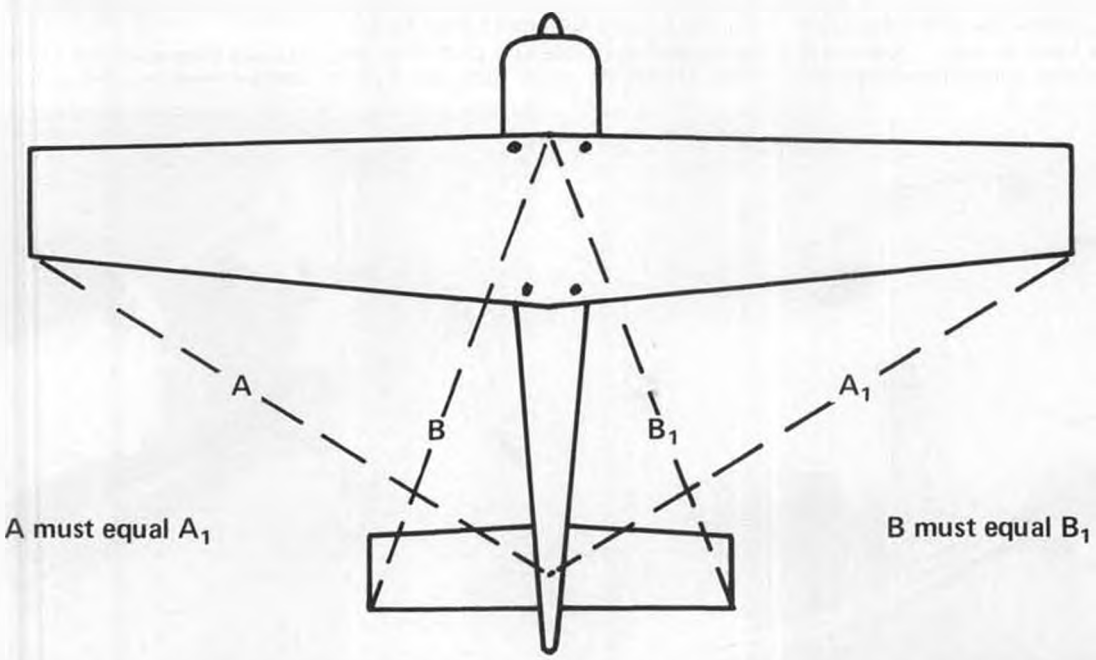
Eyeball the retract holes in the wings for variations or droopy gear, etc. We moved the main gear in closer to the fuselage on our Tipoes to reduce the possible errors here.

You might try changing side thrust angle on the engine if all else fails, but this setting is usually non-critical. A little right thrust, approximately one to two degrees, is desireable on most models.

Measure the fuselage for a bowed shape which could cause excessive drag on one side. If the rudder and fin are square with the wing and stab, this one is not particularly critical. We have tried all kinds of offset fuselage, engine, and pipe arrangements, and we've had few problems here. The reason is that the closer any error is to the center of the aircraft, the less effect it can produce. The center we speak of is the center of lateral area which is a little aft of the C.G.

QUESTION NO. 3

Continued on page 79



PROPER ALIGNMENT IS ESSENTIAL FOR ACCURATE PATTERN MANEUVERS

THE BIPE

By HAL deBOLT . . . The Bipe was first designed in the early forties as a compact, simple, control line biplane which wouldn't use up too much precious balsa wood in its construction. WW-II was a challenging era for modellers, especially C/L modelers who were just learning the basics of this new form of flight.

• It has been said many times before, free flight was king prior to WW-II. We all thought that F/F was great, of course, and enjoyed it very much. The War killed F/F and served as the stimulus that the embryonic control line movement needed. Obviously, with the phase practically dead, F/F saw little development during the war years. However, with the shift of interest toward C/L, there came rapid development in that phase, especially with so much to be learned about the radical, new method of flying. The excitement came from the modelers who were learning more about it each day, or so it seemed. This could easily be where our favorite query, "What's new?" originated. In those days, you asked the question, and really did get a thrilling answer!

There was all sorts of action within the Patuxent Model Engineers during the war, as their primary interest was control line. This was a progressive club; its members created new C/L designs prolifically, and flew them with equal fervor. It had to be progressive and innovative, with C/L so new, there had been only a few kits manufactured, and the war had stopped what production there was.

With the C/L phase so new, the emphasis was toward what we would label "trainers" today: something which you could learn to fly with, enjoy the excitement of, and bring home in one piece . . . along with a handful of busted props. The Patuxent sailors *(Also known as the Navy Patuxent River Model Engineers, the first Navy model hobby group. wrf)* put together various sorts of "designs" for this purpose, some were OK, and others simply did not cut the mustard.

By this time your author was an accomplished C/L pilot, having learned the basics with a Stanzel "Tiger Shark," and some other thing he had created with which to learn more about "U-Control." So, the urge for something different kindled more investigation into the aerodynamics of C/L designs. No thought was given to creating a design which would appeal to others, or be commercially viable.

At that time, biplanes were a rarity in free flight, and nothing was known of them in control line. Yet, when this experienced free flight designer looked at the design needs for C/L, the basic characteristics of a biplane seemed to be a good solution. Remember, the available power in those days was anemic. The required ignition system was heavy, and its size could use much precious balsa. The cost alone did not make the balsa so precious, but its lack of *availability* likened it to Gold! You really had to scratch for every piece you got.

As a designer facing such problems, the advantage of the great wing area offered by a biplane was attractive. If you had high weight, and little power, aerodynamics said to use wing area as a substitute for the lack of power. The idea seemed sound, and the thought of building a "two winger" probably clinched the decision. The only problem was that there was no design data readily available for biplanes, simply nothing to use for reference.

The Patuxent River Test Center came to the rescue. Our division library had some aircraft engineering books, and there were a couple of biplanes kicking around the dark corners of a hangar . . . Study it all, and one could assume the basic design factors for a double winger.

The effort which went into the Bipe design would be an interesting lesson in using aerodynamic principles. The additional factors which come into effect when additional wings are used, include wing gap, stagger, and decalage. Probably the paramount consideration is wing gap, for it can have a direct, negative effect on wing efficiency. Assuming one wing to be directly above the other, 1-1/2 chord widths of gap is required to obtain 100 percent efficiency from both wings (i.e. no interference between the two wings). Reduce the gap to one chord width, and the efficiency drops to 80 percent. Stagger is a sneaky way to reduce the gap effect. If the wings are not placed directly above each other, there should be no interaction to speak of. If this is true, then any amount of stagger used in a design should be advantageous in this respect.

Decalage is the preset difference in the angle of attack of the two wings. One wing is given a greater angle of incidence than the other. If you were to aim for 100 percent biplane efficiency, you would find the necessities cumbersome to use, especially in a practical control line model.

As this was an INITIAL investigation into the use of a biplane for control line flying, the way in which the laws were juggled to obtain a useable model (which did not violate any rules) is of interest. Today, things might be done differently because we have *experience* to draw on, without it, however, you had to follow the known rules just to be "safe". Remember that "in the beginning," there were no aerodynamic laws, no one could set them down on paper. The laws were created by experience only. Even today, new experiences can alter or add to the laws, as has already happened when aircraft reached the sonic range. However, at this time, and for our purposes, things are now fairly settled.

The Bipe design was an attempt to create a desirable craft while staying within the rules of that day. First priority was the need to design a compact control line model, a large wing gap

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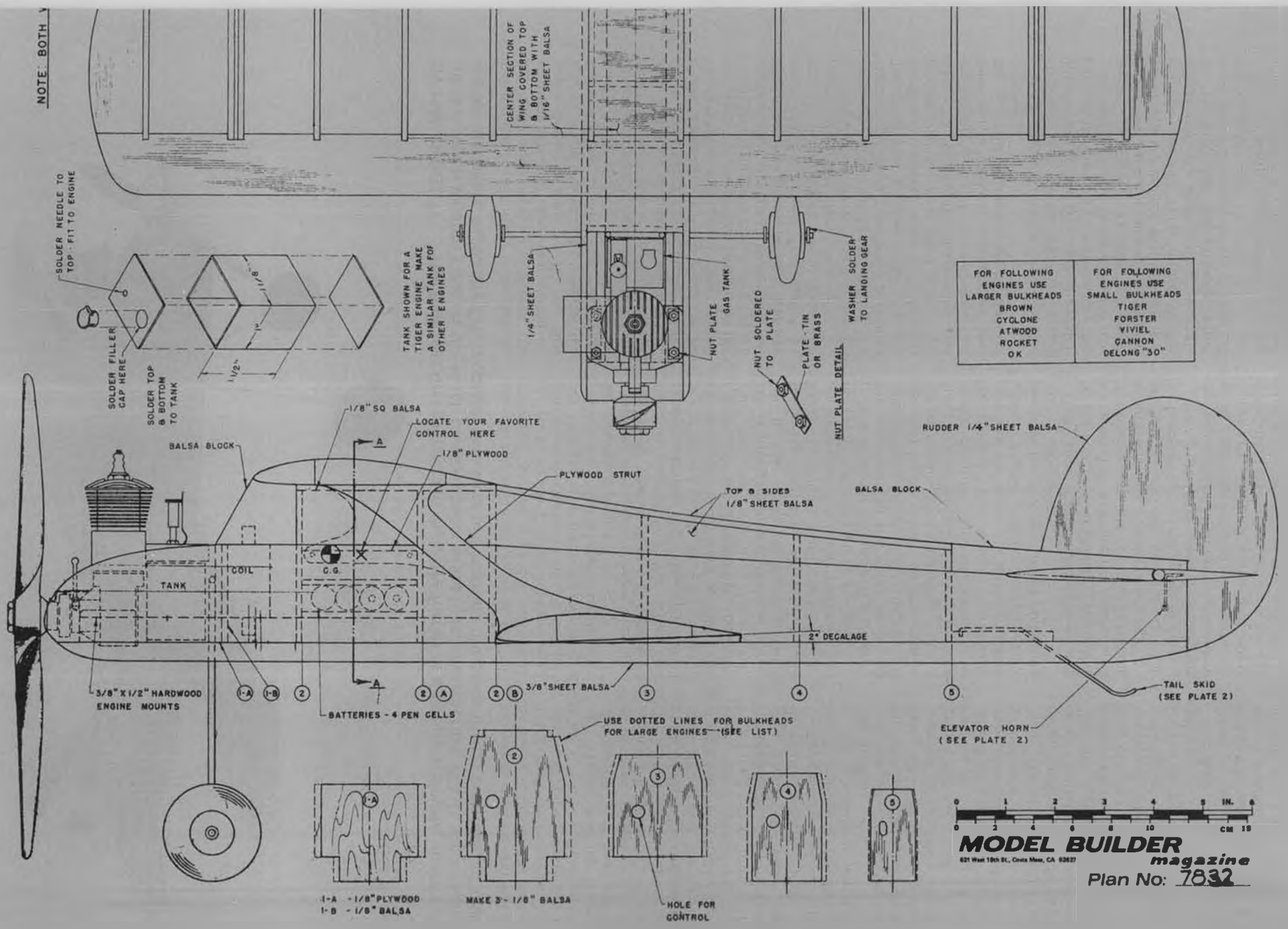
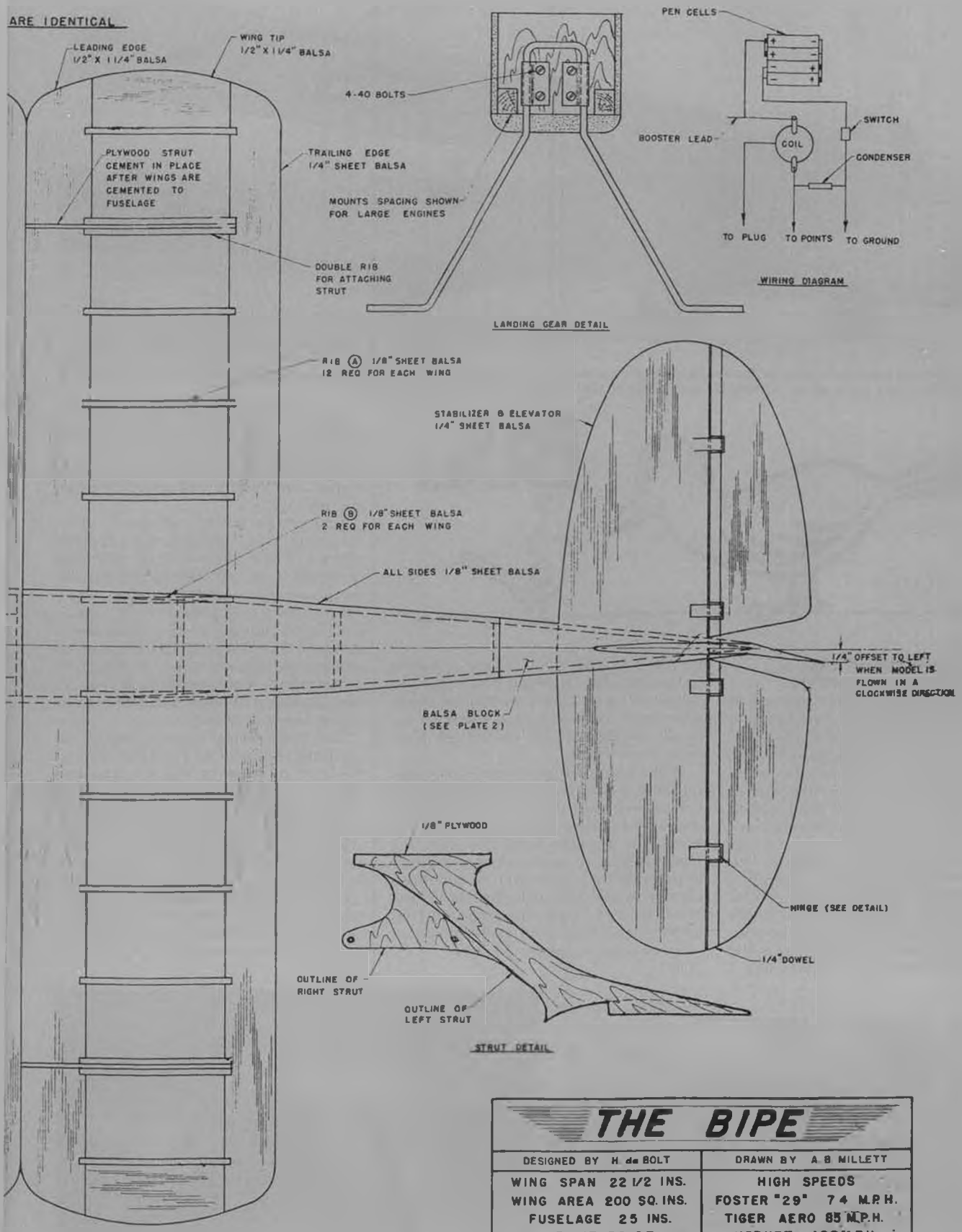

NOTE: BOTH
CENTER SECTION OF WING COVERED TOP & BOTTOM WITH 1/16" SHEET BALSA
SOLDER NEEDLE TO TOP - FIT TO ENGINE
SOLDER FILLER CAP HERE
SOLDER TOP & BOTTOM TO TANK
1/8"
1"
1/2"
TANK SHOWN FOR A TIGER ENGINE MAKE A SIMILAR TANK FOR OTHER ENGINES
1/4" SHEET BALSA
NUT PLATE GAS TANK
NUT SOLDERED TO PLATE
PLATE - TIN OR BRASS
NUT PLATE DETAIL
WASHER SOLDER TO LANDING GEAR
FOR FOLLOWING ENGINES USE LARGER BULKHEADS
BROWN
CYCLONE
ATWOOD
ROCKET
OK
FOR FOLLOWING ENGINES USE SMALL BULKHEADS
TIGER
FORSTER
VIVIEL
CANNON
DELONG "30"
1/8" SQ BALSA
LOCATE YOUR FAVORITE CONTROL HERE
BALSA BLOCK
1/8" PLYWOOD
PLYWOOD STRUT
TOP & SIDES 1/8" SHEET BALSA
BALSA BLOCK
RUDDER 1/4" SHEET BALSA
TANK
COIL
C.G.
2° DECALAGE
3/8" X 1/2" HARDWOOD ENGINE MOUNTS
1-A
1-B
2
2 A
2 B
3/8" SHEET BALSA
3
4
5
TAIL SKID (SEE PLATE 2)
BATTERIES - 4 PEN CELLS
USE DOTTED LINES FOR BULKHEADS FOR LARGE ENGINES (SEE LIST)
ELEVATOR HORN (SEE PLATE 2)
1-A - 1/8" PLYWOOD
1-B - 1/8" BALSA
MAKE 3 - 1/8" BALSA
HOLE FOR CONTROL
IN.
CM
MODEL BUILDER magazine
621 West 19th St., Costa Mesa, CA 92627
Plan No: 7832



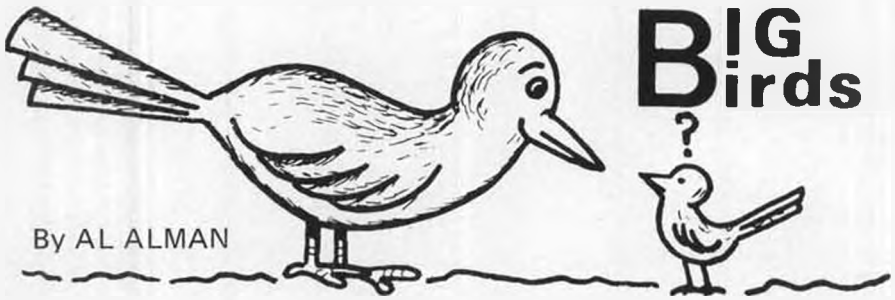
THE BIPE

DESIGNED BY H. de BOLT	DRAWN BY A. S. MILLETT
WING SPAN 22 1/2 INS. WING AREA 200 SQ. INS. FUSELAGE 25 INS. WEIGHT 32 OZ.	HIGH SPEEDS FOSTER "29" 74 M.P.H. TIGER AERO 85 M.P.H. HORNET 102 M.P.H.

A PRODUCT OF
THE de BOLT MODEL ENGINEERING CO
WILLIAMSVILLE NEW YORK

FULL SIZE PLANS AVAILABLE — SEE PAGE 100

Joe Manuel built this beautifully detailed Curtiss Robin in a little over four years of on-again, off-again work. Its 23 pounds are a little too much for its Evra power plant, but a decent turning Quadra should do well. Model has functional LG struts.



COMPUTERS, ADDRESS LABELS . . . AND JUST ONE MORE MOVE!

After going through three changes of address in less than a year, I've stumbled on the most insidious plot of all.

Yup, I'm about to move again, but this time it's gonna be into *my own* home . . . and not just another six-month lease for more cramped quarters. I can't wait to finally be able to unpack and find a place for *everything*. Huzzah!!!

Now, anyone who's recently moved knows how much of a problem sending out changes of address cards can be . . . right? You either forget to notify someone (or two), or in spite of your diligence in sending out those cards, the computers decide to treat you like a pariah, and ignore any of your attempts to be updated. The worst part is that the humans(?) who care for and feed those electronic brains always seem to be totally ineffectual . . . as though *they* were the servants . . .

Well, trying to get those computers updated is hard enough on the nervous system without discovering that the magazines allow their computers to mess you up right from the start. It's true! They're trying to make it as difficult as possible for you to even fill out those change of address cards. You think not? Then try removing the computerized address label from your magazine cover and see what happens. Go ahead . . . I'll wait . . .

Aha, back already? What's that torn thing in your hand? A label that wouldn't come off? What's that you say? It was really glued on and tore into pieces, no matter how careful you were? Frustrating, isn't it?

Now you know the real secret . . . that magazines *don't* want to know your new address. Y'see this way they can, after receiving some threatening phone calls, send out extra copies to you, which allows them to increase that "magic" circulation number (you'd be surprised at how many hundreds of thousands of address changes are mailed to magazine subscription departments each year . . . which adds up to one helluva lot of extra copies being sent out).

And even if you're swift enough to accurately transfer all the label data to the card by hand, it still gets you nowhere . . . because some serf in the mailroom is paid to do nothing else but "File 13" all handwritten labels. We gotta admit though, **Model Builder** is probably the only magazine that helps us a bit in this area by not gluing their labels on so solidly. **Model Builder's** address labels are the only ones I know of that *do* come off in one piece (I just tried the one on my May issue and it was easy to remove).

This close up of the Robin shows all of the various struts and braces . . . plus one safety hazard . . . rope starter trying to fake it as a prop washer.

US Quadra's new line of mufflers are available with preheater for making smoke. They are well constructed of stainless steel tubing.

Joe Manuel's Waco C-6 on its first take-off. The Saito 80 Twin lost a jug shortly after rotation, but bird was landed safely.

Scratch-A-Plane Fokker DR-1. Plans look great, and have lots of information . . . the prototype has had a bunch of very successful flights.

Dario Brisighella's new Skybolt weighs anywhere from 17 to 22 pounds, depending on the engine used. Standard Quadra works fine. Plans are typical of Dario quality . . . first rate!

Anyhoo . . . the bottom line for all of this is to copy my new address which is listed at the tail end of this month's column. There won't be any more address changes because I fully intend to spend whatever remaining and declining days I have left at this address. Although I could move around within Washington, knowledgeable natives tell me I would never be allowed beyond the state line because of the webbing, and strange, moldy green stuff that have grown between my toes these past few months.

SLACKING OFF?

During the past year a lot has been written and said about our enviable safety record. It turned out, of course, that all the prophets of doom were dead wrong; we didn't have bunches of BIG Birds crashing and wiping out throngs of spectators everytime they took to the air. We proved that we are more responsible and more aware of safety hazards than our bretheren who fly the "smaller" stuff.

And therein lies the problem . . . 'cause reading and hearing about our excellent safety record seems to have gone to our heads. Many are slacking off and starting to act like they used to . . . carelessly! There's a growing feeling that as we've done so well, it's okay to relax and coast for a while . . . that we've earned a break. How's that for idiotic reasoning? We can no more afford to relax in regards to safety than any full-scale pilot can.

People who have been using fire extinguishers are becoming complacent and forgetful; competent flyers are going through the motions of checking control surface movement without really paying close attention to direction. As a result, many are taking off with ailerons reversed (properly checking aileron movement from the rear, and *not* from the front of the bird, would help to eliminate much of this). There's talk of checklists, which gets some tempers flaring because, ". . . this is supposed to be a fun hobby, and too many rules are bad."

Want to know what bad *really* is? That's when your 20x10 Zinger does a number on someone else; that's what's bad! Anything we can do to keep that prop from "eating somebody's lunch"

Continued on page 82

FLIGHT TRIM (Calm Day)

S&L — Straight & Level; FT — Full Throttle; T/O — Takeoff; A/C — Aircraft; Xmtr — Transmitter; Rt & Lt — Aircraft Right and Left

TEST	CONDITIONS	OBSERVATIONS	CORRECTIONS
1 Control Centering	T/O circle field	Can A be trimmed to S&L with Xmtr trim?	Reset linkage to center Xmtr trim levers
2 Control surface throw	S&L, Loops, Rolls, Stall turns	A. Too sensitive, abrupt movements B. Not enough control	Reduce control throw by linkage changes Increase control throw.
3 Engine thrust angle (Some interaction)	S&L, FT, then chop throttle suddenly	A. Continue S&L for short distance B. A/C nose pitches UP. C. A/C nose pitches DOWN	None Reduce down thrust Increase down thrust
4 Longitudinal Balance, CG	S&L, FT, flyby. Roll to 45° bank, and neutralize all controls	A. Continues in bank for moderate distance B. A/C nose pitches UP. C. A/C nose pitches DOWN.	None Tail heavy add nose weight, or shift weight forward Nose heavy shift weight to rear
5 Split Elevator position & yaw and balance	S&L, FT, INTOWIND, 90° to YOU. Pull inside loop using only elevator. Note if A/C moves in or out. Repeat with outside loop from inverted position going into wind.	A. A/C tracks thru loop with wings level B. Goes out on inside and comes in on outside. C. Comes in on inside and goes out on outside. D. Goes out on inside and goes out on outside. E. Comes in on inside and comes in on outside.	A. None B. Add weight to right wing or add right rudder trim C. Add weight to left wing or add left rudder trim. D. Raise right split elevator half or lower left split elevator half E. Lower right split elevator half or raise left split elevator half
6 Yaw*	S&L, FT, Toward you. Pull inside loop using only elevator. Repeat with outside loop from inverted position	A. A/C tracks through loop with wing level B. Yaws to Rt in inside and outside loops C. Yaws to A/C Lt in inside and outside loops. D. Yaws Rt in inside loops, and Lt in outside loops E. Yaws Lt in inside loops, and Rt in outside loops	A. None. B. Add Lt rudder trim C. Add Rt rudder trim D. Add Lt aileron trim E. Add Rt aileron trim.
7. Lateral Balance	S&L, FT, Toward You: Pull several inside loops, increasingly tighter, or make abrupt pull-ups to the vertical. Repeat with outside loops	A. Falls off to your Rt (A/C Lt) in inside & outside loops, worse as loops get tighter B. Falls off to you (A/C Rt) in both loops, worsens as loops tighten C. Falls off in opposite directions between inside & outside loops	A. Add weight to right wing tip B. Add weight to left wing tip C. Correct with aileron trim **
8 Aileron couple	S&L, FT, flyby. Pull up to vertical and neutralize controls.	A. Climbs vertically. B. Tends toward inside loop. C. Tends toward outside loop	A. None B. Raise both ailerons small amt. C. Lower both ailerons small amt.
9 Wing incidence	S&L, FT, Knife edge flight	A. A/C moves toward top of A/C. B. A/C moves toward bottom of A/C	A. Reduce positive incidence. B. Increase positive incidence

*YAW and lateral balance errors can produce similar results. If rudder trim is very far off neutral, check lateral balance or fin.

**Ailerons CANNOT be accurately trimmed unless they are sealed.

The DR-124 transmitter, as furnished with the Circus Hobbies Circus IV radio system. Commonly known as "The Hundred Dollar Radio".

The Circus IV system also includes the NER-324 receiver, JRB-500 battery pack, and four NES-505 servos, one of which is pictured here.

Electronics Corner

By ELOY MAREZ

THE ONE HUNDRED DOLLAR HERO

Though it has been a few months since Circus Hobbies first introduced its $99.95 JR Circus IV R/C system, which has come to be known around Southern California as the "Hundred Dollar Radio", there are still some of us who are wondering just what kind of a system it might be, and what exactly does one get for such a relatively small amount of money in today's R/C market.

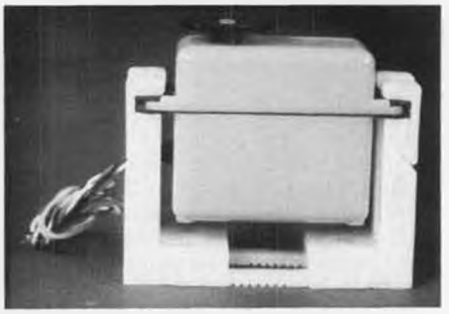
The ads tell us of a complete four-channel system, complete with Ni-Cds and charger, relatively high power (38 inch-ounces) servos; effectively everything needed to equip and fly the most commonly seen R/C airplane. The difference between the advertised retail price of $235.90, and the $99.95 sale price . . . even the servos are individually priced at $16.95 . . . has to be the result of tremendous component buying volume on the part of the JR company, coupled with an extremely high sales total by the Circus Hobbies organization. There is nothing new in this, it is an established fact that the more of a certain item a manufacturer is able to sell, the lower he can price each individual item.

But so much for the economics lesson, let's take a look at things down here where they count. What happens when

Continued on page 86

And yet another fine example of electronic miniaturization . . . this time it's tied in to solar power. Martina Fricke of West Germany models the latest in sports visors, *AM radio!*

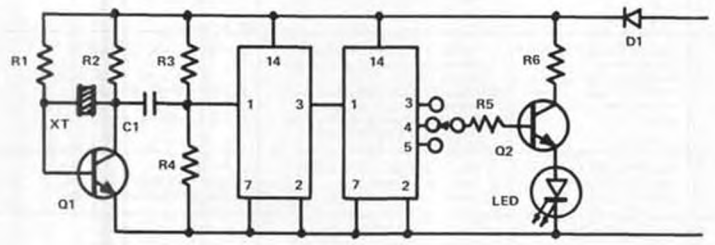
The Electric Eagle EE-1 Timer is intended for mounting to the front of the transmitter. Features: time, stop watch, countdown, more!

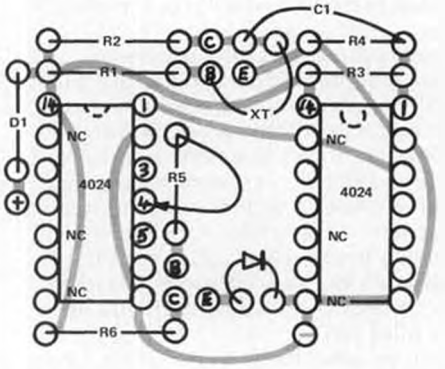


A mount for all servos, from Austria. Will hold all but smallest and largest servos.

PARTS LIST

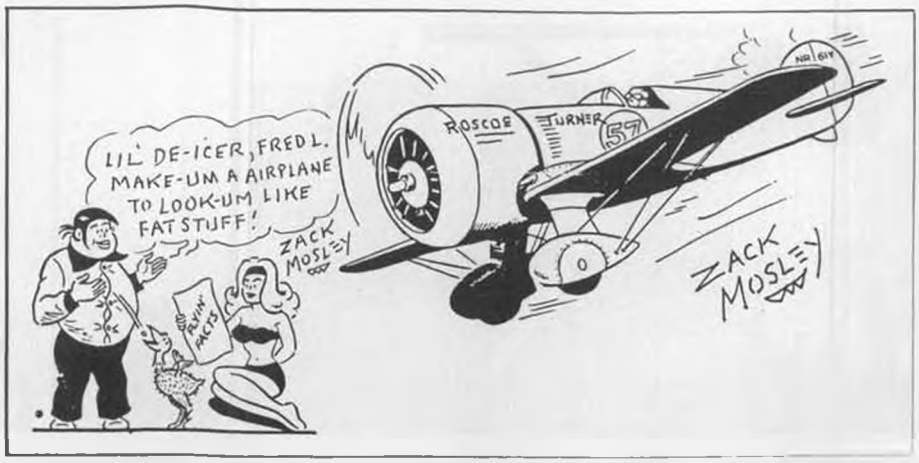
R1, 3, 4	1 Megohm, 1/4 W
R2, 5	3.3 K, 1/4 W
R6	220 Ohm
C1	Any 70 to 4000 pF
XT	TV Crystal 3579.545 kHz
Q1, 2	2N3904 or similar
ICs	CD4024
D-1	1N4001 or similar





TACHOMETER CALIBRATOR (SEE TEXT)

1. One of the winningest modelers at Horsham. Flt. Lt. Paul Lagan with ill-fated A/2 glider.



A leading promotor of aviation for many years, Zack sent this cartoon to Fred Lehmberg from his home in Florida. Reprinted courtesy of Zack Mosley and Tribune Co. Syndicate Inc.

PLUG SPARKS

By JOHN POND

• Here we are again for the second half! (Second half of the fun at the Australian Nationals, that is!) As we commented previously that Acting M.A.A.A. President Dave Axton was involved in a flag kidnapping incident resulting from the rivalry between his Kilo Club and the Sunbury Club, we would be remiss if we failed to report another highlight of the annual auction.

The auction is held at every Nationals to benefit the local crippled children's hospital. A percentage of the money derived from all auction sales is donated to the hospital at no administrative cost, and in many cases, 100 percent of the sale price is donated.

My old buddy, Monty Tyrrell, had been selected to run the auction, but when it came time to auction off his Boeing B17 control line model, he deferred to Ivor F (Stowe). As can be readily guessed, Ivor made no bones about wanting to be the auctioneer! His peppy sales talk does enliven the audience.

Ivor stated at the beginning of the auction for the B17, that he himself, would make *one* bid, and anyone top-

2. Anything can be flown in the Scramble Event and be competitive. See what this young modeler flew in the M.A.A.A. Nats.

3. Art Cooper, a competitor from New South Wales, cranks on his scramble model.

4. Here's a shot of the Scramble Event competitors hard at it in the fields of Horsham, Australia.

5. Columnist Pond gingerly launches his Coupe D'Hiver into the high wind. The event was Unlimited Rubber! Lagan photo.

6. Never say die! Ivor F repairs one of his younger boy's models. The wind claimed quite a few models.

8. Max Starich, Old Timer Spark Plug launches a 40-plus-year-old restored Sky Rover.

ping his bid would immediately become the new owner. Bidding started rather slowly, until a bid of $25.00 was received. Then bidding proceeded rather briskly: 30, 35, 40, 45 . . . then in one-dollar increments . . . slowly the bids went 50, 51, 52, and then the action seemed to lag. Ivor then gave a small speech ending with, "I'll bid $60.00!", hoping this would encourage another round of bidding.

Dead silence . . . Ivor looked about desperately for a friendly bidder's hand. *None!* Soon a voice came from the back of the hall, "You bought it, Ivor." This brought the house down!

It's experiences like these that are the main reason this writer never misses a model auction. Besides being fun, there is the excitement of a calculated risk while running up the bid. Like the voice said, I have bought many items many times without really wanting the item!

Getting back to the flying, news came out that the Free Flight Towline Glider event was cancelled by the F/F Director, Keith Harvey. With the wind gusting up to 40 mph, there were very few towline gliders that would have survived in one piece. This is the first time this writer has *ever* seen an event cancelled at any Nationals. There's a first for everything!

As can be seen in Photo No. 1, Paul Lagan is posing with his A/2 glider. What the reader *doesn't* know is that his assistant is holding the wing tip on . . . a victim of the high winds.

SCRAMBLE!

The sub-title means exactly what it says, *Scramble*. This is an event where the modeler scrambles to get as many two-minute flights in the period of an hour as he can. The best part about this event is that anything and anyone can participate. SAM might take a few pointers from this fun event!

This event is so popular that the officials schedule it as a daytime flying event, and then have another one at night! And darn if it isn't a sramble at night! As can be seen in Photo No. 2, here is a shot of a real non-competitive duration model that can be a real threat in this event. All that is really required is a quick starting engine, a dependable engine shutoff, and one pair of sturdy, YOUNG legs. In an hour's time, you can get pretty well corked-out by running back and forth. Would you believe Paul Lagan won both events! The race is not always to the swift!

While we are at it, Photo No. 3 shows Arthur "Fluence" Cooper of New South Wales, with a very simple sport model that would be able to compete in the American Nostalgia event.

You will please note the name, "Fluence." This came about one day at a contest when competition was running quite high. Arthur and one of his friends were sizing up the competition, when his buddy was heard to exclaim, "Look at that model. It's a mile high. That's a max for sure."

Art took one look at the model, and said it would be down in another minute. Incredible as it seemed, the model actually came down in the time predicted. From that time on, everyone figured Cooper could "influence" a model to come down anytime he said it would. Hence, the name "Fluence" was born. Don't laugh! This very thing has happened too many times to be coincidental. Over here, we would call it "giving the evil eye".

To give you an idea of how popular this event is at the Australian Nats, Photo No. 4 shows part of the flight line. You

7. A 1915 twin pusher (unknown design) flies from the hands of Ivor Stowe who placed second. Flight lasted only 29 seconds.

9. This Paul Lagan photo shows Bob Stone making plug adjustments to the engine of his Comet Mercury, undoubtedly the best Old Timer model on the field.

10. Dennis Parker is not too proud of his Miss America's demise.

11. Dennis Parker receives treatment from the resident doctor (actually his brother-in-law). Those Australians are neat people!

will note that every flyer has an individual timer who sits and times, keeping an account of the accumulated air time. The wind made it tough this year to get two-minute flights (a maximum time allowed per flight), and tougher still to get back to the field for more flights.

UNLIMITED RUBBER

Here was an event which this writer was prepared to enter . . . even though the model to be flown was only a Coupe D'Hiver (Winter Cup). The model had been thoroughly tested the day before in rather nice conditions for a change. The model was getting three-minute flights every time. Oh Boy! Here's where we show those Australians how they fly models in California!

Wouldn't you know it! The wind was blowing something fierce the next day! (As the Australians would say, "Blowing to buggery.") The poor Coupe model was not up to the wind. Photo No. 5 shows the columnist attempting to get off a launch that would not stall in the heavy wind. No way! Out of 15 entries, Pond ended up eighth, but we did put in all our flights no matter how small of time they were!

We can't say enough for Ivor F and his intrepid band of young flyers. As can be seen in Photo No. 6, Ivor is busily rebuilding (and we mean rebuilding!) an unlimited rubber job for the young fellows on the left of the photo. Note quickie sheet balsa fix on the side . . . now to fix the wing! You couldn't help admire these guys flying in such winds! Retreiving models was something else!

Well, we have already talked about the other events. Just as soon as we get through discussing the Engine of the Month, we will finally get to the real fun, the *Old Timers!*

ENGINE OF THE MONTH

As this columnist has pointed out in past articles, motor manufacturers experienced the biggest boom in engine sales right after World War II. Augmenting the sales was the new fad for controline flying. This newest fad was responsible for developing faster running, and longer lasting engines.

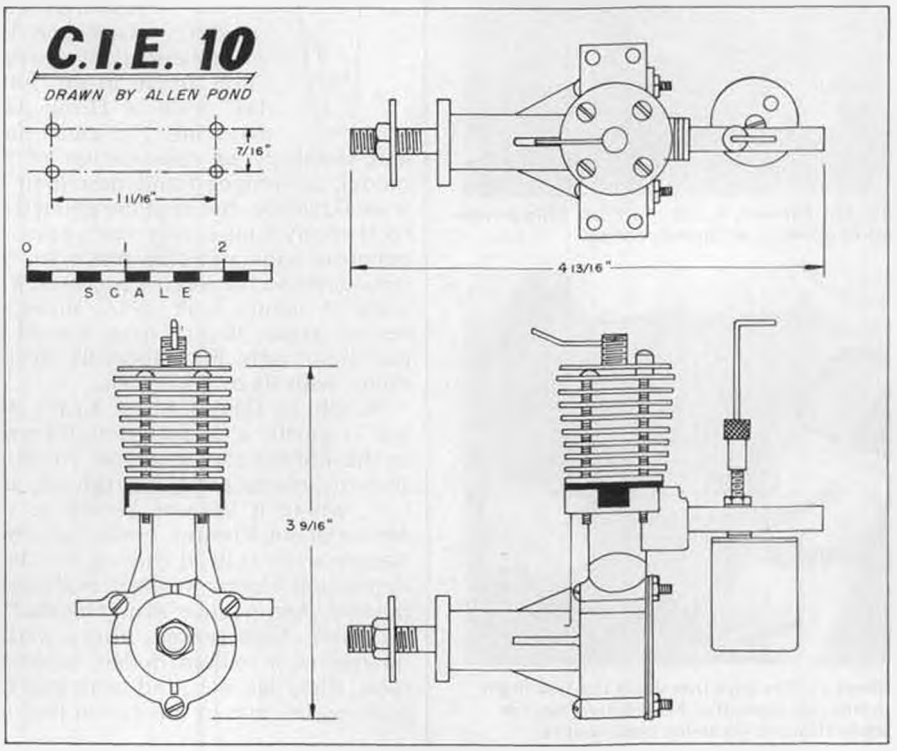
In search of constant improvement and increased reliability, several designers, notably Leon Shulman came out with the *diesel* engine in an effort to eliminate that constant de-bugging of the ignition circuit.

Following that lead, Barney Snyder of Modelcraft, introduced the C.I.E. engine which stood for Compression Ignition Engine. This is truly descriptive of what all model "diesel" engines really are. A true diesel engine has its fuel injected into the combustion chamber while under the compression stroke.

Not too many people are aware of Bill Brown's (of Brown Jr. fame) influence on this motor. If you look at the engine carefully, many features of the old Brown Jr. become apparent: long stroke, rear port induction, the 1946 C.I.E. version's Brown Jr. Model B type tank, and the general arrangement of the crankcase.

This small displacement engine allowed the use of small models with much less noise. As a matter of record, this columnist used to fly his C.I.E. powered model inside the National Guard Armory, the meeting place of the San Francisco Vultures. Those were

12. Bill Gordon of Canberra, ACT, built this gorgeous McCullough "Toreador."



13. Karl Maltas flew this Australian design, Skyrocket. It was rather cool in the morning!

14. Allen Lesher produced this Ohlsson 23 powered Plecan Simplex. Nice covering job!

great days . . . until the complaints started coming in about the hardwood floors being stained with fuel.

In 1946, the first advertisement for this motor appeared in *Model Airplane News*. The ads bragged about swinging a 10-inch propeller at 7500 rpm. This was no idle statement for an engine of only .14 cu. in. displacement! Indeed, it was a fine little engine, once you got the hang of running it!

Diesel engines have peculiar properties of sound which are just the opposite of the audible running symptoms of glow or ignition engines. When the engine knocks, it is not running lean, but rather it is running rich! Conversely, when the engine runs in quick bursts which make it sound like it is running rich, it is actually running with a lean needle valve setting! Confusing, huh?

It's so easy to get the hang of starting a diesel engine . . . simply release the compression about a quarter of a turn, start the engine, and *adjust the compression* for maximum rpm. In very few cases do you ever touch the needle valve once it is set!

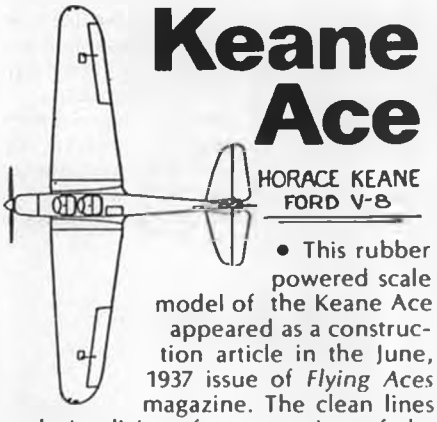
The C.I.E. engine was rather simply made as the cylinder was turned out of aluminum bar stock, then fitted with a mehanite liner and chrome-moly steel head. Hardened steel chrome was also used for the piston. An interesting feature of the tubular steel connecting rod was the bronze piston pin (the English call this the gudgeon pin) which eliminated the need for bushings. A brass bushing was provided on the conrod for the crankpin connection. The main crankshaft bearing was of "oilit" bronze.

Continued on page 61

15. Jan Thomas, N.S.W., with her Elfin powered Eliminator, an English design.

These are the guys that made the free flight events run smoothly. Peter Lloyd records while Howard Gostelow reads results.

Keane Ace



OLD TIMER Model of the Month

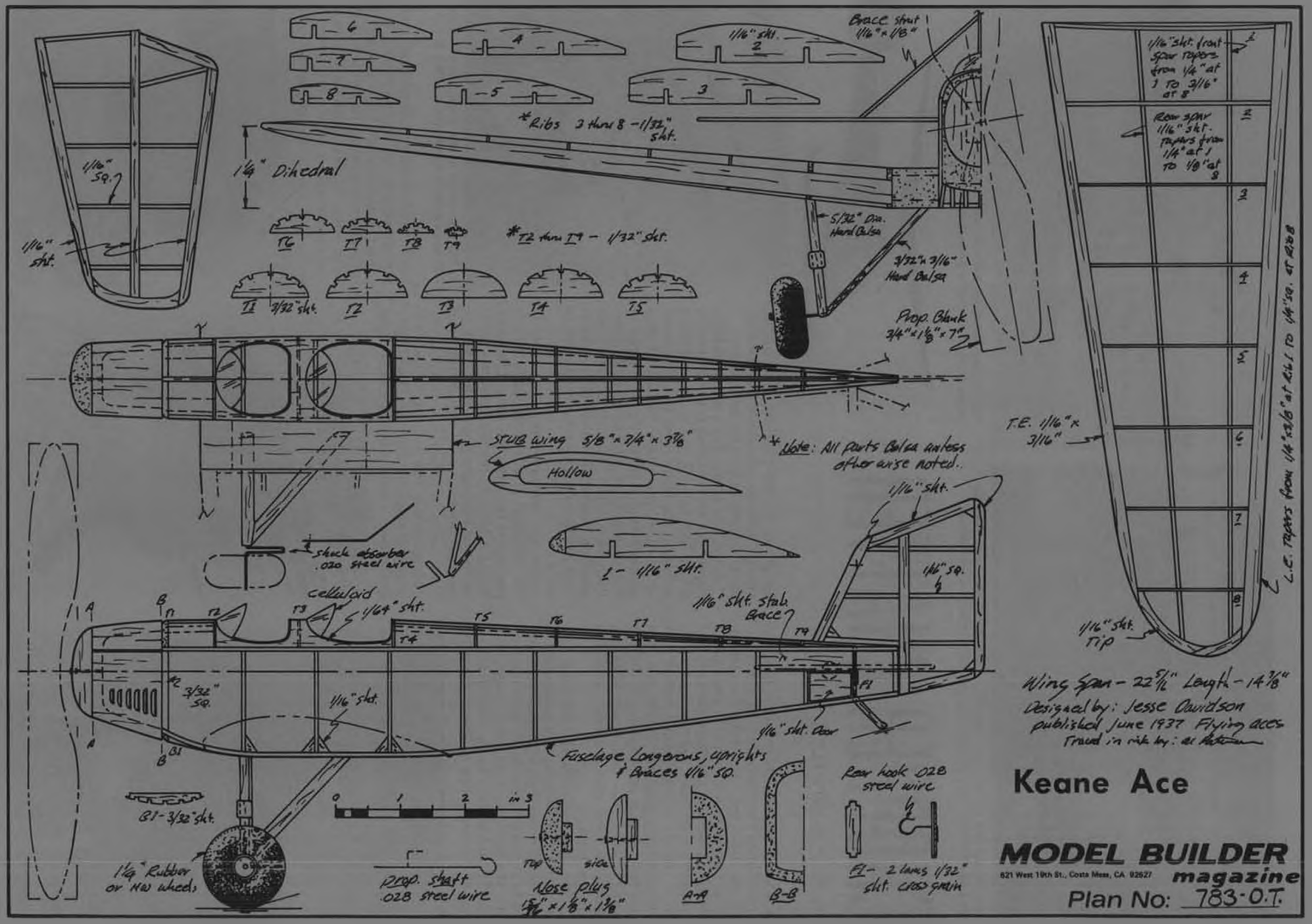
Designed by: Jesse Davidson
Drawn by: Al Patterson
Text by: Bill Northrop

• This rubber powered scale model of the Keane Ace appeared as a construction article in the June, 1937 issue of *Flying Aces* magazine. The clean lines and simplicity of construction of the model, as designed and described by Jesse Davidson, has kept me going back to it many times over the years. Its generous wing area now makes it a top consideration for electric powered R/C scale. A lightly built, 2-1/2 times up model (about 56-inch span) should be just about right for a sport 05 electric motor with six or seven cells.

As told by Davidson, the Keane Ace was originally a German design known as the Klemm. An American company secured manufacturing rights in the U.S., where it became known as the Aeromarine Klemm. Unfortunately, Aeromarine folded during the 1930 depression. Horace Keane later acquired the old Aeromarine plant, located in Keyport, New Jersey, along with a quarter of a million dollars worth of tools, dies, jigs, etc., and went into full scale production of the Ace in time for the 1937 New York air show. Keane powered it with a Ford V-8 engine, and it was able to use ordinary automobile gas and oil. The entire aircraft was plywood covered, with an outer skin of fabric for added protection.

Our decision to select the Klemm/Keane model for O.T. of the Month, resulted from an MB reader's inquiry. John Breitenbach, of Silver Bay, New York (probably not all that far from Keyport, NJ) sent us a Chris Craft ad from a ten-year old boating magazine. To illustrate its long time in the boating business, the company presented an old, brown tinted photo of an early, classic, mahogany finished Chris runabout, floating next to . . you've got it . . . a Keane Ace on floats. The noticeable modification is the installation of a seven-cylinder radial engine. Of course, this might have been a stock engine. After all, the *Flying Aces* article was written shortly after the aircraft's introduction, so Davidson could not know what developments came along later! The fuselage profile in the cockpit area also looks different, but there's no mistaking the one-of-a-kind fin/rudder shape and generous wingspan of 36'-8".

I guess the above answers your question, John, and thanks for helping to make this month's O.T. plan selection.•


Keane Ace
MODEL BUILDER
magazine
821 West 19th St., Costa Mesa, CA 92627
Plan No: 783-O.T.
Wing Span - 22 5/16" Length - 14 3/8"
Designed by: Jesse Davidson
published June 1937 Flying aces
Traced in ink by:
Brace strut 1/16" x 1/8"
1/16" sht.
2
4
6
7
8
5
3
* Ribs 3 thru 8 - 1/32" sht.
1/4" Dihedral
1/16" sq.
1/16" sht.
5/32" Dia. Hard Balsa
3/32" x 3/16" Hard Balsa
Prop Blank 3/4" x 1 1/8" x 7"
* T2 thru T9 - 1/32" sht.
T1 3/32" sht.
T2
T3
T4
T5
T6
T7
T8
T9
F7
* Note: All parts Balsa unless other wise noted.
STUB wing 5/8" x 7/4" x 3 3/8"
Hollow
shock absorber .020 steel wire
1 - 1/16" sht.
1/16" sht. front spar tapers from 1/4" at 1 to 3/16" at 8
Rear spar 1/16" sht. tapers from 1/4" at 1 to 1/8" at 8
T.E. 1/16" x 3/16"
L.E. TAPERS FROM 1/4" x 3/8" at CTL TO 1/4" sq. AT TIP
1/16" sht. Tip
1/16" sq.
Celluloid
1/64" sht.
1/16" sht. Stab. Brace
A
B
B1
F2
3/32" sq.
1/16" sht.
1/16" sht. Door
F1
Fuselage Longerons, uprights & Braces 1/16" sq.
B1 - 3/32" sht.
0 1 2 in 3
1/4" Rubber or HW wheels
Prop. shaft .028 steel wire
Nose plug 1 5/16" x 1 1/8" x 1 1/8"
Top
side
A-A
B-B
Rear hook .028 steel wire
F1 - 2 laws 1/32" sht. cross grain

Columnist and kit reviewer, Ray Hostetler hovers the very scale-like Hughes 300 Gas. Just pull the start chord and fly, no equipment.

Fully assembled Kobe Kiko Hughes 300 Gas ready-to-fly. Full explanation of assembly procedures in text.

CHOPPER CHATTER

By RAY HOSTETLER PHOTOS BY THE AUTHOR

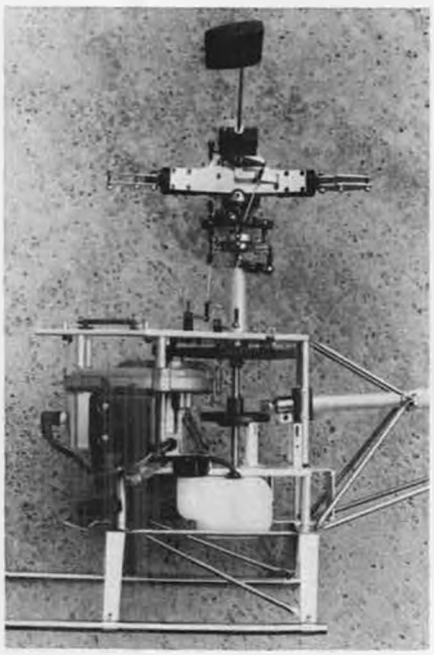
• California Model Imports has just introduced their second imported helicopter from the Kobe-Kiko Co., Japan. You may look at the photos and realize that it's a Hughes 300. But wasn't the first import a . . .? That's right, it was. If you look closely though, you'll realize that this 300 has a *gasoline engine* in it, not the typical glow powerplant. And that's what makes this helicopter different from anything else presently available on the market.

The Hughes 300 is intended for smooth, scale-like flight. If you expect to hot rod it around with jump takeoffs and radical airwork, don't, because it won't. It's the nature of gasoline engines in model helicopters to fly realistically. A lot of this tendency is due to the extra weight of the gasoline engine, cooling system, and very convenient pull starter which results in a 13 lb. helicopter.

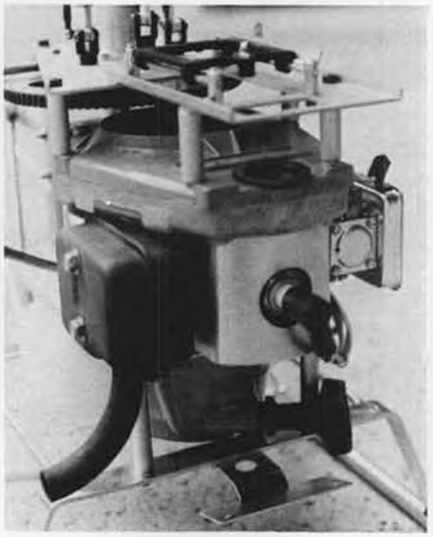
But if you enjoy flying a model helicopter the way their bigger brothers fly, if you like to walk out to an empty lot with only the transmitter and helicopter in hand, if you enjoy the sound of a gasoline engine filling the air instead of the typical high pitched glow engine, then you might want to consider the gasoline Hughes 300. Let's take a closer look at the features this helicopter has to offer.

The gas version of the 300 comes in the identical box that the glow ship is packaged in, with the only difference being a large G on the bottom corner of the box to denote *gas*. Once you've opened the box you'll find that the Gas 300 comes in a "semi-knock-down" configuration. The majority of the helicopter is assembled for you. The engine and main structure, landing gear, rotor head, and tail boom assembly all come preassembled. To complete the helicopter, you essentially have to attach the tail boom to the main fuselage, cover the main rotor blades, balance the head, install the radio, and complete the

1. The gas version of the Kobe Kiko Hughes 300 has a large *G* on the front of the box.

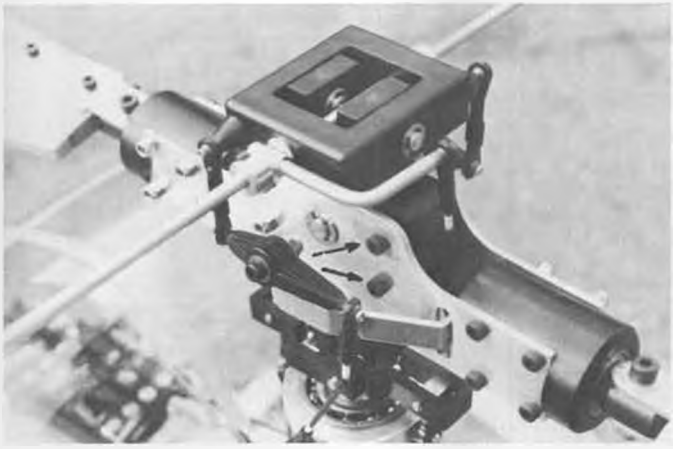


2. Side view of engine installation and drive train set-up. All assembled by factory.

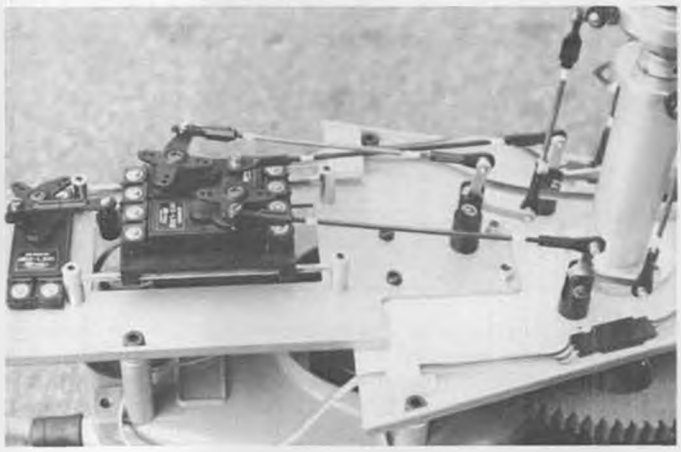


3. Front view of muffler, cooling system, and recoil starter system.

4. Standard Walbro WA carb and air cleaner. See text for optional set-up.



5. Main rotor head. Arrows indicate bolts which hold "double dampers" for positive head control.



6. Servo installation details. Collective servo is at far left, cyclic servos are mounted on sliding tray. Bellcranks transfer direction.

7. Anti-rotation link, swashplate, and washout control. See text for details concerning arrow.

8. Throttle servo detail; 1/16 plywood plate (dotted line) supports receiver. Note arrows.

linkages from the servos to the head, tail and engine. The instructions state that this will take from two to six hours. I'd tend to go with at least six hours if you plan on doing things right.

POWERPLANT AND CLUTCH

The gasoline engine for this ship is the 1.3 Kioritz, or Kioritz Jr. as advertised for airplane applications. If you've read any giant scale articles you already know that Kioritz makes a extremely high quality engine. This is one of the things that makes the Gas 300 successful. It has a tough, reliable powerplant that will be nearly impossible to wear out.

One of the nicest features of the Kioritz 1.3 is that it comes with a handy pull starter. No need to lug a starter and starting battery with his helicopter. Also, you'll never fail to fly because your glow driver went dead. A few strokes with the choke closed, and the Kioritz will be ready for flight.

A safety switch is also provided on the left side of the engine to ground the ignition system when not in use. Try to remember to flip this switch down (to "unground" the system) before use, or you'll tug on the starter all afternoon, and then some . . .

The pull starter is removable if you want to save some weight, but right now (flying at 800 feet above sea level) I just don't feel it's worth it. The pull starter is too convenient! Higher altitude flying (above 2,000 or 3,000 feet depending on temperature) will necessitate removal. More on this a little later.

Cooling is via the standard fan and shroud as used on industrial blowers. This assembly is located just above the engine crankcase, and forces air forward and down over the cylinder head. The cooling system works well. No need to worry about engine overheating and the resulting engine seizure.

Engine break in is accomplished while running the helicopter on a 20 to 1, gas/oil mix. Go to your local lawn mower shop, and buy the higher quality *petroleum based* oil (not synthetic) that

Continued on page 93

9. Tail boom braces. Tail boom joins main fuselage where short braces mount to boom. Text describes technique for assembly.

10. Tail rotor gearbox and tail rotor blades. See text for assembly tips. Author prefers bellcrank over part supplied with kit.

PORT-A-PERCH

By DANIEL WALTON . . . Here is the solution to all of your model storage problems. The Port-A-Perch, as the name implies, is a portable model stand which can be taken apart for easy transportation or storage. With careful workmanship, Port-A-Perch can be put together with simple hand tools for about $20.

• The subject for this construction article was the result of a recent job related move from Liberal to Wichita, Kansas. While living in Liberal, I was renting a two bedroom duplex. The second bedroom was used as a study and a model factory. Consequently, model storage was no real problem. In moving to the Wichita area, I settled for a one bedroom apartment. Suddenly, storage became a very pressing issue. Now I had to figure out what to do with all that *stuff* I had accumulated.

A good friend of mine, Ralph Hartlaub, had built a nifty model rack for his van using 2x2s and wood dowels covered with refrigerator tube insulation. This unit worked very well for him as a model transporter.

After some careful thought about how to handle the R/C models, the concept of the Port-A-Perch was formulated: an adaptation of the aforementioned transporter unit. It is simple (one to two evenings for construction), it will hold a large number of models, and above all, it is inexpensive. It can also be taken apart for easy transport in case one has to move . . . hence the name.

Initially, the idea was to use two poles similar to those used in inexpensive pole lamps, and some portable shelf holders I had seen. However, I was not able to find exactly the type I wanted. Next came an expedition to the local hardware and lumber yard to see what could be had. No ready-made units could be found, but there were all the necessary raw materials to make them. Here is a list:

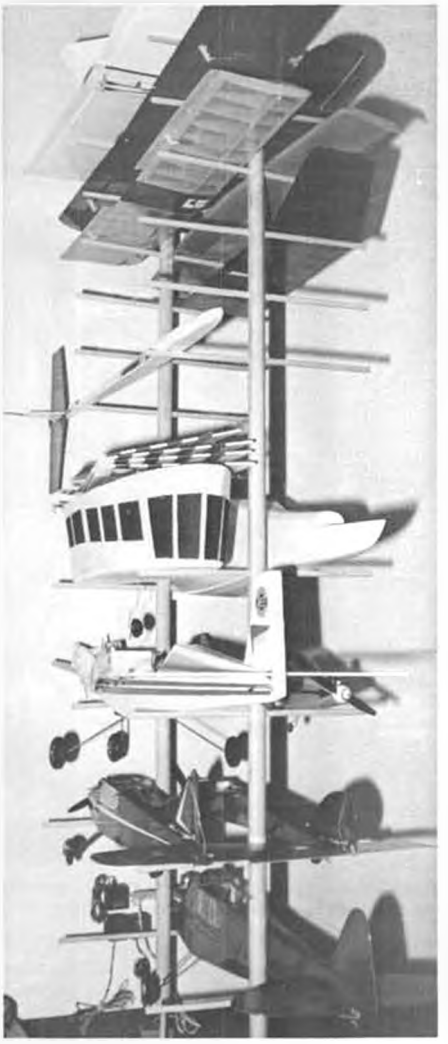
Qty	Description	Cost Ea.
2	1-3/8 in. Dia (measured) wood rod, 8 ft.	$3.99
14	1/2 in. Dia wood dowels, 36 in. or 48 in. long	.50
4	Washers, 1/2 in. ID x 1-3/8 in OD.	.15
1 Pkg	Shepherd 1/2 in. swivel glides, Stock No. 9093	1.50
2	C-856 spring p/n Century Spring Co.	1.00

The total cost for me of the raw materials was about twenty dollars for everything. Including sales tax.

Be sure that the 1-3/8 diameter poles are as straight as possible, and of reasonably uniform grain. Finish is optional as I left mine raw for the time being, with no bad side effects. I also did not bother to glue the perches into the pole. A slightly snug, friction fit seems to be all that is required. Remember, you want to be able to dismantle this unit so that it can be easily moved.

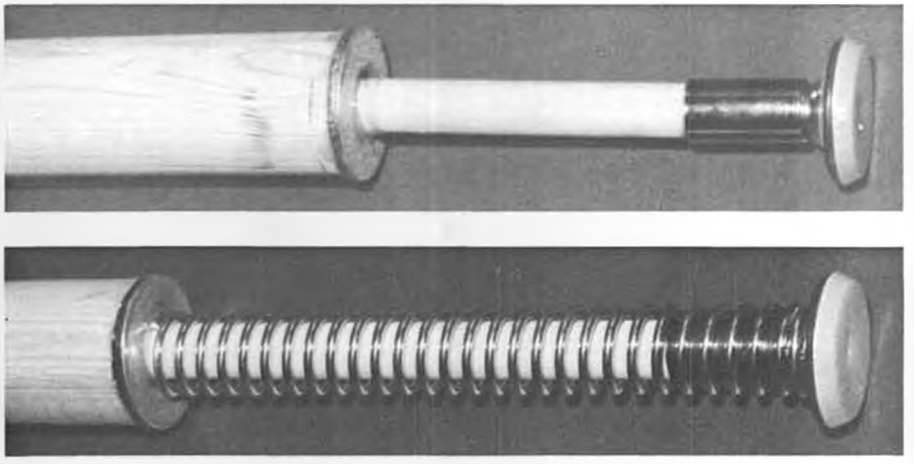
The unit is simple enough that you should be able to build one from the pictures (or a variant of it) to suit your

Continued on page 99

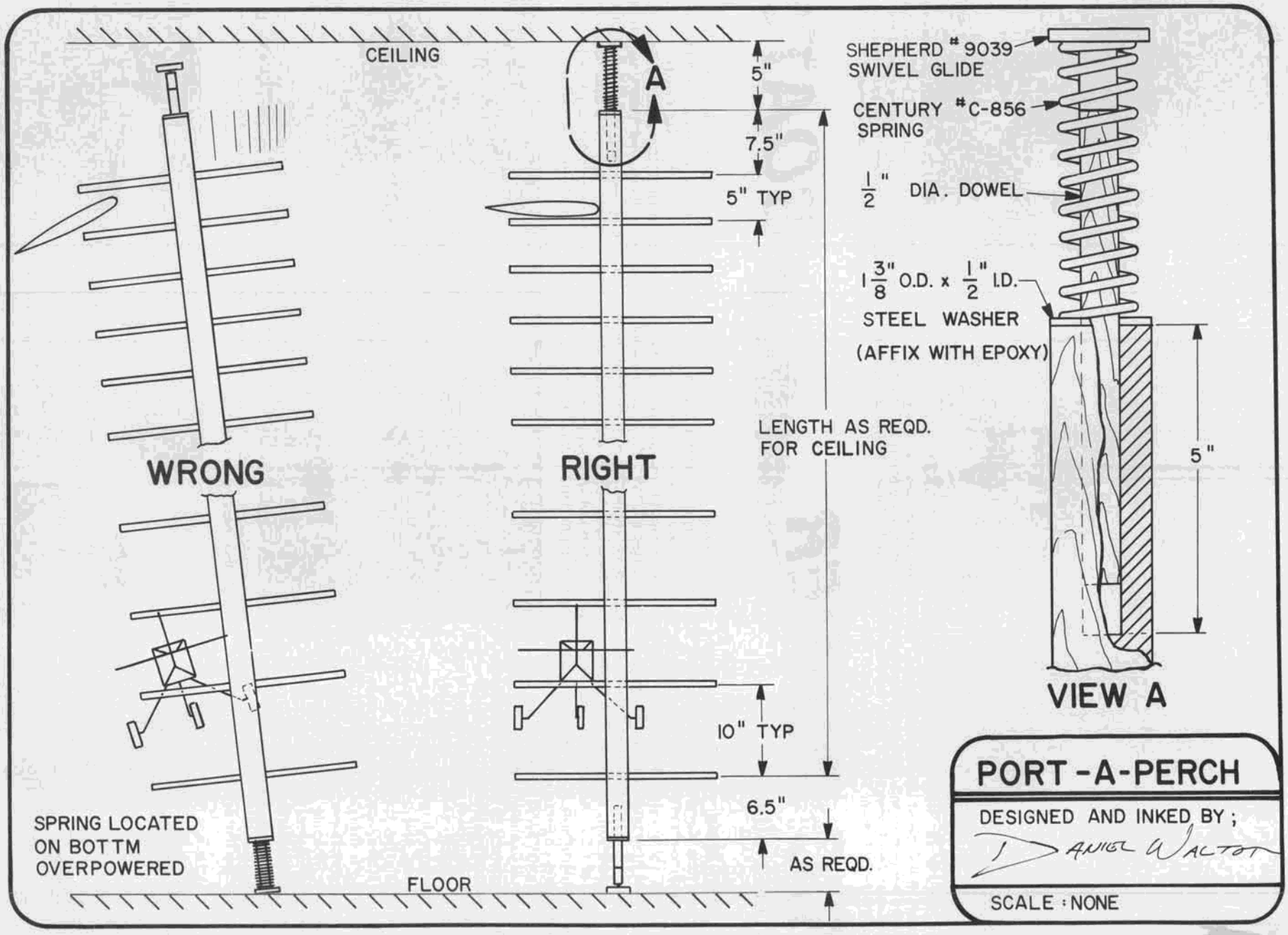


Now *this* is the way to store models! All you have to do is keep the kids away!

Ceiling end of the stand. Leg with nylon glide telescopes inside main pole.



Floor end of stand (top) and ceiling end of stand (bottom) in their assembled forms. Design is simple, inexpensive, and effective. Large washers keep wood from splitting.


CEILING
A
5"
7.5"
5" TYP
WRONG
RIGHT
LENGTH AS REQD.
FOR CEILING
10" TYP
6.5"
AS REQD.
FLOOR
SPRING LOCATED
ON BOTTM
OVERPOWERED
SHEPHERD # 9039
SWIVEL GLIDE
CENTURY # C-856
SPRING
1/2" DIA. DOWEL
1 3/8" O.D. x 1/2" I.D.
STEEL WASHER
(AFFIX WITH EPOXY)
5"
VIEW A
PORT-A-PERCH
DESIGNED AND INKED BY;
DANIEL WALTOT
SCALE : NONE

Winners of the "Small Lake Championships": (bottom row left to right) Mike Wagner, 2nd B Main; Jim Hilderbrand, 1st B Main; Gary Keyes, 2nd A Main; Terry Montoya 3rd A Main; (back row) Tom Dudley, 1st A Main; Bob Montoya, 2nd C Main; Jimmy Brazzle, 3rd C Main; Bob Welch, 1st C Main; Tony Bellizzi, 3rd B Main.

Team MRP at the "S.L.C." Gary Keyes (left) shows proper trophy handling style, Tony Bellizzi shows proper hat adjustment style, Bob Welch shows proper disregard for photog.

R/C POWER BOATS

By JERRY DUNLAP

HAVE YOU SEEN?

A few new items for model boaters have come to my attention recently, and I'd like to share them with you.

The first new product is an adjustable boat stand from Full Command Systems, 908 E. Rosewood, Spokane, WA 99208. The boat stand is of plywood and hardwood construction. It is offered as a kit, and features a special introductory price of $24.95 plus $2.50 for shipping. I first saw the Full Command Boat Stand at the 1983 Northwest Model Exposition in early February and was able to talk Bruce Batch, the company owner, out of their display version. I have been able to adjust the stand to accept deep vees, hydroplanes, and tunnels. One special feature of the stand that I think is excellent is the prop shield that serves to prevent such things as hands and starting equipment from contacting the prop while the boat is being started. Full Command Systems has acquired a number of different accessory lines for model application. I would recommend you request a catalog listing their product offerings. The catalog is available for only 50 cents.

How many of you deep vee guys have said, "I wish someone would come out with an adjustable metal trim tab." Mach Enterprises, 6321 W. 79th St., Los Angeles, CA 90045 has done just that. Their new Posi-Trim tabs for 40 and 60 size deep vees and monos are 100 percent stainless steel. The price of $19.95 is most reasonable if you consider the cost of the four adjustment turnbuckles which come with the tabs. Although I have not had the opportunity to try out the set of Posi-Trim ride plates which were sent to me, I'm impressed with the quality of the product and believe it will more than adequately meet the needs of trimming the ride of deep vees and monos.

Start of A Main at "S.L.C." held at The Lakes Apartments in Tacoma last February. Course was so tight that many racers ended up crashing into the banks . . . no room for errors!

The Posi-Trim adjustable ride plate from Mach Enterprises. Can be used on inboard or outboard models.

Paul Dunlap's Ward Marine Deep Vee 31 on Full Command Systems' Adjustable Starting Stand. Shields prop for safety.

Bob McKibbin, Auckland, N.Z., displays his steam tug *Harold H. Shriver.* Features scratch-built boiler (5x10) which is propane fired.

Here's another fantastic, scale R/C boat. This one is the *Kaammaha,* a 43-inch, Stuart Turner Double 10 steam engine with scratch-built 5x10 horizontal boiler (propane).

Anyone who regularly reads this column knows that I am an advocate of adjustable motor mounts for outboard powered boats. The adjustable mounts that have been available until now allow for adjustment while the boat is on the beach. Mini Marine Products, 3603 Lenwood, Amarillo, TX 79109 is now offering an (R/C) adjustable transom motor mount for outboard engines that is operated by a third channel on your radio system. The basic unit is aluminum, and weighs approximately four ounces. Six degrees positive or negative adjustment either side of vertical is possible. The motor plate is either slotted or threaded for vertical adjustment. The vertical adjustment would still have to be done on the beach.

The capability of adjusting the engine tilt while operating the boat would definitely be advantageous. This would be especially helpful when running into the wind or on rough water. The recommended minimum servo torque is 40 to 50 inch-ounces. The servo is protected by built-in shock absorbing features. The price for the 3.5 unit is $49.95 while the 7.5 unit sells for $54.95.

AIRBOATS PEN PAL WANTED

Dennis F. Stubbs, 9 Fosbrooke Hse., London, SW8 2XH, England, dropped me a short note and a couple of photos of his .61 powered airboat. Unfortunately, the photos were not usable for publication. Dennis would be most interested in developing contacts with others who are interested in this form of model boating. Dennis would be interested in exchanging ideas, magazine articles, photos, or whatever. I hope

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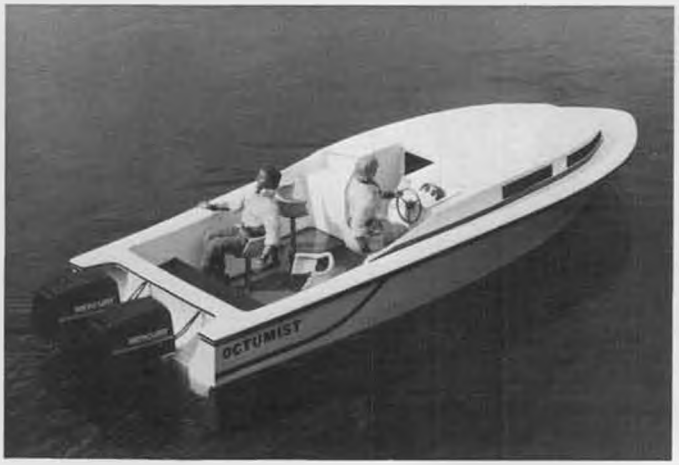
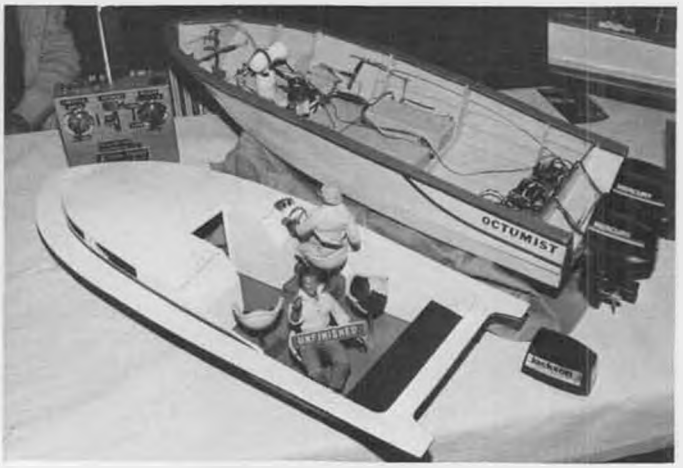
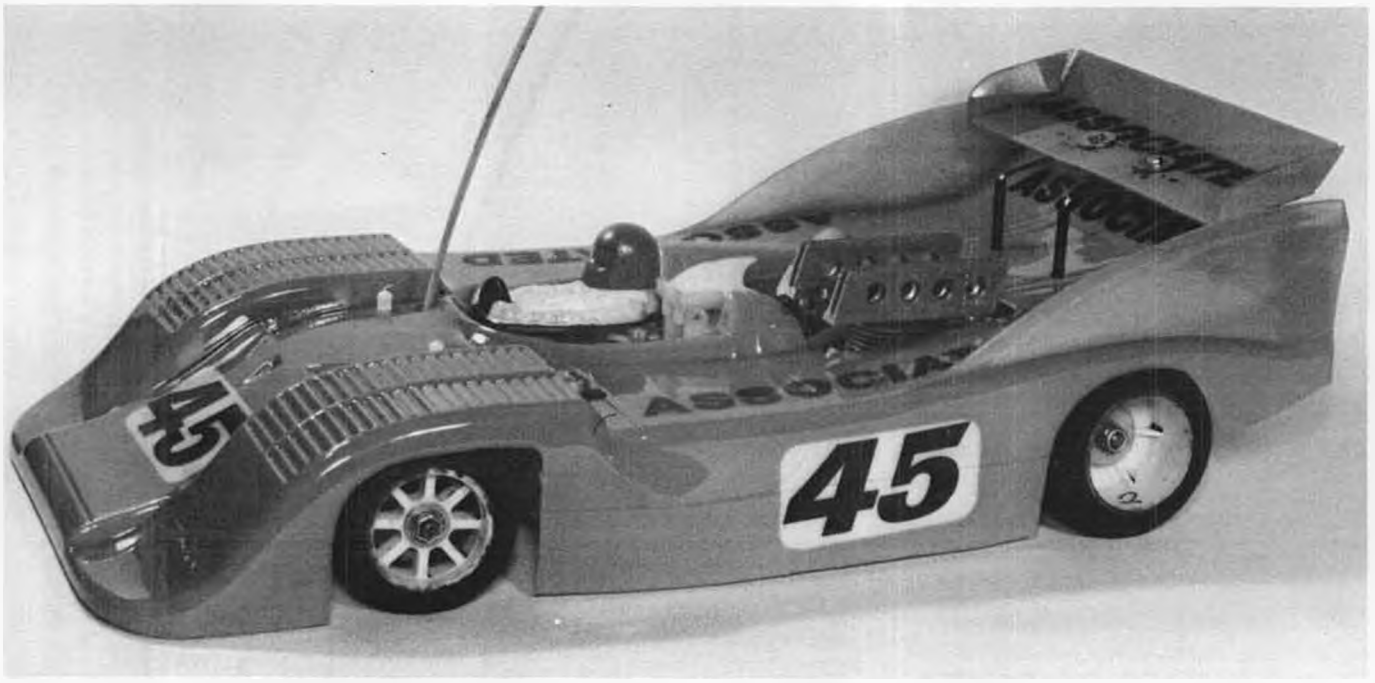
Russ Fairfield sent in these photos of his modified Dumas SK Daddle 40 with K&B 3.5 engine. Russ gives the mods in detail in text. If you've had problems securing sites for running your model boats, Russ has a story you'd be interested in . . . see text.





Harold Shriver sends these two photos of an unfinished Octumist double Jackson 54 powered outboard. Uses two 6v motorcycle wetcells, or four 6v gellcells. Average run is 25 min. Steering wheel turns with motors. L.O.A. 30 in., beam is 12 in., scale is 1-1/4 in. to the foot.



The Dirty Racing Team's Associated RC 500 suspension car, fitted with an Associated Porsche 30KL body, and ready for the '83 season. This is a very good race car that is getting better and better with each refinement.

R/C AUTO NEWS

By DAN RUTHERFORD

PHOTOS BY AUTHOR

• As this is being written (early March), our club is getting ready for the '83 racing season. Tomorrow is what we have come to call Play Day. All of us haul the cars out to the track, and do some get-down, get-serious grudge racing, and plain old tuning. It's just grab an open frequency, and roar your way around the track. Terrific fun.

The Dirty Racing Team is prepared. On charge are three Delta Super Js, a Delta Eagle, an Associated RC500, assorted transmitters, and starting batteries. Cleaned and fully detailed are an Associated RC12i and a Delta Super Phaser. Hey, we are ready. We have all of the very best in racing equipment to play with.

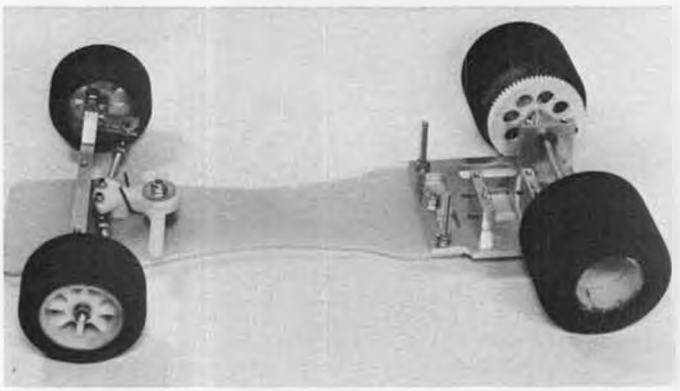
However, this racing season will be lacking something, and that something affects all of us, not just the DRT. The other day, JoMac had to close its doors.

The reasons for JoMac's demise in what might appear to be a lucrative business (there are no lucrative opportunities in the hobby manufacturing biz) are there no analyze, and as I probably know as much about JoMac as anybody outside the company, maybe I should . . . But I won't. What I will do is tell you a few things about Don McKay, as JoMac wasn't a company as much as it was an extension of Don's personality, unbelievable drive, and resourcefulness.

I first met Don years ago at a C/L Combat meet. I was just starting to fly C/L as Don was wrapping up his career in C/L, soon to move on to R/C car racing. Our time flying together was just long enough for me to decide that if I had to make a choice between liking or disliking Don (no room for middle ground), I would take the negative side. There was no single reason for this feeling, it was just that Don took the hobby a lot more seriously than I thought it deserved, and would do almost *anything* even remotely within the rules of competition to win.

One of my most salient memories of him at this time was when one of his team members lost a match, and another one was up in the following match. His buddy had lost, but it appeared that a technicality or two might reverse the result, and at least a rematch was likely . . . But it would take some really fast talking. Don was pitting for the next team member, but as always, he was the boss, and as such, needed to be the lawyer-type in the upcoming argument. Arrangements were made for Ken Burdick to do the pitting for the next match. If Don was successful in negotiations, the model would be ready to go. If more pleading and cajoling time were needed, Ken was to yell out that the motor blew a head gasket in warm-up, and they would need a few extra

DRT's new Associated RC 500 with Custom Racing Shocks. Balloon dust covers must always be in place. Units improve performance.



Left Over Special takes shape. Associated RC 150 is bare roller. Designed and marketed as a club racer chassis. More to come.

The 24th in a continuing series of pictures of Delta race cars sporting the MRP Budweiser Spyder body. Is this one the ultimate in colors-plus-stickies body art?

minutes to fix it. There was nothing strictly illegal in any of this, after all, the Contest Director is *the man,* and if he allows it . . . Well, he may be wrong in doing so, but he is giving a team leader like Don an opening, one that will definitely be capitalized upon. This attitude at contests (or RC car races) I find to be needlessly disruptive, and the attendant actions stretch my sense of fair-play just a little too much.

As our flying careers were overlapping, there was another happening observed that also tells much about Don. It was the Slow Combat Finals, and he was out of models to fly. One of the early-round losers offered Don the use of one of his models, complete with motor, tank and lines. For those not familiar with Combat, the loan of a model is very risky. Many times the loaner is crashed into oblivion. Don and crew (the team was more accurately known as the Bod Busters) prepped the model, and at the start were first in the air.

Never having flown the model before, Don sneaks in a few maneuvers, not legal but generally allowed at the time. Wouldn't you know it, there are a few things wrong with the plane: it is light on the lines in outsides, the motor wants to cut rich in hard outside corners, etc., but instead of waiting to critique the model later in the relative privacy of the pits, Don starts listing off all of the things that are wrong with the plane *and* how to fix them! The owner of the airplane was embarrassed; here he thought he was doing somebody a favor, instead what he got was a put-down. The interesting point here is that Don was right on all counts regarding the model, and probably was trying to *help* a competitor who would no doubt have to be faced within the next contest or so. Had the guy listened, it would have been a much tougher match. Don knew that, but just couldn't wait for a more appropriate time to say what he had to say. Putting things off till later has never been Don's style.

Our paths didn't cross much for a few years after that. At one time I was considering opening a hobby shop (we all have such crazy ideas sooner or later). We met shortly one afternoon as Don was then a buyer/salesman for Northwestern Hobby & Toy, the hobby shop idea fizzled (good sense prevailed), and that was that.

About this time Ed Sweeney had developed the idea of a 1/12-scale R/C car powered with a Cox reed valve motor. John Congdon (the future *Jo* in JoMac) was working for Rocket Research, and he designed the Jerobee cars which Rocket produced locally here in Redmond, Washington. It was then Rocket's intention to get into the toy market; it was often bandied about that they would soon be bigger than Mattel. The Jerobee car was meant to be nothing more than a toy vehicle, selling, complete with radio, for less than $100.00. Naturally enough, Don couldn't resist, and bought the line for his employer. This put him in contact with Congdon and others at Rocket. When they decided the manufacture and marketing of the Jerobee was way out of their line, Don was there to buy the company, which is what he and John did with what I believe was a 50/50 (or very nearly so) split. Although John was always more than content to design and work on production problems, Don was by far the more visible partner.

One of the problems with the Jerobee was that Congdon had actually done too well in designing it. He was supposed to have designed a toy, instead he came up with a vehicle that was durable enough to be raced, but not priced cheap enough to be bought as a mere toy.

Today we can look back at the Jerobee car as being archaic, but at the time it was great, easily the best . . . because it was the only car made. We can also plainly see that the basic Jerobee design, from chassis to radio layout, was also in production, and winning races, for far longer than any current or future R/C car can ever hope for.

It was clear to Don that his market was racers, and while I do not know all of the details and/or the sequence of events, it was not too long before ROAR had a class for 1/12 racing. A new racing class has to be promoted, and Don went for it. He literally traveled the country selling the car and putting on demos. These demos would take place at car shows, hobby shows, 1/8 races, small hobby shops, anywhere Don figured there were potential customers. The man *created* the market, and damned near did it single-handedly. You simply wouldn't believe the effort involved, even those of us who became close to Don can't believe it when we look back, and *none of us knows everything* that he did in the promotion of 1/12 racing!

The competition career of the basic Jerobee chassis was absolutely amazing, and credit is due to both Don and John Congdon . . . although it was usually

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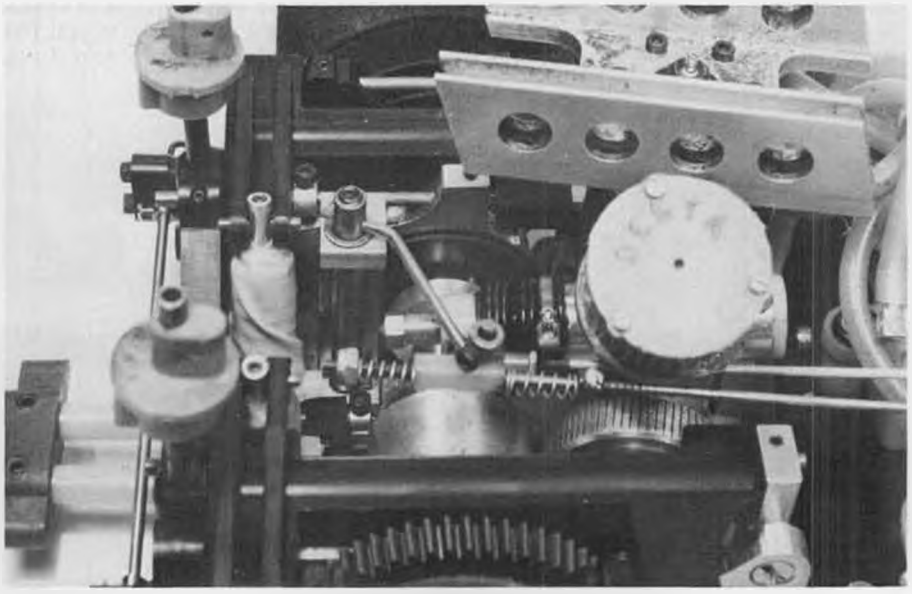


In there somewhere is Delta's new double-disk brake. At only $10, an inexpensive conversion involving only an R& R operation, no cutting, grinding, or filing necessary.

Jim Parsons launches Rich Porter's "Double-Size Voodoo". Power is by Super Tigre 60. Event is a stuntathon.

Control Line

By MIKE HAZEL

PHOTOS BY THE AUTHOR

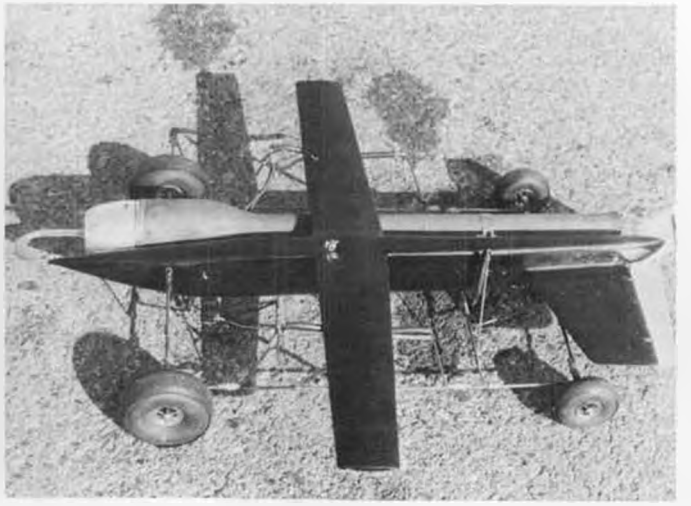
• After an absence of several months, control line is returning to **Model Builder**. Those interested in seeing control line coverage continue in a monthly column should write to the editor and express your desires. The current plan is to include the control line column on a bimonthly basis . . . only because it is felt there is not enough interest. I believe that there are enough of us out there to prove otherwise, as demonstrated by the write-in campaign to one of the other magazines that did not think we existed anymore. It is important to show your support for putting C/L between the pages of **Model Builder** on a regular basis. If you like what I write, please say so. And if you don't, please say so. *Please write.* Any feedback that is received will have the positive effect of showing our numbers.

The next topic would most logically be the question, "Who is this columnist?" You can catch that at the end of this article. Meanwhile, here's what I would like to do with this column.

My first priority is to get as much information on a general spread of control line activities as possible. This is not to say that equal coverage is promised for all aspects of wire-flying, because that would be a promise too impossible to keep. But there will be no exclusion of specialty type competition events as there is in some other magazines. I will lean toward my favorite interests just as any other writer will do, and I make no apology for that.

Another priority will be to include whatever political coverage that seems appropriate and vital to the control line ranks. Politics are equated with promises, and mine is to keep this subject matter relevant. If I don't make good on this one, wrap me up with your strongest

Did the jet engine get away? N.A.S.S. Chairman Chris Sackett cleans up his jet speed ship.



New *Model Builder* columnist, Mike Hazel, shot this photo of his sidewinder jet speed model sitting in its takeoff dolly.

Control line display area at the '82 Northwest C/L Regionals. Planes in front are from Frank Macy's Fireball collection. The board holds Terry Miller's collection of RTF models.

Seattle area stunt flier Paul Walker demonstrates his abilities at Portland contest.

set of lines, and send me back.

An occasional feature of this column will be a focus on a C/L specialty organization. This month's in-depth look is not at one of the largest groups, but rather the newest. N.A.S.S. stands for the North American Speed Society. The organization's goal is stated very clearly on the letterhead as being, "Dedicated to the advancement of control line speed." N.A.S.S. is currently chaired by Chris Sackett, who also edits the newsletter "Speed Times". The following is a verbatim copy of an introductory letter to N.A.S.S. which tells its own story:

"As a speed flier, have you been frustrated by the lack of coverage of your favorite event in the model press? Sure you have, that's why the N.A.S.S. was organized in April of 1982.

"The N.A.S.S. boasts better than 98% of all active C/L speed fans as members. Such all-time greats as Bill Wisniewski, Chuck Schuette, Dale Kirn, Nick Sher, Jim Clem, Al Stegens, Dub Jett, Leland Morton, and Jerry Thomas are among our members, along with such contemporary stars as Les Baer, Charlie Lieber, George Brown, Dick Shannon, and Frank Hunt.

"Although the N.A.S.S. is comprised of many hot doggers, this does not mean that hot dogging is a requirement for membership. A full 25 percent of the roster is comprised of people who are semi-active, or who are just interested in speed flying and enjoy keeping in touch with the speed world.

"As a member you receive a quarterly newsletter that is second to none. Twenty-five to 30 pages of state-of-the-art photos, plans, hints, and kinks, as well as contest results, old timer plans, speed equipment sources, and human interest stories.

"You also receive a personalized name tag displaying your name and membership number, a yearly membership card, and four N.A.S.S. decals. The overriding goal of the N.A.S.S. is to popularize C/L speed flying and bring it

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Tom Knoppi displays his Nelson powered, flying wing FAI team racer.

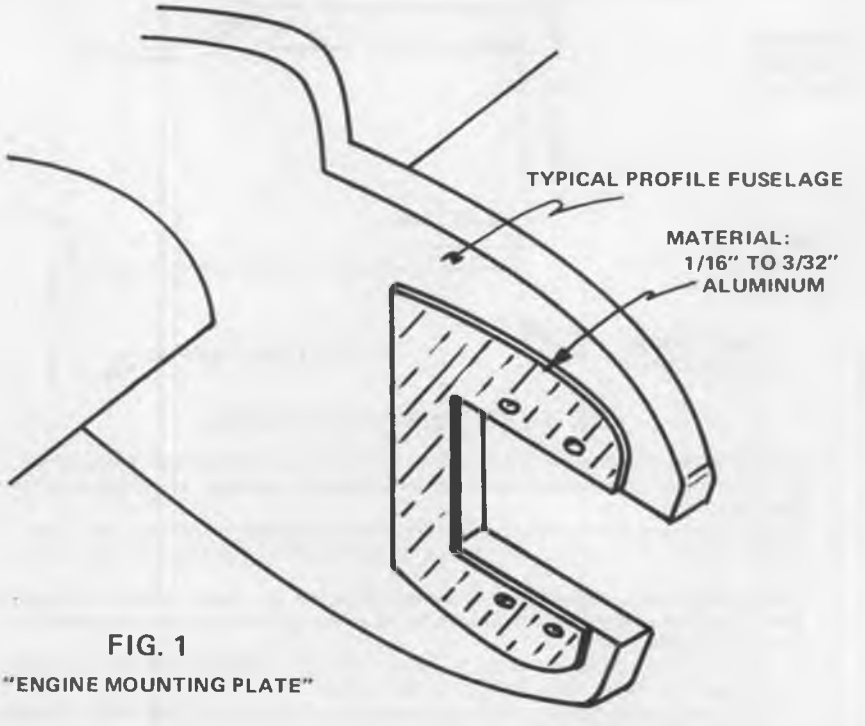


FIG. 1

"ENGINE MOUNTING PLATE"

Aluminum engine mount plate design can be fabricated in just minutes, can save a fuel-soaked, wooden mount from an early demise, also will aid in engine substitutions. See text.

FREE FLIGHT SCALE

By FERNANDO RAMOS

• This month's column is a bit different from the usual format. I received a very interesting letter from Curtis Moss of Orlando, Florida telling of his approach to gas powered F/F Scale. Those of us who still enjoy gas powered scale will find Curtis' techniques a complete change of pace from the usual flight path of a well-trimmed, stable F/F Scale model. Here are Curtis' words:

"I want to discuss a special kind of gas powered scale model that emphasizes flying fun more than scale appearance.

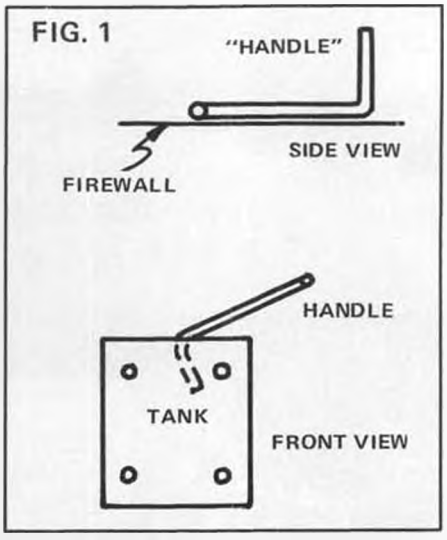
"It is the nature of most F/F models that once trim adjustments are completed, all succeeding flights are pretty much the same. They fly in a 'groove', and about the only thing that varies is flight duration. A good groove is both needed and desirable in an endurance model, but it can become boring in a sport or scale model. Actually, a gas powered scale model can be trimmed (or programmed) to safely fly at a wide variety of speeds and attitudes, thus duplicating much of what the full-scale aircraft does. This can be *very* enjoyable and educational (and sometimes comical . . . did you ever see an SE-5 flying backwards under power in an 8 mph breeze?).

"What is needed to get the scale F/F model out of that fixed groove, is a special kind of model and power plant combination. Variable, but constant, thrust and torque are needed to safely change the trim of the model, so a glow or diesel engine is needed. The steadily decreasing torque and thrust of CO_2 and rubber motors allow very little variation in a safe flight groove.

"The second requirement is a model with extremely light wing loading, and preferably a relatively large wing area (the two go hand-in-hand, to some extent). The light wing loading is necessary to allow the model to maintain flight in a wide range of speeds and flight attitudes.

"A third requirement is a provision for making easy and frequent trim adjustments. Rudder, elevator, aileron, thrust line, props, and rpm adjustments are all necessary to get the maximum versatility in flight performance.

"My favorite engine for these models is the Cox .020 Pee-Wee. I usually use a Top Flight 5-1/2 x 3 propeller. Most flights are made with the prop reversed, and the needle valve set rather rich. This combo allows a wide range of power with just needle valve adjustments. The prop can be installed correctly for more power when needed. Thrust line adjustments are made by placing a piece of L-shaped piano wire between the tank and firewall. By moving and/or rotating the wire, this gives me fast and almost infinite changes of thrust line. (See Sketch 1)



Simple, L-shaped wire is used between the tank and firewall to adjust thrust line.

"The easiest and the best way to achieve the desired light wing loading in the model is to choose a scale subject that can be built light and strong with simple structures. A large wing area, straight, simple lines, and very little weight-adding scale detail are all desirable. WW-I bipes are best, and the SE-5 is super. So is the Fokker D-7, or most any bipe which had an inline engine (radial engine models will be tail heavy, and the drag is detrimental). In monoplanes, the Curtiss Robin, Taylor Craft, and Piper J-3 Cub are good choices.

"Although most any scale subject could be built light by using complex and difficult structures, I don't think this is advisable. Dozens of flights will mean that fuel soakage, dirt, and minor dings will exact their toll, and the model will usually need to be rebuilt or retired after one flying season. For this reason, I don't think investing either a lot of time or money on the model is worthwhile.

"As the main purpose of these models is flying fun, I think it's advisable to cheat a bit on scale detail on even the simplest of scale subjects, if weight and/or strength would be improved. Flat bottom airfoils, greater than scale rib and stringer spacing, etc., can simplify and lighten the model.

"A biplane such as an SE-5 with a Cox Pee-Wee engine, about a 30-inch span, and an all up weight of four to five ounces will do most anything that a F/F model can do. A monoplane with a Pee-

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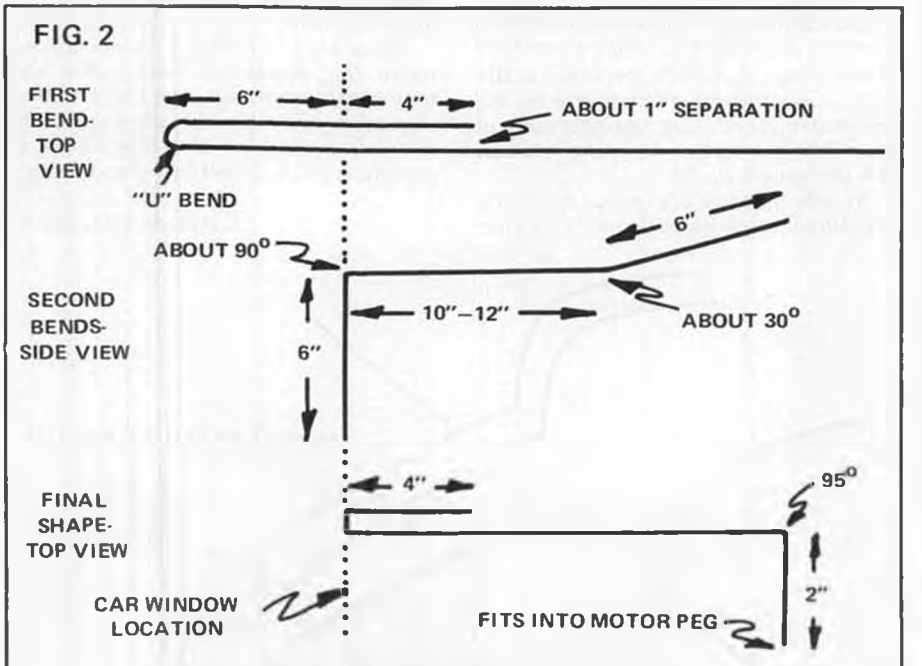
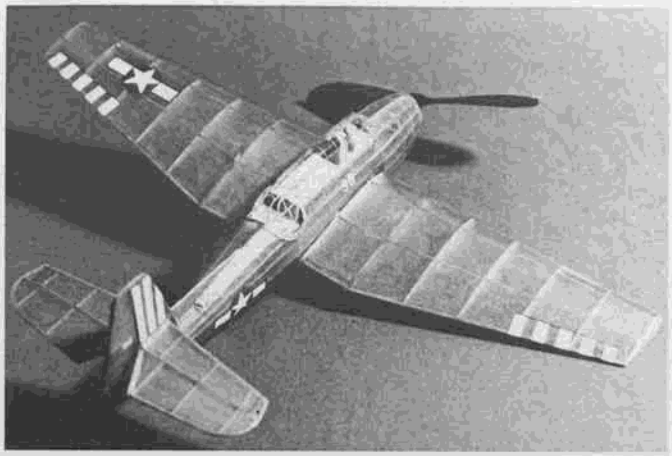
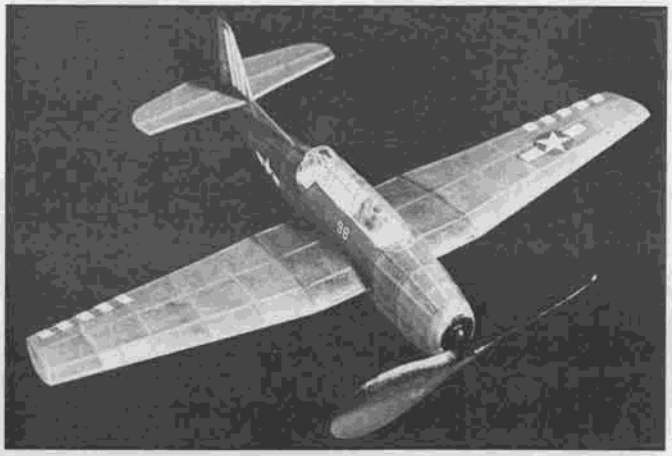


"DETROIT" WINDING STOOGE

1. Use the largest diameter piano wire that will fit into your smallest motor peg tubing.
2. Wrap the entire 10 in. doubled-over section with tape to protect car window and frame from scratching.
3. The 30 degree upward bend is to allow the model's stabilizer to clear the wire. This works well for tall vans, etc., but may not be sufficient for short cars. Change as necessary.
4. The two-inch motor peg wire should project to the left, and angle upward about ten degrees. This is to prevent winding torque, wind, or gravity from causing the model to slide off the wire.
5. To use the Detroit Winding Stooge, lay the wire on top of the car window, and roll up the window to trap the wire. A snug fit will do nicely.
6. An extra stooge mounted on a separate window can provide a safe, convenient place to store models between flights.



Rear turret area is the trickiest part of construction. Follow notes in text, and this shouldn't be a problem.



Peanut Avenger was covered in blue Japanese tissue. Canopies are vacuum formed of very lightweight acetate.

PEANUT AVENGER

By ALAN CALLAGHAN . . . Veteran Peanut builders will get a kick out of building and flying this WW-II torpedo bomber. Intricate canopies and unusual wing slots are the challenges of the Peanut Avenger.

• Although the Avenger is not really suitable as a beginner's model, the work involved is not too difficult given that some experience has already been gained in handling the small sections of timber shown on the plan. Basswood is a delight to work with, and is stronger than balsa when compared size-for-size without being significantly heavier in the thicknesses used on this model.

The trickiest part of construction is the rear turret area, and the following notes should help.

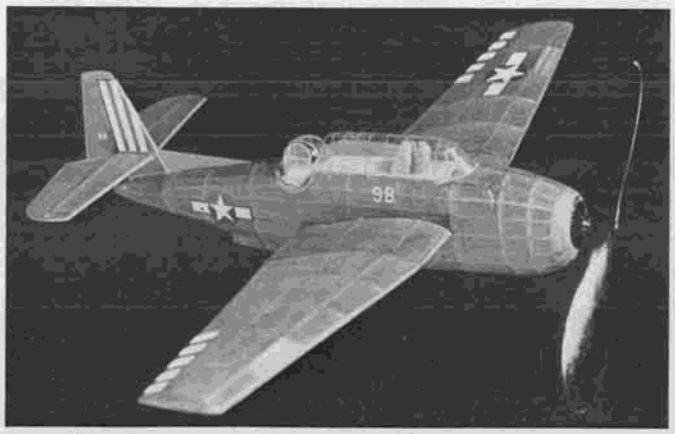
After building the keel (shown shaded) flat on the plan, together with one set of half-formers, fit the 1/16 sheet root rib, remove the structure from the plan, and fit the other half-formers and root rib. Check that when seen in the plan view, all the formers are at 90 degrees to the keel. Stringer notches are not shown on the formers because cutting these before assembly usually guarantees that the stringers will finish up in wavy lines.

Once the keel/former assembly is complete, carefully sand all the edges of the formers with a wide sanding block while sighting along the fuselage fore and aft, making sure that the curved edges of adjacent formers blend well. You may damage a former as you sand, but simply glue it back in place and carry on. Have the Hot Stuff handy.

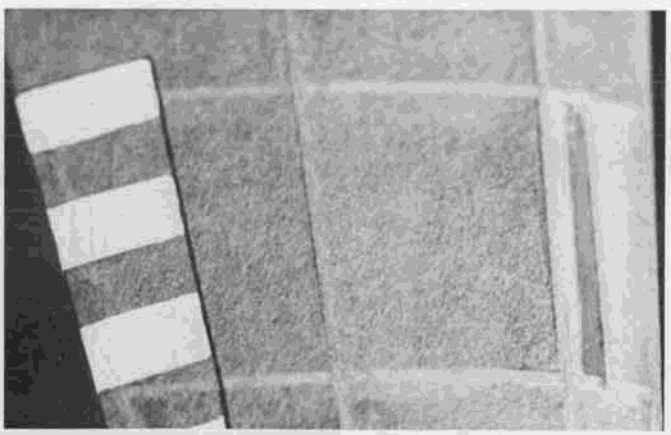
Working on one stringer at a time, and using the dotted lines on the plan as a guide, stick a piece of drafting tape along the length of the fuselage . . . letting it follow a natural line . . . and put a mark on the edge of each former where a notch should be. Take a small piece of fine glasspaper, fold it double, and using the folded edge, file in the notches on the marks holding each former as you go along. Practice getting the notch to match the size of the 1/32 square stringers on a piece of scrap balsa first if you like. Remove the tape, and glue in the stringer. Repeat the process on the other side, *and always work in matching pairs.* It takes longer to describe this technique than to do it, but the end result is far better than precutting the notches.

The two uppermost stringers should align with the top edge of the main keel when seen in side view, so that the cockpit floor can sit flat on all three members. Install the front floor after all the stringers are in place, then cut away the relevant part of F-8 and the keel where the rear turret goes. Install the turret floor between the next two stringers and add parts "X" and "Y". Obviously some careful fitting is required, so please do not rush! Sand the area very carefully and then add the turret rim. Other parts of the fuselage are straightforward. The "chin" to the lower turret is simply two pieces of soft 1/8 balsa glued to either side of the keel. The keel should be cut away here, too, as shown on the plan. The glazing here may be omitted if you like as it allows access to those broken motors. You never break them? Glaze it!

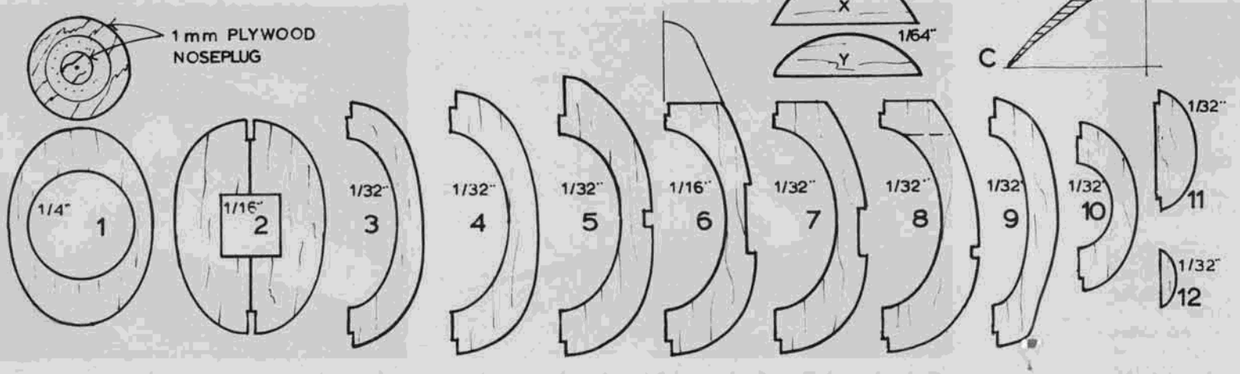
Continued on page 96

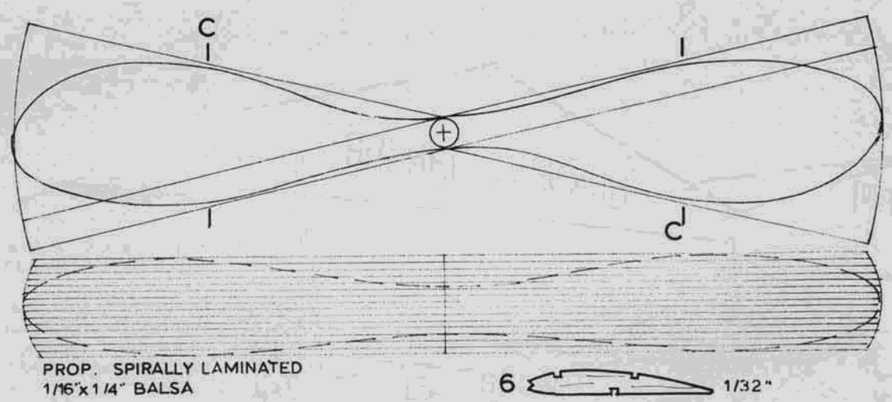


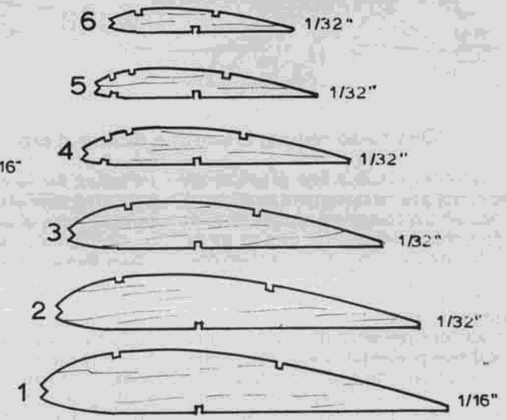
The original Avenger weighed just under 10 grams. Keep balance point well forward and fly rather fast for first flights.

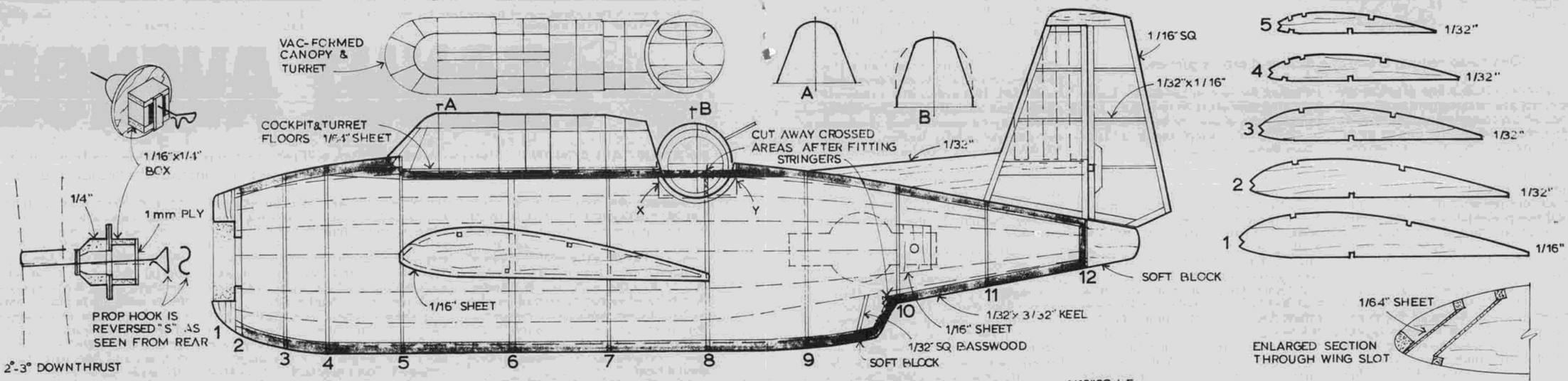


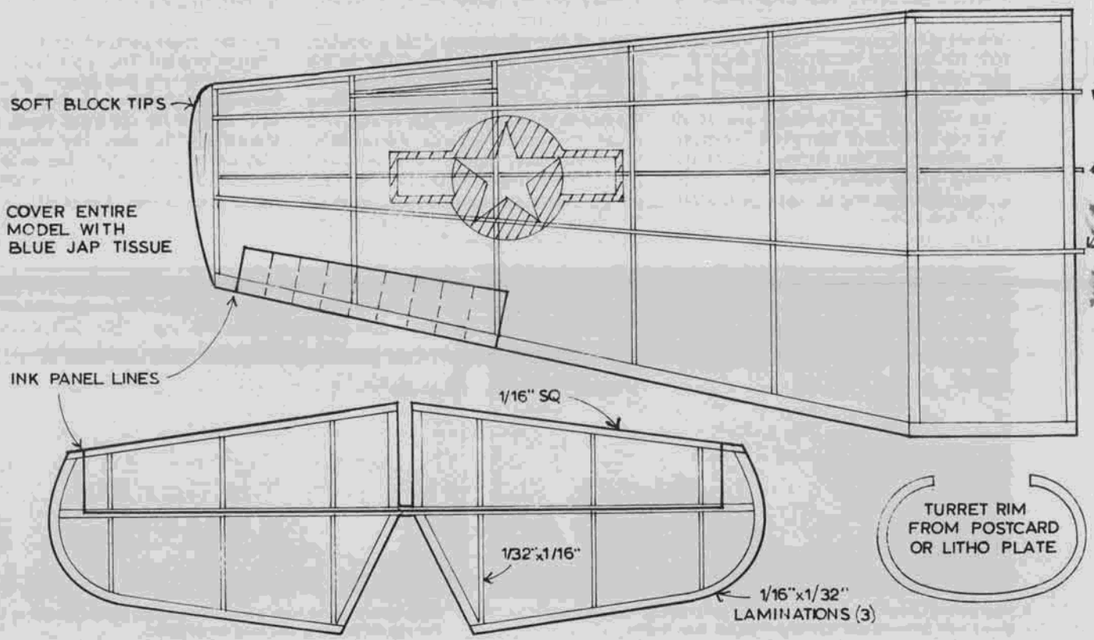
Wing slots seem to have a stabilizing effect on the model in flight. For simplification, they may be omitted.

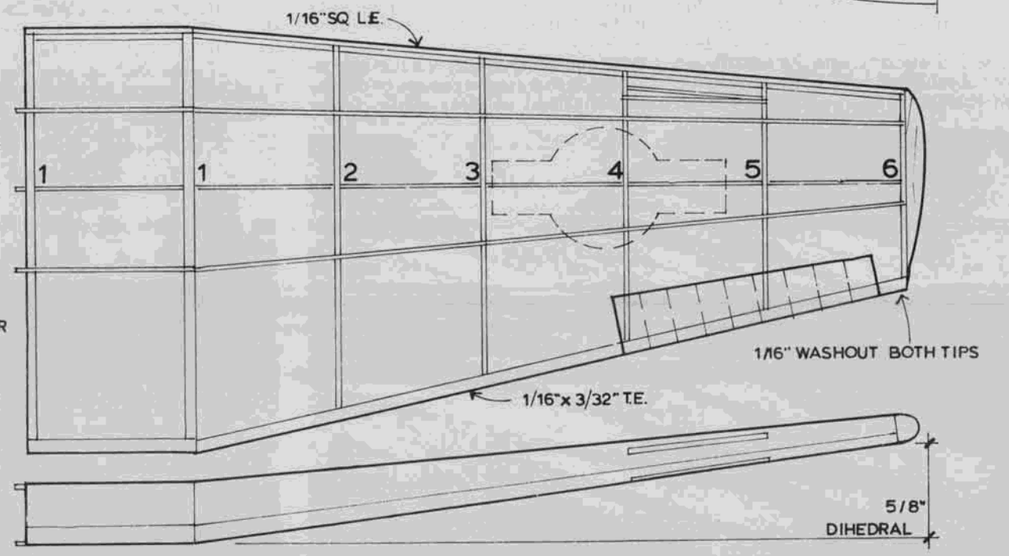




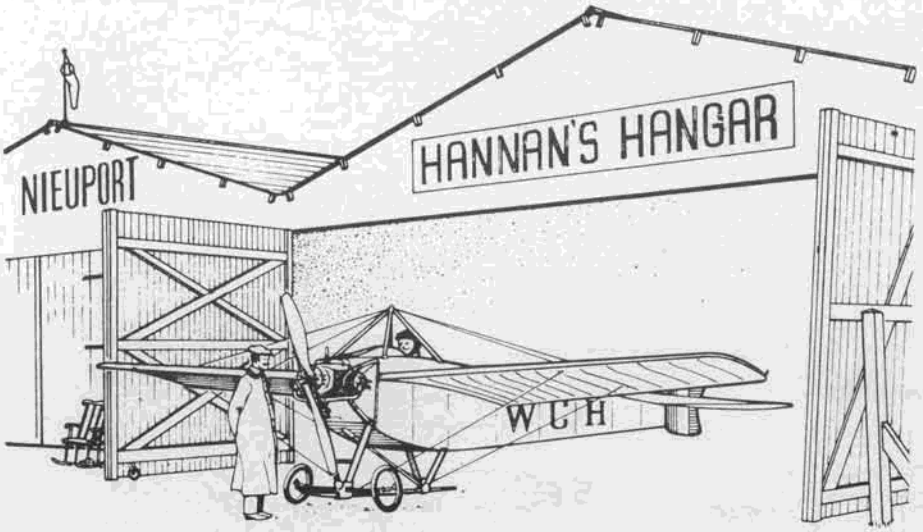








+ PEANUT GRUMMAN TBM-3 AVENGER + ALAN CALLAGHAN +



"One measurement is worth a thousand expert guesses."

• This month's lead-in line, of unknown origin, was passed along to us by Richard Miller, who is compiling a book of such philosophical tidbits. This one seems to dovetail nicely with: "If more than one person is responsible for a miscalculation, no one will be at fault."

NASM LECTURE

It was our privilege during March to attend two presentations by the Smithsonian National Air and Space Museum, held in the Reuben Fleet Space Theater in San Diego, California. The first, by Aeronautics Department Chairman Donald Lopez, consisted of a well narrated color slide tour of the museum and restoration facilities. Of the Washington installation, Mr. Lopez quipped: "The Air and Space buildings were finished under budget and ahead of schedule . . . rare for *any* building but especially so for a government job."

The Smithsonian collection numbers sone 285 aircraft, with 72 actually on formal exhibit. Another 50 machines are on loan to various other museums, including the one in San Diego. Lopez extended special credit to Paul Garber, now 83 years of age, for his persistence in saving these irreplaceable artifacts down through the years.

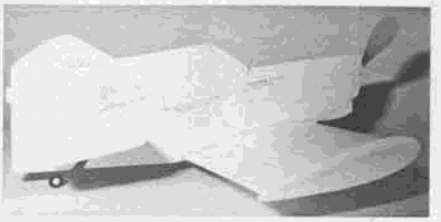
A brief description was given as each craft was shown projected onto the ceiling of the dome shaped planetarium. The effect was exceptionally dramatic, however the hemispherical screen gave wings distortion rather like warped model planes. Numerous anecdotes and obscure bits of information were advanced by Lopez, himself a pilot of vast experience. For instance, did you know that the FM-2 version of the Wildcat was referred to as the "Housecat"? Or that the wings of many wartime Italian aircraft were unequal in length? In the case of the museum's WW-II Macchi the difference amounts to some eight inches. This asymmetry was in lieu of the more common offsetting of the vertical fin to counter propeller reaction effects.

Noting that a space capsule on display was sheathed in clear plastic, Lopez commented that while the vehicle's skin had successfully survived the heat and stress of reentry, it could not be expected to withstand tourists!

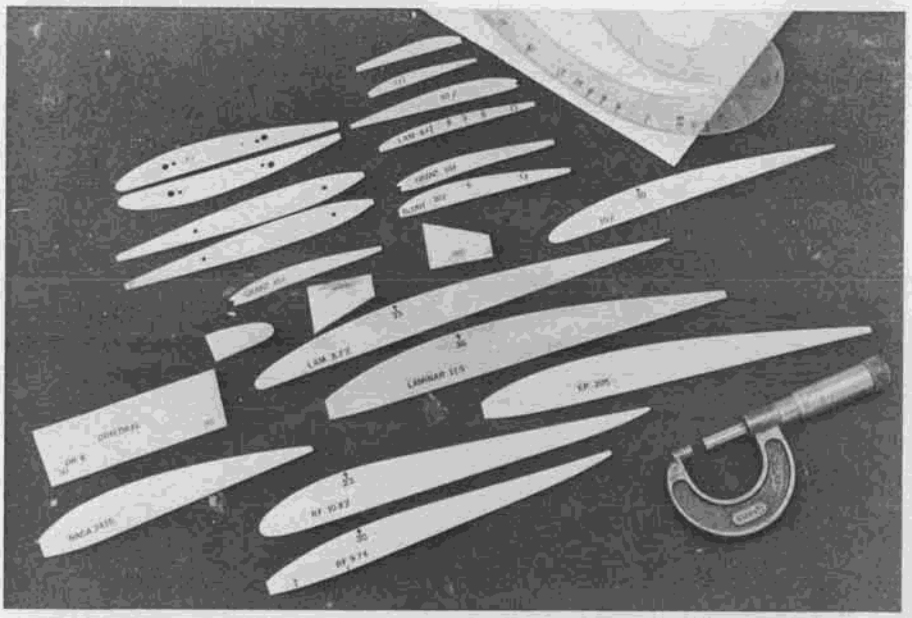
We were pleased to see two slides devoted to *model* aircraft: one of the upstairs scale model collection; and the other the exhibit of famous flying models.

From a researcher's standpoint, we were especially impressed with the photograph retrieval system developed by NASM. This video disc projector stores some 100,000 images, any one of which may be selected and displayed with extreme rapidity. Further, a second 100,000 photos will soon be added to this remarkable instrument's repository. It is hoped eventually to make such units available to other museums in various parts of the country. Now then, if only someone would do this with 3-view drawings!

The second presentation, "U.S. Women in Aviation", was given by Claudia Oakes, Curator, Department of Aeronautics, of the NASM. Ms. Oakes exploded somewhat of a startling bombshell with her opening announcement of a very recently uncovered bit of aero history: Who was the first to solo in the United States? Nope, it was not Orville, nor Wilbur, nor Gustave Whitehead nor Montgomery . . . but a woman! Yes, according to documentation tracked

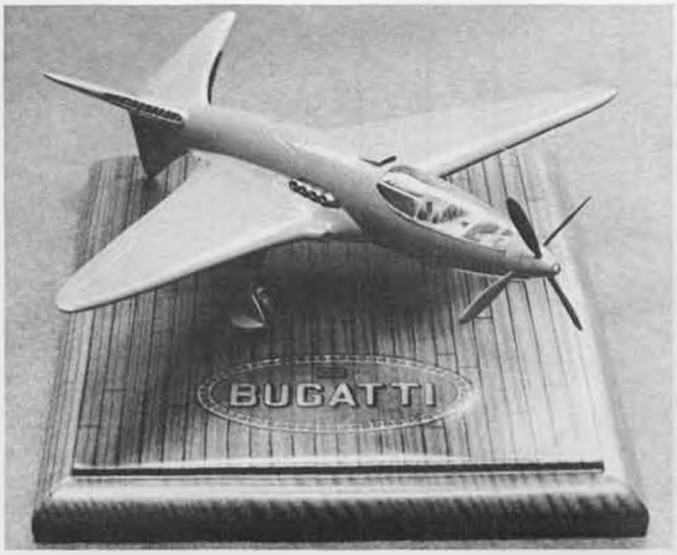


No-Cal Stits Junior made almost entirely from sheet foam. Model and pic by Tom Schmitt.



Fritz Mueller's model wing documentation system includes aluminum rib templates, dihedral gauges, and calibrated french curve. Labeling airfoils is a good idea.

Ebbe Jensen, of Sweden, with a rare luxury, a flying field in the heart of the city!



This 1/72-scale Bugatti racer was made from a limited run kit. Craft featured two engines driving contra-rotating props.

WW-II pilot complete with oxygen mask converted from Williams Bros. pilot by Don Typond. See text for details.

down in the Library of Congress by Dr. Tom Crouch (who was inadvertently demoted to "Mr." in our review of his Bleriot book), the flight took place during 1825 with a Ms. Johnson aboard. In a balloon, of course.

Claudia Oakes opined that witches on brooms may have been the quintessence of women aviators, and her projected slide of one drew many chuckles. The remainder of the show was a truly fascinating review of the accomplishments of female balloonists, fixed-wing pioneers, barnstormers, WW-II flyers and present day airplane pilots and astronauts. We were particularly pleased to see Janice Brown, charming test pilot of the McCready Solar Challenger capping the presentation.

THOUGHT FOR THE DAY:

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

CUSTOMIZED PILOT

Don Typond favored us with a photo of one of his model pilots, as shown. Intended to occupy the cockpit of a Top Flite P-51, it was modified from a Williams Brothers' product. According to Don: "The oxygen mask is a bunch of plastic model putty, which I smeared all over the face, allowed to dry, then carved to shape. All straps are strips of masking tape, and the hose is heavy copper wire wrapped with finer copper wire. The entire bust was painted with artists' acrylic paint. The shoulder harness is elastic tape . . . not super-scale, but it'll do. Earphone bulges were also added to the helmet to simulate the WW-II style."

COEXISTENCE

"Aerospace research has made it possible for man to live in outer space. Living quarters have been designed so that he can stay at the bottom of the sea for several weeks. How wonderful it would be if he could manage to live in the area between." Rodale's Quinto Lingo, March, 1968.

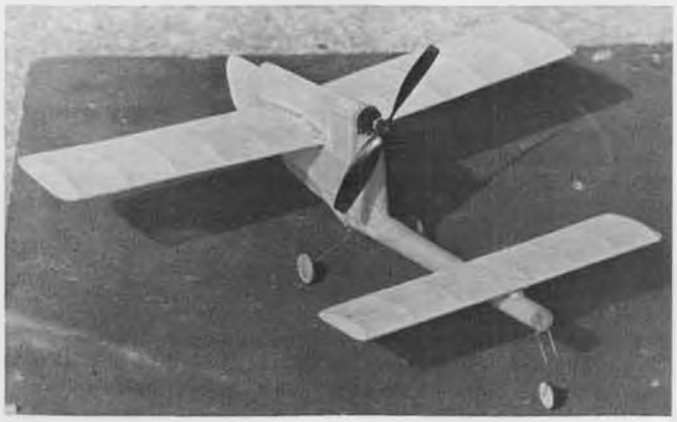
FOUR SECONDS AROUND THE WORLD?

Nope, its not a new hypersonic transport, but rather an ultralight! According to a clipping from *The Plain Dealer* sent in by Dave Gibson, of Canton, Ohio, a world record circumnavigation attempt is planned for April (and may have already been completed as you read this). As the machine has a top speed of only 75 mph, it might seem impossible for it to circle the globe at all. But here is the sneaky part: By flying directly over the North Pole, even a 50-foot diameter circle will qualify! Well, at least for inclusion in the Guiness Book of World Records. Best of luck to Chuck Slusarczyk and Joe Tong, pilots for the venture.

LABILITY, ANYONE?

Yes, that spelling is correct, and no, we had not been aware of the word until it was brought to our attention by tireless experimenter, Fritz Mueller, of Columbus, Georgia. According to the dictionary *lability* means "readiness for change". A labile model should therefore be controllable by small forces. As readers of the Eloy Marez column may recall, Fritz has been experimenting with very light control units for models, and thus has a special interest in this subject, along with his many other enthusiasms for design, aerodynamics, and study of materials. Says Fritz: "I invented a new science! (I) Had a ball making a series of wings, test-bed fuselages, small tailless models, etc. I found that lateral stability can be maintained by other than dihedral. Reflexed airfoils, for example, can produce stability even in anhedral (drooping) wings. One of my test models, a 12-inch span delta, for instance, has a special semi-symmetrical airfoil, a relatively sharp leading edge and *no* dihedral. Properly balanced, it flies with the wing's flatter side down. However slightly shifting a

Continued on page 95



Fritz Mueller's variation on the Gee Bee Ascender theme. Spans 17-1/2 in., powered by Telco CO_2 engine.

Bob Brown, of England, built this R/C autogyro featuring side-by-side rotors.

Carl Fries with Gard Wakefield. Carl was one of the co-founders of the National Free Flight Society. Others were Dick Black (deceased), and Bob Stalick. "Uncle Carl" is a Hall of Famer.

FREE FLIGHT

By BOB STALICK

• Welcome back for another month. If you are reading this as soon as you received your magazine, you have just about six weeks left to qualify for the 1985 FAI Team Program. So, get with it! To help you finish up, this month's column will conclude a two part feature on VIT systems . . . but you'll need to go to the end of the column to find it. . . First, let's try to solve the mystery of this month's DGA: the Goldberg G-5.

JULY DARNED GOOD AIRFOIL: THE GOLDBERG G-5 (OR SHOULD THAT BE G-6?)

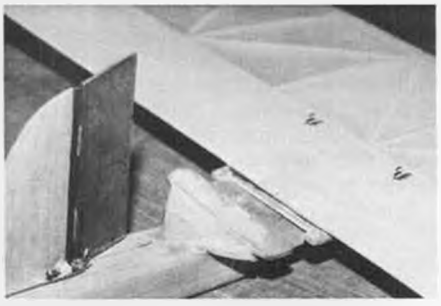
Several months ago, I asked for help in locating the coordinates for the Goldberg G-5 which I believed to be the airfoil of the Goldberg Sailplane. Numerous replies came through indicating that the airfoil was contained in John Malkin's book. Sure enough, there it was. However, as I compared the G-5 in the sketch to the actual airfoil on the Goldberg Sailplane (identified by Carl Goldberg as the G-6), I made an interesting discovery. The "G-6" Sailplane airfoil looked suspiciously like the G-5 in Malkin's book. The G-6 in Malkin's book doesn't look like *anything* on the Sailplane, the Zipper, the Clipper, or the Interceptor. My conclusion is that someone misnumbered the G-6 airfoil in Malkin's book, and called it the G-5. If this is true, the mystery of the Goldberg airfoils is solved. If not, I'm sure someone will straighten me out. *(Which leaves one question. What does the real G-5 look like? wrf)*

The point of all of this is that I wanted to give you the airfoil from the Sailplane. This section is significant because it is a superlative gliding airfoil for power models. In fact, the response which I got from George Stephenson of Newcastle on Tyne (England) contained not only the coordinates and the profile of the G-5 (G-6), but also the following description from *Model Aircraft*, July 1953:

Described last month, here is the Crocket VIT system. Excellent workmanship is evident.

Same fuselage as below and right. Note how stab slides into mount.

Stab "ears" slide under metal plate for a slop free fit. No hold-down bands needed.



Same model as below. As in system on left, stab "ears" slide under mount.

Typical double arm V.I.T. Magnesium stab mount. Springs are attached in middle of lines. Note the layout of the auto rudder at left.

AMA gas model equipped with V.I.T. and autorudder. Stab mount is made from plywood. Model is Joe Foster's Buck 650.

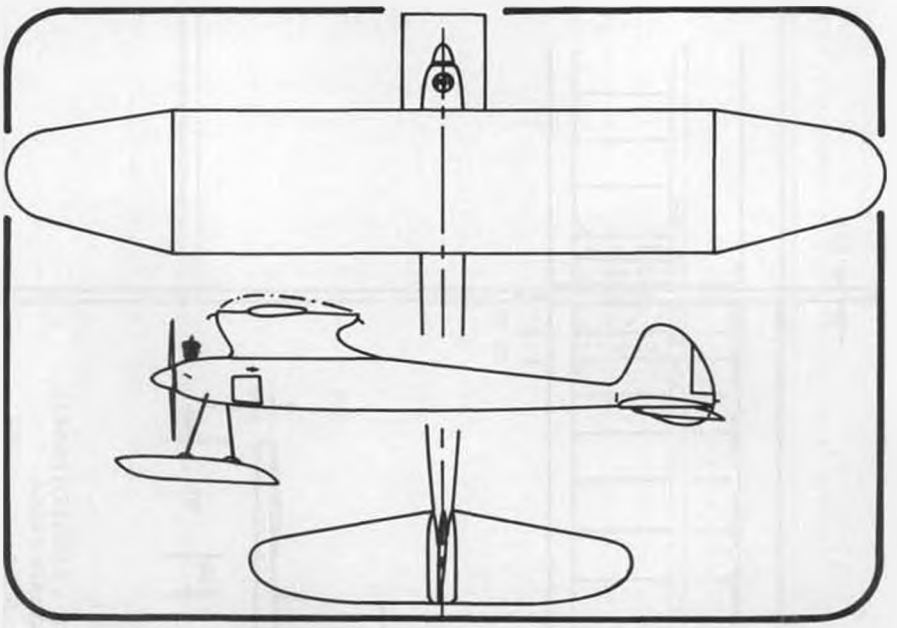
"Developed for power duration flying, this section offers one of the best compromises between climb and glide performance. It is on the thin side for accommodating deep spars, and was originally, widely used with multi-spar construction. A single top spar with sheet covering to the leading edge would be in keeping with modern practice. The same section has also proved excellent for medium-size gliders of around FAI loading. It is, in fact, one of the best sections which can be employed for a flat, floating glide on duration designs. It is a little on the thin side for rubber models, however."

This is a great description of a great airfoil . . . although most current designers would take exception to the assertion that the G-5 (G-6) is too thin for rubber powered free flight use.

JULY MYSTERY MODEL

I first saw this airplane at a free flight contest in Albany, Oregon about 20 years ago. It was being flown by its designer. What impressed me about it, in addition to the seven-foot wingspan and the .60 engine, was its glide . . . it just hung there. When it was DT time, the spoilers popped up along the wing's high point, and it came down very nicely. Upon inspection, I found that the spoilers were actuated by an Elmic Timer.

Was I impressed? Do the French drink wine? I saw this model fly numerous times after that, and the performance was the same. Since retired, the model still remains a vivid memory in my mind's eye. If you can name it, you can get a free **Model Builder** subscription from Bill N., just drop him a line with the correct answer . . . and be in line first.



JULY MYSTERY MODEL

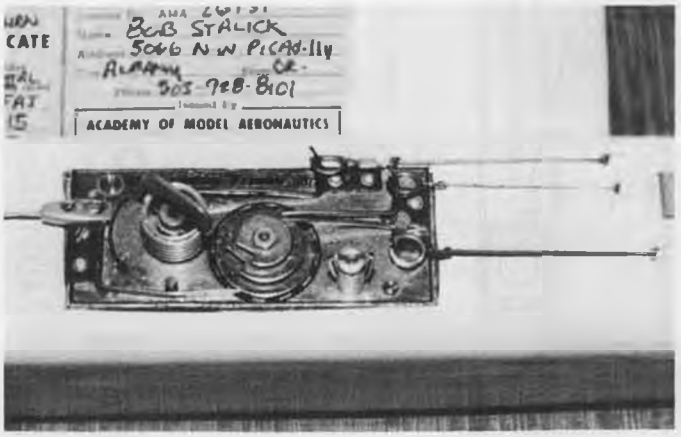
JULY MODEL OF THE MONTH — ESTI AIR A-2

Peter Lloyd is arranging for the 1983 World Champs, scheduled for Australia. Peter is not only a meet organizer, but also an accomplished A-2 flier. He has visited and flown here in the Northwest several times. The Esti-Air No. 8 is his latest attempt to design a simple, but competitive A-2 for international competition. I like it. The wings are straightforward, and the fuselage is a profile layout, which means it can be produced easily. Nice design.

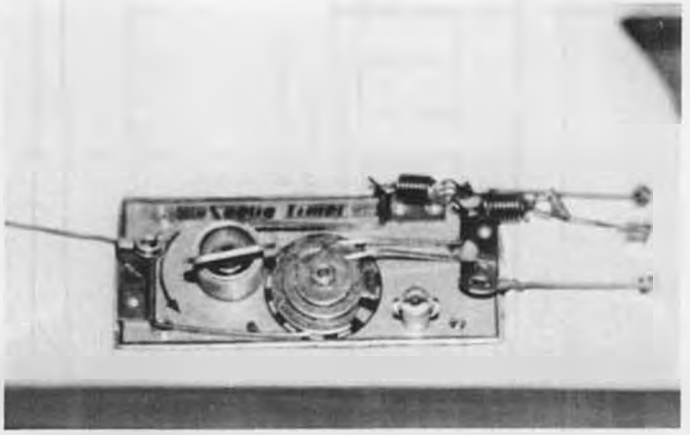
HOW TO DETHERMALIZE THE PACIFIC ACE

With all of the current interest in the Pacific Ace 30, I decided to build one to enter in our N.W. club challenge event. One problem quickly reared its head . . . how do you DT the silly little things?

Like the Marines, Ernie Linn (recently of Seattle, now of Wichita) came to the rescue. The sketch contained in this column shows you how to do it. I tried it, and it works like a charm. It is the first time I've ever tried a pop-up wing DT,



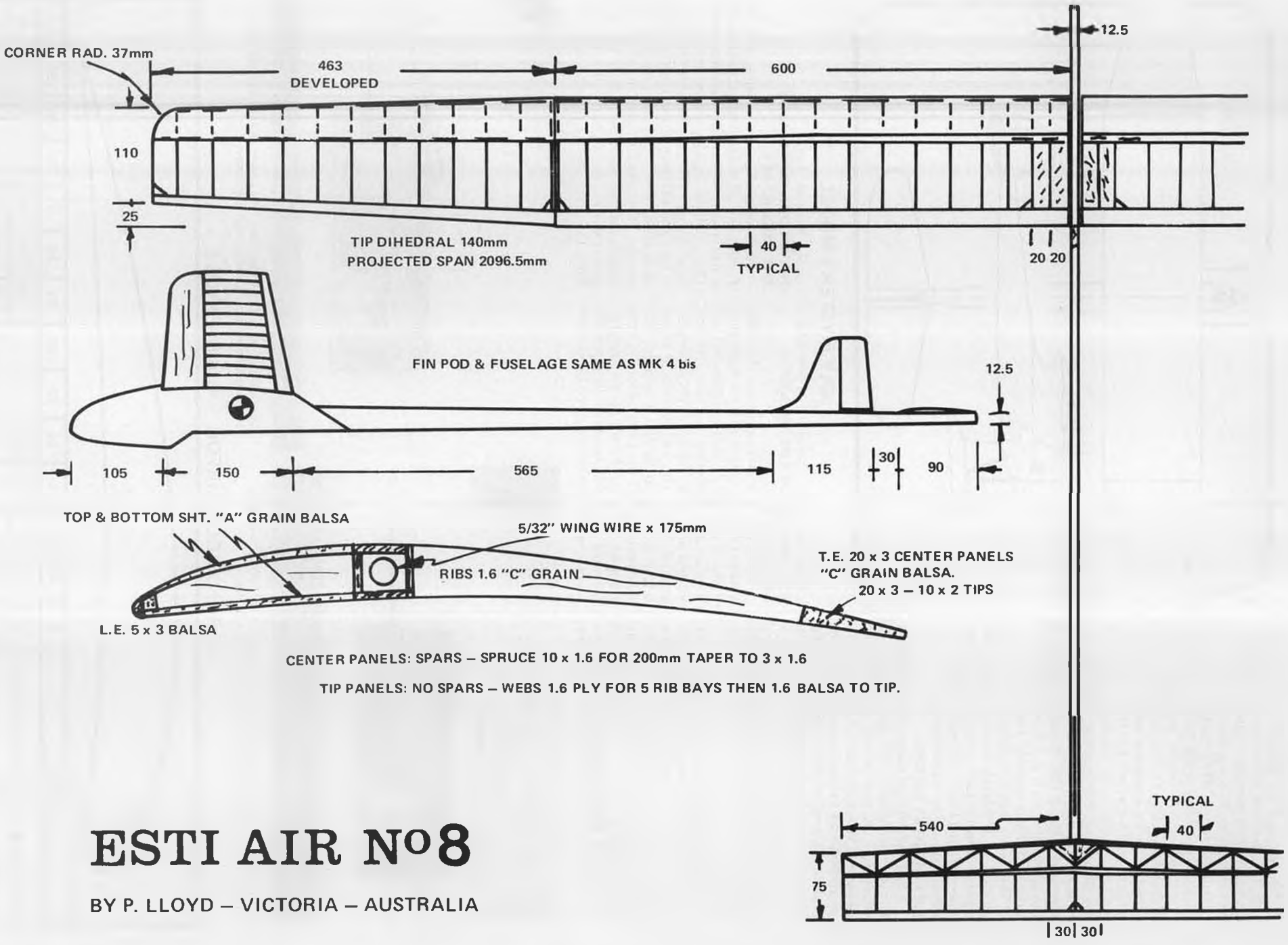
Seelig timer set-up. Top line is for D.T. Middle line is for V.I.T. Bottom line is for auto rudder. Front line is engine brake.



Seelig timer on a Korla Plankton FAI power model. Springs are externally mounted, and visible near the timer.

DARNED GOOD AIRFOIL – GOLDBERG G-5

STATION	0	1.25	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	1.65	4.26	5.35	6.82	8.02	10.3	11.6	11.28	10.34	8.86	6.72	4.6	2.15	0
LOWER	1.65	.29	0	.14	.46	1.2	2.16	2.48	2.48	2	1.48	1.01	.58	0



ESTI AIR Nº8

BY P. LLOYD – VICTORIA – AUSTRALIA

CENTER PANELS: SPARS – SPRUCE 10 x 1.6 FOR 200mm TAPER TO 3 x 1.6

TIP PANELS: NO SPARS – WEBS 1.6 PLY FOR 5 RIB BAYS THEN 1.6 BALSA TO TIP.

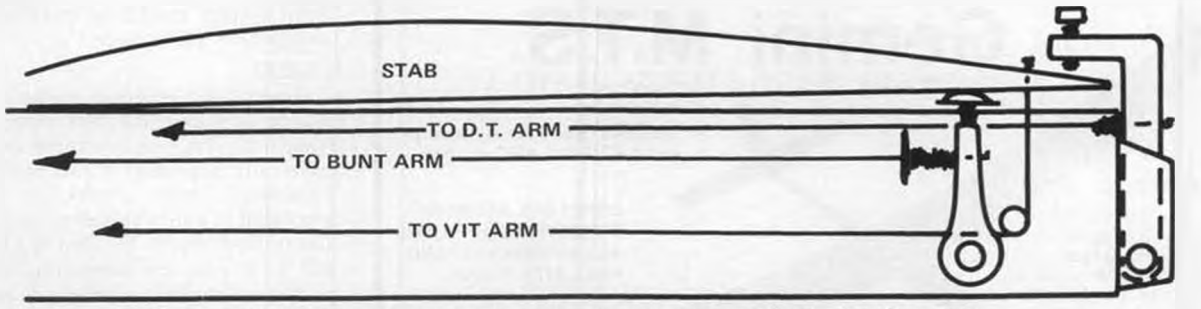


FIG. 2a TYPICAL BUNT INSTALLATION IN POWER POSITION

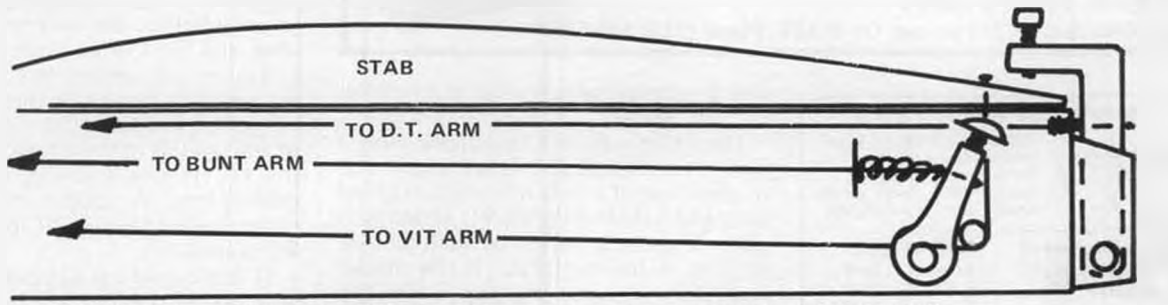


FIG. 2b TYPICAL BUNT INSTALLATION IN BUNT POSITION

but it will probably not be the last.

THE PACIFIC ACE BOSTONIAN

Earle Moorhead, President of the Willamette Modelers Club, got so intrigued with the Pacific Ace 30, that he scaled it down, and came up with a Pacific Ace Bostonian. Earle flew it at our last indoor meet, and it survived the initial flight tests with a minimum of hangar rash. Look for three-views and pix in the next issue of **Model Builder** Free Flight. It's a cutie.

VIT: VARIABLE INCIDENCE TAIL . . . PART II

Last month I covered several reasons to consider a VIT on your power model, several kinds of systems that can be used, and some information about the components of these systems.

This month, I'd like to give you some pointers on trimming your model, describe the newly developed "bunt" system, and provide some tips on timers. So let's get started.

TRIMMING YOUR MODEL WITH VIT

The models that I have which are equipped with VIT are set up as follows:

1) Rig the timer so that the engine cuts at 6.9 seconds for FAI models, or .1 seconds less than the maximum engine run if used in AMA events. All other functions are timed to act after the engine cuts.

2) The autorudder is set to actuate nearly immediately after the engine cuts off. I try to set it to operate about .2 to .5 seconds later.

3) The VIT is set to actuate about one second after the engine cuts.

The above settings are starting points, adjustments can be made on the field to change these settings depending upon what the model does. One nice feature about VIT is that when using a multi-function timer, you can set the DT to actuate anytime you want to, so that it can save your model from the cold hard ground.

THE FIRST TEST FLIGHTS

Let's set the DT to actuate about three seconds (or less) after the VIT functions as a starting point. In addition, let's check to see that everything works the way it's supposed to . . . and according to the time you've set.

I begin my first test flights (in FAI) with about a four-second engine run. If everything is safe, then I move up to the maximum 6.9 seconds on the second flight. If everything is not safe, then I adjust the model as follows:

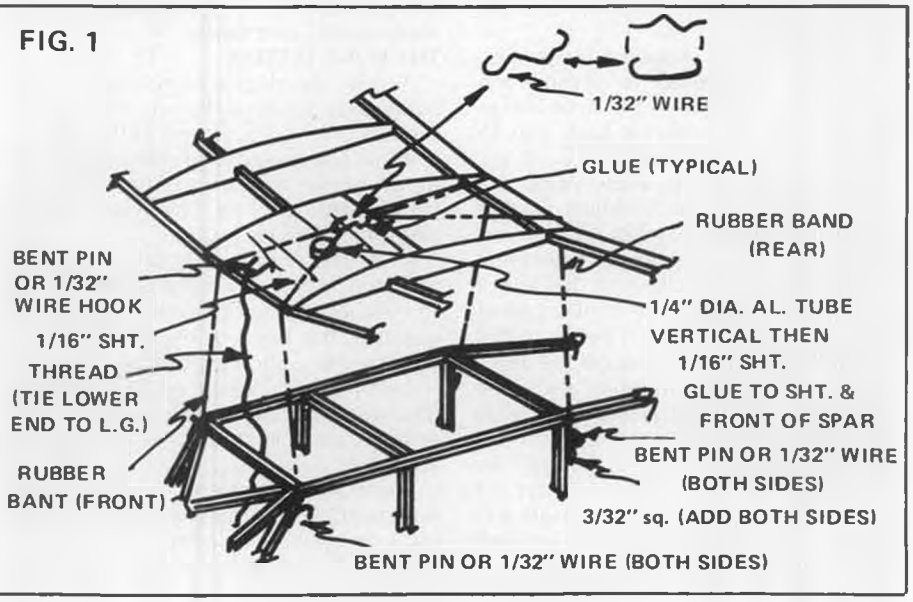
1) If the model veers to the left under power, the problem is traceable to: a) too little stab incidence (raise the stab's trailing edge in 1/64 increments); b) too much left rudder (decrease rudder deflection, or add a rudder tab with opposite deflection).

2) If the model veers to the right under power, the problem is traceable

PACIFIC ACE DETHERMALIZER

1. Install DT fuse in 1/4 in. diameter aluminum tube like a smoke stack.
2. Install front hold down rubber from right fuselage hook, over wing hook, both sides of DT fuse, and over to left fuselage hook.
3. Install rear hold down rubber in similar manner, but without a DT fuse.
4. Light fuse before launching.
5. The fuse burns the rubber in two, allowing the leading edge to pop up to a 45 degree incidence angle.
6. As the Pacific Ace's wheels are well forward, the plane lands on them undamaged.

FIG. 1



to: a) too much stab incidence (decrease TE in 1/64 increments); or b) too much right rudder (decrease rudder deflection, or add left rudder tab).

3) If the model dives under power, the problem is traceable to: a) not enough stab incidence (increase incidence in 1/64 increments); or b) balance point too far forward (move BP back). On a VIT model, the BP should not be much further back than about 75 percent. It should also not be much further forward than about 60 percent. If your model has a forward BP (60 percent or less), move the BP back to the 65 to 70 percent position.

4) If the model loops under power, the problem is traceable to: a) too much stab incidence (decrease in 1/64 increments); or b) BP is too far back (see 3b above). Move the BP forward.

Once these power adjustments are made, then it's time to adjust for the transition from power to glide. I trim my models to fly in a right power, right glide pattern. I adjust my climb so that about one turn or less is taken in the power phase. Once the model safely handles the climb, I begin working on the autorudder. I adjust the timer to allow the autorudder to actuate just enough after the engine quits to kick the model into a right-hand glide circle. Too rapid an autorudder will cause the model to nose down, and perhaps dive in. Too late will cause a series of stalls. I use only enough rudder offset to cause a good transition. My autorudders deflect about 1/8 in. and are comparatively small (1.5 in. high x .75 in. wide).

The VIT is adjusted to actuate shortly after the autorudder. Once again, the model's speed needs to have decreased enough so that when the VIT actuates, it doesn't cause a series of stalls before settling in for the glide. If the model does stall, or worse yet, loop . . . the VIT has been set to actuate too soon, and needs to be timed to actuate later in the sequence. If the model continues to stall at glide speed, then the VIT angle is too high, and needs to be adjusted to a lesser amount. If the model dives, or doesn't have a good "floating" glide, then the VIT angle is not high enough, and needs more stab incidence.

If the VIT is adjusted to actuate too late, the model will lose its forward speed, and begin to dive before the VIT kicks in. In this case, simply actuate the VIT sooner.

I should point out that the amount of stab deflection will vary slightly from model to model. This is somewhat dependent upon the size of the stab, and the location of the BP. I adjust the stab deflection on my models (FAI) at about 1/8 in. to start. Usually, this is a bit more than is needed. I should also point out that if you use the quick DT as mentioned earlier, you will have very few problems making the above adjustments easily and safely.

THE BUNT SYSTEM

A new development has been tried somewhat successfully on FAI power models of late. It is known as the "Bunt" system. The purpose of this adjustment mechanism is to effect a better transition from power to glide. The system works essentially as follows:

1) As the engine cuts off, the stab is adjusted to move from the power setting to another setting of *less* incidence, thus pointing the nose of the model into a more normal gliding position quickly.

2) As soon as the model's speed decreases, the autorudder and the VIT actuate, and the ship assumes a gliding attitude.

The Bunt adjustment is only in effect for a brief time . . . perhaps one second, until the glide VIT comes into action. When all systems are working, this adjustment should affect a *perfect* transition. (Figure No. 2 shows how a Bunt system could be installed using a single arm VIT system.)

TIMERS

One of the essential features of a VIT system is a timer that has more than one function. The most versatile timer commercially available is the Seelig Multi-Function. These timers are currently available at a new lower price ($25) from Doug Galbreath, 707 2nd St., Davis, CA 95616. If you are intending to use the Seelig on an AMA model, please specify the "Big Fan" version when ordering.

I have used the Seelig timer, the Monks timer, and a modified K-Mart camera timer for my VIT systems. I don't know whether the Monks is still available, and the K-Mart timer takes a bit of extra work to set-up, but stay tuned, I will describe how to do this next month.

I have included a number of pictures of my models to show how I have set up the VIT systems. I believe they are self-explanatory. A couple of tips are in order before closing off this section on VIT systems:

1) Always set up all your timers similarly so that when you change from model to model, you won't have to remember how to set up each one under the pressure of flying. My top line always goes to the DT arm of the timer. The middle line always goes to the VIT arm. The bottom line always goes to the autorudder arm.

2) Always check your lines and replace any frayed or kinked ones. When you build your models, be sure that metal lines, if they must "turn a corner," have a large radius on which to turn. I use plastic covered steel lines to minimize kinks.

3) When you build your models, consider that you will need to run your lines through the fuselage, and that they will need to be replaced. This task can be a headache if you have filled the fuselage with bulkheads behind the timer. You can use "Golden Rod" tubes or the equivalent in which to run the lines, or you can do what I do . . . don't build any bulkheads into the fuselage behind the timer. This way the fuselage is, in effect, a hollow tube. Replacing lines is relatively painless this way.

ODDS AND ENDS

Recently, I featured a brief product review of Flite-Rite Models' product line. Unfortunately, I gave the incorrect address. Let me correct that now . . . write to Phil Hainer, c/o Flite-Rite Models, 10412 S.E. 228th St., Kent, WA 98031. The kits produced by Phil include the Fun Bird 30, a P-30 kit, No. CR-1 for $13.95; the Kwik Flip Jr., No. HLG-1 for $3.15; and the Kwik Flip II, No. HLG-2 for $4.95. All kits are currently available from Phil, and from most hobby shops that carry F/F equipment. If you order from Phil directly, please enclose 10 percent for postage and handling.

REQUEST LETTERS

As is the case with most columnists, I enjoy the letters and pictures I get from free flighters all over the world. I have to

make one request of those who send me letters asking my advice or some information about free flight matters. *Please* make it easy on yourself, and on me. . . enclose a self-addressed, stamped envelope. I appreciate it.

You can send letters to me care of **Model Builder** magazine, but they will be delayed because Bill forwards them to me. Save yourself some time (and Bill, too) by sending them directly to my home. Here's the address: Bob Stalick, 5066 N.W. Picadilly Circle, Albany, OR 97321. If you decide to phone, be forewarned that I work many evenings out of town, but you can try if you feel like it. The phone number is (503) 928-8101.

Now, go out and catch a big thermal! •

Plug Sparks . . *Continued from page 38*

The crankshaft was unusual in that it was a permanent mold casting of 356 heat treated aluminum alloy. For the technically minded, the C.I.E. engine featured a bore of 1/2 inch and stroke of 3/4 inch giving a displacement of .147 cu. in. Bare weight was noted at 5-1/2 ounces, which is good when you recall that there were no ignition components required.

Fuel requirements were a little different for the C.I.E. as they called for one part ether, one part white gas, and one part SAE 40 oil. This contrasts greatly with the standard diesel mix of equal parts of ether, kerosene, and castor oil. Some tests have indicated that a heavier weight oil gave better compression and easier tuning for the C.I.E. engine.

With the emergence of the glow engine, the diesels quickly fell into disfavor, both from the standpoint of fuel availability and power output. The high speed diesel had not been developed yet, so another segment of our engine development passed into limbo.

OLD TIMER DAY

This is something that really pleases this writer, a whole day of official O/T F/F events. Australian rules differ somewhat from American rules in that they allow *all* forms of power (and glider!) to fly in the same events.

Two classes, Vintage, and Old Timer, are annually staged. The cutoff date for Vintage models is December 31, 1954, while the Old Timer cut off date still conforms to the American SAM rule, December 31, 1942.

An interesting aspect of the Vintage event is the incentive to build as old a practical design as possible. One extra point is given per year prior to the cutoff date. For example, if you had a 1938 design, then you would receive 17 points. These points are then added to the flying score of each flight. The year 1900 is the earliest date allowed for these points.

Photo No. 7 shows the irrepressible Ivor F (Stowe) flying his ancient 1915 twin pusher design. Although Ivor made only a 29-second flight, he got 67 points for the model's vintage. "True grit" won it for Ivor as this writer witnessed a complete demolishment of the twin pusher in the wind. Thanks to Hot Stuff, Ivor pieced it back together for an official flight!

One other comment about Vintage flying: much to the writer's delight, the M.A.A.A. committee on Nationals events has seen fit to expand the Vintage category into three events, gas, rubber, and glider. Certainly makes for a full day that way!

The Old Timer event is restricted to spark ignition engines, similar to the official SAM rules. The maximum allowable engine run is 25 seconds with five extra for ROG. All flights are three minutes with bonus points (similar to the Vintage events) added for every year that the model's design predates December 3, 1942. One other interesting item is the allowance of a spare model. This is really planning ahead as it seems every Australian Nats has been plagued with wind.

We would be greatly remiss if we didn't acknowledge the original Australian Old Timer Spark Plug, Max Starich. As can be seen in Photo No. 8, Max is launching his ancient Sky Rover which he actually found moldering in someone's attic and subsequently restored! This writer estimates the actual vintage between 1935 and 1938. That's a long time ago! Also worth mentioning is the fact that Max also writes an old timer column for *Airborne* called "For Old Timers Sake."

Starich has been demonstrating this model at all old timer get-togethers for four years now, and his efforts are really starting to pay off in the form of renewed interest and numbers involved in competition.

Of course, we have to show a picture of the winning old timer, a Comet Mercury, seen in Photo No. 9 as built and flown by Bob Stone (photo courtesy of Paul Lagan). This model is a real classic with an Ohlsson 23 for power. The only things of recent vintage are the Tatone timers which are only about ten or fifteen years of age and of course, the recent Du-Bro wheels.

It is interesting to note (if you are serious about winning) that pylon models easily dominate the field. The most popular design is the Playboy followed by the Ranger, Zipper, Mercury, Interceptor, and Sailplane. The last four are Goldberg designs!

Some comic relief from intense competition needs to be provided, and Dennis Parker of Victoria was up to the challenge. Photo No. 10 shows him with his nicely built Miss America rather neatly broken in half. Photo No. 11 shows Denny with his doctor, Colin Collyer (the resident M.D. and brother-in-law) as he is being treated for an infinitesimal cut. It was quite a humorous sight to see the white attired doctor circulating among the contestants. Too bad the doctor didn't have something to alleviate the pain of the Miss America's crackup. How about a cold beer?

Talking about crackups (and there

were plenty), Photo No. 12 is presented of Bill Gordon, Canberra, ACT, with his faithfully reproduced "Toreador", a design appearing in *Flying Models* circa 1949, and designed by Claude McCullough. Claude's models were always distinguished by Zipper type wings and tails, colorfully striped in offsetting colors. Unfortunately, the model did not fly as good as it looked as it promptly looped in the stiff wind. A major rebuild! Along that same line, John Tidey powdered his Playboy, but through intensive work, got it to fly again. The reason for the pressure is that most free flight events are held between 6 a.m. and 12 noon. Isn't that great? Just in time for a steak sandwich and a Carlton draft beer!

While wandering around the field looking for new subjects, this writer ran across Karl Maltas with a 1950 Australian design by Noel Wolden called the "Skyrocket". Seen in Photo No. 13, this diesel powered model somewhat resembles a Shulman design like a Zoomer. Shulman designs, particularly the Banshee, have enjoyed tremendous popularity in England where many of their own designs stemmed from the original model. Most of Shulman's designs from 1941 to 1946 resemble each other in outline and force setup.

Because of its simple construction and ease of flying, the Paul Plecan Simplex enjoys a worldwide following, especially for those who like their models equipped with a black box. Australia is no different than the rest, as can be attested to by Photo No. 14. This particular Simplex, covered with silk and finished in red scallops, was the handiwork of Allen Lesher of Bordertown, South Australia. This model turned out to be a very steady flyer in the wind, rewarding Lesher with several enjoyable flights.

About now, the reader is probably asking, "Is there anything besides male modelers and beer in this column?" Yes, there is! This writer is pleased to submit Photo No. 15 showing Jan Thomas of New South Wales with an Elfin diesel powered Eliminator. For those modelers looking for an easily built, good performing model, this English design by Wheeler is just the ticket for the Nostalgia event. This design appeared in the June 1953 issue of *Model Aircraft*, an English magazine, and also in Frank Zaic's *Year Book* of 1953. The best part is that with only a 45 inch wingspan, the model can be easily transported.

Actually, Dave Thomas flew the model with Jan acting as "fetchimite." This slang word means exactly what it says. It's a contraction of "Fetch it, mate." Over here in the good old USA, we call them "shaggers."

Finally, after talking about the contestants, we come to those unsung heroes, the contest directors. Photo No. 16 indicates the velocity of the wind, as all shelters and tents normally used for timing and recording had to be folded, put away, and the scoreboard put behind a car.

Seen in the shot is Peter Lloyd who is no stranger to Southern California boys, having been over here several times for meets at Taft. Giving him the dope to record is Howard Gostelow, a long time competitor who invariably gets drafted for administrative work at the Nationals.

After all the foregoing fun, what better way to top it off than with a Victory Awards Banquet? This is something this writer sorely misses at the US Nationals, and tries to make up for with his Old Timer Reunion Banquet. Since then, more banquet nights have sprung up sponsored by the individual groups, i.e., free flight, radio control, controline, etc. In short, no organized National banquet!

This is not so with the Australians! They gather together into one big group *after all the flying is over and done.* This does not mean the modelers lose their identities. Rather, they are recognized as groups or clubs. This makes for real enthusiasm during the awards.

Besides the regular awards, the Australians have their own special "Goof" trophies. Among those were special awards for flying into trees, flying the wrong model, and other humorous incidents. All the recipients of these dubious honors are asked to take the floor with their special award, and to recite the incident leading to their fame. As a winner, if you fail to bring the award to the Nationals, you are fined five dollars! Worst of all, this does not let you off the hook, as this will emphasize your outstanding misdeed.

The columnist also got involved in this unwanted award as one the boys recalled an incident four years ago at Camperdown, the first time the writer had visited Australia. I know, you want to hear how a relative outsider can obtain such an award . . . well, here goes:

Four years ago, when this writer first visited Australia, he was warned that the Aussie beer was much stronger than the American beers, therefore, could not be consumed in equal quantities.

Upon arriving in Sydney, the columnist was met by Brian Potter who immediately took me to his home town, Tamworth, about 200 miles north in the New South Wales wheat district. Much to the writer's chagrin, the only music available on the radio was "western corn pone". Upon inquiring why, he was informed that Tamworth was the Nashville, Tennessee of Australia!

Spending a week at the Potter household meant touring the town and visiting the various service clubs. This is when the sampling of such N.S.W. beers as Tooths, Toohey's Auld Beer, Tooheys New, etc., took place. The beers weren't bad, but for some reason (maybe too much bitter hops or something), they didn't seem to hit the spot.

About this time, the group of Tamworth boys decided to go to the Nationals at Camperdown, Victoria, a trip of roughly 800 miles. To show how long the trip was, and the narrowness of the roads, we left at 5:30 a.m. and arrived at 8:00 p.m. that day. The trip wasn't too bad, however, as we stopped several times for "refreshments," and once for an unexpected blowout.

As explained before, the free flight events at the Nationals begin at 6:00 a.m. and knock off at 12 noon. This unusual arrangement (to me, anyway) allows everyone to adjourn to the nearest town and quaff a few beers. It was then that I discovered the Camperdown Community House which consisted of a pub, restaurant, and lodging house. With steak dinners only $2.50 (for any kind of steak, by the way), who in his right mind would eat anyplace else?

Being in Victoria, the draft beer which was sold was Victorian, Carlton draft to be exact. I didn't know until years later that Carlton makes Foster Beer, an export beer generally associated with the Australian brand of beer. Upon trying this beer (and the writer was determined to try them all!), I pronounced the Victorian beer the best beer I had ever experienced, much to the chagrin of the New South Wales boys. This was sort of like calling their child *ugly.* The N.S.W. boys gave up in disgust after some time and retreated to the motel to bolster their hopes I might change my mind.

However, I thought Carlton draft was so great, I remained at the pub for the rest of the day and pleasantly enough, experienced no ill effects from the consumption of same. This was a great start, right after which we had dinner, and then went back to the pub section

again. I couldn't buy enough rounds (for it was quite inexpensive) to satisfy my appetite for this marvelous draft.

This turn of events went on for five or more days, something that did not go unnoticed by the proprietor. On the fifth day or so, while enjoying an excellent steak dinner (dinner in Australia is what we call lunch), the proprietor brought over a *quart* of Carlton draft, and placed it on the table with the statement, "Compliments of the House to the best beer drinker in Camperdown."

Without losing any aplomb, I thanked the owner and proceeded to enjoy the "proceeds". Just about the time the dinner was nearing an end, the proprietor again showed up, this time with a pint of draft. Upon asking why this pint was being served, the barman replied, "That's second place. No one want to challenge you." Haw!

Four years later, this incident arose to plague the writer at the Horsham Nats, and I was inducted into the "Odd Fellows Assn." or the "Goof Trophy" group. I was presented with an empty Foster beer can with the M.A.A.A. badge glued to the outside surface. Instructions were to bring this award to every Nationals I attended, and to regale the audience with the tale of how I acquired it. Talk about more darn fun!

In return, I also had something for the boys who flew in the Old Timer events. Everyone who placed in the four events received a merchandise prize brought especially from the good old USA by this writer. This policy is generally frowned on by the M.A.A.A., but in this case, no one seemed to mind that the "old man" gave out such things as Tee Dee Cox motor, kits, and Old Timer plans. I had as much fun as they did!

Well, all good things come to an end. Wednesday, January 6 arrived, and it was time for the trip back to Melbourne to visit with my host, Monty Tyrrell, who lived in a suburb called Hansworth. Once there, the arrival called for more libations with the group which included Norm Garrett, his son, Mark, and a few neighbors, whose names escape me for the present. It was a good homecoming!

The next day was spent visiting the various hobby shops, including a trip to the Kraft agency in Geelong. Several souvenirs were also picked up along with the aforementioned trip to Tony Farnan's place of business. (He is the official O.S. engine representative in Australia.) Another great day!

This was followed by a trip to the Veterans National Memorial in the heart of Melbourne. There's a really great view of the city from the top of the tower! After a few purchases of items designed to help the various veteran groups, the final leg of the trip was to the airport for final departure. Guess what? The Australians have a $20.00 *departure fee* for leaving their country! *(What a way to say goodbye! wrf)*

The *piece d'resistance* as far as this writer is concerned occurred when the group gathered for one last beer while awaiting the call for aircraft departure. Monty Tyrrell brought out a beer produced by Carlton called "Premier Lager". This, I was informed, was Victoria's best! Actually, it *was* the most fantastic beer this writer has ever sampled. What a fitting way to end a most enjoyable trip to Australia!

EPILOG

As is their custom in the daily newsletter published at the Nationals, a guest writer is featured. As usual, this columnist was asked to write a page of so on any subject.

This writer responded with a comparison of the U.S. Nationals and the Australian Nationals, noting that the Old Timer events were actually *official* events every year at the M.A.A.A. Nats. The following is a quote from the article in the Nats News Bulletin, Friday, January 1, as edited by John Hughan.

"With Old Timer activity on the increase, Old Timer articles being published by Merv Buckmaster, editor of *Airborne* magazine, and plans being made available, this writer sees no earthly reason why the Old Timer movement should not be formalized in the form of SAM Chapters."

There were several other suggestions made as to how to form a chapter, and the benefits to be derived from same. Well, it couldn't have been more than four months later when the writer received a latter from John Tidy asking for a dispensation of the SAM publication, "SAM Speaks", similar to what the English group, SAM 35, was receiving.

Starting with 30 members in July, the movement doubled by November. Tidey reports plans are being made to stage the First Old Timer Nationals in 1983 at Goulbourn, New South Wales. This writer has a standing invitation to attend, but this year has been a busy one with most of his time taken up by the work entailed in being the secretary-treasurer of SAM. Some guys never learn how to leave well enough alone!

SUPER-EPILOG

My host, Monty Tyrrell, of Melbourne sent in the following report:

"Eddie Keggins was surprised when Henry J. Nichols (England) arrived accompanied by Monty and Adrian. Henry J. has that sort of magnetic personality which makes him completely at home with one and all. The suggestion to move to the lounge for a few drinks brought forth the comment from Henry J, 'Into the kitchen, that's where the action is, and also the fridge. We all live in the kitchen, don't we.'

"This was followed by a trip to the workshop . . . more bull sessions, more libations. The venue then changed as all buzzed off for lunch at Monty's, and then to Tony Farnan's place for some more pick-me-ups. After several drinks, which were suggested by Henry J. after seeing Tony strip down to his socks to indicate how hot it was, the afternoon passed quickly with reminiscences of people around the world.

"Back to Keggins' place we went (he calls it Pinetree), and many bottles later with the stereo going full blast with Benny Goodman records, Monty and Henry finally left in the wee hours for Monty's place.

"More 'punishment' was in store, as Henry was shown the club flying area. The following day, we had a tour of Melbourne, well punctuated with cooling libations. I (Monty) finally poured him aboard the plane Tuesday morning with the fervent hope that he doesn't return for another twenty years. *Wotta lost weekend!* Here is a recapitulation of the actual amounts of liquor consumed (to the nearest bottle): 73 bottles of beer, and 2-1/2 bottles of Scotch . . . in 2-1/2 days!! This amount has been

audited by Tony Farnan.

"I had less than a month between the visits of John Pond (January) and Henry Nichols (February), and I was impressed by their staunch friendship due to their worldwide ramblings in pursuit of the hobby.

"Each of these gents is as good as the other when it comes to knowing how to enjoy oneself. I sincerely hope they never turn up in Australia together! There isn't a group of modelers in Australia that could physically take it! John is 66 and Henry is 27, but both physically nudge 30 when it comes to elbow bending. This is doubtless due to the many years of practice and 50 years of participation in the fine hobby we enjoy. They have possibly learned the elusive secret of perpetual youth. Even though I am feeling poorly, I am now less pessimistic about the future!"

Actually, the foregoing report was quite abbreviated, but man, we have run out of space! Back to the U.S.A. reports next month! •

Scale . . . . . *Continued from page 20*

four people to the championships in Sweden. They have been a fountain of help and understanding not only to me as a modeler, but to my family as a whole. My daughter, Cathy, has discovered a friend in the truest sense of the word in Dolly, whose enthusiasm is only outdone by her energy.

There was Sid Axlerod who always kidded me if I didn't have a Top Flite prop on the front.

Monty Groves who discovered more things about an Alcor C61 than anybody could have thought existed.

Don Murray of St. Louis who lives nearby, and has provided me with endless guidance and encouragement. I remember his kind words to me after I worked 16 and 18 hours a day to complete a Hiperbipe project which had been delayed because of my hospital stay. He said, after inspecting the model closely, that I was ready! I suspect he was right, because the word I sent back home to him following the event in England was of a second place win.

There is the Abel family, Dave, Elsie, and the kids who have helped us in so many ways, like providing me a home town rooting section up in Ottawa in 1980.

There have been times like the one at the Mint Julep when my model blew off its stand and broke in several critical places. As I ran to stop it, I severely detached a muscle in my leg. It was Hal Parenti and Skip Mast who came forward and engineered the repair. (To the model, of course!)

Consider the Rabes of Stuttart, West Germany who provided our daughter Anne with a lovely, family Christmas when she was away at school, and unable to be with us for the first time in her life.

There are so many more . . . Frank Beatty, a C/L scale modeler who convinced me that a D-12 "Bonzo" would fly; Bob Mosley, a hobby shop owner who has cheerfully put up with the trauma of urgent orders and unusual requests; Gene Klotz, who helped me solve metal engineering problems that were way beyond my expertise.

To those many friends and acquaintances who are not listed here, I beg your kind forgiveness. There are many, literally hundreds and hundreds, who have touched my life in such a meaningful fashion. The point is that this would never have happened if it had not been for the fact that modeling, and in many ways *scale* modeling, entered my life. If there are those out there who have any doubt as to the purpose that can be served by gluing some sticks together and creating a scale model airplane, I hope you'll ponder the few, not very well expressed thoughts, I have presented here.

I suspect that by now you have judged that I am folding up my scale tent, and fading into the sunset. This is not true in any shape or form. I have, however, reached a milestone in my modeling life. Since the first of the year, I have been serving as AMA District VI Vice President. The time requirements for this task are quite extensive, and I find it most difficult to fulfull my responsibility to such a large number of tasks. My responsibilities to the school district this year have been great with many workshops added to the regular school day as we have incorporated computers, new language programs, and outdoor education programs in our curriculum. As a result, I have reluctantly requested **Model Builder**, more succinctly Bill Northrop, to find a replacement author for this column, "One to One."

I feel that it is most important for you to understand that I am so very grateful to Bill and Anita Northrop for the opportunity that has been afforded me over the years in the writing of this column. Not at any time over that period have they edited my material to the point of censorship, even though at times I am certain that there have been

CLAUSEN AND RC12i

OUT HANDLE THE WORLD

IFMAR INTERNATS / 1982
Stock Class World Championship

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

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Ask Kent Clausen, two-time 1:12 Scale National Champ. A winner indoors and out. And Kent took his Team Associated RC12i all the way to the World Championship stock class title.
Or ask the Team. Team Associated RC12i's filled 7 of 10 grid positions for both the stock and modified Championship main.
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We knew from the start our new RC12i would be a winner. We tested and engineered it to handle and respond better than any Associated car ever.
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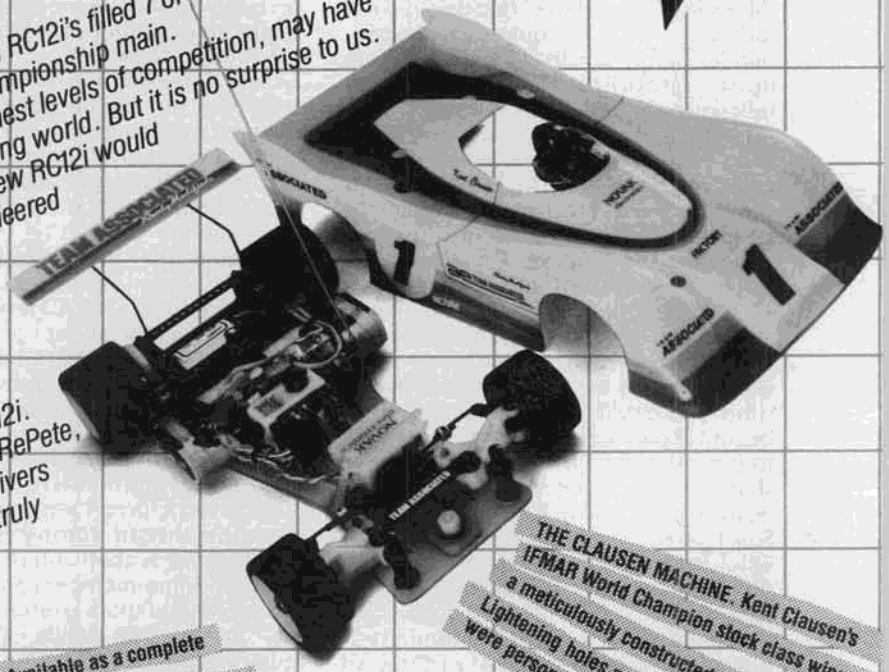
We're proud of our RC12i. And we're proud of Kent, RePete, Frank and all our other drivers for proving the RC12i is truly World Class. ■



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

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things in "One to One" that they did not fully agree with. It requires a fair, open-minded approach to do this, and I am most grateful to **Model Builder** for following this course.

I hope to see each of you at the "Scale Wars" this summer. It is going to be a great year for scale! The East Coast Nats should provide great scale competition as well as interesting workshops and seminars. The "biggie" for many of us will be the FAI team selections in Louisville, August 12 through 14. Even if you are not planning to compete, I hope that you can join us there. The event is shaping up to be most exciting. By the time you read this, there will be a beautiful patch available through NASA to promote the 1984 World Championships in Paris. The patch, which was designed by Mike Gretz, depicts the Spirit of St. Louis flying in front of the Eiffel Tower. I know that you will want to purchase one or more of these to help support the C/L and R/C teams. All proceeds will go toward the administration of the selection event, and toward team expenses in 1984. Contact Bob Underwood, 4109 Concord Oaks Dr., St. Louis, MO 63128. The cost of the patches is $3 each. Make checks payable to NASA.

Registration forms and updated FAI rules can be obtained by writing to AMA Headquarters in care of Micheline Madison; Monty Groves, 791 Nisqually Dr., Sunnyvale, CA 94087; or Dale Arvin, 3428 Charlestown Pike, Jeffersonville, IN 47130.

To each of you who have read this column over the years, I say *thank you* from the bottom of my heart. I hope that in some small way I have been able to help you in your enjoyment of the world of scale modeling. Good luck in all your future endeavors.

One to One, and "Out," Bob. •

Fuel Lines . . . *Continued from page 16*

lar. Ron and Dave, I apologize for any unintentional innuendoes.

Now that the general and often erroneous impression of engine collectors has been buried, let me tell you about a recent get-together of MECA members in Southern California.

Early Saturday morning, March 5, there was an engine collector's swap meet at an Orange County recreation center. Personally, I enjoy any kind of swap meet, but especially model swap meets. Take a look at the photos from this session.

OK guys, are you at all intrigued? Even if you're only slightly so, you might consider joining MECA. Here's a little bit about the organization:

Over 2100 members have joined MECA since it was founded by a few interested collectors back in the early 1960s. Members come from all over the world, including teachers, engineers, salespeople, machinists, doctors, airline pilots, even a former astronaut. The one common thread among this diverse membership is their interest in model engines. Some members are interested in the old time spark ignition types from the '30s and '40s, while others prefer today's modern glow plug and diesel models.

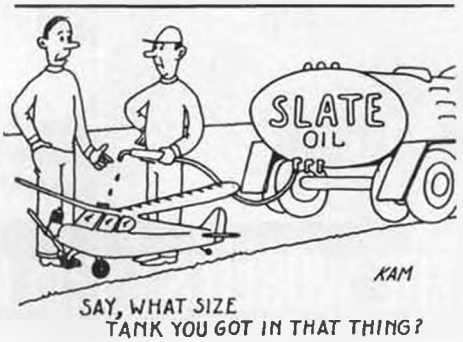
The association is organized into 14 regions. Eleven in the United States, one in Canada, one in England, and one for the remaining countries represented. Each region has a director who is responsible for organizing periodic "Collectogethers" (swap meets). The "Collecto" offers members the opportunity to display their engines, to buy, sell, and trade for others, to discuss engines, and socialize with other members.

MECA is very active in most large metropolitan areas. The association stages an annual "Grand National Collecto." This is usually in conjunction with the Society of Antique Modelers' "SAM Champs". The location of the "Grando" varies from year to year. This offers most members an opportunity to attend periodically.

MECA has two publications: the "Bulletin" and "Swap Sheet." These are sent free to members. The "Swap Sheet" as the name implies is a listing of ads from individual members. These ads contain items available for sale or trade, as well as wanted items. These ads are free to members. The "Swap Sheet" is issued on a bi-monthly basis. The "Bulletin" is combined with the "Swap Sheet" three or four times each year. The "Bulletin" deals with the news and business of the association. It contains engine history and information, hints on collecting, restoring, and displaying engines.

If you are still interested, write to MECA, R.L. McClelland, 3007 Travis St., West Lake, LA 70669. The annual dues are $10. That's a real bargain in today's world. Here's another: for $5.50 per year, you can get six issues of *The Engine Collector's Journal.* This publication is edited and written by authorities on the subject of antique engines. The magazine includes technical articles as well as stories on the background of old engines and some of their manufacturers. Write to the Model Museum, P.O. Box 15162, Lakewood, CO 80215.

Guys, take care. . . •



SAY, WHAT SIZE TANK YOU GOT IN THAT THING?

EPI-SUE . . . . . *Continued from page 17*

of the 1-1/2 in. trailing edge (TE). Also, pin down a 1/16 x 3/16 balsa strip along the front of the trailing edge. Both strips must be pinned down *within* the lines which indicate TE position.

2) Cut the trailing edge for this section to length, and pin it in position on the plan, but supported now by the two alignment strips from Step 1. This puts the proper washout on the trailing edge, and aligns it with the ribs. Now, pin the leading edge to the plan, and glue the 1/16 x 2 in. panel to it while pinning it down firmly. It simplifies matters to have the leading and trailing edges marked at each point where the ribs will be attached. Glue and pin all ribs in place now. Pregluing these joints is a good idea (if you are using aliphatic resin glue) before final gluing and pinning.

3) Note that there is an R-1 rib at the end of each wing panel. These ribs are notched, and act as guides for making 1/8 x 1/4 spar notches on the R-2 diagonal ribs inside each wing panel. The *inboard* R-1 ribs of both the outer and middle panels must be tilted to the appropriate angle (see front view of wing) to allow for the proper dihedral angle when assembling the panels together. (Note: Glue the front ends of the R-1 ribs *very lightly* to the leading edge, as this joint will be cut away later to install the plywood dihedral braces.)

4) After cutting the 1/8 x 1/4 notches on all diagonal ribs, install the three 1/8 x 1/4 spars (a medium-hard balsa is good here).

5) With the exception of the exclusion of the 1/16 x 2 in. bottom panel on the wing tips, and a 1/8 plywood insert in the center section (for the landing gear), all five wing sections are built identically as described above. I glued additional balsa blocks around the plywood insert after the landing gear was mounted for added strength.

6) Final assembly is simply a matter of joining the mating panels to each other, and checking for the proper dihedral angle at each break.

7) When the entire wing is thoroughly dry, remove an 1/8-inch wide vertical section from the front of each R-1 rib at the dihedral break points. This allows room to insert the 1/8 plywood dihedral braces onto which the R-1 ribs are reglued.

8) If you don't like an external antenna, now is the time to install it inside one wing half.

9) I'm an old Silkspan fan, so my choice of covering material was two layers of Silkspan applied crossgrain to each other. However, you may use *your* favorite covering here with the secure feeling that your wing is highly warp resistant from the nature of the construction. The wing will show little tendency of warping, if it was built right in the first place.

EMPENNAGE

The rudder and canard surfaces are a snap, as they are all cut from solid sheet balsa. Using the sheet dimensions shown on the plans, use coarse sandpaper to round all edges and fair the 1/4-inch sheet horizontal stab with the 1/8-inch sheet elevator surfaces. Use top quality nylon hinges to attach all control surfaces, and use a U-control (pardon the expression) split elevator control horn. Remember to reinforce the elevator surfaces with some light gauge cloth or fiberglass tape where the control horn wires are buried.

FUSELAGE

Now comes the fun part!

1) Start by cutting out the left and right side panels. Trace the outline of the wing root on each panel, but *do not* remove yet.

2) With each side panel laying flat with the outside surface down, glue in the 1/8 x 1/4 framing and all plywood doublers to each side. Allow to dry thoroughly.

3) Cut out all body formers (grain running horizontally).

4) Using body formers B-1, B-3, B-6, and B-12, join the two side panels. A rubber band directly over each glued former will hold it firmly in place. After the rubber bands are placed, set the partial assembly over the top view of the fuselage to be certain there is no skewing left or right.

5) When the first four formers installed are thoroughly dry, fill in the remaining former stations, positioning them according to plan.

6) The fuselage bottom can now be installed. First, cut to rough outline, gluing and pinning to the underside of the fuse, and finally trimming to size with a razor. Sandpaper when dry.

7) Now you can carefully remove the portion of the fuselage directly below the wing root outline. This becomes the wing fairing that will be glued to the underside of the wing center section. Also remove the wing root outline at this time, plus 1/16 more to make room for the wing saddle sheeting and the wing itself.

8) The turtle deck is next. However, before starting, consider the installation of your tank at this time. Formers B-9 and T-6 must be notched out to make room for the tank, plus a thin wrapping of urethane foam to keep down vibrations to the fuel. I found that cutting the suction line in the tank so that the weighted end lays about midway inside the tank makes for the most efficient fuel feed and smooth engine running.

9) Add the remaining turtle deck formers and the single stringer along the top. Note: by installing two T-7 formers, a small access hatch is formed between T-7 and T-8. This can be cut away after sheeting the turtle deck by cutting between the two T-7 formers with a razor saw. You will need this opening for tank inspection, and the installation of the radial engine mount.

10) The turtle deck is sheeted as follows:

a/ Cut out five strips of 1/16 sheet balsa, 13 inches long, 1 inch wide at one end, 1/2 inch wide at the other.

b/ Wet one surface of the first strip so that it becomes very flexible in one direction.

c/ Glue the strip down (wet side out) to the fuselage side panel (narrow end to the rear). Then glue and pin the sheet to each former so that it conforms to the curvature.

d/ Repeat for remaining four strips until the turtle deck is completely covered. The last strip may take a little trimming to make it fit in the remaining space between the previous strip and the fuselage side panel.

11) The front hatch cover and nose block are carved from solid, medium soft balsa. I found it convenient to build up the necessary thickness from 1/2 and 1/4-inch sheets laminated together. The quickest way to get the hatch to the proper curvature is to trace the top view onto the built-up balsa block, then cut it out, "leaving the line" for final trimming. Do the same now for the side view. Now glue former T-1 to the back end of the hatch block, and shape the entire hatch to match this curvature. Drawing a center line the full length of the hatch cover helps to make the shaping symmetrical.

When the front hatch cover has been roughly shaped, proceed to shape the nose block, tracing and cutting out the top and side view outlines first. Now tack glue the front hatch cover down to the fuselage and permanently glue in the nose block. Final shaping and sanding of both pieces is now accomplished. Using a razor saw, cut diagonally through the front hatch cover at the front end as per the plan (be careful not to cut into the fuselage). Now you can remove both pieces of the hatch.

The front piece is glued permanently in place after installing the nylon break-away hold-down bolt. Note the use of 1/8 sheet plywood under this block for strength. Now the remaining hatch cover can be notched out to accept the horizontal stabilizer (remember 1/8 in. total positive incidence). After gluing the stabilizer in place, installation of the alignment and locking pin at the back end of the hatch cover completes this unit. An additional small block of balsa behind T-2 is in order for additional strength. Add the cowl cheeks and the wing saddle sheeting to complete the fuselage.

12) Finishing of the model consists of a thorough sanding of all balsa surfaces with 300 sandpaper prior to clear doping. I have found that three coats of clear dope and two coats of color, with light sanding using 300 wet or dry between coats, brings out a reasonably fine finish without too much fuss or time expended. Again, the new plastic sheet finishes can be used at the builder's discretion.

RADIO GEAR AND ENGINE INSTALLATION

The engine is mounted using a radial mount against firewall B-12. Access to the mounting bolts is obtained by removing the small hatch formed between T-8 and the second T-7 former (as described above).

The size and wing area of EPI-SUE lend themselves to the use of the lightweight radio equipment now available (10 oz. or less airborne weight). The elevator servo is installed between B-2 and B-3 A, a small notch cut out of B-3 and B-3 A is necessary to clear the elevator push rod. The remaining two servos (for engine and rudder), the battery pack, and the receiver should be located in the remaining hatch space, so that the balance point (BP) falls 2-1/2 inches ahead of the leading edge of the wing. Some lead shot placed in a drilled out recess in the nose block may be necessary to attain the proper BP location.

TRIMMING AND FLYING

The engine (a .20 is ample; a .25 to .29 is very lively) should be mounted with the thrust line smack on the fuse center line. I found no adverse torque effects that required counteracting.

For the first flight, pick a calm to slightly breezy day. The engine should be at full throttle, elevator trimmed in line with the horizontal stab, and rudder neutral. Please note! On a canard, *down elevator* will have the effect of *up elevator* on a normal airplane! Think of the elevators as flaps and you can't go wrong. Be sure all trim levers are at neutral, so that you can apply appro-

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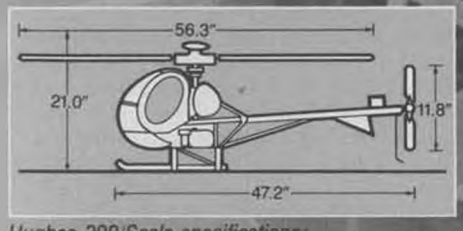

Hughes 300/Scale specifications:

Engine:	*21.2cc Kioritz Echo 20 ignition*
Output:	*1.2HP*
Carburetion:	*Diaphragm*
Fuel capacity:	*6.7 oz. (.5 liter)*
Weight:	*13 lbs.*

Pre-assembled, polished alloy collective Bell/Hiller head.

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priate correction, if it is required.

Unfortunately, our club (Thorn Creek R.C., Lansing, Illinois) is not graced with a field smooth enough to accommodate a small-wheeler airplane for takeoffs. Consequently, all my flights thus far have been from a hand launch. An ROG is preferred, but if your field is like ours, have your buddy give it the old heave, shoulder high, and in a slightly climbing attitude.

Once on its own, EPI-SUE will pick up air speed remarkably fast, and become immediately responsive to your control commands. Get a few hundred feet of altitude, then release the stick with the airplane heading *into* the wind. Note any pitching or yawing tendency, and apply the necessary trim. From here on in, the airplane will practically fly itself.

Have yourself a ball flying EPI-SUE and indulge in a snicker or two as you hear the exclamations from the unbelieving crowd as they watch you wheel EPI-SUE around the sky *episu*. •

Gemini . . . . . *Continued from page 23*

construction sequence, are in order.

The plans suggest that the noseblock may be relieved for noseweight. We highly recommend this, as both of our Gemini, and one built by a friend, all required noseweight. Provisions for three to four ounces of lead in the noseblock will free up space in the battery compartment which is at a premium with a 500 ma pack. If, however, you don't bother to wrap your battery with foam, or are using a 225 pack, you needn't worry, as there will be more than enough space.

Moving rearward, you will notice that the fuselage sides as supplied are not shaped in the wing saddle area, you as the builder must perform this operation after the fuse is framed using the fuselage doubler (which is shaped) as a pattern. We did this as the instructions suggested on our first Gemini. On the second model, we cut the wing saddle in using the doubler as a template *before* framing the fuselage, and thought this method was a little easier. Both worked equally well in the end, so the choice is one of personal preference.

Next is the ballast box and tow hook area. Notice how the upper and lower fuselage doublers hold the pushrod housings between them? This makes the inside of the ballast compartment smooth so that you can use all of the available space, plus you don't have to worry about knocking a pushrod loose while changing ballast between rounds. These same fuselage doublers also provide a strong base for the ballast floor, which has the tow hook mounting block epoxied to it, and the plywood fuselage bottom. Our experience with the Gemini leads us to believe that this is the *best* towhook mounting design we have yet seen.

Continuing aft, we come to the fin and rudder area. Here we chose to substitute a Kraft nylon flying stab bellcrank, and its resultant larger pivot tube, for the plywood article supplied in the kit. Our reasoning for this one and only substitution is that once we become accustomed to the flying characteristics of a particular aircraft (for use in competition) we don't like to change anything on that aircraft which would affect performance or handling . . . until forced to do so when something breaks in a crash, or the appearance of an unquestionably superior design. I felt that this being the case, the nylon would wear better. Also, if you happen to be a competition flyer, you know that when trying to hit a simultaneous time and spot landing target, the landing exercise is usually more of a planned "arrival" than the greased-on beauty we all remember from our sport flying days, and we felt the nylon would stand up to this S&M shock treatment a little better. At this point, I would hasten to add that this is my personal opinion only, and as no failures have been reported in this area by Gemini owners, it is again, your choice.

Last but not least on our tour of the basic construction, we come to the tail surface. The fin and rudder are pretty simple, and require no further explanation here, however the all-moving horizontal stabilizer has a few highlights we feel are noteworthy. First, we noticed its thickness, half an inch at the root tapering to 3/8 at the tip. This is a radical departure from the normal 3/16 or 1/4-inch stab seen almost universally on kit sailplanes. The Gemini's stab thickness, its unique built-up stabilizer spar, and its semi-geodetic construction, combine to produce a light but strong and rigid stabilizer.

At this time I chose to put a second coat of glue on the shear web and spar joints, as well as fillets of microballoons and Hot Stuff on the stabilizer joints.

After the usual shaping and sanding, the decision had to be made as to how to finish the Gemini. Because of the indentation on the bottom of the fuselage, I felt I could do a better covering job using fiberglass cloth and resin. For extra durability, I used two-ounce cloth from the nose to just behind the wing saddle area, and 3/4 oz. from there aft for light weight. After trimming and sanding the cloth to remove the rough edges, a heavy coat of Superpoxy primer was sprayed on, left to dry, and then sanded smooth. For the fuselage's color coat, I used R & M acrylic lacquer for its ease of application and quick drying properties. The open structures of the model were covered with Super Monokote.

The radio installation was next, and presented no problems for me. It shouldn't present any problems for you either, unless you happen to have a very old radio with extremely large servos, and even then you could probably fit them in if you were willing to give up some of the ballast compartment area.

At this point the model was assem-

bled and checked for warps, of which none were present. Trim ballast was added to the nose to bring the balance point to the recommended 3-1/2 inches behind the leading edge of the wing. Control throws for the first flights were: elevator, plus and minus 1/4 inch as measured at the leading edge; rudder, 2-1/2 inches each side of neutral, measured at the trailing edge. A quick trip to the scales showed that our Gemini weighed in at exactly three pounds, which put the wing loading at 7.4 oz. per sq. ft. Actually, we didn't worry too much about wing loading on the Gemini, as prototypes have been flown with weights ranging from 46 to 54 oz. (unballasted).

Now the Gemini was complete, and it was only Wednesday night. Due to the simple construction methods used, and my mounting emthusiasm to see what the thick airfoil could do, I was finished three days ahead of schedule. I usually try to finish an airplane on Friday or Saturday night, as I hate to be in suspense for any longer than that.

Saturday finally came, and I was off to the flying field of a neighboring club which uses 12-volt winches almost exclusively. Upon arrival at the field, the Gemini was assembled, and given a couple of hand launches. No trim changes were required, so it was off to the winches. The first launch showed all of us at the field that day *why* Gemini is different. After building up tension on the winch line, the Gemini was thrown straight up. At this point in time (with most other sailplanes on 12 volts) you would begin to pulse the winch motor for less power. This is optional with the Gemini depending on the wind velocity and the macho of your winch. I chose not to pulse, and watched the airplane rapidly accelerate toward the top of the launch. As the Gemini started to round off at the top of the tow, I gave it down elevator to start a dive, followed by a quick blip of up elevator a second later, and was rewarded with a 70-foot zoom launch, well above other planes that had pulse launched only seconds before me.

"Now for the real truth," was the thought running through my mind that day. Will that fat airfoil work, or will it fall out of the sky? I'm happy to tell you that the 15 percent thick airfoil works *extremely well*, and the Gemini is an all around super performing sailplane. Not only does it have the strength to take the zoom launch technique, but it also penetrates well in the wind with or without ballast. The Gemini has the ability to slow down, and float along at minimum sink like a gas bag lightweight. I would have been happy with just these characteristics, and you might be too, but wait there's more. As a bonus, the Gemini handles very well close to the ground, and will slow up for landing like a lightweight floater. I also found the elevator controls to be very smooth and responsive through their complete range of travel due mostly, I believe, to the thick stabilizer.

Since that first day, I have put quite a few hours of flight time on the Gemini. I like it more the more I fly it, especially the way it hangs in there in light lift, yet will fly fast to outrun the sink even without ballast.

If you're thinking by now that I'm enthused about the Gemini, you're absolutely right, and I'm sure you will be too if you try one. The excellent quality kit, easy building, rugged construction, and outstanding flight performance of the Gemini make it what I believe will be the best AMA and multi-task sailplane available to the serious competitor or casual fun flyer for quite a few years to come.

SPECIFICATIONS OF MODEL AS TESTED:

Wingspan	100 in.
Wing area	930 sq. in.
Length overall	47.5 in.
Weight	48 oz.
Wing loading	7.43 oz./sq. ft.
Controls	rudder and elevator
List price	$99.95

Soaring . . . . . *Continued from page 26*

paragraph a . . . current AMA rulebook). This mass is equivalent to 11.023 pounds or approximately 176 ounces. From the same paragraph, we see that the maximum allowable surface area is 2,325 sq. in. So, if we design the maximum allowable size and weight glider, we end up with a wind loading of 10.9 ounces per

square foot, MAXIMUM! This is a *huge*, floating glider that has a very narrow speed range . . . NOT GOOD. What you want is a sailplane that covers ground quickly, yet retains its ability to thermal well. So, because of the weight limit, *very* large sailplanes are not desired.

(Just in case you don't know, and are wondering *why* the FAI has any say in the matter of the size and weight of AMA sailplanes, I recommend that you read page 66 of the AMA rulebook, specifically rule 3.2. Also, a rule proposal has been passed by the AMA Contest Board which emphasizes this size/weight limitation . . . Proposal number 24, R/C, December *Model Aviation*.)

The capability to ballast up to a surface loading of at least 20 oz. per sq. ft. is desirable for those weather conditions requiring high speed flight, i.e., strong lift, high winds, or both. Remember, because this model is going to be somewhat larger, because it's going to fly fast and have a good-size wing chord with the resulting high Reynolds numbers, and because it's going to have a decently high aspect ratio . . . it will handle the high wing loading much better than even your large F3B models will.

Given the weight limit and desired maximum surface loading, let's see what kind of surface area we are going to need: if surface loading equals total weight over total surface area, then we can determine the surface area by dividing weight by surface loading: 176 oz./20 oz. per sq. ft. equals 8.82 sq. ft. or 1,270 sq. in. This is a suggested maximum surface area which will allow you a decently high wing loading without exceeding the FAI maximum surface loading of 24.51 oz./sq. ft. The recommended minimum surface area, just to be legal at maximum weight, is 1,034 sq. in., anything smaller than this, and you're over the maximum allowable surface loading.

It is my personal belief, based on my experience working with glider pilots of the skill and experience of Jerry Krainock (National and International distance record holder), Mike Bame, Mike Reagan, David Peltz, Gary Ittner, and many other San Fernando Valley Silent Flyers, many of whom are current AMA distance record holders, that for an unlimited class, cross-country sailplane, you should be looking at a total surface area of between 1034 and 1270 square inches.

Here are some more quick recommendations:

1) Keep the wing chord between 11 and 14 inches for good visibility at high altitude;

2) Likewise, keep the *minimum* stab chord at six to seven inches;

3) Use an airfoil section of between 13 and 16 percent thickness, you won't notice any difference in drag (compared to thinner sections), but you will have a much stronger, safer wing that will resist blowing up on you in a high speed dive (I'd try the MB-253515 or the MB-303515);

4) Make the fuselage big and roomy, this will allow you to carry oversize battery packs for long duration flights, or carry thermal sensors, or barographs for altitude records, and more importantly, it will allow you to see the fuselage at greater distances which will aid you immensely in thermaling and spotting temporarily "lost" sailplanes;

5) Design stability into every aspect of the plane's handling; long tail moments with fairly high tail volumes, polyhedral wings with lightweight outer panels, fin and rudder volume balanced to wing area and polyhedral angles for hands-off circling ability;

6) Use bright colors in combination with highly reflectant colors (such as orange, red, yellow, and especially white) for the upper surfaces of wings and stabs;

7) Use primarily dark colors on the lower surfaces of wings and stabs for contrast against white clouds, and bright skies, but include a band of something bright (12 to 18 inches wide) like white, or dayglow yellow or orange so that in case you get below a gray cloud or exceptionally dark blue sky, you will still have good visibility;

8) Design your bird with some kind of effective glide path control device whether it be spoilers, flaps, or dive brakes, whichever you feel most at home with;

9) Set up your elevator trims so that full down trim when fully ballasted won't get you into your redline speed or cause the glider to tuck (a very steep dive which looks like a big, outside loop), and full up trim gives you a good, stable thermaling speed without "porpoise-ing."

10) Don't use anything but your most trusted radio gear. When you are flying half a mile up, the last thing you need is a range or interference problem. Those down glitches can spell disaster, and you don't want to risk a $200 to $400 sailplane to a flakey transmitter or receiver.

11) A thermal sensor can be very helpful in determining whether you are flying through lift or not, and sometimes that's difficult to tell when you're bouncing down a country road at 55-plus miles per hour. Let someone else listen to the damn thing when you are flying, though, or it will drive you bananas. He can tell you if the sensor is indicating lift, and then you (the pilot) can either confirm or deny the presence of lift by trying a circle or two. This can work the other way too, as the pilot is often fooled by what *appears* to be lift, but is not. The thermal sensor will confirm or deny the presence of lift with a persistently high-pitched tone.

Well, that more than *generally* covers a few aspects of cross-country flying. Of course much more could be written, and probably will be in the future, but that's enough for now.

ASKANT SLOPE AND TWO-METER GLIDER

The Askant is a brand-new, sleek looking slope glider for aerobatic, speed, or just fun flying off your favorite

hill. It's made by a relatively new company by the name of Aeronautics, Inc. which is based in Huntington Beach, California.

The Askant is the result of the combined effort of two men, Dennis Cook and Wayne Selway. I've known Wayne for many years in the Southern California Soaring Clubs wars, also known as the SC squared contest circuit, and I'd say he was one of the nicest, friendliest competitors in the whole bunch. He is a pretty good pilot too! Dennis is another friendly glider type whom I haven't known more than a couple of months, but I have learned to respect his openness and honesty.

Together, they make a pretty good team. Wayne is more the designer and competitor, as well as being slightly extroverted, while Dennis is more the quiet businessman who enjoys flying slope gliders on weekends. I think they compliment each other well as business partners, and I think they have a good attitude toward the future of Aeronautics. They would rather put out a top quality kit airplane, establish a good rapport with the fliers along with a good reputation, and not try to make a big profit (this isn't their primary source of income), than compromise their Askant design by trying to make it cheap to manufacture. In many respects, Aeronautics reminds me of another sailplane manufacturer, Pierce Aero Company of Northridge, California.

Anyway, enough about the manufacturer, let's talk about the product. The word *askant* doesn't mean anything in any language. I'm sorry if that spoils the mystique of the name Askant for you, but if the truth be known about it, it's just a name. The closest I can come to making anything out of it is "a cant" or "a slant" meaning a slope of some kind.

Basically, the Askant is a typical foam and fiberglass type model. The foam core wings are hot-wired out of one to one-and-a-half pound density, expanded bead polystyrene "white foam." The guy who cuts them for Aeronautics is no stranger to these pages, he is the one and only foam-freak-perfectionist, Mike Bame of Santa Monica, California. These cores are as perfectly cut as you can imagine. When Wayne selected one core at random and mic'ed it, he was amazed to find that it was only four thousandths of an inch from dead-on! When you're talking about an 11-inch root chord, .004 is nothing.

The wing section used in the Askant design is one of Eppler's best . . . it's the 374, and it's unadulterated. I've used this section on a six-foot span slope plane, and I can vouch for its performance characteristics. (See **Model Builder**, March '83, page 24 for theoretical glide polar comparison of the 374 and 205 Eppler sections.)

Other wing-related facts are:

1) Two available spans: 69-inch and two-meter (78-1/2 in.), both are one-piece wings.

2) Optional spar system: 69-inch

version includes 24 inches of T6 aluminum alloy tubing which doubles as the ballast compartment (one piece tube). Two-meter version includes two of the same T6 spars, one 24 inches and the other 30 inches. Total No. 9 lead shot carrying capacity: 69-inch Askant, 23 ounces; two-meter Askant, 53 ounces.

3) The root chord of both versions is 11 inches. The tip chord of the 69-incher is seven inches (for an area of 621 sq. in.), and the tip chord of the two-meter is eight inches (741 sq. in.).

4) Empty flying weight (with spar system) is 43 ounces for the 69-incher, and 53 ounces for the two-meter (depending on how many functions and servos you use). Either version usually ends up having a 10 oz./sq. ft. wing loading.

5) Wing skins are 1/16 sheet balsa and totally cover top and bottom surfaces. The 69-incher uses trailing edge stock for its T.E., and the two-meter does not, instead, its foam core goes back to a sharp edge and is sheeted over with the 1/16 balsa.

6) The only dihedral in the Askant wing comes from the taper of the airfoil (top surface is built flat). This amounts to about one inch . . . which isn't much, but the wing does have five degrees of sweep in each wing panel, which has much the same affect on stability as dihedral.

The fuselage is two-piece molded epoxy-fiberglass. The main piece includes the fin, tail boom, mid-section, and nose, while the smaller piece forms the canopy and upper wing fairing. The wing saddle is molded into the lower piece for easy mounting.

Tail surfaces are also foam core. The rudder and all-moving stab halves are cut from white foam and sheeted with 1/16 balsa. There is a pine pivot tube carrier block in the stab for extra strength.

Moving surfaces are controlled by steel cable. There is no bellcrank in the fin, the stab is directly actuated by the cable.

Finally, the kit comes with all necessary hardware, balsa, plans, and instructions . . . so, if I've left anything out of this mini-review, perhaps you should contact me or the manufacturer and ask. You can write to me in care of the magazine, and Aeronautics in care of Dennis Cook or Wayne Selway, 20291 Beam Circle, Huntington Beach, CA 92646, or call (714) 952-7070.

WHAT'S NEW AT WILSHIRE?

For a sailplane enthusiast who likes to know what's new in the literal *world* of R/C soaring machines, there is no better "candy store" than Wilshire Models in Santa Monica, California. Hans Weiss, proprietor, makes at least two trips to Europe every year, and while he's there he often contacts the various model manufacturers to secure models for sale in his shop, and to establish the continued distribution of those models. This is why his shop continually has fascinating new models in it.

I visited Wilshire Models last week to say hello to Hans and his wife Maddy, and to check out "the latest stuff" from Germany. I was pleasantly surprised to hear that there are four new sailplanes available through Wilshire. Two of the four are from Eismann: the Gentron and the Vampir. The other two are from a company I'd never hear of before, Rowing, they are: the Merlin and the 1/4-scale open class LS5.

Without going into much detail about each model (I've only *seen* one of the four models), I can give you a brief rundown of some of their specifications as I was given a flier on each . . . written in German, of course . . . which I can't read, of course, but here goes anyway.

EISMANN GENTRON

The Gentron is a high performance F3B sailplane. In fact, it strongly resembles the sailplanes that the 1981 German F3B team of Vauth, Shaeffer, and Decker flew (especially Vauth and Shaeffer) at the Sacramento World Champs.

SPECIFICATIONS:
Wingspan ..... 3100 mm (122 in)
Length ..... 1360 mm (53 in)
Surface area ..... 65.1 dm² (1009 in²)
Weight ..... 2300 g (81 oz)
Ballast capacity ..... 1000 g (35 oz)
Profile ..... Eppler 211 mod.

GENERAL DESCRIPTION

The Gentron has a T-tail, a sleek pod and boom fuselage molded out of epoxy-fiberglass, and a high aspect ratio, tapered, two-piece wing probably molded of epoxy-fiberglass.

EISMANN VAMPIR

The Eismann Vampir is a slightly overgrown two-meter "Allround-Segler", or multi-purpose glider. The fuselage looks very similar to the Gentron's fuselage, so I wouldn't be surprised if it came from the same mold. As far as what it is intended for, well, get out your German-English dictionary and translate this: "Der Vampir ist ein auBerst wendiger und schneller Segler und fur jede Art von Kunst- und Hangflug bestens geeignet."

SPECIFICATIONS:
Wingspan ..... 2200 mm (86 in)
Length ..... 1240 mm (49 in)
Surface area ..... 46.2 dm² (716 in²)
Weight ..... 1900 g (67 oz)
Ballast capacity ..... 700 g (25 oz)
Profile ..... Eppler 211 mod.

GENERAL DESCRIPTION

The Vampir is a V-tail glider. It has a sleek pod and boom fuselage molded of epoxy-fiberglass. The rest of this flier is "Greek to me" . . . how about the word describing the V-tail (maybe): "Querruder - Wolbklappenuberlagerungen"! On second thought, that may be the word describing the flap system.

ROWING LS 5

The LS 5 is a 1/4-scale LS 5 sailplane. That sounds obvious doesn't it? It's made of molded epoxy-fiberglass (flying

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surfaces and fuselage). It has a *huge* wingspan of 5-1/2 meters, a T-tail, flaps, ailerons, rudder, and the three-view indicates it has a retractable wheel.

SPECIFICATIONS:

Wingspan ..... 5500 mm (216 in)
Length ..... 1750 mm (68 in)
Aspect ratio 30:1
Surface area ..... 103.4 dm² (1603 in²)
Surface loading .. 63 g/dm² (20 oz/ft²)
Weight ..... 6500 g (229.5 oz)

PERFORMANCE:

Best glide ratio 33:1
Minimum sink rate . 0.3 m/s (11.8 in/s)
Best glide speed ..... 11 m/s (36 ft/s)
Minimum sink speed . 9.5 m/s (31 ft/s)
Normal speed range ..... 8-30 m/s (18-67 mph)

ROWING MERLIN

This is the model that I saw in Wilshire Model Center. As you can see from the photograph included with this article, the Merlin is another V-tail sailplane. It has a long, slender fuselage molded from epoxy-fiberglass. Wings and stabs are likewise constructed from molds, and are top quality items.

The fuselage has a very unusual feature. While I don't think that it was an original idea for the Merlin, nevertheless it's a good one. The canopy is more than just the area that is painted black on the fuselage. If you can imagine a plane (remember your high school geometry?) passing through the fuselage at a 45 degree angle just behind the black "canopy" (cutting down and forward), you can also picture that whole front part of the fuselage being removed, which it can be. The canopy might be more accurately described as a nose cone.

If this idea sounds pretty lame to you . . . well, it did to me at first also. What saves this design from a bent-out-of-shape nose after every landing is a very strong, vertical, 1/4-inch plywood (I think) plate which is the same shape as the fuselage profile. The fiberglass nose cone is a very snug, slop-free fit onto this plate, and is held securely by two pins. Short of a full-on AMA banzai dork, this fuselage should hold together flawlessly.

I think the primary reason for having the entire front section of the fuselage come off in this way is to enable the modeler complete access to servos, receiver, and battery pack. You see, these items are all mounted to the side of this plate like little parasites. The servos are actually mounted in the plywood plate as if it were a giant servo tray. If you hate radio system installations, you'll love this sailplane.

The wings are molded of epoxy-fiberglass, as I said earlier, and they are without a foam core, which is to say they are hollow. As for the type of spar used, well, that's a question for Hans, because I've forgotten (boo-hiss). Anyway, the wings appear to be of a Wortmann section, possibly one of the FX 60s, but the brochure doesn't say.

SPECIFICATIONS:

Wingspan ..... 3300 mm (129 in)
Length ..... 1270 mm (50 in)
Surface area ..... 54 dm² (837 in²)
Weight ..... 2500 g (88 oz)
Surface loading ..... 46-64 g/dm² (15-20 oz/ft²)
Aspect ratio 20:1
Minimum sink rate .. 34 cm/s (13 in/s)
Best glide ratio 25:1

U.S. FAI/F3B TEAM PINS, PATCHES, DECALS

If you are: A) an American; B) a modeler; C) a soaring pilot; or D) an F3B enthusiast, and I have reason to suspect that most of you are at *least* one of the above . . . then you probably know that this summer the world soaring championships will be held in York, England, and that you will be represented by Mark Smith, Alex Bower, and Don Edberg as a team, and defending world champion Dwight Holley. You can contribute to the success of this team by helping them defray some of the expenses that they will incur as a result of traveling halfway around the world with all of the necessary equipment and personnel that are essential to being competitive in today's world of F3B soaring. The AMA has provided for transportation to the flying site, food, and lodging for the basic team. However, there are many other expenses which are not covered, as you well know. That's why it is so important for us to give generously to *our* U.S. team. They need to know that we are behind them in more than just our thoughts.

Thanks to the efforts and private expenses of the U.S. team manager, Dick Odle, we can now proudly wear and display patches, vinyl decals, and lapel pins bearing the official seal of the U.S. F3B Soaring Team. I have included with this article a black and white photo of the patch. I only wish you could see how brightly colored this distinctive patch looks! For a donation of only $6, this patch will be yours to wear with pride.

The official logo or seal of the U.S. team is red, white, blue, and gold. The outer edge of the circular design is gold. The dark band just inside of this gold edge is dark blue. The words "F3B SOARING TEAM UNITED STATES OF AMERICA" are white. The inner band is also gold, and it surrounds a white field with a gold eagle, 13 stars, olive branches, and arrows. The union shield is red, white, and blue, of course. If you think it looks somewhat familiar, it should be . . . it's styled after the Seal of the President of the United States.

For a donation of $5, you can get the same logo on a double stick-pin lapel button. This little item is really classy as you can wear it with anything, and it can be transferred from garment to garment.

For a donation of only $3, you can get a pressure-sensitive, adhesive backed, vinyl decal with the official logo in full color. Stick these goodies on your F3B ship, and who's to know *you* aren't an

actual flier on the U.S. team? Flight boxes always give their owners the "knowledgeable look" when they have stickers of this caliber on them. At three bucks each, you can easily afford a handful.

Send your contribution to U.S. F3B Team, c/o Dick Odle, Mgr., 5775 Los Angeles Ave., Suite 210, Simi Valley, CA 93063. Do it today!

AIRFOIL OF THE MONTH

Airfoil of the month will be back *next month*, so stay with us.

Q & A FORUM

Remember, any questions are welcome regarding any facet of R/C soaring, just send 'em to me, Bill Forrey, care of this magazine. •

Electric ..... *Continued from page 27*

Truant because it kept escaping the schoolyard! Anyhow, it was published as an .020 gas powered F/F model in *MA*, and the Waddell's modifications to convert it to electric power are clever and well worth describing here.

The motor, as shown in the photo, is set back quite a bit farther than the gas version, and it is inset into a slot in the front. The distance from the very front of the motor to the leading edge of the wing is 1-3/4 inches, with the same downthrust angle as the gas version.

The battery is set into a slot cut in the fuselage, with the rear end of the battery just at the trailing edge. Now for the neat part! The Astro 020 motor is used, but only two AA GE Ni-Cds are used for the motor battery. Usually, the Astro 020 uses four.

Using two cells has at least three benefits: it is less expensive, it weighs less, and the cells can be charged from a common, dry-cell, six-volt lantern battery. This is absolutely ideal for kids learning how to fly free flight, as the charging battery is easy to get, inexpensive, and very portable for those schoolyard flights. This is the same system that was used on the Mattel Superstar in the '70s. All you do is hook up the lantern battery directly to the two nicad cells, and charge for about three minutes.

You are ready to fly!

You will have to experiment to see exactly how long you need to charge the battery, as no automatic charger/timer is used, and it could get away! Do note, however, that only a *dry-cell*, six-volt lantern battery will do. There are some six-volt *rechargeable* lantern batteries around, and of course, many six-volt motorcycle batteries around. Don't use them! They will overcharge the Ni-Cds because they have a much higher current capacity (low internal resistance) than the dry-cell lantern battery.

Use a Top Flite 5-1/4 x 4 prop, this is ideal for this motor and battery setup. The Top Flite 6 x 3 prop would be another one to try for slower flying planes. Try the Truant, you'll like it!

IN REMEMBRANCE OF LEE RENAUD

On a sadder note, by now most of us have heard of Lee Renaud's passing. I would personally like to say that I am grateful to Lee for what he has done for us all with his designs. I fly the Olympic 650 and the Olympic II. These are the finest planes in existence for the sport flier. Lee emphasized quality, and his kits are a pleasure to build as a result of that emphasis. He did it right, a rare thing in this world.

I would call Lee an artist, in the very best sense of the word. His planes, as they fly in the sky above us today, are the best possible testimonial to his creative talents. I wish he had had more time to design more of them for us. Well, Lee, you showed us how to do it right . . . we thank you.

Lee wanted his designs to be as perfect as possible before he turned them out to the public. As a result, he had some planes which never became generally available. One of these designs was the Buteo, which handily beat my Olympic II at the 1980 Astro Champs. This was the fastest climbing electric I had ever seen with the old 05 units, and it would be even more fantastic with today's new 05s. Does anybody have plans for the Buteo? If so, could I borrow them to trace? I guarantee that the plans will be well taken care of and returned promptly. The Buteo was a beautiful plane as well as a super performer, and I wish that it could be made available to the public. Short of that, I would like to build one for my own enjoyment.

IBA LECTRO

I have written a lot about the IBA ready-to-fly planes lately. Well, now there is one more! Wilshire Model Center is now importing the IBA Lectro, which is designed for the sport flier, and is powered by seven or eight sub-C cells. This would make it ideal for the Leisure LT50 motor, the Astro 075, or the Astro Challenger (cobalt) 05. It has a span of 79 inches, and a flying weight of 3-1/4 lbs. The construction is sheet balsa, with the immaculate workmanship which has become so characteristic of IBA products. The price at Wilshire Models will be in the $190 to $200 range. The Ampere Flyer, a monthly newsletter on electrics from Europe, commented that the way to get the most out of the Lectro as a glider would be to use a folding prop with gear drive. The IBA literature shows it as a direct drive, which should be fine for general sport flying.

NEW LEISURE GEAR MOTOR

Leisure Electronics has a new gear drive system out, the LT50 Gear Motor, with dual ball bearings, a brass pinion gear, a Delrin main gear, and a polycarbonate 'glass filled housing. The really neat feature of the Gear Motor is that it can be taken apart easily and a range of gears may be installed. Leisure lists a 2.5:1; a 3:1; and a 3.6:1 set. The 2.5:1 set is ideal for the Leisure Playboy, and the 3.6:1 is a potent combination for maximum climb with a folding prop for two-meter electric gliders. This looks like a good one for the Lectro.

The quality of the Leisure motor is, as usual, superb. The motor is cast and machined beautifully, and the brushes are spring loaded with pigtail leads, the very best for high current loads. The Leisure motors are well-known for their ability to "take it" if they are over-propped due to their top quality brush design. The performance specifications for the motor are: 6.38 ounces with the gear drive; 5500 rpm on a 11 x 6 Rev-Up prop on six cells and 2.5:1 gears; 6200 rpm on the 11 x 6 Rev-Up with seven cells and 3:1 gear drive; and 3500 rpm on the 15 x 8 Geist folding prop with seven cells and the 3.6:1 gears. This combination can produce up to two pounds of static thrust.

The motor with batteries and wiring is No. 603 in the Leisure catalog, and lists for $89.95. This comes with the 2.5:1 gears and a six-cell battery pack. Specify if you wish other combinations.

Leisure also has some other combinations well worth considering, they offer their direct drive motors in competition (racing) wind and in pattern wind, with six-cell battery packs, wiring, and their No. 105 charger, for a combination price of $100. This is a very good deal, and represents a $25 savings compared to buying the flight system and charger separately. Catalog No. 600 is for the pattern wind, 601 is for the competition wind. The pattern wind will handle props in the 6 x 4 to 8 x 4 range, and the competition wind is best used with a 6 x 4, though it can be used with up to an 8 x 4 if you are willing to accept slightly reduced run times. I like the pattern wind for general sport flying, and the competition wind for (guess what!) . . . competition.

Leisure says that straight and level speeds of 75 mph are possible with the competition wind in the J&M Glaskraft Barbarian. I have watched it in a pylon race, and even on six cells it was competitive with seven-cell systems. I would guess that the Barbarian reaches speeds of about 60 mph around the course. In straight runs this would be higher, but turns slow racers down. On seven cells, I'm sure it would hit 75 mph in the straights.

For more information on the Leisure systems, and for copies of their technical bulletins, write Leisure at 11 Deerspring, Irvine, CA 92714, or telephone (714) 552-4540.

TURN IT OFF!

Now that you know how to climb fast and go fast, what about slowing down? Specifically, how do you turn the motor *off* when you want to? I have punted on this fourth-and-long situation before by installing push-push switches, but all the systems on the market come with toggle switches. . . So, I finally decided to get with it and make a system that uses these toggles. I came up with a system that I like a lot, and it is really simple and easy to install.

With this system, you can either use a separate servo to turn the toggle on and off, or use the elevator servo, with full down throw for off, and full up for on. By the way, I don't advise doing it the other

way around, as full up to turn the motor off is an open invitation for a stall, which can get quite painful when you are on a landing approach!

The photos show the basic idea . . . I used Structoplast tubing, which is available in hobby stores, with a 3/16-inch inner diameter. I cut a one-inch long piece, then drilled a 1/8 diameter hole crosswise through the tubing about 1/4-inch below the end of the tube. This tube is slipped over the handle of the toggle switch. It is not a tight fit, but it has worked just fine for me this way. If you feel that you need a tight fit, build up the diameter of the toggle switch with wrappings of masking tape. Do not try to use glue of any sort, as there is a good chance that it will get down into the switch and jam it.

The link to the servo is 1/16 music wire, with two wheel collars for adjusting the *on* and *off* points for the servo throw. On and off should be near the ends of the throw so that the servo won't stall as it tries to push the switch beyond its limits. In my particular setup, the wheel collars are about 3/4 of an inch apart.

Now for the installation. The servo can be servo-taped to the fuselage side. The toggle, however, needs a very firm mount, otherwise there is too much "twist" when the servo pushes on it. I use a 1/4-inch thick spruce block glued to the fuselage side. The toggle switch is glued to that block. Thick, Super 'T' Hot Stuff does a good job. There you are, all ready to go!

This setup was designed especially to avoid some particular problems. The first was that the toggle switch handle must not be modified in any way, because it has a tiny spring inside it that runs all the way up to the top of the inside of the handle. If the handle were drilled or squeezed, the spring would be damaged, and the toggle would not work. The slip-on tube avoids all that. The other problem was binding; the system has to have some free play so the servo will not jam. The 1/8-inch hole in the tubing will allow the 1/16 wire to slide freely even toward the extremes of the throw, so it will not jam. The wheel collars also allow a lot of adjustment for maximum freedom of movement.

That's all for now, so turn on to electrics, and fly high! •

Pattern . . . . . *Continued from page 28*

What causes a model to be difficult to land?

Evaluate the problem using elevator imput as a guideline. If the model tends to require lots of up-trim, and fails to rotate at slow speeds, it's probably nose heavy, *or* it has too little throw on the elevator. It could have an undersized stab and elevator, *or* have a badly placed stab which falls directly into the wing turbulence, *or* the darn plane is just too heavy for its size.

However, if the model floats with very little up elevator, and tends to get vague and drifts and drops from side to side, it's probably tail heavy. Very light models tend to also react this way so don't confuse the problem. Holding power on will help these models. Just set the nose a little high and drag it in at a high idle.

QUESTION NO. 4

How do you get the model to perform a smooth takeoff?

A) Align landing gear and wheels for smooth hands-off tracking down a very gentle driveway. *Do not* run it into the street or expect a kid to catch it! Be careful. Cars will crush models, and kids will catch them with a claw-like grasp, either can be fatal to the model.

B) Set the nose gear so that the model has a slight positive angle of attack. I would recommend an approximately 1/16 to 1/8-inch positive wing setting relative to the runway, and a 1/8 to 1/4-inch setting for grass fields. I know the Falcon trainers all had short nose gear and a negative wing-to-ground setting, but the idea here was to prevent bounce-landings and premature take-offs. We pattern fliers don't have these problems . . . do we?

QUESTION NO. 5

What is the best way to get a pattern ship to roll?

Don't expect overweight, noseheavy, and slow models to roll easily. They are problem children at best. A light, quick,

propely balanced model is far easier to learn with.

Try trimming the model while flying *into* the wind to keep it in sight throughout the rolls. Set up the model by doing shallow, climbing rolls with no corrections. Adjust the low roll rate for about a six-second roll, and then time for three full rolls. The process of learning how and when to add the required up and down elevator inputs is widely misunderstood. The old idea of slowly and evenly moving the elevator stick up and down during the roll will produce very wierd rolls if you are using good servos. The movement required is usually a quick, easy, "blip" of down elevator half-way through the roll, and a smaller, quick, easy, "blip" of up elevator at the finish. *When* to apply the blips is the trick of this maneuver. If you fly old-fashioned radios and chubby airplanes, you may need to add much more elevator, and start applying it earlier, to allow the obsolete servos enough time to react.

The amount of slop in the aileron linkage, differential elevator throw, model design (or lack of it), will all affect the roll. The amount of aileron differential will also affect the roll. Very light models require *less* differential as a rule, provided the ailerons were adjusted at center to begin with. Swept or straight trailing edge wings *usually* require less also. A *little* differential is desirable for most double taper wings. The best I can figure is that the chordwise airflow of different sweep arrangements affects aileron effectiveness.

The bottom line is that *you must practice faithfully with the same model* if you expect to develop the skill for accurate rolls. Once you get the hang of it, try different airspeeds, and notice the difference in elevator timing required. You will find that with patience and practice, you can do a slow, rolling sequence, and even control the horizontal path by turning right or left while rolling. Believe it or not, you can do very respectable rolling circles by using only the elevator and ailerons.

Enough of the questions for this month. I would like to add my two-bits-worth to the most stupid argument ever heard, namely: "Which is better, Mode 1, Mode 2, or Single Stick?"

In all the silly analyses I have read on this subject recently, nobody pointed out that characteristically, Single Stick fliers cradle the TX to provide a very stable platform. Secondly, most successful European fliers who fly a modified Mode 1 use a tray for stability, but our Mode 2 fliers use all kinds of grips, such as thumbs only, pinched thumb and finger, strap plus thumbs, even a barber chair with foot pedals and a "joystick"!

My point is that perhaps the advantage some fliers see in Single Stick and Mode 1 over Mode 2 may only be due to the stabilized transmitter arrangement popular with them! Any comments? •

The Bipe . . . . . *Continued from page 29*

would negate that design objective. Secondly, cabane struts are a perfect pain, the use of a "cabin" instead is so much more practical. Hence, you see the use of 100 percent wing stagger in this design which theoretically allows much smaller wing gaps, and eliminates the need for cabane struts.

The proper use of decalage can enhance longitudinal stability. The law says that if you fly the *forward* wing at a higher angle of attack than the aft wing, then the *forward* wing will stall first. Thus, the forward wing will lose lift while the aft wing maintains it. In that case, the center of lift automatically moves rearward tending to pivot the nose downward at approximately the center of gravity, or control pivot in this case. Once the nose comes down, the forward wing gets its lift back, and you are flying safely once more.

Note that the Bipe uses two degrees of negative incidence in the rear wing for this purpose. Negative incidence can be used in this case because the airfoil used for both wings commences lifting at about four degrees negative. At two degrees negative, that rear wing is still providing lift, which will increase drastically when raising the nose, and increasing the angle of attack. Remember, at this point in C/L development you only concerned yourself with right-side-up maneuvers, as up to that time no one had flown inverted!

Along the way, we saw a demonstration of this stability factor. One of the Patuxent modelers was flying a Bipe, when somehow he lost an entire half of the horizontal tail. Flown without it, the only apparent difference was a bit of control response sluggishness when performing a loop.

One thing that you can do when talking about something which happened in the beginning is see how things have changed. Is everything really better today? Remembering that the first Ukies were designed by "freeflighters," some of the thinking had to be influenced by what they knew to be fact from their limited experience.

Jim Walker was "Mr. U-Control," and he pointed the way for the rest of us. For whatever reason, Jim commenced C/L flying in a counter-clockwise direction, and did it successfully. Naturally, everyone else followed his trend, because after all, he should know . . .

However, in those days, if you were a freeflighter, you were awfully concious of what was called torque effect. If a model started into a left turn under power, it seldom recovered. This torque was believed to be a strong force. Note that the Bipe was flown CLOCKWISE. If you needed to keep the model tight against the end of the lines, it seemed obvious to let torque help you do it. Thinking further, it seemed absurd to design the model so that it would stay out there, and then add some more yaw to compensate for the torque. Obviously, for whatever reason, counter-clock-

wise became the standard, but you have to wonder if those clockwise designs might not have been just a bit more efficient.

Speaking of Jim Walker, he kept a tight rein on his "U-Control Patent" which many thought was not valid. But who was to argue with "The Man"? The Bipe was like all other kits of that day, only the location of the control was shown, not the system itself. In a sneaky way the *size* of the control horn was indicated, but that was all you got. Of course, you always had the positive direction, "Locate your favorite control here!"

What is your favorite fuel tank, a wedge, a hopper, a pressure tank, something else? What is the best brand you have found? In the Bipe's time, those descriptions would have fallen on ignorant ears. Buying a store-bought tank was unheard of, you either used the *excuse* for a tank which came with the engine, or you made your own. At least the Bipe drawings showed how to make a tank that might work. Actually, a major handicap in C/L was fuel tanks. DMECO developed and produced one of the first, it was a tall, square metal type which featured a "swivel pick up," and it worked!

Blind nuts? You would have to have been kidding! If you did not use wood screws, you had to make a "nut plate" as the drawings show. Hinges? Again you would be dreaming . . . You used a dowel for the elevator leading edge, wrapped some strips of tin can around it, and pinned it to the stabilizer.

There were some encouraging signs though . . . Matty Kania of the Patuxent group devised a hinge which pointed the way. Matty found some .003 thick *spring steel* shim stock, and with it devised the first strip hinges. The edges of the stabilizer and elevator were slitted, and the narrow, steel strips were inserted. They were then pinned in place. These "springs" also offered a self-neutralizing feature for the elevators, thought to be useful whenever the lines might go slack. Hey, these hinges worked fine, and probably *only* the scarcity of the thin, spring steel shim stock kept from becoming very popular. Of course, the basic idea did not die, and years latter, with the availability of polypropylene ("the living plastic"), strip hinges proved very successful, and became popular.

Yes, the years did change things, but mostly with improvements. Some of it got lost along the way, and other things are still with us, like using a bellcrank and those steel lines. . .

It should be pretty obvious that the Bipe was a most unexpected, and very successful design. It was not a pretty airplane, yet its stark appearance proved attractive, and its performance cinched its acceptance by other modelers. What was not immediately obvious was its extreme ruggedness, which was most important in those early, learning days. Often, you could cartwheel one end over end, and put another prop on, and fly. The original Bipe was most unusual as it survived thousands of flights, suffered through several engines, had its wire gear fatigue off, and wound up flying from a hand launch with belly landings. Other designs just did not have that kind of stamina in those days.

Attracked by its virtues, a number of Patuxent people built and flew Bipes with equal success. Enthused by this success, the designer went through a number of variations on the theme. One less successful variant featured extreme streamlining, including a cowled engine, which was frowned on in those days. Another version was strongly "beefed-up," and powered with a Hornet racing engine. This one was a real snorter, and would darn near pull your arm off on the long, seventy-foot lines. It was aptly named the "Brute" before we were done with it. The bottom line is that we really did have FUN with the Bipes. . .

In the early forties, model construction in general was not much more than an elaboration of the original "stick and tissue" structures. While such a structure still provides about the lightest way to go, and is sufficient in strength for flight, it will not take much abuse. This method can also be tedious to assemble. It did not take much control line flying experience before it was realized that these models needed a more rugged structure, plus, simplicity would be desirable.

Check out the Bipe structure, it does not look much different from what is used today, does it? Now understand, this method was brand new at the time, and while my memory is vague in this area, it could be that the Bipe was the first aircraft to use these ideas.

When I entered the Navy, I had been working in a variety of industries, in reflection, trying to find myself. If nothing else, you have a lot of time for thinking when you are in the service, and after the service, you are usually in a position to pursue just about any career you wish. I made the decision to go where my heart was . . . into model aviation, more specifically, into model manufacturing. The available service time also allowed some advance preparation. With the general acceptance, and the apparent worth of the Bipe, it was decided that this would be the first deBolt Model Engineering Co. (DMECO) kit.

Immediately after leaving the Navy, the necessary meager start was made, setting up a workshop, purchasing all the materials, and all the many details. Fortunately, a good buddy in the Patuxent club was an excellent draftsman. Bernie Millett had kindly produced the needed original drawings while still in the Navy.

When thinking back, it is hard to believe that the first Bipe kits were produced, sold, and delivered in January of 1946. Less than one month after leaving the Navy! There probably is a lesson there . . . when there is a real need, we can accomplish things which would otherwise seem impossible. After that, DMECO progressed well because of "the times", more than anything else. Immediately after the war, it did not make much difference what sort or type of product you produced, things there in such short supply there was a demand for just about everything. Kaiser even got into the automobile business

through this loophole! On top of that, C/L was about to explode, and guys were anxious to get back into modeling; They needed kits, and not many were available.

The Bipe kit was an instant success; as a labor of love, it was top quality all the way, while other offerings left much to be desired. It also was a badly needed type, especially suited for a beginner to control line flying. At $3.95, it fell into the "upper price" category of those times, yet this did not seem to effect its sales. Speaking of price, the Bipe box was jammed full of balsa, and all the other needs. It sure is a sign of *our times* when you realize that the $3.95 would not even buy the *box and plans alone* for the model today!

DMECO was as small an operation as you could visualize, yet the "good times" allowed rapid expansion of production. It was not long before Bipe kits were going out the door in gross lots, and they were seen on flying fields the country over. DMECO produced Bipe kits exclusively for over two years, and before it was replaced with an "improved" design, something close to 50,000 of them had been sold.

It was a couple of years or so after the war before anyone managed to fly inverted with control line. Some modeler did it first on the west coast, and the news traveled like wild fire. Naturally, deBolt had to get with this exciting new style of flying. After much thought and concentration, a design was developed for inverted flight. In the process, the design was patterned after the Navy's Wildcat fighter. As it turned out, the first inverted flying on the east coast was accomplished with this "Wildcat" design. Learning the maneuver did not come as easy as the model design did, it was many crashes before a complete inverted flight could be accomplished.

With no inverted flight ability, the demand for the Bipe slacked off. Something was needed. This demand lead to the "New Bipe" which was really a major redesign. Not only were the airfoils changed to allow inverted flight, the whole structure was re-engineered for lightness, and the use of smaller, more popular engines. The New Bipe was a major improvement, and turned out to be one of the nicest flying and performing designs of the day.

Flying two models simultaneously with control line is a chore, but Walker did it, and deBolt was quick to follow. To be successful, you really do need a model which will fly itself, for there is no way you can concentrate on two planes simultaneously. The stability and ease of flight of the New Bipe made this trick relatively painless.

The last of the Bipe series was labeled the "Super Bipe," and in reality, it had little relation to the original, beyond the use of two wings. This was a larger model, designed around the Drone Diesel engine, and aimed at the performance needed for stunt competition. While the performance was competitive, and in general it was an excellent model, the Super Bipe was never one of my favorites. The Super Bipe lost many of the features of the original Bipe, as the engine was side-mounted to obtain a better fuel tank location, the wing gap was increased to allow a reduction in stagger, and a slimmed-down cabin was incorporated to reduce drag. Even so, its success obviously had its roots in the grandaddy. . .

As an indication that the Bipes have not been forgotten, there is news from the old timer C/L movement that apparently a New Bipe did well in a USA national competition. Then, old friend Ron Moulton of England passes the word that a Super Bipe recently won their national championship. Perhaps they are mellowing with age. . . •

BIG Birds . . . . *Continued from page 33*

has got to be good!

There *cannot* be any compromise where safety is concerned! For some strange and unexplained reason, some guys refuse to accept the fact that this is an inherently dangerous hobby/sport and, unlike tiddley-winks, requires rules, standards, and monitoring so that *everyone* is protected. We'd all be better off if these irresponsible individuals would give up modeling, and get involved in something much less life-threatening.

So c'mon guys . . . let's use a helper and/or a stooge when starting that engine. Let's get rid of those electric fuel pumps. Let's put out those cigarettes when servicing or starting, and let's do really thorough preflight and postflight inspections instead of depending on a casual glance or two. The BIG Bird you save may be your very own, and the arm or leg you keep from getting mutilated may also be your very own. *FLYING SAFETY IS NO ACCIDENT!!!*

AND NOW, A FEW(?) WORDS ABOUT ROPE STARTING. . .

This is something I can't believe, having a starting rope less than an inch away from the prop. Talk about safety hazards! We make a lot of noise about safety, and fortunately, we do a good job of following through and cleaning up our respective acts . . . *but*, how anyone could justify using a rope starter on one of the gas burners is impossible for me to comprehend. I know that some Kawasaki owners use the original recoil starter, but at least these pull-ropes are anchored to the starter, and most importantly, are mounted on the *rear* shaft about a foot behind that menacing prop. On the other hand, the Evras and Ropers I've seen have had rope pulleys trying to fake it as a prop washer (see the pic of Joe Manuel's Curtiss Robin), or immediately behind that man-eating propeller.

With very few exceptions, our present generation of gas engines are docile, and very easy to start by hand. There's no reason why any engine being sold for aircraft use shouldn't be a pussycat to get going. I get chills running up and

down my spine every time I see, or hear of a rope starter being used on a BIG Bird. *DON'T DO IT, GUYS . . . PLEASE!* Anything, including not flying, is preferable to getting hacked to death by the handle end of a starter rope that's caught in a whirling prop. Using a rope so close to a prop is just plain stupid . . . and if you don't care about your own safety, let's have some consideration for others. That rope could easily be whipped into the air, and it could tear up whomever was in the way.

BEAUTIFUL BONES . . . REVISITED

Back in the March issue you got a glimpse of Joe Manuel's Waco C-6 in all its naked glory. Well, he finally got around to finishing and flying his nice birdie. The C-6 topped the scale at 8-1/2 pounds, and *did not* need any extra weight for balancing. I'll let Joe tell you the rest:

"I covered it with Super Coverite and painted with Fire Red Black Baron spray cans. Looked good till I pulled the self-stick shelf paper off the wings after spraying on numbers . . . because the red came off with it. Had never had this happen before, but did patch it up and it looks okay.

"Used a Holman AT-6 Glass Cowl which fit perfectly. The Saito 80 Twin we used gave us the kind of thrill you don't need on a first flight. My good friend and test pilot, John Bartosh, took it off while I attended to the camera work. At an altitude of about twenty feet, one cylinder quit, so he hit the onboard ignition switch . . . still only one cylinder power. John brought the bird around beautifully and landed at our feet. Operating on half-power was marginal, to say the least. We tried real hard to get the engine to run like it did on the bench, but to no avail. I made a trip to Houston, and picked up some four-cycle plugs. The plugs had to be the problem, but I have not had a chance as yet to try running it again. Other than the engine trouble, it flew realistically, and according to John, handled great."

I called Joe, and found out that those OS four-cycle plugs got the engine running properly . . . so, if you've got one of these four-strokers, you might want to try running with the four-cycle plugs; it would seem that you would have a much higher reliability factor.

Joe also included some pictures and data on his Curtiss Robin, a project that he started some four years ago. (Isn't it nice to know that there's at least *one* other person who also builds kinda slow?) According to Joe, ". . . It was scratch-built from Scale Craft Plans, although I did have to modify them considerably. The plane spans nine feet, weighs 23 pounds, and has a hard-to-start Evra under the hood. The shocks (covered with Coors cans) are functional, as are the scale exhaust stacks which were fabricated out of stainless steel tubing by my talented friend, Jerry Mathis. This bird is covered with Super Coverite . . . but sprayed with Randolph Aircraft Dope: international orange fuse, and yellow wings. Will send flight photos later. . ."

While talking to Joe about the four-cycle plugs, I advised him not to use the Evra in the Robin for two very good reasons . . . and both come under the heading of safety. *The* most important reason, not using a rope starter, I've already covered. The other safety item was the fact that the standard Evra does not have enough power to handle 23 pounds of airplane. If he tried to fly it with the Evra, his beautiful Robin would most certainly be an accident looking hard for a place to happen. As the firewall and plumbing are all set up for the Evra, Joe's best shot would be to have Ernie Pritchard (E & L Manufacturing, 8631 E. Laredo Lane, Scottsdale, Arizona 85253, (602) 941-0633) work his balancing, timing, and piston ring magic on the punky, aggravatin' mill, turning it into an easy starter with lotsa moxie.

SPRING HAS SPRUNG

Which means that it's the time of year when some young men's fancies turn to thoughts of love . . . and all that jazz. However, the rest of us who know and understand *priorities* are much more interested in the advent of good flying weather . . . and getting the new BIG Bird properly flight trimmed.

And in order to make it as easy as possible to get the job done, here's a simple, but comprehensive chart that pretty well incorporates all of my trimming procedures. I'm not sure where this particular chart came from, or who laid it out so well, but these are the same basics I picked up a number of years ago. Everyone I know who has followed these procedures has ended up with a mighty good and groovy flying machine.

It's important to follow these directions on a reasonably calm day, otherwise you're into a by-guess-and-by-golly situation . . . with the added qualifications that ailerons truly *cannot* be accurately trimmed unless they're sealed, and that yaw and lateral balance errors *can* produce similar results.

As you can tell from this chart, it does take some time and discipline on your

part to get that BIG Bird flying right . . . so don't believe any of those fairy godmother stories about being able to trim an aircraft just one or two flights; too many of these myths are perpetuated by people who are just too damned lazy to learn how to really trim their aircraft. As a result, these same people always fly what appear to be ruptured ducks, planes that are never "on the step," and that forever wallow and skid. They look like they're about to fall down and go boom (which many of them are). To properly trim the average aircraft, you're looking at a minimum of 10 to 12 flights.

Soooooo, you've got to be in earnest about trimming. If you're not going to put the necessary effort into *each step*, then forget the whole thing, and keep on doing whatever it is you've always (not) done. A halfhearted job of trimming is worse than not trimming at all.

Don't be one of "the undisciplined" who bore holes in the sky just for the sake of boring holes, because that kind of flying time isn't worth much. And, don't go around spouting that old saw, *practice makes perfect* . . . because that's a bunch of pure, unadulterated horse-puckey. Only *perfect* practice makes perfect . . . and as no one is perfect, we'll have to settle for, *good practice makes almost perfect*. The point is that it's gonna take some doin' on your part to become a better and safer pilot who flies a better trimmed, and safer BIG Bird.

Try easing in just a little discipline when you fly. Plan ahead so that part of every other flight has you practicing some maneuver . . . like five minutes of touch and goes, or the traffic pattern (Huh? What's that?), or slipping into a landing, or rolls, or loops, etc. You'll probably find out how much real fun you've been missing, and how much longer your birds will stay in one piece, because you'll be more capable of handling those inevitable emergencies.

SIMPLY SMASHING!

I just got through watching both of Satellite City's tapes, the older, more well-known, *Video Tips I*, and the brand new *Video Tips II*, which picks up where number one left off. And as the latest tape demonstrates some advanced ideas and techniques involving Hot Stuff, it does make good sense to view them in order. Both *I* and *II* were the program for the Puget Sound Rocs' April meeting, and they did their job well; we all picked up some dandy ideas. A few of the guys who felt they couldn't really trust *any* CA glue had their eyes opened about building with Hot Stuff . . . especially as the new Hot Shot helps make almost instant bonds that are virtually indestructible. It was most impressive to see heavy maple engine bearers splinter and give way instead of the lapped Hot Stuffed joint. Don't believe the tales going 'round that Hot Stuff has P-poor shear strength, 'cause in the shear test, the maple bearers once again gave way first.

You're going to be amazed at what the Satellite City Boys do with their products in tape two. Besides glassing wing sections in a fraction of the usual time, regular covering materials can be strengthened with 3/4-ounce cloth, and super-strong, lightweight tubing can be formed using glass cloth. Because Hot Stuff is used instead of polyester resin or epoxy, there are no minute pieces of cloth to cause itching or a rash. *(Run that by again? wrf)*

Why do I have the hots for Hot Stuff? Certainly not because I'm related to the Hunters, or that I've got stock in the company. Here's the straight skinny why I don't use any of the other CAs on the market: first, as far as I know, Hot Stuff is the *only* American made CA glue: second, I have tried the others, and none were any better than Hot Stuff; third, Satellite City has always been easy to get along with, and more than happy to replace any bottles that have been on a dealer's shelf too long; and fourth, although I've never met Bob and Bill Hunter, they've endeared themselves to me because of the *Video Tips* tapes they've made. These guys are modelers, and took the time and trouble to do something no one else had thought of doing, or perhaps thought wasn't worth the effort and expense. They not only told us how to use their products, they *showed* us how to use them.

Hey guys, don't misunderstand! I'm under no illusions that Satellite City is a super-altruistic, non-profit organization. The Hunters are in business to

make a living, just like everybody else, and these videotapes not only help us as model builders, they boost the sales of Hot Stuff, too. The Hunters have proven over the last 10 years or so that they are concerned for, and about, other modelers. Their tapes are available to anyone. They even bear the brunt of the cost of tape number one, refunding the entire $30 deposit if the tape is returned undamaged within 65 days. In order to stay even with the cost of providing the tapes however, they are *renting* tape two as opposed to the *free loan* for number one. Even so, the price is right, and you get to view both tapes for a very nominal fee of only 15 bucks; an outstanding two-hour program for any modeler. For info on ordering the tapes, check the Hot Stuff ads, or write to: Satellite City, P.O. Box 836, Simi Valley, CA 93062 . . . and tell 'em the BIG Bird sent ya!

One last bit about the new tape. Besides demonstrating new building techniques, this tape also has an unusual ending, and was succinctly described by a British buddy of mine as "simply smashing!"

DARIO'S AT IT AGAIN

For all you guys out there who also think that Brisighella turns out top-notch plans, here's yet another great bird to add to your hope-to-build-someday collection: the Skybolt.

All the latest updates and mods are incorporated into this 26 percent of full-scale "Bolt." She's got a 78-inch span and 1600 squares, and depending on the engine used, will gross out between 17 and 22 pounds. As usual, a semi-kit, with epoxy-glass cowl, wheel fairings, and preassembled landing gear and cabane assembly are also available. Ordering info is on the plans, which are typical Dario Brisighella quality. What else is there to say except that the plans are $30.

Also available from US Quadra (1032 E. Manitowac Ave., Oak Creek, WI 53154, 414/762-7155) are a whole new line of mufflers designed for the new Q-50 Quadra, the 3.15cc Kawasaki, and the 2.4cc Kioritz engines. These mufflers are welded from light gauge steel, can be positioned for either left or right-hand exhaust ports, and can be bought with a preheater coil for those who like lots of smoke. The standard mufflers are $26.95, and six bucks more will get you the smoker version. Dario says mufflers for other engines will be out soon.

SCRATCH-A-PLANE

There's a beautifully bald guy named C. Wayne Jessee who appears to be the main man at a company called Scratch-A-Plane, and his big thing is to turn out professionally engineered and inked (rolled) plans.

Jessee's slogan is, "If you can build a kit, you can build a Scratch-A-Plane," and after carefully going over his plans for a Nieuport 17, a Fokker D-VIII and a Fokker DR-1, I have to admit that he isn't telling any lies. Not only are his plans neat, clean, and easy to read, but in spite of the simplicity of design, Wayne still appears to have captured the full essence of scale; in fact, to me these plans look like a good place for a scale buff to start.

The $24.95 for the plans doesn't include shipping, but does include something most guys will appreciate: a separate sheet containing all of the templates, so there's no need to cut up the plans. Another innovation is *the* instruction sheet. As far as I can tell, this *single* sheet of simplified, but complete instructions are all you really need. The plans are so complete that even the incidence angles are easy to find, which is more than I can say for many other sets of plans.

Frankly, I was a bit concerned about the rather light flying weight of Wayne's birds (14 to 15 pounds), because you do need some amount of mass to help keep things together, and to stand up to vibration. However, after talking to a number of BIG Bird lovers who are flying the Nieuports and Fokker D-VIIIs (the DR-1 is brand new, and not yet released), I've been reassured that these airframes are indeed standing up to the gaff. And don't you worry about cowls either, because C. Wayne Jessee has nice ones for you. His cowls are thick (about .090"), they fit well, and no one has had any cracking problems with them. In fact, the only ABS cowls I've ever had problems with have been the really thin ones that were barely .060; Scratch-A-Plane's heavy gauge stuff should be okay.

If WW-I birds turn you on, don't overlook Scratch-A-Plane's WW-I offerings. Write to Scratch-A-Plane at 5552 Kafir Dr., NE, Salem, OR 97303; (503) 393-2656.

ACHTUNG! ACHTUNG!

If you have, or plan on having, a Messerschmitt BF 109C, D, E-1, E-2, E-3, or E-4 . . . or any other Luftwaffe Day Fighter manufactured between 1937 and 1940, you won't have to fake the colors anymore. Hobbypoxy has pumped sunshine into your life by coming up with the formulas for four camouflage colors used during this time period.

It started with Black Green 70 and Dark Green 71 on the top surfaces, and Light Blue 65 on the bottom. Then, when the E-4 was introduced in May of 1940, the colors changed to Black Green 70 and RLM Gray on the top, with Light Blue 65 still being used on the belly (these are factory standard colors).

Black-Green 70: Five parts H81 Black and two parts H33 Stinson Green.

Dark Green 71: Seven parts H65 Bright Red, four parts H33 Stinson Green, three parts H81 Black, and three parts H47 Bright Yellow.

Light Blue 65: Ten parts H70 Gray, seven parts H10 White, two parts H26 Light Blue, and one part H33 Stinson Green.

RLM Gray 02: Twenty parts H70 Gray, two parts H49 Cub Yellow, two parts H65 Bright Red, and one part H33 Stinson Green.

Mix one to one with H05 Flat Hardener for an authentic matte finish.

The reference used for these colors is *The Official Monogram Painting Guide to German Aircraft 1935-1945*, published by Monogram Aviation Publications, 625 Edgebrook Dr., Boylston, MA 01505.

A boo-boo was made some months ago, and here is the correction for it: According to Hobbypoxy, the FS number for Sea Blue should have been FS35042, and not FS35402.

Just to round things out, the guys and gals at Hobbypoxy have added four new colors to their lineup, giving them 16 standard colors, plus clear. They've matched the new colors, Bright Orange, Sky Blue, Cream, and Maroon, to Super Monokote for your convenience.

A FEW FLY-IN REMINDERS

The Puget Sound Rocs 1st Annual BIG Bird Bash on July 16 and 17, will be held at the roomy Mt. Rainier Club's "Hog Hollow." There will be two great days of relaxed, no-pressure, flying fun . . . and it's free, *no entry fee!* There are plug-ins for campers, *all* freqs can be used, and there will be good BIG Bird door prizes for the lucky pilots. Also, there will be a six-channel Futaba for the raffle. I'm the event director (ED), so drop me a line for complete information, including maps, and motel listings. I must not forget to tell you that we're IMAA and AMA sanctioned, and that all birds will undergo the IMAA Airworthiness Inspection. No test flying, please.

★ ★ ★

IMAA's '83 Fly-In Festival is just around the corner, so don't wait any longer . . . especially because pilots MUST pre-register if they want to fly. This pre-registration closes on August 1. Plan ahead now for this four-day Festival (August 18 through 21), and help celebrate this greatest of BIG Bird happenings. Of course, you'll need current AMA and FCC tickets, and there are going to be *TWO* separate flight lines so that all of the frequencies can be used.

I've got Festival brochures, so an SASE will get you going on the first step to attending this Gathering of Eagles.

★ ★ ★

The QSAA people are limiting their October 27 through 30 Fly-In to the first 200 aircraft . . . *pre-registration only.* Remember, "Birds must be Quarter Scale or larger, same as in previous years, and all planes must be flown before the Fly-In."

Contact Pat Bunker, QSAA Secretary, 6532 Bourbon Way, Las Vegas, NV 89107; (702) 870-6076, for all the information.

TIP OF THE MONTH

Keep yourself lookin' good because, "Beauty is only skin deep; ugly goes right to the bone!"

Al Alman, 605 E. 168th St., Space 95, Spanaway, WA 98387.

Fly safely! •

Electronics . . . *Continued from page 34*

you send off one hundred green ones, and that pink colored box is delivered to your door. I recently had the opportunity to closely examine one of these systems for the first time, and I must admit to being favorably impressed. Obviously, you are not paying for, and should not be expecting, the features found in the higher-priced systems (those competition types available from JR and from many other manufacturers). There are no servo reversing switches, no roll buttons, no mixers, no coreless motors, no nothing, but a basic four-channel radio and all of the items necessary for its use. Similarly, some price cutting measures had to be included, such as extensive use of plastics throughout the transmitter, the use of three-pole motors in the servos, the lack of servo trays. However, on the positive side, you get a transmitter which appears to be of high quality, with very acceptable gimbals, a meter power indicator, ratcheted trims, and the already mentioned Ni-Cds, which are a necessity in my opinion. You also get a small, 1.58 ounce receiver, four average-size IC servos (two operating in a reverse direction), a flat-pack airborne battery, and an LED indicator equipped dual charger. The electronics in all components of the system are of modern design, and are assembled with reasonable quality. The precision from the stick to the servo arm is as good as the average control installation with its Z-bends and stretchy plastic rods. In conclusion, I feel that this system, though not the one I would recommend for your World Scale Masters model, is well worth the asking price . . . and more!

FUTUBA 12-VOLT TRANSMITTER CHARGER

Silverton, Oregon, as represented by Jordan Flakser, has been heard from once again. He writes:

"Someone gave me a Futuba Ni-Cd charger. Thought I could put it to good use. On the charger, the inscription reads: Output: D.C. 12V 4.8V 45mA.

"It's the 12V that concerns me. Can I use it to charge my 9.6V Tx Ni-Cd?

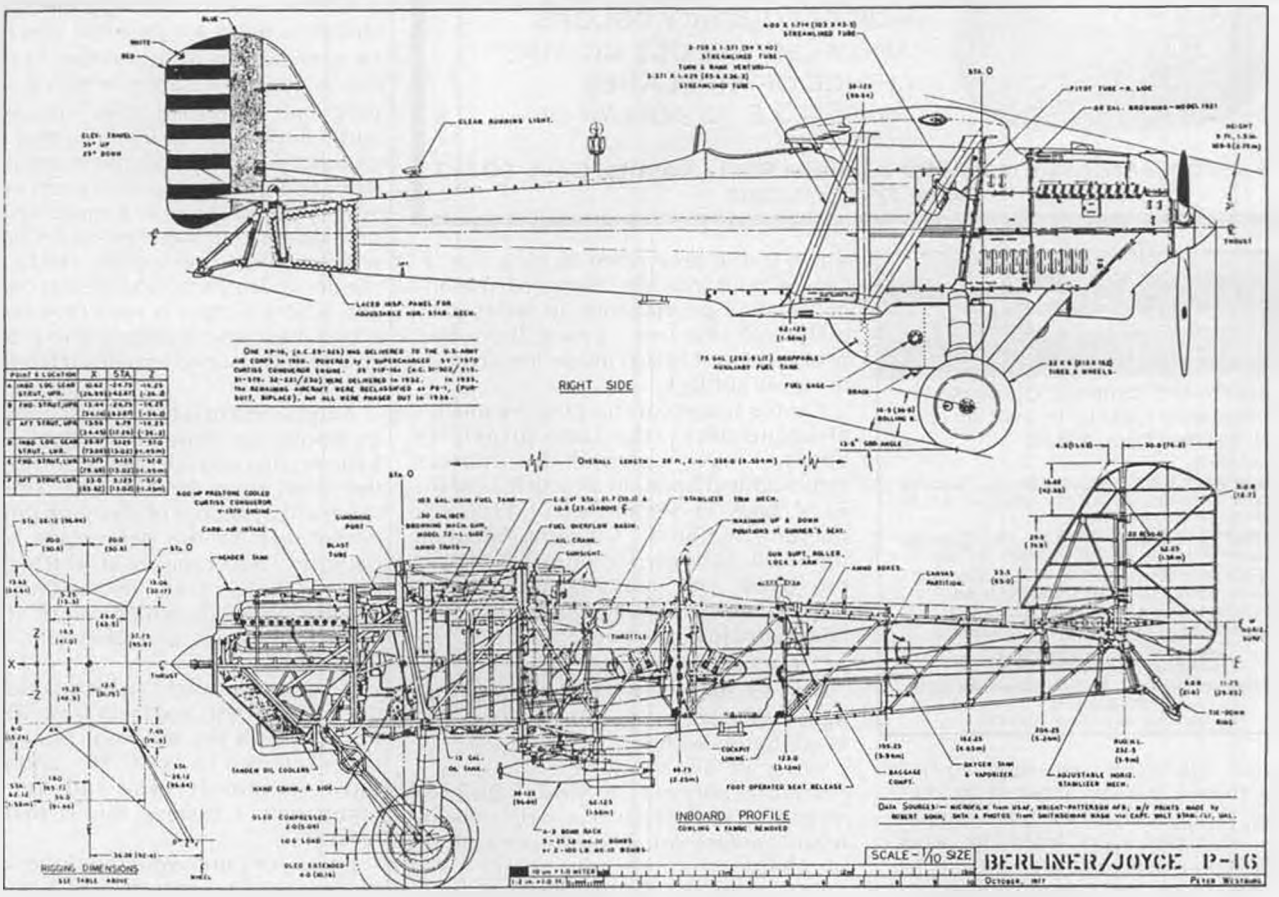
"I seem to recall quite a long time ago that an electronics 'expert' told me that it's actually advantageous to use a higher voltage to charge with. Is it true, and can I use it? Related to this, I happened to see the Futuba catalog, and it lists two chargers, one putting out 10V D.C. and the other putting out 12V D.C.

"Hoping you can help me on this, many thanks again.

"P.S. What resistor would I need to charge my 100, 225, and 250 Ni-Cds?"

Well Jordan, in answer to your first question . . . yes, you can use the 12-volt charger to charge a 9.6-volt battery. Regarding the higher voltage requirement, you must know that is electronics "experts" tend to stick together, and that I can not disagree with the one up in Oregon. Actually, the higher voltage is not only better, *it is a requirement* for battery charging, as the charging voltage has to be able to overcome the battery voltage before current will flow in the proper direction. It also follows that the higher the charging voltage, the greater the charging current. Judging from your

Peter Westburg's
SCALE VIEWS



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.

1/24th scale: ½" = 1 ft.	Shts	$
Douglas O-35/B-7	1	4
Douglas XO-36-XB-7	1	4
1/12th scale: 1" = 1 ft.		
Boeing F4B-4/-3	4	16
Boeing P-12E	3	12
Curtiss A-8 Shrike	3	12
Curtiss Gulfhawk IA	2	8
Curtiss N2C-2 Fledgling	4	16
Curtiss O-1B/A-3 Falcon	3	12
Curtiss P-1B Hawk	3	12
Curtiss XP/YP-23	3	12
Curtiss SBC-4 Helldiver	4	16
Czech Avia B-534	2	8
Davis D-1K	2	8
Douglas O-25C	3	12
Douglas O-31A/O-31B	3	12
Douglas O-38/O-38B	2	8
Douglas O-43A	3	12
Douglas O-31C/Y1O-43	3	12
Douglas O-46A	3	12
Fokker D-17	3	12
General Western Meteor	1	4
Grumman F2F-1	3	12
Grumman F3F-2	3	12
Stearman 4E Mailplane	2	8
Travel Air 2000	2	8
Waco ATO Taperwing	2	8
1/10 scale: 1.2" = 1 ft.	Shts	$
Berliner/Joyce P-16	4	16
Curtiss BFC-2 Goshawk	4	16
Curtiss F9C-2 Sparrowhawk	4	16
Curtiss P-6E Hawk	4	16
Fiat CR-32	3	12
Great Lakes Trainer	4	16
Hawker Fury Mk I	4	16
Hawker High Speed Fury	3	12
Hawker Persian Fury	3	12
Monocoupe 90A	2	8
Swedish Sparmann P-1	2	8

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, P.O. Box 10335, Costa Mesa, CA 92627.

CALIFORNIA RESIDENTS ADD 6% SALES TAX

previous questions, you seem to have more than a passing interest in these things, I suggest that next time you have a few minutes away from the workbench, you use them for a quick review of Ohm's Law. It's easily understood, and is the basis for such electronic relationships. Such information can be found in any electronics manual, so I will not use too much space for it here.

Back to the Futuba chargers! This company uses some out-of-the-ordinary power and charging circuitry, such as fuses and diodes in the transmitters, for protection against quick and fast charging rates (which Futuba batteries are not made for), and apparently against reverse polarity applied with other than the furnished charger. Both of these components would introduce resistance into the circuit, requiring, as already established, a higher voltage in order to maintain the desired rates. In this case, I would assume that the stated values are very close to the actual ones; in other cases we see some discrepancy in the markings on the chargers, in that the values given are those of the battery with which they are to be used, and not the actual charging voltage itself.

Jordan, using the 12-volt charger with a 9.6-volt battery would result in an increased rate, which I measured in a electrically similar mockup here to be 150 mils. A ten-ohm, one-half-watt resistor in series will drop the current down to the prescribed 50 mil value. It can be built into the charge cord itself, or installed permanently in series with either of the lines going from the printed circuit board inside the charger to its output jack.

On the subject of charging the smaller airborne packs, the same principles apply. I have covered this subject thoroughly (I hope) in an article I did for *RCM* back in September of 1979, entitled, of all things, "Charging Adapters for Small Airborne Batteries." A copy is enclosed, and is available to other readers for a S.A.S.E. and a photo of their latest airplane!

. . . AND MORE CHARGERS!

The Pacific Northwest is heard from again; George Kyer, of Carnation, Washington writes:

"First of all, thank you for such a readable column in **Model Builder** *magazine. Perhaps you can help me with what I am sure you will consider a minor problem.*

"My radio is a 1976 single-stick Kraft with the charger that came with the radio. I also have a Kraft 225 mA charger. I checked the output of both chargers on the receiver output, and my regular charger puts out 180 mA, and my 225 charger puts out 18 mA.

"My problem is that I do a lot of small plane flying, and I have two 100 mA packs and two 225 mA packs. I use my 225 charger to charge my 100 mA packs but always have a niggling fear that I might overcharge them. I can't always get to them and unplug them after I think they've been on charge long enough. I guess what I'm trying to say is that I'd like to be able to trickle charge my 100 mA packs, and haven't been able to find an ad for a 100 mA trickle charger. Is there anyway to put a resistor in the line to lower the charge rate without modifying the charger? If this is possible, what size resistor (or anything else) would I need to modify both my regular charger and 225 mA charger?"

Well George, I am going to kill our friendship before it even begins . . . I am going to disagree with you! You see, I don't consider this a minor problem. Nothing that can lead to the loss of an airplane is minor in my opinion, and improperly charged batteries is as positive a way as I know to get you to the hobby shop looking for another kit. The information you are looking for is included in my previous article, as mentioned in the preceding item, and a copy is on its way to you. If any questions still exist, please write again. In the meantime, there are a couple of points worth mentioning.

One is on the subject of low current chargers, there are two that you might be interested in. Both are from Ace R/C: one is the Uni-Charger, which is a wall plug unit furnished with information and components so that you may tailor its output for any possible combination from two cells at 10 mA to eight cells at 50 mA. Then there is a more versatile one called the Metered Vari-Charger, which, as the name implies, can be set to the desired rate with an external control, and whose output is read on a built-in meter. Its output is adequate to properly charge from one to ten cells at from 10 to 100 mA.

Another point which I must comment on is your use of the word "trickle"; I do believe what you are really referring to is the slow, or overnight rate. You see, there are a number of charging rates, all determined by the percentage of the batteries rated capacity at which charging is taking place. These rates are: standby, or trickle, which is done at from .01 to .04 percent, and takes from 100 to 25 hours.

Slow, or overnight, which is done at .05 to .1 percent, and takes from 20 to 10 hours. This is the ten-hour rate, sometimes referred to as "C/10", and is the most commonly used rate for R/C equipment. I believe this is that you refer to.

Quick, or rapid, which is done .2 to .3 percent, and takes from 5 to 3 hours.

Then there is the fast rate, going from 100 percent to 10 times that, and taking from one hour to six minutes. This is the area in which the electric power chargers are operating, and requires extreme care to avoid overcharging and cell damage.

So you see, while your batteries can be charged at a "trickle" rate, I think that you would be most interested in the more normal overnight rates which is most common to us R/C'ers. Again, if you are still unsure, please write back, there is nothing worse than flying around all puckered up waiting for something bad to happen!

TACHOMETER CALIBRATOR

Remember Fritz Mueller and his electronic switch back in the January issue? That circuit generated more reader mail than any other we've had! Well, Fritz has done it again . . . I'll let him tell you about it:

". . . This is how I made the Tachometer Calibrator as you suggested in the April issue. A TV colorburst crystal is usually made with a tolerance of 0.1 percent, good enough for a calibrator. The oscillator is made up with R1, R1, XT and Q1, followed by a pulse shaping net-

work to drive 14 binary counter stages.

"Each IC is a CMOS seven-stage binary counter. Pin one is the input, which is divided by two at each stage, and winds up at pin three divided by 128! The second 4024 divides by 128 once more, reducing the crystal frequency from 3,579,545 to 218.48 Hz. That, when multiplied by 60 and divided by two (for a two-bladed prop), is 6,555 RPM.

"Pin three is the seventh stage output. At each preceding stage, the frequency doubles. On my device, Q2 is driven by the sixth-stage from pin four, thus simulating the light pulses reflected by a two-blade prop at 13,107 RPM. Other output stages could possibly be used, but only the last three are of interest:

Seventh stage, *Pin 3: 218.48 Hz; 6,555 RPM (two-blade) 4,369 RPM (three-blade).*

Sixth stage, *Pin 4: 436.96 Hz; 13,107 RPM (two-blade), 8,739 RPM (three-blade).*

Fifth stage, *Pin 5: 873.92 Hz; 26,215 RPM (two-blade) 17,478 RPM (three-blade).*

"D1 prevents accidental reversing of the supply. While looking at the LED, move the assembly rapidly through the air. When it is strobing properly, you can observe red light dashes."

Well Fritz, you made a serious mistake! I will tell you about that later. But first, I must say that the calibrator works, and works perfectly. As Fritz says, if you move it through the air at the right speed, you can see the solid LED glow break up into a series of evenly spaced dashes, which is the on-off effect that is taking place too fast for the eye to follow when the LED is standing still.

My only comments are that if yours strobes as explained, and your tachometer does not show an RPM reading, it may be that it is not sensitive enough to the monochrome red of the LED; try one of a different color, or even a white one. And, if you happen to have some other crystal on hand that you want to use, be sure that it is of at least .1 percent tolerance. The formula for determining its RPM reading is: crystal frequency (in Hz) divided by 16,348, multipled by 60, divided by 2 (for two-bladed prop). For three-bladers, simply so the last division by three.

Your mistake, Fritz, is that I now know where to unload all those projects I never seem to find enough time for.

To begin with, we'll soon need a constant speed control for those variable pitch props available from Europe. It should be Hall Effect, or maybe infrared controlled, as against purely optical pickup to prevent "glitches" caused by changing ambient light conditions. And as we have a calibrator for it, how about a new tachometer, analog, not digital! We haven't seen a new design in at least ten years; the new frequency-to-voltage IC's should make one possible with a much lower parts count. It should have expanded scale readings, go to at least 40K, be switchable from optical to audio pickup, and have a memory button which you could activate to hold an RPM reading so you could refer to it after the flight. And when you get through with that. . .

NEW STYLE SERVO MOUNT

I ran into an interesting servo mounting idea on my recent trip to Europe. It is an adjustable mount, both in length and width, and by using a different length of upright, adjustable in height also. It is composed of a number of tightly interlocking nylon pieces, which slide in the proper direction to accommodate servos as wide as 9/16-inch, and as long as 2-5/8 inches between the mounting grommets. Different heights of upright are available, one for servos up to 1-1/4-inch high, from base to the bottom of the mounting ears, and a shorter one for 15/16-inch or shorter servos.

The base must be secured to the airplane structure with four screws, and the servo is held onto the mount with a snap-on clip that holds it securely, yet allows for easy removal if necessary. A completely different size servo can be installed simply by adjusting the mount to the proper dimensions.

Though they are not yet available in this country, I found it interesting enough to mention here, and maybe one of our importers will become interested. In any event, it isn't as difficult to order foreign items as you might think. *Anybody, anywhere* will accept a US International Money Order, or Cashier's Check, and I have had mail from Europe in as little as three days, though the norm is about a week. Customs seldom collects any fee for small, individual shipments. So, unless you are thinking about a 1/4-scale ARF, or some thing really big and heavy, don't let the fact that it is on the other side of the ocean stop you, it isn't all that hard to get.

Back to the mount . . . pricing and shipping information can be obtained from Modellbau Kirchert, Linzer Strasse 65; 1140 Wien (Vienna), Austria. Tell them you read about it in the Americanische *Modell Baumeister* Magazin!

THE ELECTRIC WHAT?

I've just discovered a neat little electronic item which I would like to tell you about. It's called the Electric Eagle EE-1 Timer, and it does everything that you could expect from a timepiece, except start the coffee, but it will wake your pitperson up in time to do that!

The EE-1 is small . . . only 1-1/4 x 2-1/2 x 3/8 inches. It comes complete with a slip-in holder which can be attached to the front of your favorite transmitter with a piece of furnished double-sided tape. As a basic timepiece, the EE-1 can be programmed to tell you the correct time, down to the second, in a 12 or 24-hour format, on a 5/32-inch LCD display which is plainly visible even in bright sunlight. It also tells you the month, date, and day of the week. There is a "Time II" function, which can be set to give you the correct time in another time zone, in case you have trouble remembering what time it is back home when you are out on the contest trail. And there is an alarm function, complete with a snooze feature, for you sleepyheads.

Of interest to us flyers, *there is a countdown feature*, which can be preset to give you the time remaining, from 11 hours 59 minutes, on down. At the end of the preset period, a 20-second audible alarm is heard.

And there is a stopwatch function, accurate to the second, incorporating a total and lap time feature. For power, the EE-1 uses a readily available mercury button cell, which is claimed to last for one year. It comes with a battery, and even an internally carried spare, giving you up to two years of accurate time. A small fold-up leg is found on one end, so the EE-1 can be set upright on a table, and additional holders are available at $1.00, so that the same timer can be used with more than one transmitter. A 12-month warranty covers everything except the battery.

The EE-1 is priced at $21.95; a similar model without the seconds feature called the TCO-2 is available for $13.95 from Electric Eagle, 25 Weeping Wood, Irvine, CA 92714.

DIGITAL VERSUS ANALOG

I hate to do it to you, knowing how tough life can be with all of those decisions, decisions, decisions! Most of you probably haven't even decided yet about the *other great controversy* of grilling versus flame broiling, and I hit you with another tough one. But the time has come, we have to consider the pros and cons of digital and analog measuring instruments. We all know what digital readouts are, we are inundated with them in everything from watches to micrometers. But while we are also equally familiar with them, we don't usually think of analog instruments in that manner . . . they are simply the old, clock-like meters we've all used for years.

Both systems have advantages . . . and disadvantages . . . which must be considered when you are thinking about measuring something, or purchasing any type of measuring instrument. For example, if you want extreme accuracy, such as in the case of Ni-Cd battery quick charging (when charging must be stopped at a precise point to avoid overcharging), the digital instrument, with an accuracy of .05 percent or better is your best choice. The analog instruments are seldom found, or accurately read, with better than two or three percent accuracy.

On the other hand, if your application involves a minimum or a maximum, such as receiver tuning or an RPM reading, an analog meter is a better choice. Watching the movement of a needle against a calibrated scale as you make a mechanical adjustment is more readable (and easier to comprehend) than watching the changing numbers of a digital readout.

In the case of the multi-use instruments that read voltage, current, resistance, etc., there are other considerations. The digital instrument has at least some of the following advantages: automatic setting of "zero" with each change of range, auto selection and indication of polarity, ability to read a DC voltage riding on the AC line frequency signal, very high input resistance, better reliability, and the ability to hold calibration longer. Some of the better digital instruments have another feature known as auto-ranging, which signifies their ability to automatically change ranges as the value being measured changes. While this sounds like a worthwhile feature, it takes long enough between changes to become annoying if a lot of different measurements must be made, in which case a manual ranging meter is more desirable.

An important feature of the analog instrument is that it is far less expensive. Also, one should consider just what use, and the frequency of that use, is to be expected before either type is chosen. The analog meter also lends itself better to calibration to non-linear scales, such as the reading of decibels. On the other hand, the analog meter instrument uses multiple scales, making it easier for the operator to take a reading on the *wrong* scale if he isn't careful. There is also the possibility of the error incurred when viewing the pointer and the scale from different angles . . . a phenomenon referred to as parallax.

I feel that it is important to know at least the basic advantages and disadvantages of both of these methods of measurement, so you can make the proper decisions based on your needs. As for the *other controversy*, I prefer mine flamed-broiled, with everything but catsup, and a side of French-fried onion rings. See you there after the next flying session! •

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

Don who figured out what to do to make the car better, and then John had to design the production parts.

Right about here, a great quote comes to mind, it is from Bob Akins, a full-scale endurance racer who campaigned Porsche 935s. Referring to the 935, Bob said, "You can't make a thoroughbred race horse out of a pig; but you can make an awfully fast pig." And while the Jerobee shouldn't be referred to as a pig, even though it *is* by today's standards, Don did in fact continually develop and refine a toy into a very fast "toy" indeed. Cycolac bodies gave way to light Lexan; plastic chassis were molded in Lexan, the super-slow yellow radios were improved not only in reliability but in servo speed and servo gear strength, ways were found to make the Cox reed valve engines reliable, and the fast and nasty Cox TD 049s were somehow made to fit, which in turn created a new racing class.

Then the electrics appeared on the scope. No problem, the car was fitted with batteries and an electric motor. Another version of the JoMac radio was designed, this one with an electronic speed control in place of the throttle servo, and the chassis was further tweaked and refined to handle the vastly different type of power offered by the electric motors.

Backing up a few steps in the story, when I became actively involved in R/C car racing, JoMac was handling the marketing of the MRP line, and had given me one of their Class B cars (complete with JoMac brown-box radio) to play with. I wrote about it here in **Model Builder**. The following year I received an MRP 1/8 car on the same kind of deal (play with it, write about it if you want . . . I did both), and have been racing ever since.

About early '78, Don decided that a magazine devoted to RC cars was needed, so he talked Jim Sunday (then publisher of the now defunct *R/C Sportsman* magazine) into publishing it, and me into being its editor. And we did it, until Jim was talked into selling both magazines to what turned out to be a con artist who skipped with some of

Jim's money along with his new publishing business. I got out clean (except for some time invested), Ken Willard of *RCM* got ripped off, and as Don had never been involved financially, other than special deal on ad rates, he wasn't burned.

With me as editor, you can imagine that *Race Car World* was always in some sort of controversy, but I walked away knowing that the magazine was always honest, even though that honesty kept us in hot water most of the time. (I was never totally satisfied with any of the issues we did, but even today there has not been an American RC car magazine to even come close to what we did with *RCW*.)

The reason for bringing up the subject of *RCW* is to mention that while Don and I quite often totally disagreed on some of the things I would write about, or do with the mag, he never once interfered with me. We would have these terrific arguments, and then "agree to disagree," a favorite way of Don's for ending a discussion and moving on to another subject.

Part of the reason for our having such differing points of view was that we were doing more and more things together. Trips to the Nationals, local races, after hours meetings at JoMac, sitting together on the ROAR rules commitee, and so on.

Slowly my first opinion of Don changed. He would still go the extra step or two to win, and was always a potentially disruptive influence at a race (although hardly the only one, especially at National races), but he would also tell *any* competitor the answers to questions asked. The reply might come too quickly, and the delivery technique could have been polished a lot, but the answer was always there . . . if the question was asked. I can recall lots of times when he would *actually help members of rival manufacturer's teams.* Many times the advice was not understood, or was not believed, or the racer didn't trust Don, or, depending upon who was asking, only half an answer would be given, but you could get an answer. This wasn't always the case with all the other racing teams.

It was sometime during this period when I came to the realization that while Don is a fierce competitor (as he is to this day), when it came time to see to the needs of ROAR racers, he was always very concerned about the cost of their racing, and in making R/C racing a long-lived activity. Back in the days of gas-only 1/12 racing, he came out with a rear wheel that had a huge diameter, and was fitted with a quite thin ring of rubber. It worked great. Too great, all racers were faced with buying new wheels, and this, combined with the non-scale appearance of the wheels, lead Don to initiating action to ban them. Tooling money out the window.

One of our most memorable "discussions" took place just before one of the Nationals, I think it was the one in Columbus, Ohio. At that time, we all used GE batteries in 1/12, but the boys from Northern Cal were on to Sanyo cells, and obviously intended to use them that year.

Don said that Sanyo cells were expensive, and could not be sold through normal retail channels at less than $6.50 per cell, as required by ROAR rules.

My contention was that it was going to be very hard to justify that rule to a racer who had infact bought a 6-cell pack for less than $39.00 from Ron Sheldon in San Jose.

It was obvious that the Sanyo batteries offered more power, even though they were heavier, and that all racers would soon be faced with replacing their obsolete batteries, just the kind of situation Don was trying to avoid.

Of course, there were other reasons for objecting to the Sanyo batteries. Because most of the manufacturers were pooling their orders for GE cells, they were getting good prices on their bulk orders, prices that could not be matched (at that time at least) by Sanyo. So there was probably a profit motive involved. I am in no way trying to make Don out as a saint!

Don's concern for the racer, and how much it cost him to race was always there. We still have concerned people in places of influence within ROAR, but we also have some very shortsighted people out there to watch closely, and with Don out of the business, we have lost a loud, and a persistent voice calling for some long-range thinking.

I find this to be quite ironic . . . Don went through the slot-car thing as a competitor, a buyer for a distributor selling slot merchandise, and as a sales rep working with slot shops. If anybody was in a situation to use past experience in capitalizing on a fad, and making some big bucks doing it, Don was that person. He could have done it, the environment was perfect for someone with his drive. From a personal riches standpoint, maybe he should have done it. Yet he didn't. And now the company he owned is gone.

Before it went, a lot of effort went into saving it. The leased space was given up, and JoMac was moved into Don's house. I know, a couple of friends and I actually volunteered for "slave duty" one fine Saturday, and helped with the move. The offices were upstairs in an open area, and one unused bedroom. Manufacturing was done in a two car garage. Excellent spatial planning saw it all squeezed in (barely). I don't want to see another U-Haul truck for at least a couple of years, nor do I wish to be asked to carry another huge, fireproof

file cabinet up a staircase with a 180° turn in it. *Ever.*

Even with all of the cost-cutting measures which were taken, JoMac was operating too close to the edge, and finally lost its balance (not an intentional pun). As I said at the beginning, I'm not going to write about why I think it failed, although it is obvious that the economy certainly hurt a lot. That JoMac is gone is a fact, and that we racers have lost because of it, is also fact.

And what of Don? Don't be worried about him, he has more lives than the proverbial cat, and like the cat, can easily land on his feet. The last time we talked was the day after the bank had taken over, his resume was completed, another for his secretary was in the word processor, and plans were being made for where to look for a job. By the time you read this, I have no doubt that he will be deeply involved in a new career.

I am really going to miss him, as our common interest was RC cars, we very rarely met socially. And you are going to miss him too. . .

LATE DEVELOPMENTS. . .

It is now three weeks later, the preceding story has been sitting around long enough, and it's time to mail it in. . .

I just got off the phone with Don. He is now working as a computer specialist for Radio Shack, and he started the job off right by whipping through what was supposed to be a two month training period in *two days*. He is now booking business left and right, and is already planning on having his own store soon. I told you he would come out in good shape.

And JoMac isn't gone either! A fellow by the name of Preston Keith (I'm only hoping I got that name right) has purchased all assets, and word is that he has the bucks to do right by the company. He has already retained Ralph Burch, Jr. as a sponsored racer. Don didn't know what the new name of the company would be, although he will be on call as a consultant, probably to further develop the Lightning 2000 chassis. Good news.

One more thing. In many ways that you will never know about, I owe Don a lot. What you should know, especially those of you who have at times been critical of him, is that *never once* did he call in his chips. Articles in widely distributed magazines can be a powerful tool in the selling of a product. You know it, I know it, and on a monthly basis we still see this tool abused in several publications other than **Model Builder**. Even in the worst of times, on behalf of JoMac, Don never asked for favors of me through my published writings. This was partly due to the fact that he knew up front I wouldn't do it anyway, but the real reason is that while he is a tencious competitor, he is also able to lose one now and then, simple coming back for more, no favors asked, no quarter given.

Yes, we will indeed miss him. . . •

R/C Boats . . . *Continued from page 45*

some reader will take Dennis up on his request.

MORE ON ELECTRIC OUTBOARDS

Harold H. Sriver, of Clearwater, Florida, sent along photographs and information on an electric outboard powered model making sure of the Jackson 54s. As can be seen in the photos of Harold's boat, it is possible to develop a very scale appearing model using these type of electric outboards. Harold is using gel-cell and motorcycle batteries for his power sources. He has named his electric powered outboard hull the "Octumist," a name derived from Octura Models, the source of the Jackson electric outboards.

Besides the photos of his electric outboard, Harold sent along some shots of his beautiful steam launch, as well as a steam tug built by Bob McKibbin of New Zealand. The photos of Bob's tug were taken while Harold and his wife were visiting the McKibbins in New Zealand. Harold also spent some time with other model boaters in that country, as he has been corresponding with scale model boat enthusiasts from there and around the world. His address is 1764 Lawrence Dr., Clearwater, FL 33519. Those of you who are interested in this aspect of our hobby may wish to contact Harold, and share your projects with him.

BOATING IN BIRMINGHAM

Russ Fairfield of Birmingham, Alabama send me a few photographs of his modified Dumas SK Daddle 40, and a letter about what's been going on down his way:

You have been right all the time . . . little boats are more fun and less expensive. It takes lots of aggravation, time, and money to keep a competitive .65 deep vee or hydro race-ready. Those Italian parts are expensive.

This year I am running nearly all 3.5 and 7.5 engines (except in scale hydro). I've discovered model boating to be fun again. Contrary to the popular opinion in this part of the world . . . I run K&B engines. I'm having fewer problems than the guys running the imported engines, and I can get three pistons and liners for the price of one for any of the foreign engines.

As I was in need of a 3.5 size vee, I decided to build my own. The enclosed pictures are of the resultant model. If it looks sort of like the SK Daddle 40 it's because it was (built back in 1967). I also sort of copied a SK Vee-10 after looking at it for three years. A claw hammer, Dremel tool, and a disc sander changed the bottom of the old SK-40 in short order. I am pleased with the results. The boat is solid in both straights and turns. Since the pictures, I have changed to an OPS 29-40 nitro pipe to improve engine rpm. Five-eighths of an inch was also added to the turn fin. I'm now working on porting to see if I can get the boat into the 40 to 45 mph range to make it a sure winner. The hull should be able to handle the speed. It is very stable in any kind of water. The V is 18 degrees at the engine and 22 degrees at the stern. This might seem rather steep, but it seems to be a blunder in the right direction. The prop is an Octura X-442.

Your discussion on lake sites a few months back sounds very familiar. We had a temporary site two years ago while the downtown park lake was being dredged. We lost the downtown site to bird lovers and a paddle boat concession. Then we lost the temporary site to NOISE. It was a perfect 40-acre, oval-shaped industrial water reservoir, and we were the exclusive users. Fishing is prohibited. During 1982 we were without a lake.

We then became a political body, exerted pressure on the Water Board, took our case to the city council, got on the council agenda three times, and in general made ourselves known. In December of 1982 it all paid off, and we have exclusive use of the reservoir again. Our efforts included audio data taken in the yards of the complaining neighbors who were a half-mile away, behind a hill and trees. This was presented to the city council. This all proves that we should not take "Get out!" without a fight, and it proves what can happen when we become politically active. Another thing that got the attention of the city council was telling them we would have to move our annual Heart of Dixie race, and the 150 people it attracted to Huntsville if we didn't have a running site.

I'd like to thank Russ for relating his group's experience on securing a running site. His point is well taken. You must become politically active when attempting to convince governing agencies that model boating is a worthwhile activity to be sanctioned on publicly owned bodies of water.

1983 DISTRICT 19 OUTBOARD CHAMPIONSHIP SERIES OFF TO SUCCESSFUL START

Bobby Tom, the service manager at K&B Manufacturing, has provided us with the results of the season opening outboard race in the Southern California area. This was Bobby's first endeavor to serve as a contest director. He reported that inspite of not having a public address system things went very well. Bobby said that he had to do a considerable amount of running around the pit area to make sure everyone could hear.

A beneficial result of this behavior was getting to know all the participants.

As this was his first race, Bobby thoughtfully provided all the racers with what he called, "A Few Notes and Sensible Rules!"

1) Drivers should face the lake when racing.

2) No Dr. Pepper drinkers in the pits.

3) No body contact between caller and driver.

4) No dead boats will be allowed on water.

5) No DNFs allowed.

6) No electric starters allowed.

7) Contest director will *not* acknowledge complaints, certain hand signs, moans, groans, criers, snivelers, faulty engines, wild boats, recounts, strange facial expressions, drunks, engine makes other than K&B, strange sounds from callers, leg shakers, aluminum can collectors, bribes, nudity, and anything else that is not conducive to proper model boating. P.S. Proper bribes will be taken into consideration.

As an experienced contest director, I certainly cannot find fault with Bobby's rules. For a model outboard race, I especially like that number six rule.

Well, inspite of those "rules," there were some winners and the results are as follows:

A STOCK TUNNEL	B STOCK TUNNEL
1. John Cochrane	1. Jim Kalpafoff
2. Dick Vale	2. John Cochrane
3. Dave Brooks	3. Bob Gonzales
4. Irene Brooks	4. Barry Lawrence
5. Bob Gonzales	5. Jerry Roman
A MOD TUNNEL	**A HYDRO**
1. Bob Gonzales	1. Steve O'Donnel
2. Tom Haggerty	2. Cathie Galbraith
3. Joe Monohan	3. Mark Grim
4. Mike Bounty	4. Rick Lee
5. Roger Wiechman	5. Jack Oxley
A MONO	**B MONO**
1. Mike Boundy	1. Joe Monohan
2. Jack Horwitz	2. Chuck Shaw
3. Al Williamson	3. Rich Fish
4. Jerry Roman	4. John Cochrane
5. Mike Clerc	5. Cathie Galbraith

ON A DIFFERENT COURSE

Two of our Northwest early season races have been contested on the grounds that course layouts different than the traditional oval configuration (used for most types of model boat racing) were used. I'd like to make mention of the two different courses because I found them to be both challenging and somewhat frustrating.

Back in late February, our club hosted a 3.5 tunnel race on a very small pond that is located in an apartment complex. The apartment complex was having a promotion for their new recreation hall, and invited us to stage a race. The apartment manager paid for the trophies and the printing of fliers, so the club made out well financially even though the entry fee was very modest.

Because the size of the pond was limited, the course was simply one buoy at each corner, and a couple of buoys running down the center. I didn't think my 3.5 tunnels would have any problems making right turns. How wrong I was. During the course of the day's racing, I managed to run up on the beach five times. My new 3.5 tunnel, which is an excellent boat on a regular course, had to be brought down to almost an idle to make the one-buoy turn. We probably only had 20 to 25 yards to make the corners before hitting the shore. That was the total width. Most model boaters are accustomed to having lots of space to make a turn. I wasn't the only racer who parked a boat in a bank. On this tight race course, there was no room for error. On a regular size course, you can blow a corner, and simply lose time or maybe let someone pass. When you blew a corner on this little race course, you generally ended up pulling your boat out of the bank.

What frustrated me the most about racing on this small course was my own liability to adapt my driving techniques to meet the needs of this type of racing. Most of my model boat racing has been on large oval courses where you could jam the throttle wide open and steer. I wasn't able to break that mindset, and didn't do very well on this small course.

The apartment manager has invited us to come back and use the pond for other races. I'm looking forward to taking another crack at this type of racing.

The other course that proved interesting was shaped like a right triangle. On this course, the start/finish line was at the 90 degree angle and the first leg was raced with the boats going straight away from the drivers' area. You started the race by coming down the base leg of the triangle, and starting and turning at the same time. The turn buoy on the first leg was at least 150 yards off the beach. Believe me, this proved to be a real test of depth perception. When you finally made that turn you had to remember that the backstretch ran diagonally. It was possible to lose considerable time by not keeping tight to the buoys along the backstretch.

Compared to the single buoy corners at the small pond, this triangular course was easier to run. However, I suppose the reason for this was that there was plenty of room around the edges of the triangle.

I would encourage more model boaters to try varying the shape of the race course. The best time to try different courses is at a local club event. If nothing else, you'll learn to appreciate that standard oval course even more. Some of these different courses force us to use a radio function that most model boaters hardly ever use. I'm referring to the *throttle*. You might be surprised to learn that it can be used for something besides shutting off the engine at the end of a race.

Jerry Dunlap, 119 Crestwood Dr. S.W., Tacoma, WA 98498. •

Choppers . . . *Continued from page 41*

they have. I use One Mix. One Mix comes in plastic tubes, one tube per gallon of gasoline, which yields a 40 to 1 ratio. For break in, use one tube per *half-gallon*. (This equates to about 6.4 ounces per gallon for 20:1.)

Complete break in takes 10 (!) hours. I switched to a 40 to 1 mix somewhere bewteen two to three hours of flying. I believe this should give me very nice performance for the balance of the helicopter's life.

If you are at a higher elevation (or want higher performance at lower altitudes) you may want to add some Power Booster from CB Associates. This is a six-ounce bottle of additive that you add to one gallon of gasoline. It includes a 50 to 1 mix of an unknown oil and three

ounces of nitro-ethane. I have flown this mix in my 300, and I must say that it gives a very noticeable increase in power. However, I can't speculate on the long-term effects of using the mix as I've only flown one tank at this time. The price is in direct ratio to the performance. At $5.65 for this six-ounce mix, it isn't cheap. Adding a gallon of gas gives you a fuel which costs $6.65 a gallon. The Kioritz will run three to four hours on a gallon of gas, so $2.00 per hour gasoline consumption rate is still cheaper than that of glow engines.

I would suggest that this mix only be used after several hours of break in with the 20 to 1 petroleum based oil. To start any new engine out on hot fuel is not a good idea.

Another way to significantly increase performance is to install an optional Walbro WZ type carburetor. This carb is distinguished from other diaphram carburetors by having a throttle barrel similar to glow engines. Priced at $65.00 from CMI, a solid 10 percent performance gain can be attained using this carburetor.

The clutch is of the shoe and retaining spring design. As the gasoline engine has lots of torque, it is very important that you start it at low trim settings. If you start the engine at anything other than idle expect the clutch to engage and rip the rotor head right out of your hands. The instructions do a good job of emphasizing this point.

"My wife says that I iron Monokote so well that from now on I can iron my own shirts."

DRIVE TRAIN

The whole drive system is geared. From engine to main rotor, the ratio is 6 to 1. From main rotor to tail rotor, the ratio is 1 to 4. These gear ratios are different from the usual glow ships that run anywhere from 8 to 1 from the engine to main rotor. This is because the engine delivers its performance at a lower rpm. As the numbers don't say much in this case, I'll tell you that the gear ratios are perfect. I'm flying my 300 at a main rotor speed of 1,400, and tail rotor speed of 5,500. This lets the engine turn at 8,400 rpm. From experience, I would recommend this as the maximum rotor speed that you should run. With the main rotor turning at 1,450 (tail at 5,600), a definite decrease in performance will be noticed. When pitch is applied, the rotor speed should (and will) fall off slightly. This loads the engine and brings rpm down, but the torque is still there to provide nice vertical ascents. If you expect to run the rotor completely constant on the ascents, the vertical speed will be much slower. Let the rotor pull down the engine *a little*.

All gears are set and aligned at the factory. You will not have to set gear mesh at any time. The large main gear (Photo 7) is made of some bionic fiber material that should never wear out. This gear should be balanced on a High Point balancer before flying. It is large enough to disturb main rotor balance if it is off balance and not checked. The medium-sized, black tail rotor drive gear (Photo 8) is typical of black plastic main gears found in other model helicopters.

The hardware from the tail rotor drive gear back to the tail rotor gearbox is identical to the Glow 300. A Kavan style tail rotor drive shaft is used which runs in a nylon bushing slipped through a stiff, foam bushing. The tail boom joins the body of the chopper at the end of the short braces (Photo 9). The task of installing the tail boom can be made much easier if you push out the main foam bushing from the middle of the tail boom, and cut a half-inch wide slice from it. (Pull the tail rotor gearbox, and use a one-quarter-inch square stick to push the foam bushing out.) Cut straight through so you get a piece of the nylon tube, too. Re-insert the main bushing back into the center of the tail boom. Take the half-inch wide foam bushing and insert it into the very front of the tail boom. This holds the drive wire in the center of the tail boom tube, and makes it much easier to engage the wire with the front gear.

The other thing you'll want to do is bevel the front of the drive shaft to a point with a Tuf-Grind wheel in a Moto-Tool. Then, as you guide the tail boom with your left hand, rotate the tail rotor with your right hand. This helps the flat spots in the shaft and gear to line up.

Given these aids, inserting the tail boom into the body should be quite easy. If you do not make these changes, expect to poke around for at least twenty minutes trying to get the tail rotor drive shaft engaged to the front gear!

LANDING GEAR

The landing gear is tempered, one-eighth aluminum. In Photo 2, you can see the original length of the struts. I trimmed one inch off of each strut to lower the ship and make the helicopter sit closer to the ground. I just think it makes the ship look better. Don't go any more than one inch . . . in fact, if I had it to do over again, I think I'd only take off three-quarters of an inch. The landing skids are not aluminum, they are stainless steel, so you will never wear out these skids by flying off concrete or asphalt.

MAIN ROTOR HEAD, TAIL ROTOR

Refer to Photo 5 for a close-up of the main rotor head. Two side plates sandwich the blade axle and bearing assembly. The head's rigidity is controlled by four rubber dampers, two on each side of the head (arrows). This gives the chopper a head that is neither too stiff nor too soft. I was pleased with the way this head handled the Hughes 300. This new style head with "double damping" is now standard equipment on the glow powered Hughes 300, also.

The main rotor blades are beautifully laminated with three hardwood pieces on the leading edge and two pieces of balsa for the trailing edge. These blades are special because they have four degrees of washout. This means that if the tip runs at four degrees, the root runs at eight degrees. This twist of the blade distributes lift more evenly along the span of the blade, in turn giving more lifting efficiency. The airfoil is semi-symmetrical.

The blades are covered with a heat shrink plastic sleeve which is slipped over the blade and then heated with steam to shrink the material. When I first reviewed the Glow 300, I didn't really like the idea of using steam to shrink the covering. Since then I have finished several blades using steam, and it does work very well. Do not use an iron or heat gun . . . use the steam from a boiling tea kettle.

The tail rotor blades and gearbox are shown in Photo 10. The blades are laminated and of high quality. Before you insert the blades into the blade holders, sand off some material in the area from the blade attachment hole to the inside root. This allows the blades to slide into the holders better, and gives more even contact. It is just visible in Photo 10, if you look closely.

The tail rotor bellcrank shown is my addition. The ship comes standard with an angled plate which transfers the back-and-forth servo motion into the in-and-out motion of the pitch-change wire. The angled plate works fine, but I like the bellcrank method of pitch-change linkage better.

RADIO INSTALLATION

The instructions provided with the kit are excellent. They follow a step-by-step radio installation which automatically leads into setup and complete balancing information. Fifty photos back up the

written text. Because the instructions are complete, I am not going to give a step-by-step installation; just a few things that you should know about.

Kobe-Kiko has produced a new heavy duty ball link which comes standard in all kits. It is similar to the heavy duty Rocket City and Schluter ball links. The early style ball links were barely adequate; I'm glad to see such improved quality in this critical area of the helicopter.

The plastic servo tray (Photo 6) will accept servos 38 by 18 millimeters. Most standard JR and Futuba servos will drop right in. The plate may have to be modified somewhat if you have servos which are either too small or too large. I used JR's Apollo radio, and everything dropped right in. The throttle and tail rotor servo mounts are adjustable for various, different-sized servos.

I would not recommend that you stuff the receiver and battery pack together in the "radio box" provided. It's too tight to provide adequate vibration isolation. I simply cut a piece of one-sixteenth ply, three inches by two-and-a-quarter, and Hot Stuffed it to the top of the radio box (Photos 8 and 9). Cut notches for the tail boom support braces at the aft end. See arrow in Photo 8. This becomes a nice area to rubber-band the RX with plenty of room for foam rubber protection. The radio box should house the battery pack only, with the switch mounted on the top plate as seen in the top of Photo 8.

The only other thing I'd like to note is that the throttle servo should be set up with some differential throw. As the Kioritz develops most of its power near half of the carburetor's opening, you want to bring the throttle in slowly, and then progressively faster. This is backwards from normal glow operation where you want to get the throttle open as soon as possible. Refer directly to Photo 8 where you can see the throttle servo. At idle, the servo arm should be fairly far back as shown. This will give the needed differential and provide lift-off at half stick with a broken-in engine. It will be normal to lift off at more than half stick when the engine is new.

SET UP

Again, the instructions give perfect setup procedures. Follow them closely and your ship will be set up properly. Follow the balancing procedure to the letter. This gives a very smooth flying helicopter *every time* with no trial and error.

FLYING AND ASSORTED HINTS

The gasoline Hughes 300 is a fine flying helicopter. Due to its 13-pound weight, it is smooth and rather impervious to wind. Scale-like flight is what it does best. Smooth takeoffs, fly arounds, and approaches are fun to do, and make the ship look realistic.

The Apollo radio that I'm flying has never glitched at any time while in the Kioritz Hughes. Initially, I was concerned about possible radio glitching due to the ignition engine, but the concern has proven to be unwarranted.

After several hours of flying, the washout control will probably loosen up a touch. This will result in the helicopter feeling "mushy" in hover. Simply take regular pliers and squeeze the pin on both sides simultaneously. Pin location is pointed out in Photo 7. This will fatten the pin, and take up all sloppiness. The crisp hover will return. I didn't believe this would make much difference, until I tried it. Watch this on any other helicopter that has a washout control. I thank Dave Robertson at California Model Imports for pointing this out to me. On the gasoline 300, this needs to be done just once, and then the washout will stay crisp for a long time to come.

Make sure the canopy is not screwed on too tight. The gasoline engine is rougher at idle than glow engines, and extended idling will crack the canopy sooner or later. This is really the only weak point I've found in the whole helicopter. Watch closely for any cracks and reinforce these cracked areas before they grow too large. At the back of the canopy, the clear portion is very thin. I trimmed about an inch-and-a-quarter off the rear, clear portion to get into the thicker material which will not start a crack as easily.

CONCLUSIONS

To pull things together, I've found the gasoline powered Kioritz Hughes 300 to be a reliable, trouble free helicopter. The Kioritz engine is a strong point; it has worked perfectly for me. Keep in mind that power will be less than normal during break-in at 20 to 1 oil mix. The engine will grow stronger and stronger the more you fly. And I'm sure you'll enjoy flying for only a few dollars a gallon for fuel!

As the Hughes does have a gasoline engine it will attract attention at most flying sites, so be prepared to answer lots of questions about it's operation.

The thing that I still like best about the Kioritz 300 is the ability to take it out to a field with no support equipment, pull the starter cord, and fly a realistic helicopter for nearly forty minutes on one tank of gas . . . See you next month.●

**Hannan . . . . . ** *Continued from page 55*

2½ gram weight rearward produces stable inverted flight."

Mr. Mueller has also been conducting some fascinating experiments with unusual glues and gluing techniques that would seem to have desireable applications for model building, which we hope to present in a future issue. As Dave Gibson put it, "the ability level of people in this hobby seems to be getting more incredibler and more incredibler!"

KOOLHOVEN

The newest addition to the hangar library has the simple title *Koolhaven* . . . short for Frederik Willem Koolhaven, one of aviation's most versatile designers. Produced by Theo Wesselink and artist Thijs Postma, the volume was published in Holland. Comprising 144 pages on top quality paper, the soft-bound book features hundreds of crisply reproduced photographs, drawings (including over a dozen three-views), and beautiful full-color paintings. Koolhaven's career in aviation began in the box kite era, and eventually included design activity in several countries, and involved an amazing variety of products, ranging from the ultralight BAT Crow of 1920 (no three-view of it . . . drat!) through cabin lightplanes, fighters, floatplanes, bombers, and transports. Name a configuration and Koolhaven

probably tried one, including low-wingers, mid-wingers, high-wingers, parasols, biplanes, triplanes and even his famous Armstrong Whitworth quadruplane!

In addition to actually manufactured aircraft, photographs of models, mock-ups and drawings of machines that never reached the hardware stage are presented, giving vivid testimony to one designer's prodigious output.

From a scale modeler's point of view, this is a "must", and our only regret is that more three-views were not featured, as many of the aircraft fairly cry out to be reproduced in miniature. But then, we must not become too greedy!

Our copy of *Koolhaven* was obtained from Midland Counties Publications, 24, The Hollow, Earl Shilton, Leicester, England LE9 7NA. At the time of this writing, the price was six English pounds plus postage. At the present rate of exchange, this is surely a bargain for such a top-notch offering.

LONGEVITY RECORD?

The very nature of model aircraft, particularly the stick and tissue variety, makes them unusually subject to damage and deterioration. Yet, some manage not only to survive for lengthy periods of time, but to participate in contests as well. An outstanding example is the rubber powered Stormovik belonging to Clarence Mather, which was recently flown in the Los Angeles Naval Armory. This model, which has participated frequently in both indoor and outdoor events, is now 24 years old! Can anyone top that?

A ROSE BY ANY OTHER NAME

Speaking of that type of model, Richard Lape calls 'em "twig 'n tissue" aeroplanes. . .

SCALE IS IN THE EYE OF THE BEHOLDER

Personal taste is important in the selection of a scale subject, just as is "rareness". In competition, one can hardly expect judges to be impressed with a visually boring or offensive machine. Even the typical ho-hum high-winger can come to life with exciting colors and markings, raising it above the mundane. One needs only to visit a fly-in of full-size aircraft where similar designs are lined up side-by-side to appreciate the variations in esthetic impact the finishes can create.

It is possible to study this phenomenon even if you don't live anywhere near an airport, as it applies equally to automobiles. Particularly refined types such as the Porsche 924 and Mazda RX7. Compare your own reaction to either of these machines in silver, as against red or black. Note how the contrasts in trim can affect the overall effect. The exact same principles apply to aircraft, where color can accentuate already pleasing lines or bury them in an sea of disorganization.

Another way to make such comparisons is with the aid of color profile drawings. These are featured in many aviation books and magazines, or you can draw them yourself. A good example is the two-page Spitfire spread in the January 1983 *Air International* magazine. Almost any enthusiast would rate Spitfires high on the esthetic hit parade. Yet, each of the 14 different color and marking schemes presented may give us a different reaction, as they range from all black with red striping, through camouflage, all the way to an all pink example! The mind boggles.

So, before you invest all those man-hours in a flawless finish for your next model, why not spend an hour or two investigating its decor possibilities?

SILLY SIGN-OFF

From an Experimental Aviation Association newsletter, courtesy of Granger and Larry Williams, we have abstracted the following pseudo-German aeronautical definitions ("Kleinen" is small; "fliegen" is flying):

Light aircraft: Der Kleinen fleigenvagen.

Propeller: Der airfloggenfan.

Student pilot: Der Dummkopf lernen fliegen.

Instructor: Der Dummkopf shtuk mit der Dummkopf lernen fliegen.

Air Traffic Controller: Der Schweinhund ubbenzie taur who vatches aller udder Dummkopfen fliegen. •

Avenger . . . . . *Continued from page 51*

The wing slots may be omitted to simplify construction, but they do seem to work quite well in stabilizing the model in flight. Do not forget the 1/16 washout (i.e. trailing edge raised 1/16 inch) on both wingtips. I find the most consistent method is to twist this into the finished, covered wing using dry heat, not steam, in front of an electric fire. *(Did someone say FIRE! wrf)* Steamed warps have a habit of losing their settings when the weather changes, and in the U.K., change it does!

Dope the airframe at least once with a 50/50 mixture of dope and thinner, and lightly sand before covering. Blue, natural Jap tissue was used on the original with two further coats of the same 50/50 mixture to seal the surfaces. The covered fuselage can be heavily steamed before doping to get out any little wrinkles in the tissue.

The canopies are vac-formed in the lightest acetate sheet you can find. A good artists' material supplier should have suitable thicknesses as used for covering presentation drawings, etc. A Mattel unit or similar home-made device working from a vacuum cleaner should make this reasonably easy. Carefully trim the canopies to sit neatly where they should on the tissue covering and the turret floor. Fit any cockpit details now. Once the main canopy is made to fit well, hold it in place at the rear using a strap of masking tape strapped over while you run a thin line of full strength dope around the front half where it touches the tissue. Leave it to dry a good 10 to 15 minutes, remove the tape, then apply the dope at the rear. Using this technique, with a well-fitted canopy, you should get absolutely no indication of how the thing is held on when the model is finished. Glazing bars on the original were blue tissue strips doped in place.

National insignia are cut as solid blocks from a darker shade of blue tissue and doped in place. The white star and bars are added in matt enamels, as are all the other white markings. For full-colour details, the Airfix 1:72 scale kit was used as original reference, but alternative documentation on the Avenger should be quite plentiful.

The original prop was spirally laminated from balsa as detailed on the plan, carved to a very thin section, and tissue covered. Lightweight commercial props may be used, but will probably benefit from having a little extra pitch tweaked in. No freewheel device is used . . . one of the more subtle aims of indoor flying is to always land with only one turn left on the motor! If you make yourself the reversed "S" hook as shown on the propshaft, you will never again have problems of the rubber winding up the shaft.

The original model weighed just under 10 grams ready for flight, but without rubber. Every peanut built from the same plan will be different, and with

a more challenging type such as this, even more so. Therefore, as a loose guide to flying trim, keep the balance point well forward and do not try to make it fly too slowly. Airspeed helps the slots to work more effectively. Ballast may be put inside the front fuselage with a small balsa spatula, and the rudder can be hinged with fine wire to aid trimming even more. Start with the downthrust shown on the plan, and with a few test flights on a weak motor, see which way the model naturally wants to turn. The original was happiest turning to the right, and used a 12-inch loop of .070 Pirelli with about 1000 turns. More motor should only be tried once the trim is consistent.

If the model turns right happily under power, but seems to fly "downhill" in a steepening trajectory, gradually decrease the noseweight and bring the balance point back, but maintain the same elevator setting. The model may then seem to want to stall on the initial climb and drop the outboard wing in the turn. If you can gently add a little more power you should be able to get it to pull "over the top" of this stall, and a tiny piece of clay on the inboard wingtip should help stabilize matters.

All of the flying surfaces are true to scale. This was one of the attractions of the Avenger as it has generous tail areas, nicely proportioned moment arms, and generous dihedral. If you insist on it, an undercarriage could easily be fitted, but the challenge of the exercise from the designer's point of view was to get the model to fly without it. When the original managed smooth, stable flight on its first day out, it all seemed very much worthwhile. Conversion to a Campus A-23 would not be difficult at all. I have not tried it yet, but if you tackle it either way, best of luck! •

F/F Scale . . . . *Continued from page 50*

Wee, about a 225 sq. in. wing area, and a wing loading of about 2 oz. per sq. ft. is also good, but the bipes are best.

"Unfortunately, most existing kits and plans are unsuitable if built as is, because the wing loading is usually too heavy to allow the model to be very versatile. One way to get a light model would be to use existing plans for the necessary outlines, and change the structure.

"The models I build are so light they would be suitable for rubber scale duration in spite of the necessary changes for the engine mounting, a stronger landing gear, fuel proofing, etc. In fact, I first 'discovered' what fun could be had with an ultralight gas model when I converted a couple of lightly built rubber models to .010 and .020 gas power.

"I hinge the rudder and elevator with soft wire hinges, and I add a clear plastic sheet trim tab to the left wing trailing edge (about four sq. in.) which gives me complete control, when combined with prop selection and reversal, and needle valve setting.

"What can you do with those models? You can:

1) Fly at speeds of about eight mph to about 40 mph.
2) Fly at climb rates of zero to 300 fps.
3) Fly level or at bank angles of 75 degrees.
4) Make ROG runs from five to 150 feet.
5) Loop at safe altitudes.
6) Fly at very low sink rates, so the model lands under power (this requires a good-sized field).
7) Fly in circles from 10 to 1,000 feet wide.
8) Make a touch and go landing, or a "strafing" run.
9) Other things too numerous to mention.

"It is important, when first trying to see just what can be done with a particular model, to keep the engine run very short and to make trim adjustments in small steps. Initial flights should be at relatively low power . . . reverse the prop and run a bit rich. Also keep engine runs short on first flights after a trim change. I advise short runs any time winds or thermals might be present. (These light models can have a tremendous glide ratio).

"Discussing all the possible fight patterns and necessary trim adjustments would require a book, but here are a couple of suggestions to add realism and fun to gas powered free flight flying:

1) Set power low and hand launch *very* slowly for a touch-and-go landing.
2) Increase launch speed a bit for a strafing run.
3) If trim is for a left turn, hold the model at about a 30-degree right bank at launch. It will dip, and slowly rock over to the left in a strafing run. This is a really beautiful effect.
4) Adjust for almost straight flight. Adjust power and elevator for a slow, gentle power stall. The model will gain both speed and altitude with each stall, and will eventually start to loop at a safe altitude. (Reverse prop and peak rpm for medium power.)
5) Increase power and aileron trim to establish a maximum bank angle at which the model will still climb slightly.
6) Adjust for maximum climb angle without stalling.
7) Adjust for minimum values on five and six.
8) Adjust for slowest, flattest flight. (Only on wide field with no spectators or obstructions around.)
9) If a smooth surface is available, adjust for a long, slow ROG. (The effect is beautiful and realistic.)
10) Adjust power so that the model sinks very slowly, and will land power-on several hundred feet away. Launch from highest point possible.

"Once again, only gas models are suitable for this 'realistic' and enjoyable type of flying. Versatility increases directly with a decrease in wing loading, and the lighter the model, the more you can safely do with it. Most flying is done at low power and/or slow speeds, so there is little danger of damage to the model in flight or in crashes. *But*, one must be careful of what one does with a F/F model if either people or property could possibly be hit by a model under power. Keep flights 'conventional' if either are present. (Safety first, last, and always.)

"Based on my own experience, I think the following tips might be useful to anyone who would like to try this kind of model:

1) Use a Cox .020 Pee-Wee.
2) Choose a biplane size that will have about 225 sq. in. of wing area, or a monoplane of about 200 sq. in.
3) Choose a scale subject with a relatively large wing area, and straight, simple lines.
4) Avoid designs that would come out tail heavy.
5) Provide for easy and frequent trim changes on all control surfaces and thrust line.
6) If working from an existing design, it may be beneficial to decrease airfoil thickness and/or wing incidence a bit. Also, the horizontal stab area should not be excessively large.
7) Use structures and materials that you would use for a rubber model. Fuel proof only where necessary.

"I hope that other F/F scalers will try this. It's loads of fun, and a good way to see what good F/F trim provisions can do for a scale model.

"Good luck, and happy free-flighting, Curtis Moss." •

C/L . . . . . *Continued from page 49*

back to the forefront of aeromodeling where it belongs.

"Join today! Help C/L speed and help yourself . . . Chris Sackett, N.A.S.S. Chairman".

Having been a member since the start, I can attest to the fact that the newsletter included with the membership is super! A wealth of information has been included so far, such as history of speed flying, contest results and calendar, airplane and engine building hints, construction articles, photos, equipment directory, and much more. For more information, write to N.A.S.S., Box 82294, North Burnaby, BC, Canada V5C 5P7, and ask for a membership application.

While on the subject of the speed events, it is my observation that this activity definitely seems to be on the upswing, along with general control line interest. Speed has not been very popular the last several years, with would-be participants citing such problems as lack of equipment, too technical, etc. Lack of equipment is no longer an excuse because it is out there, if it's not in your local hobby shop. One good reason to join N.A.S.S. is to receive the "Speed Times" and get to the sources. It is still a technical event, but if it were not, it would not be speed! If you need help in this event, just ask a speed flier. I think you will be surprised how willing they are to help a beginner.

WIRE DEPARTMENT

What could be more appropriate to a control line column than information about control lines? The chart of wire sizes is for the benefit of beginning fliers. The wire sizes and lengths listed are for the usual multi-strand (or braided) lines that you find in your local neighborhood hobby shop. If you buy Sullivan brand lines, you will notice that there is a chart on the box. Veteran modelers will note that this chart appears to be somewhat obsolete. The chart included in this column is more up-to-date with matching contemporary engine sizes. The size suggestions are for middle-of-the-road sport flying. Other sizes and lengths may be more suitable for special applications. If you are into flying things such as tool boxes and brick outhouses, then you will want to upgrade the line sizes. And if you are flying in competition, then you will want to consult appropriate rules for line requirements.

LINE SIZE CHART

ENGINE (in cubic inches)	SIZE (in inches)	LENGTH (in feet)
.049	.008	26 to 42
	.012	26 to 35
.09	.008	42 to 52
	.012	35 to 42
.15-.19	.012	52 to 60
	.015	52
.29-.35-.40	.015	60 to 70
	.018	60
.45-.50	.018	60 to 70

Speaking of special applications, this brings to mind some oddball exceptions to the norm. One of them is that of a local 1/2A stunt plane that does the pattern on 70-foot wires! More on that in a future issue. Another is my K&B 40 powered ringmaster that is tethered with 100-foot long, .014 single strand wires. The wildest example that I can think of was a dumb mistake. I have a set of .018 wires that are cut down to 40 feet of length to simulate high speed flying using a sport plane. The mistake was that the reel for this set of lines was not labeled. Well, one fine Sunday I brought out my brandy-new Dyna Jet powered plane for its maiden flight. Guess which set of lines I tossed into the tool box to use. You guessed it! Common sense did not prevail in the decision making process of whether to fly it or not. After one short flight of what felt like 300 mph, I decided that labeling all my reels was a good idea!

HINT AND KINK DEPARTMENT

Sketch No. 1 shows the use of an aluminum plate to mount an engine upon. This can be fabricated in a few minutes with a bandsaw and file. If you do not have access to a bandsaw, the work can be done with a hacksaw, but it

will take a bit more time. Many of the profile kits on the market do not have hard enough wood (or enough hardwood) up in the nose area. The result will be that the engine mounting lugs start to sink into the plywood doubler after successive bolt tightenings. The aluminum piece spreads this compression. Another application of this piece is to mount an engine on a plane which was perhaps originally fitted for a different size engine, in this case the plane may have too wide a gap between engine mount surfaces, or the front end might look like Swiss cheese from drilling holes for different motors. This is no problem, the aluminum plate will support the engine, but use a thick piece in this application, such as 3/32-inch stock. If necessary, the piece can be duplicated and used on the other side of the fuselage as well. The plate can be attached to the plane, or may be simply held down by mounting the engine. If it is removable in this fashion, then you can easily switch it along with the engine to another plane.

RULES BLUES DEPARTMENT, CL-84-22

Most of you racing types will recognize this lead-in as a reference to the current debate of changing the AMA slow rat race event. Right now there are several cross-proposals against a proposal that the CLCB passed, but that few people liked. The proposal was passed on the initial vote as an agreement in principle, but now the process of cross-proposals will sort out the bugs. The main reason several people do not like this specific proposal is because it will make nearly all current, competitive equipment obsolete, as it calls for a complete revision of airplane and engine specifications.

Before going any further, perhaps a short glimpse of racing *history* is in order. Even as far back as the '50s when the rat race event got into the rulebook, there were proponents of a "limited," or "stocker" class of racing. Throughout the country, local sport race, and slow rat type events sprung up over the years, and these offered the novice competitor an event in which he could more easily get started. These events became more and more popular by the early '70s as the rat race event grew as far away from an entry-level competition as the Indianapolis 500.

The time finally came for a slow rat event to make its way into the AMA rulebook. Obviously, with all the local and regional groups flying their own versions, which of course were best for them, it would be no wonder that everyone would not be pleased with a nationally standardized version. But the event was there, and enjoyed varying amounts of popularity in different areas.

The problem was that the rules were left a little too open, and more technology crept in than perhaps should have been allowed. Even after the engine rule was modified to require factory produced units (which were very specialized motors), now we had fancy, trick tanks, and the swing weight carburetor, a real foo-foo device. Both of these allowed for big bore intakes, which is usually not possible on a conventional suction tank setup. I am certainly not against technology or the natural competitive evolutionary cycle of an event, but the end result here has not been close to what the original proposers probably had in mind.

Currently, the problem is simply that to be competitive, your air speed must be in the 125 to 135-plus mph range, and that speed coupled with a big airplane, makes for an event that is physically difficult to fly. So much for the historical glimpse, now let's get back to the discussion.

The slow rat revision that received the initial approval was authored by Frank Williams. Here is a brief summary: Current restrictions regarding exhaust pipes and pressure fuel systems still apply. Models are to be of the profile construction type with completely exposed controls. The fuel tank shall be totally outboard of the center line of the engine crankshaft. No variable area carburetors are allowed. Fuel shall be provided and contain no more than 10 percent nitro. The maximum engine size is .36, and it must be of the front intake, single bypass port type. Ball bearings are OK. There are also specific restrictions as to the modifications allowed on the engine. For a complete explanation, refer to the December 1982 *Model Aviation* magazine. As you can see, if this passes final vote, there are going to be a lot of obsolete entries out there in racing land.

Probably the most painless change would be that of the one proposed by Vic Garner. His proposal is to simply drop all provisions of 84-22, and fly the event as is, but using contest-provided, 10 percent nitro fuel. As most folks are using somewhere in the neighborhood of 50 percent nitro, this would obviously slow things down a bit. And it would not make anything obsolete. The only modification allowed might be to lower the head clearance on the engine. The fly in the ointment of this proposal is that the event would still be too fast, according to some participants. Speeds of 120 mph might still be easily attainable, and this is none too slow; although it might be the best compromise, considering the factor of making equipment obsolete.

As I stated at the beginning of this discussion, there are several cross-proposals for the contest board to consider. Many of these are from Ron McNally, the C/L contest board chairman. He has broken the 84-22 proposal into separate parts to be separately voted upon. He has stated, "By dealing with each part separately, we have the best chance of finding an acceptable combination of desirable changes."

Well racing fans, whatever we wind up with for a slow rat event, let's hope it is beneficial in the long run. Meanwhile, let your district contest board member hear your opinions. The voting process starts in July, and the final deadline is September 1, so hurry.

ABOUT MIKE HAZEL. . .

As promised in the beginning, here is a brief introduction of myself. I started flying C/L under the tutorage of my dear old dad, who at the time was into a bit of competitive flying. At the age of 12, I saw go-fast flying as my calling, and the very first C/L plane I built was a rat racer. I have been active in all kinds of C/L racing ever since, including rat racing. I have also done some combat and carrier flying. A few years ago I picked up a monoline handle, and since then I have been flying the speed events. Lately, I have been making some Cro-Magnon efforts at being a stunt grunter, due mainly to the evil influence of a local PSSF (pseudo serious stunt flier) who shall remain nameless for now.

My favorite events (not in any particular order) are: Race Race, Sport Race, 1/2A Combat, Jet Speed, Formula 40 Speed, and going for pizza after the contest. My least favorite events are: Multi-engine Inverted Dive Bombing, Stunt Appearance Judging, and rolling up the lines.

I also enjoy working on the organizational end of contests (weird, huh?). I am also a co-conspirator of the Northwest Region newsletter, "Flying Lines". And last but not least, I am married to a very wonderful and supportive wife, and have two small boys who look like the makings of a good racing team. So much for my biographical sketch.

LOOKING FORWARD

Some subjects that are tentatively lined up for the future are: close-up looks at some of the competition events, mini coverage of the '83 Northwest C/L regionals, building and flying a Formula 40 speed plane, engine and propeller work, product reviews, the militant control liner, club news, a look at pulse jets, safety tips, hints and kinks, and of course some of your good suggestions. By the way, I would be interested in receiving club newsletters. Here is a chance for some of you editors to see your name in print for fame and glory. My address is: Mike Hazel, 1040 Windemere Dr. NW, Salem, OR 97304. •

Perch . . . . . . *Continued from page 42*

needs. The only things that need mention are the washers and the spring installation. Don't be tempted to leave the washers off the ends of the pole as they help prevent the wood from splitting. The springs are mounted at the top of the poles, and the length of the bottom foot is such that the spring will be compressed at least two inches. If the spring is placed at the bottom, there is a good chance that the weight of the models will overpower it, causing the fixed foot on the other end to come clear of the ceiling. This would of course allow everything to topple to the ground, damaging your models. Finally, if you have large, quarter-scale models,

everything will have to be made stronger than shown. The unit as designed is intended for lighter, .60-sized models on down. No elephants perched in the trees please!

The way in which I drilled the half-inch diameter holes to five inch lengths was indeed by "eyeball". A one bedroom apartment doesn't leave much option in such matters, and I have no vise, wood lathe, or *shop* in the usual sense of the word.

First, I marked the center of the ends of the rods, and dimpled the marks with a center punch. I then drew half-inch diameter circles on the ends using a small compass. The metal washers were then cemented to the ends of the rods, centered on the circles. When cured, the holes were drilled with a half-inch wood "spade" type bit in a cordless drill. Because the bit is so long (six inches), I was able to eyeball its centerline relative to the centerlines of the rods with relative ease. The drill was hand held, and the job was done with a great deal of care.

Now that your Port-A-Perch is complete, it's time to set it up. Just about anywhere will do, but it is advisable to place it near a wall outlet so it can also act as a charge center for your models. An adapter for the wall outlet which has six outlets is a nice addition if you want to charge more than two models at once. I also put a piece of plywood under the perch to protect the shag rug from any incidental oil drips. You too may wish to consider this when you set your unit up. Consideration should also be given to putting it in a location where it will be inaccessible to very small children. Remember, this is a model airplane perch, not a jungle gym, or a climbing tree.

So there you have it. A simple, inexpensive, quick, and portable model storage system. •

Counter . . . . . *Continued from page 10*

This adapter is machined from aluminum barstock and will accept most standard carburetors, such as the Perry carb in the photo.

The diesel conversion kit is available for $26.00 (plus $2.00 postage and handling), and the adapter is available for $6.50 (plus $2.00 P&H) either from your local hobby store or direct from Davis Diesel Development Inc., Box 141, Milford, CT 06460, (203) 877-1670.

★ ★ ★

D.G. Products Co., 209 Carrlands Drive, Dayton, OH 45429, (513) 294-1192, has introduced six new Perma-Grit tungsten carbide sanding tools to its line of quality products. If you've never used a Perma-Grit sanding tools, you won't believe how sharp, abrasive, and long lasting they are. Now you can purchase them in the following shapes: 1/4-inch diameter round, 1/2-inch diameter round, 3/4-inch diameter round, 1/8-inch tangent radius (V-shaped with a radius) and 3/4-inch radius (a flat, U-shape) . . . each having two grades of abrasive, course and fine. Also new in the line are two flat sanders, each with a single grade abrasive, medium or fine, and each nine inches long (as are all the sanders).

Write or call D.G. Products for more information or prices.

★ ★ ★

If you've been toying with the idea of mounting floats to your favorite sport plane in preparation for flying off of the nearby lake, you should consider Buzz Waltz' newest kit . . . the Begin/Air Float Kit. As you can probably guess, this float was specially designed for the Buzz Waltz Begin/Air trainer, but it can be easily adapted to any .25 to .40-size airplane from three to five-and-one-half pounds.

The kit includes all balsa and plywood necessary to build the floats themselves, plus one dual landing gear and mounting plate for adapting to the Begin/Air trainer. Of course, all other necessary hardware is included as well.

The Begin/Air Float Kit is $26.95, and is available directly from Buzz Waltz R/C Designs, 403 Industrial Place, Palm Springs, CA 92262, (619) 325-5494.

★ ★ ★

Attention R/C car and boat owners! Leisure Electronics, 11 Deerspring, Irvine, CA 92714, (714) 552-4540, announces its newest motors: the No. 1002A for Stock Off Road use (ORCA legal), the No. 1002E for Seven-cell Modified Off Road use (ball bearing), the No. 1002M6 for Six-volt Marine use (ball bearing), and the No. 1002M12 for Twelve-volt Marine use (ball bearing).

Pictured in this month's Over the Counter is the dual ball bearing Off Road Motor (No. 1002E) for seven-cell racing. Here are some specifications for this motor: dimensions: 2-1/8 in. x 1-3/8 in. dia.; weight: 5.88 oz.; voltage rating: 7.2 to 8 v.; output shaft: dual ball bearing, 1/8 in.; replaces Mabuchi, shunted brush assembly (rebuildable). The latest word from the manufacturer is that they are ". . . Selling like hotcakes . . . and the word really hasn't gotten out yet!" So, take note all you dirt racers out there, there's a new *hot* motor available from Leisure.

Prices are: $15.00 for motor No. 1002A, and $35.00 for numbers 1002E, 1002M6, and 1002M12. Write or call Leisure to order your motor or to obtain more information.

★ ★ ★

Top Flite Models, Inc., announces the soon-to-be-released Antares sailplane for radio control. The Antares is a multi-task, 99-3/4-inch span, 47-1/2-inch long, four-channel glider employing rudder, stabilizer (or all-moving horizontal stabilizer), flaps, and ailerons for control.

The prototype, or developmental Antares was shown at the 1983 Toledo Show. The Antares should prove to be a tough competitor in soaring contests this summer. Its designer, Scott Christensen, is the co-founder of the League of Silent Flight, and is the designer of the Top Flite Metrick . . . not to mention the fact that Scott is a V-P at Top Flite.

Additional specs and features of the Antares will be released at a later date, so keep your eyes and ears open!

★ ★ ★

Dick Hanson Models announces the availability of its newest kit, the Quarter-scale C.A.P. 21. This C.A.P. 21 is the first of a series featuring bonded foam/balsa construction for extremely high strength. Typical flying weight for the completed model is nine to ten pounds using the O.S. 60 gear box engine.

The basic kit consists of: fuselage, cowl, canopy, landing gear wire, wheel pants, and foam cores for the wing and tail group. A removable, adjustable stabilizer is just one of the advanced features of this kit. You can purchase

INDEX TO ADVERTISERS

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CANOPIES, MAJOR BRAND. first quality, assorted sizes, styles. Five for $5.00, 12 for $9.00. Add $1.00 shipping. Large quantity inquiries invited. Charge cards. Stanton, 4734 Milwaukee, Chicago, IL 60630

EXHIBITION MODELS. Curtiss SOC-1 scale rubber powered model plans. Span 28-3/4 in. A real beauty and flier. $4.00. R.L. Stearns, 514 Holden St., Raleigh, NC 27604.

P A W DIESELS. England's finest, now available at low, low prices, .049 to .29 standard and R/C. Send $1 for list. Eric Clutton, 3816 DeSoto Ave., Fort Meyers, FL 33905

OLD AIRTRAILS, Flying Aces, M.A.N., pulps, etc., for sale. Write R.J. Twohy, 24248 Crenshaw #103, Torrance, CA 90505.

FOR SALE — IGNITION ENGINES: one Morton M-5 (1948), two Bunch Tiger Aero's (1940), one Anderson Spitfire (1950), all are complete and in excellent condition. In group only. $2600. R.B. McKenna, 1620 Artesia Blvd., Redondo Beach, CA 90278.

FOR SALE, OLD IGNITION ENGINES. 60, old, complete. Numerous parts engines. Thirty old glow engines. Also 30 new Lindbergh Hornets built by Cole. For complete list and prices send $2 and legal-size SASE. William A. Cole, 4978 NE 56th St., Altoona, IA 50009.

SKYROCKETS — Make your own! Powerful rockets with homemade tools and fuel. Complete illustrated manual, $5.00. Propellant Engineering, P.O. Box 28114, Dept. M2, St. Louis, MO 63119.

NORTH AMERICAN O-47 observation plane, 1/24th scale, rubber scale, $3.75 postpaid. David Diels, Box 101, Woodville, OH 43469.

NORTHROP N9M FLYING WING. Scale plans, photos, model plans. Send $1.00 for information. Bill Young, 8106 Teesdale Ave., N. Hollywood, CA 91605

RAZOR BLADES, single edge industrial first quality — extra sharp, 100/$4.25, 200/$8.00, 300/$11.75, 500/$19.25, 1000/$37.50 postpaid in U.S. Cobbie's Gifts, Postbox 2, Deal, NJ 07223; (201) 531-6842.

OLD TIMER MODELS — Everything for the rubber modeler. Pirrelli, balsa, tissue, absolite film. Over 300 plans. Too much to list. Send $1 for catalog to: Old Timer Models, P.O. Box 913, Westminster, CA 92683.

RAS-STICK. 19- 40 Fun Flyer, 51" foam wing, balsa fuselage. Complete kits, $49.95. Send money order, we pay UPS. Send stamp for picture sheet. Dealer inquiries invited. GT MODELS, P.O. Box 869, Rantoul, IL 61866, phone (217) 893-4136.

TISSUE PAPER (Domestic) 20"x30" sheets, sixteen colors, 20¢ sheet. S.A.S.E. brings sample of all colors. Contact Bill Wilson, Box 8489, Lumberton, TX 77711, (713) 246-4177.

FORSTER IGNITION ENGINES, English & Chinese diesels. Parts and Supplies. Send SASE to M&G ENGINES, P.O. Box 6026, Denver, CO 80206.

WANTED — OLD MODEL ignition engines, cars, etc. Paying top dollar. Bill Simpson, 7413 Via Lorado, Rancho Palos Verdes, CA 90274 (213) 377-3532

WANTED — OLD MODEL IGNITION ENGINES. Paying top dollar. Don Chapton, 1252 Bennington, Santa Ana, CA (714) 838-5469

WANTED. Spark ignition model airplane motors, parts, race cars. Circa 1930-1950. Russell Stokes, Rt. 1 Box 520, Keller, TX 76248

WANTED — OLD MODEL AIRPLANE ENGINES, spark ignition, glow, and diesel. Any related items. Doug Beardsworth, Apt. 228-D, Oakville Ave., Waterbury, CT 06708; (203) 756-3450

CUSTOM MACHINE WORKS: Sketch with SASE for quote. Retracts, adapters, mounts, etc. Roy B. Stewart, 514 Zimmerman Dr., Princeton, IN 47670.

JIM WALKER'S INTERCEPTOR, Sky-Diver, and Ceiling Walker Helicopter, limited reproduction. Fireball plans, all factory versions. For information, send $2 and large SASE (37-cent stamp). A-J Fun-Pak, P.O. Box 548, Oregon City, OR 97045

ROTARY ENGINED AND WW-I FIGHTERS. Factory or best-source drawing enlargements. Experienced scratch builders only. 72-inch span $26, 80-inch span $36. Photo packs 500 aircraft. Catalog $3. Scale Plans and Photo Service, 3209 Madison Ave., Greensboro, NC 27403.

"MOLDMAKING FOR THE MODELER, CRAFTSMAN, HOBBIEST." How to booklet with instructions and illustrations. Send $4.50 to Placer Publications, P.O. Box 7252-A, Orlando, FL 32854

your C.A.P. 21 as a kit, a semi-kit (all woodwork is completed, but the wing and stab are not joined), or a completed airframe (wings and stab are joined and aligned to the fuselage).

Write or call Dick Hanson Models at 5269 Lucky Clover Lane, Murray, UT 84107, (801) 261-1402, for prices and details.

★ ★ ★

By now many of you have seen the new video tape "Hot Stuff Video Tips II"; those who have seen this video have also seen the Hot Tips demonstrated by Bob Hunter of Satellite City, and know how handy they are for working with Hot Stuff and Super 'T'. Those who have not seen the video will just have to take our word for it, and buy a box of applicators to demonstrate for themselves. At any rate, once you've tried these applicators for yourself, you'll never want to use just the bottle and tube method again. At four for 89 cents, they are a bargain . . . the time and frustration they will save you is worth far more.

Hot Tips applicators are available directly from Satellite City, P.O. Box 836, Simi, CA 93062, or from your local hobby dealer.

★ ★ ★

Francis Smith's Ship Yard is happy to announce that its newest release in its all-wood, R/C operated, scale boat line is the Bunker Boat. The Bunker Boat was a **Model Builder** feature in February of this year, as you may recall, and originally appeared in the February and March 1956 issues of *Young Men* magazine.

The Bunker Boat measures 42-1/2 inches long, has an 8-1/4-inch beam, stands 27 inches high, and weighs 13-1/2 pounds. Watch for the Francis Smith Ship Yard ad for details, or write to them directly: P.O. Box 118, Norwood, PA 19074.

★ ★ ★

Indoor fliers and potential indoor fliers should note that Indoor Model Supply, Box C, Garberville, CA 95440, now has a very special line of Peanut kits called "Miniature Scale Aircraft." These MSA kits include tremendous detail. You can build them as contest or display models they are so good. There are two plan sheets, one of which has three-views of the aircraft and engine, and a history of the aircraft with reference material. The plans include emphasis on what it takes to produce a fine flier: incidence angles, thrust angles, wing twist (wash out), correct use of a winding stooge and winder, covering hints, etc. Some kits incorporate built-up strip type ribs for the wings, and William Brother's engine cylinders . . . and so many more features you wouldn't believe it!

Send for the Indoor Model Supply catalog ($1.50), and build a Peanut Scale model for this summer's activities.

★ ★ ★

"Geepers, creepers, where'd ya get those peepers?" They aren't peepers, they're binocular *magnifiers*, and they magnify 2-1/2 times anything which can be seen with the naked eye (and some things which can't).

Maxon makes 'em for professionals and hobbyists who need distortion free, three-dimensional viewing with magnification. The plastic headband is adjustable to any size. The one-piece, high-impact plastic visor fits easily over eyeglasses and can be conveniently tilted up and out of the way when needed. Lenses are scratch resistant acrylic.

For prices and details, write to Maxon, P.O. Box 243, Carlstadt, NJ 07072, and ask for literature on the H910 binocular magnifier.

★ ★ ★

Repla-Tech International has added four new lines to their outstanding group of plan, drawing, and other scale documentation catalogs. First is a collection of British scale drawings by *Aviation News*. These are the finest scale drawings available, and they are printed here in the U.S. for immediate availability.

Secondly, Repla-Tech is now offering Arco Publishing's line of airplane, ship, and armor books. Of special note is the neat little library on Illustrated Guides, the famous Salamander Books which are a boon to the scale modeler.

Next, Repla-Tech has available a series of 11 x 17-inch scale drawings including *Aviation News'* drawings as well as those of Robert C. Morrison, Bjorn Karlstrom, and Dustin Carter.

Finally, we come to the new MAP drawings for 1983, and the introduction of BK Packet No. 9 on Japanese WW-II airplanes. Also listed is Repla-Tech's collection of card models, the popularity of which increases every day.

As you can imagine, the folks at Repla-Tech have just about everything you could need in the way of scale drawings, documentation, and miscellaneous items. For additional info, write: Repla-Tech International, 48500 McKenzie Hwy., Vida, OR 97488.

★ ★ ★

Kimbrough Products, 1430 E. St. Andrews Pl., Unit E, Santa Ana, CA 92705, (714) 557-4530, has two new products that all of you 1/10th scale off-road, 1/8th scale car, and R/C boaters should know about. First, we note the larger version of Kimbrough's Servo Gear Saver (50 percent larger). It comes with three interchangeable plastic inserts so that it can be used on a variety of servos, including spline-drive servos.

Secondly, we note the new Steering Servo Mount (pictured) designed for use with the new, large Servo Gear Saver. With this mount, the height of the tie rods will be approximately level with the steering arms for minimum-bump steer. The mount comes with two tie wraps, two aluminum 8-32 screws and nuts, and double-sided tape.

The large Servo Gear Savers, part No. 121 is for cars, and part No. 122 is for boats (has two output arms on opposite sides of shaft), cost $5 each. The Steering Servo Mounts, catalog No. 123, sell for $2.50 each. Minimum order from Kimbrough is $10, California residents add six percent sales tax.

★ ★ ★

Vito Tomeo Models presents its latest, true-to-scale, 1/6-size P-47 in either razor back or bubble canopy versions. The model spans 81.5 in., is 70 in. long, has 1200 in.^{2} wing area, and weighs 19-1/2 lbs. It is 100 percent accurate in scale outline, and 98 percent accurate in mechanical feature.

Plans are highly detailed. They show motor and radio installations, working scale gear legs, scale gear doors, canopy sliding mechanism, bombs, belly tank, and jettison mechanical locations. Plans come in three sheets approximately 36 x 90 inches. One sheet shows all part templates. Price for the plans is $33, postage-paid.

Plan packs are available for $93, postage-paid, and come with the three plans, fiberglass cowl, bubble canopy, oil cooler shutters, excess exhaust, supercharger exhaust vent, and intercooler exhaust.

Also available are detailed, fiberglass, 1000-pound bombs, M44 bomb kits $22 a pair, and 250 gallon fiberglass belly tank kit for $18.50.

If you are interested in obtaining more information about either plans, plan packs, or custom cut kits, write to Vito Tomeo, 1050 Alabama Ave., Ft. Lauderdale, FL 33312, or phone (305) 792-8591.

★ ★ ★

Wolff Pack, 5008 Chippewa Court, Fort Wayne, IN 46804, (219) 432-2414, announces "a new generation of Sport, Fun-Fly airplanes." The first in this series is the Shrike, a high wing all wood construction Sunday flier for .25 to .45 engines. It has a span of 60 inches, wing area of 535 in.^{2}, length of 43 inches, and weight of three to four pounds with three to four-channel radio. This kit features accurately machined balsa, hardwood, and plywood parts which are shaped, beveled, and drilled, for easy assembly. This is a fast building, foolproof airplane. Kit price is $59.95, and is available through your local hobby dealer, or direct from Wolff-Pak.

The Thrush is the low wing version of the Shrike with the same dimensions and statistics as the Shrike. It also sells for $59.95, and comes with a detailed 21-page instruction booklet.

★ ★ ★

H&N Electronics, 10937 Rome Beauty Dr., California City, CA 93505 is pleased to introduce its single unit digital tachometer/pulsemeter called Ack-U-Tach/Pulse.

As a tachometer, the Ack-U-Tach/Pulse has a four-digit range (display times 10) of 150 rpm to 40,000 rpm, plus or minus 50 rpm. It features a hold switch for holding the rpm display for viewing away from the propeller.

As a pulsemeter, the pulse width is displayed directly in milliseconds to three places. Thus, it is easier to spot fluctuating pulses, as 1.5 ms will be displayed as 1.500.

Other features include the use of

LIMITED EDITION PRINTS

Original painting in artists' acrylics by Robt. A. Benjamin, member, International Society of Aviation Artists.

Full color, finest quality collector's print on 24 x 30 inch heavy coated litho stock.

$50.00

Plus $5.00 shipping and handling

This is one of a series of limited edition collector prints to be produced from paintings by artist Bob Benjamin, most of which have first appeared publicly on the cover of MODEL BUILDER Magazine.

Only 500 prints are available, each personally inspected, signed, and numbered by the artist, and accompanied by a certificate of authenticity. Prints rolled and shipped in sturdy tube, UPS insured, ready for professional mounting and framing.

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Sig . . . . . *Continued from page 15*

Everyone present was honored by the attendance of Maxey Hester and Hazel Sig-Hester, who also brought with them the two latest models to become Sig kits. One is the King Kobra, a 60-powered aerobatic ship for tuned pipe operation. The other one should turn the heads of old-time R/Cers; Fred Dunn's "Astro Hog", looking slightly different with trike gear, strip ailerons, and top-of-fuselage stabilizer.

Incidentally, entry fees collected at the contest were, as usual, turned over to the Glen Sigafoose Memorial Fund for Scholarships.

Results of the competition were as follows:

		SCORE	PLANE
NOVICE			
1st	Fred Henry	189.33	Unknown
2nd	Preston Blake	187.63	Dirty Birdy
3rd	William Meyer	181.84	Lucky Fly
SPORTSMAN			
1st	John Cutrer	253.49	Dirty Birdy
2nd	Mike Cecil	249.67	Compensator
3rd	Ken Collett	245.66	Tiporare
ADVANCED			
1st	Jeff Hannah	249.33	Compensator
2nd	Gary Kirby	245.82	Curare
3rd	James DeFauw	228.68	Tiporare
EXPERT			
1st	Jeff Owens	919.67	Deception
2nd	Ron Ellis	892.17	Super Arrow
3rd	Orlando Ruiz	851.82	Phoenix 8
MASTERS			
1st	Ron Chidgey	739.82	Tiger Tail
2nd	Steve Helms	735.68	Arrow
3rd	Bob Violett	735.48	Arrow

Workbench. . . . *Continued from page 6*

Walter Wise, "Snake" Donaldson, "Blackie" King, McGregor, etc.

"P.S.: I saw Lindbergh land at Roberts Field. I knew Doug Davis, too."

POLISH PEN PAL

Marian Nazimek, Lesna 1, 46-250 Wolczyn, Poland, wishes to make contact with modelers, stamp collectors, or photographers, who are interested in exchanging items of mutual interest. It is impossible to send money out of Poland, so exchange is the only way to go. Marian, age 27, will correspond in English or Polish, and is into the following hobbies: radio controlled model aircraft and cars, music, philately, some fashion, and photography.

MAGAZINE STUFF

Frankly, we were glad to hear from the many concerned modelers who noted the momentary hiccup in the normal flow of control line columns. And momentary it was, as you will note when you get into the C/L-F/F section of this issue.

There will now be two significant changes in MB's control line coverage; the contributing editor by-line and the publishing schedule. Michael W. Hazel, 1040 Windemere Dr., N.W., Salem, OR 97304, has taken over for Dan Rutherford, who will continue with the "R/C Auto News" column. Secondly, and at least until Mike gets into the swing of things, the column will appear every other month, alternating with Ken Johnson's "Indoor" column.

Actually, we kinda made up for the momentary pause this month by also presenting Hal deBolt's "Bipe", a historic C/L model out of the early post war days, along with Hal's interesting account of the founding of DMECO.

To help Mike along with his column, we hope our control line readers will contribute photos (black and white, please) and news of C/L activities in their respective areas.

★ ★ ★

In publishing our complete full-size plans list in the May '83 issue, we opened up a small can of worms. It seems that that **old** Pea Pod Plan set, No. 4733, which sold for $4.50, was listed. In truth, this plan set is now $6.00, as it includes the drawings and text reprints from Ken Cashion's excellent "hopping up" article in our November '82 issue. Until this correction is published (June 1, 1983) we will accept $4.50 for all of this Pea Pod material, but after June 1, we will have to insist on the $6.00 price tag.

INDUSTRY NEWS

Airtronics Inc., formerly located with K&B in Torrance, California, has moved to a new location; 16191 Construction Circle West, Irvine, CA 92714. This puts the company within a 10-minute drive of Orange County (John Wayne) Airport, and within sight of the famed blimp hangars at Santa Ana MCAS. The new phone number is (714) 551-0180. Call 'em up and ask about the new single stick transmitters!

★ ★ ★

Speaking of K&B, it's all good news! As of April 22, at 11 a.m. California time, K&B Mfg. is back under the full ownership of John Brodbeck, Sr. K&B, as a subsidiary of Leisure Dynamics, was not included in the Leisure bankruptcy, due to the fact that it was showing a profit at the time the parent company went into Chapter Eleven. Final acceptance of Brodbeck's offer occurred on Friday, April 8, and the news quickly spread among the manufacturers exhibiting at Toledo during that weekend.

★ ★ ★

The Pettit Paint Company, Inc., continues its series of Hobbypoxy mixing formulas for military scale models of the World War II era. This time it's camouflage color formulas for German Luftwaffe Day Fighters of the 1937-1940 period. The standard factory finish on Messerschmitt BF 109C, D, E-1, E-2, and E-3 aircraft consisted of Black-Green 70 and Dark Green 71 on the upper surfaces, and Light Blue 65 on the under surfaces. In May 1940, with the introduction of the BF 109E-4, the colors were changed to Black-Green 70 and RLM Gray 02 on the upper surfaces, while staying with Light Blue 65 underneath.

It should be noted that many field-applied modifications were used to suit local conditions. The formulas given are factory finishes only:

BLACK-GREEN 70
Five parts H 81 Black
Two parts H 33 Stinson Green

DARK GREEN 71
Seven parts H 65 Bright Red
Four parts H33 Stinson Green
Three parts H 81 Black
Three parts H 47 Bright Yellow

LIGHT BLUE 65
Ten parts H 70 Gray
Seven parts H 10 White
Two parts H 26 Light Blue
One part H 33 Stinson Green

RLM GRAY 20
Twenty parts H 70 Gray
Two parts H 49 Cub Yellow
Two parts H 65 Bright Red
One part H 33 Stinson Green

Note: All formulas are mixed 1:1 with H 05 Flat Hardener for an authentic matte finish.

Correction: U.S. Navy Sea Blue, was incorrectly listed as FS35402 by Pettit. It should have been FS35042. The complete formula was listed on page 100 of our November '82 issue.

MORE ON THE G-MARK

Tony Recht, Van Nuys, California, has some comments to add to those of Don Stephens on the G-Mark .03 engine ("Workbench" column, May '83 issue).

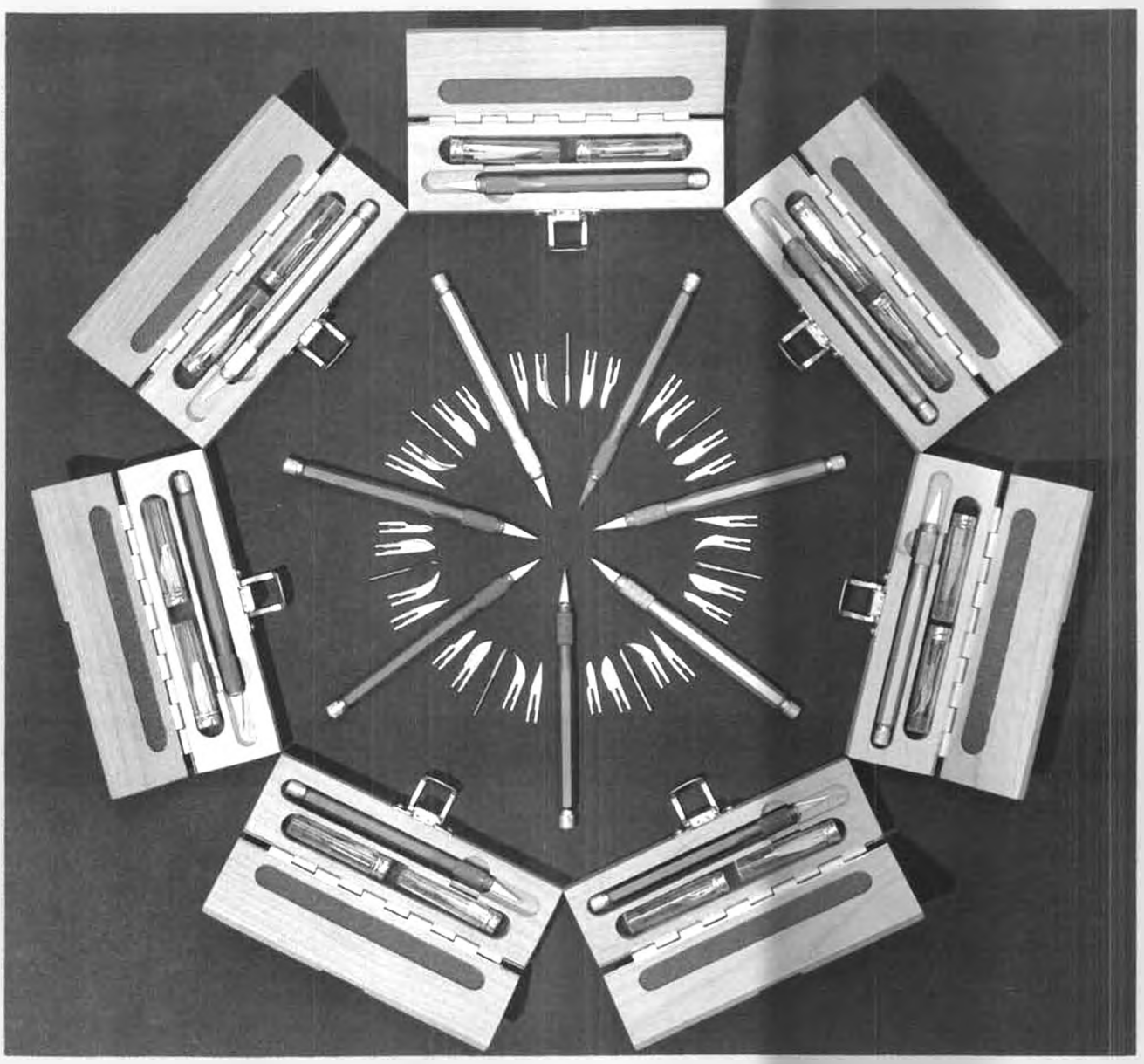
"This note is probably unnecessary as you probably realize the 'cracking' referred to is most likely 'pre-ignition'. The loosening head is from excess heat, causing the glow head to 'grow'. When the engine cools (head 'shrinks') it works loose.

"Small motors run lean (bad needle adjustment or dirt in the fuel, and thus in the carb) will produce this phenomenon. Occasionally a motor is produced with tolerances 'ganged' on the short side such that compression is a little high. Washers (shims) may be installed as Stephen suggests (which will slightly alter induction timing) or they may be placed under the glow head (extra gaskets), thus reducing compression and improving the idle.

"One point I've observed that should be mentioned, is to ensure that the plastic 'air intake' (into which the carb fits) is in line with the cylinder. A loose air intake may rotate clockwise (against prop rotation), thus altering induction timing! Anyway, I love the G-Mark .03. An occasional de-varnishing keeps it running like new."

Thanks for your input, Tony, and the most amazing part of it is that you put *all* of that copy on one side of a 13-cent postcard!! If you had a regular piece of 8-1/2 x 11 writing paper, you could give Joe Klause a month off! •

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



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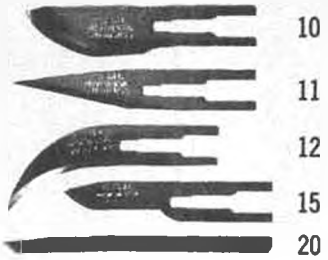

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