

MODEL BUILDER

ICD 08545

DECEMBER 1982

\$2.50

volume 12, number 131





Staggerwing Beech
1/5 scale



Christen Eagle II
1/3 scale

Recognized for Quality
THE WORLD OVER



F-86 Sabre Jet
Avail. in D & H
models (ducted fan)
1/8 scale

General information about
these new product re-
leases found in catalog.



Kfir
1/7 scale

**NEW
for '82**



P-51 Mustang
1/5 scale



A-36 Beech
1/6 scale



A-4 Skyhawk (ducted fan)
1/7 scale



F-16 (ducted fan)
1/8 scale



MiG-15 (ducted fan)
1/6 scale



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Byro-Jet ducted fan
(for .60 engines)



F-33A Beechcraft
1/6 scale



Pitts Special
1/3 scale



Beech Baron 58
1/6 scale



T-34C Mentor
1/6 scale



Mirage (ducted fan)
1/7 scale



CAP 21
1/4 scale

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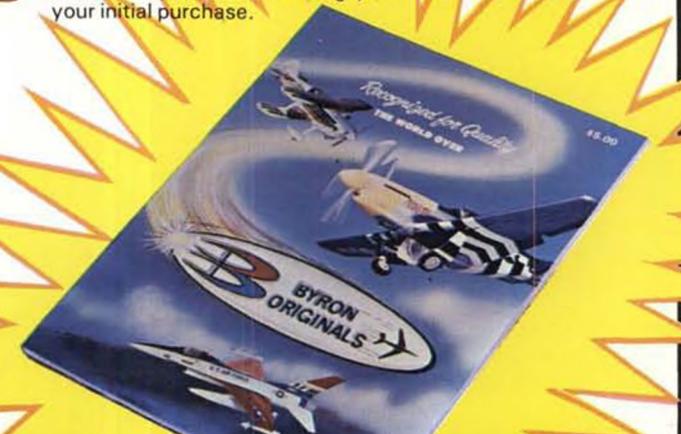
For complete product line information, send \$5.00 for our new comprehensive catalog. It's full of color and B/W photos, drawings, product reviews and all the pertinent technical information you need. Catalog price will be credited towards your initial purchase.

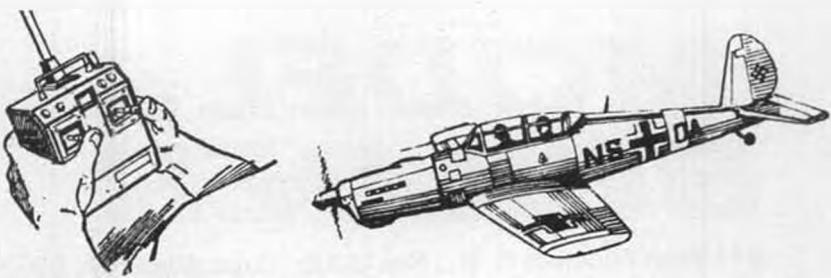
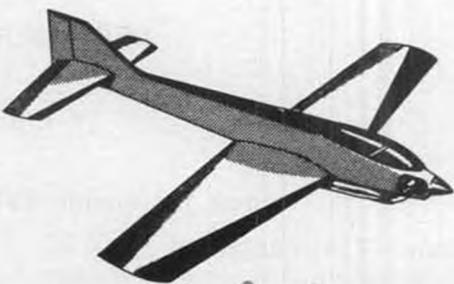
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Ida Grove, Iowa 51445,
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ADMISSION: Adult admission is \$3.50 per day, \$2.25 for Juniors (under 18). Weekend passes \$5.00 adult or \$3.00 Junior. Children under 9 admitted free when accompanied by an adult. Discount tickets woth 50¢ available at most hobby shops within 500 mile radius of Pasadena.

STATIC MODEL COMPETITION: Entry is free, open to all ages, no limit on number of categories entered, but one entry per category. Trophies and ribbons awarded in over 40 categories. Complete competition rules at your local hobby shop, or write/phone IMS headquarters.

SWAP SHOP: Bring your saleable items to the Swap Shop area. NO DEALERS, PLEASE! Rent a whole table for \$5.00 or half a table for \$2.50, in addition to general admission. You are responsible for conducting your own sales. IMS not responsible for lost or stolen articles.

*SWAP SHOP!
*GIANT RAFFLE!

GIANT RAFFLE: Radio control systems, kits, engines, etc. will be raffled off Sunday afternoon. Tickets on sale during show. You need not be present to win.

621 West Nineteenth St., Box 10335, Costa Mesa, CA 92627-0132 Phone: (714) 645-8830

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Cover: "Cigars, cigarettes, transmitters . . . ?" Connie Stafko, 18, models the latest fashion in R/C car/boat control systems; Eloy Marez's Ace Silver Series transmitter in a Kraft tray holder. How-to-build-it begins on page 29. The dual electric outboard boat is the Casablanca, by Kyosho, from Condor Hobbies; the vehicle is the 1/12-scale FMC XR311, from MRC/TAMIYA; and Connie is a deluxe model from Corona, California. The Kodachrome 35mm transparency was taken by Eloy Marez.

Below Connie is the Griffin III, a "full-house" (rudder, elevator, aileron, and throttle) R/C sport model which spans only 28 inches! It represents the smaller half of a two-in-one construction article by Bill Cannon, Cannon R/C Systems, and quite logically, is designed around his Super-Micro radio and the .03 G-Mark R/C engine. The larger half of the article is for the .06 powered, 36" version, for which plans are also available, although not shown with the article, which begins on page 18. Photo by Bill Cannon.

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It takes great servos to make a great system. Servos that can perform to the demands of today's sophisticated models.

Our new Precision servos use electronics so advanced and

 miniaturized, it takes a special computer to assemble the board.

We design and develop our very own integrated circuits for optimum resolution and minimum drain.

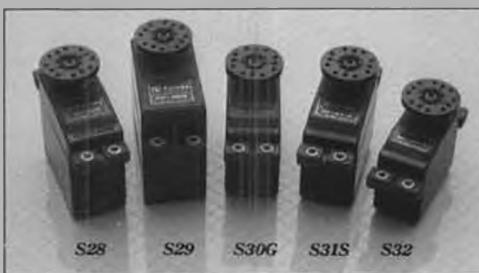
For extra reliability, there are long-life, sealed potentiometers, with Isopot protection, triple-segment wipers and rotary carbon center contacts.

Then we top our servos off with silky-smooth, super-tough

precision gears. Cold-molded from special resin, they make lash a thing of the past.

Even the case is unique. Molded to strict tolerances from glass-filled PBT, the Futaba case provides perfect alignment and superior protection.

And those are just the standard features that make these the most reliable, responsive, accurate and efficient Futaba servos ever.



	S28	S29	S30	S30G	S31S	S31SH	S32
Height:	1.59	1.71	1.36	1.36	1.40	1.40	1.20
Width:	0.91	0.91	0.77	0.77	0.79	0.79	0.71
Length:	1.71	1.71	1.52	1.52	1.59	1.59	1.46
Weight: ¹	1.86	2.10	1.47	1.47	1.75	1.72	1.13
Transit: ²	0.24	0.25	0.24	0.34	0.22	0.16	0.16
Torque: ³	41.7	48.7	55.6	65.3	69.5	44.5	33.4

¹ weight in ounces ² transit time for sec/60° ³ torque in oz/in.

Ball bearing, coreless motor, reverse action and high-speed versions are also available.



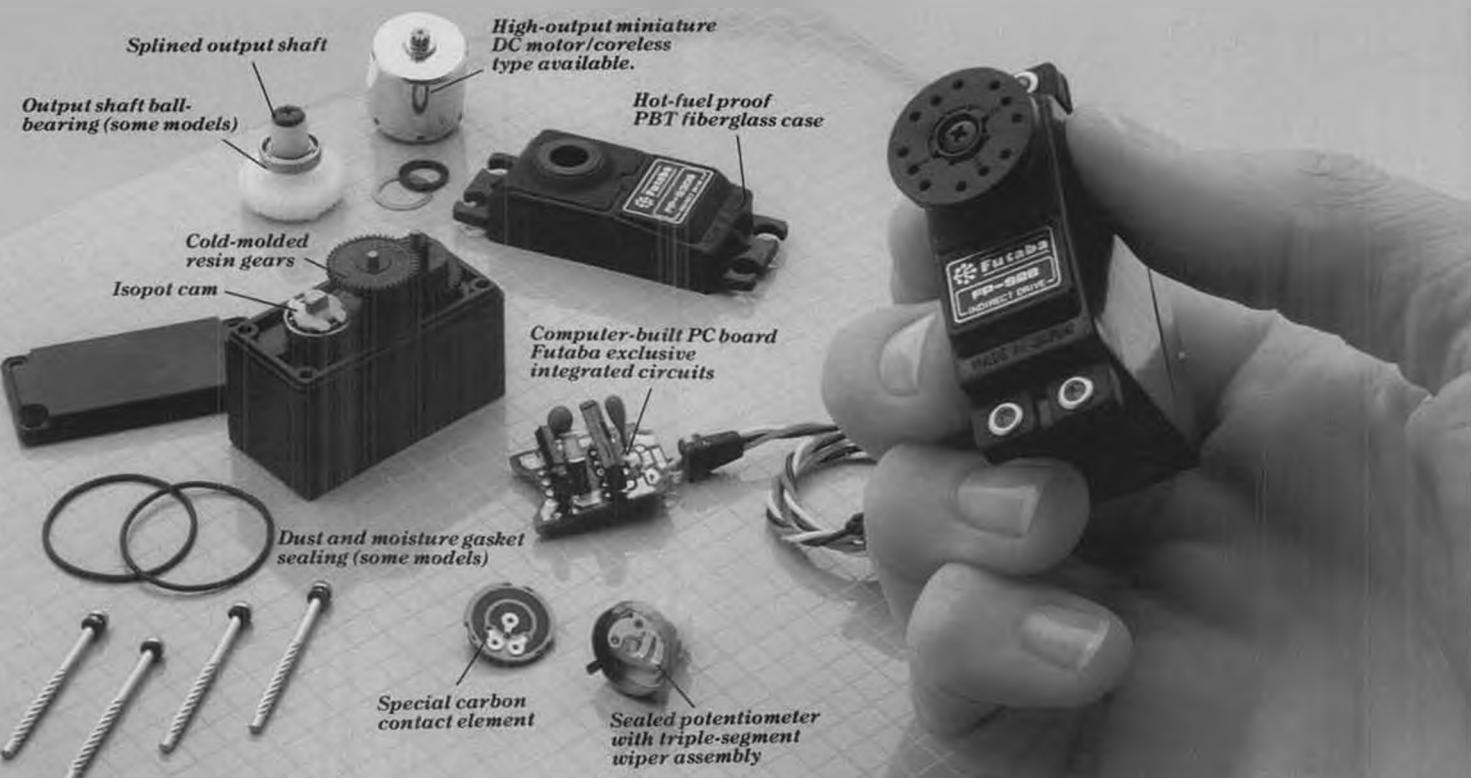
New R4H
micro receiver
1.26" x 2.05"
x .77"/1.19 oz.

In fact, Futaba has a Precision servo for every kind of RC application. Because Futaba systems deserve the best.

Futaba

555 West Victoria Street/Compton, CA 90220

We've got a Great Deadband and super resolution for a total absence of slop.

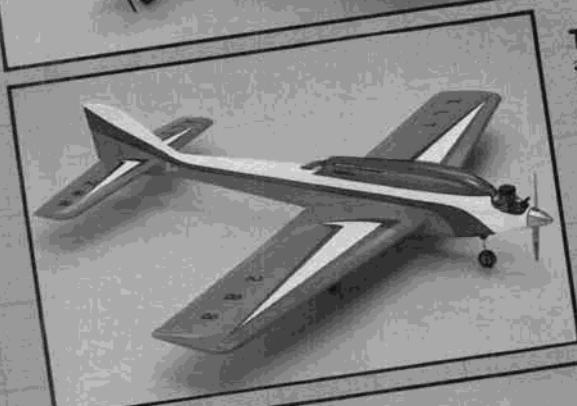
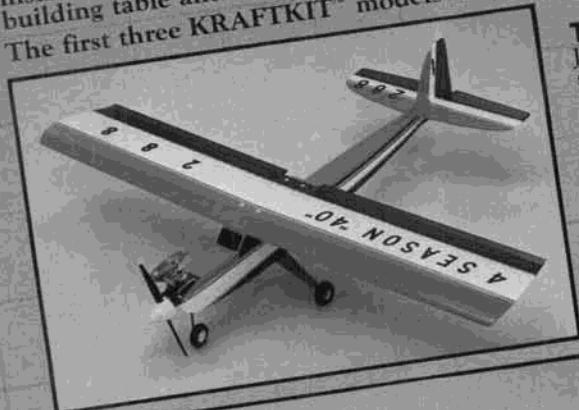


Introducing KRAFTKIT

Designed by *Joe Bridi*

Ask the experts at your local R/C flying site about Joe Bridi aircraft designs. They will probably tell you how they learned to fly R/C on a Bridi designed trainer, or how they won a pattern or scale contest with a Bridi design.

KRAFTKIT™ continues this tradition with an all new line of R/C kits designed by Joe Bridi. Each quality kit contains precision, machine cut and sanded balsa, plywood, and hardwood parts. You will also find high quality Kraft hardware packages, including Kraft motor mounts. Detailed parts, You will find instructions, and full size plans allow the beginner and the expert alike, to get the model from the building table and into the air quickly. The first three KRAFTKIT™ models are on your dealers shelves right now, and more are coming soon.



THE FOUR SEASONS 40

Joe Bridi's approach to R/C fun flying. Its design allows the modeler with some experience to get through construction and a flight training program with very little difficulty. The FOUR SEASONS 40 is also an aircraft you can grow into; its symmetrical airfoil makes this a real performer when you become a more experienced pilot.

Wing Span.....
Length.....
Wing Area.....
Recommended Engines.....
Suggested Retail Price \$64.95

58 inches
49 inches
615 square inches
25 thru 45 cubic inch
Part No. 004-046

THE XLT—Joe Bridi is an expert pattern flyer and this XLT pattern aircraft is the culmination of his experience at competitions on the national level. The XLT is designed for tuned pipe, rear exhaust on the pipe. This aircraft is great for the installation of Kraft electrical retracts. For a pattern aircraft that is engineered for precision flying, buy the XLT.

Wing Span.....
Length.....
Wing Area.....
Recommended Engine.....
Suggested Retail Price \$119.95

65 inches
65 inches
845 square inches
.60 cubic inch
Part No. 004-047

THE WIND SURFER—Joe Bridi designed this new 2 meter sailplane to be light and strong. Constructed of machine cut balsa, and hardwood, the WIND SURFER can take the stress of towing, high starts and aerobatics. Its large forward compartment makes radio installation simple. A clear canopy provides a touch of realism and stabilizer allows easy transportation to the nearest thermal.

Wing Span.....
Length.....
Wing Area.....
Airfoil.....
Suggested Retail Price \$46.95

78½ inches
42½ inches
544 square inches
Flat Bottom Highlift
Part No. 004-048

Ask for these KRAFTKIT™ designs at your favorite R/C hobby dealer.
Kraft Systems Company, Division of Carlisle Corp., 450 W. California Ave. Vista, Ca 92083,
(714) 724-7146 TWX 910-322-147



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K&B
.61 R/C

at your hobby shop
only **\$99.50**

The NEW K&B .61R/C for only \$99.50!!! You can't afford to pass it up. This popular engine designed for Sport Pattern and Scale is an all-around, top performer in its class. With the modifications it is even more durable and dependable. Modifications include: NEW K&B all metal Carburetor • NEW Crankcase with tapered

Collet-type Prop Driver and • K&B's own Super Bearing (rear only). It still incorporates the "Squish band" Head and the unusually quiet "bolt-on" muffler fitted with a pressure top. To be sure you're an outstanding performer when you're flying... **power your plane with the new K&B .61R/C.**



K&B MANUFACTURING
12152 WOODRUFF AVE., DOWNEY, CA. 90241



**from
Bill
Northrop's
workbench**

• • •

As the hoped-for time draws nearer for the FCC to legalize additional frequencies for radio control hobby use, modelers in many parts of the country are nervously watching the ever-increasing loss of otherwise useful frequencies to industrial users, primarily paging systems.

The idea is, that with a whole bunch of frequencies available to us, we should, in any given area, be able to find some unused frequencies for operating radio control systems. One problem is, that as each new paging system comes on the air, another R/C frequency choice is eliminated. As the paging systems increase, particularly around major metropolitan areas, the R/C frequency choice gets smaller and smaller.

Another problem, and a major one, is that no rapid means of notifying modelers and hobby dealers about the assignment of frequencies to industrial users, has been developed. For example...

After talking with Boeing R/C Club member, Dave Katagiri, in the Seattle, Washington area, and learning about the frequency problem there, we asked for and received the following:

Bill Northrop:
Dave Katagiri, who is currently President of our Boeing R/C Club, asked me to pass on some information we have recently discovered concerning the utilization of our currently assigned R/C frequencies in the greater Seattle area. We stumbled onto this quite by accident on May 2nd during a sanctioned F-500 race, when our frequency monitor picked up audio on 72.96 mhz. Since then, we have learned that a commercial paging company in Seattle is authorized



MB's Editor with Bruce Godbersen in the "Mold Storage Room" at Byron Originals, Ida Grove, Iowa. Yes, that's the Staggerwing Beech fuselage mold between us. We were there for the IMAA Fun-Fly Festival. More about it beginning on page 11.

to operate on 72.96. The disconcerting part of our discovery is that it is very likely that within one to one and a half years, the remaining R/C frequencies in the Seattle area will also be authorized by the FCC for commercial usage.

We have prepared the enclosure for release to all of our local newsletters and affected organizations, and feel it may be of general interest to all U.S. R/C users.

Frankly, Bill, we are somewhat surprised that this information has not surfaced prior to now. But, on the other hand, we may just be seeing the beginning of a major problem yet to face us. It is only too obvious as to the magnitude of the problem this presents right now to manufacturers, dealers, etc.

Sincerely,
D.L. Connell
Boeing Hawks Safety Officer

The enclosure referred to above, is as follows:

The greater Seattle area discovered quite suddenly, on 2 May 1982, that a commercial paging company had been authorized by the FCC to operate a transmitter and five relay stations on the 72.96 mhz frequency. The paging company transmits 5 watts of power omnidirectionally, utilizing the new simulcast technology. This is no real surprise in that the AMA has always been aware of the fact that authorized commercial usage could (and would) take precedence over hobby users. Nevertheless, 72.96 is a frequency that can no longer be used by aircraft in the Seattle area.

A communications engineering company spokesman informed Seattle AMA officials that the opening up of frequencies in frequency ranges adjacent to hobby frequencies by the FCC a few years ago has induced the investment of risk capital in the commercial communications for usage on model frequencies. He went on to report that frequency searches are now underway by many

companies that want to enter this very lucrative and competitive field from all over the U.S.

This spokesman predicts that the remaining five R/C frequencies will, in all likelihood, be authorized for commercial usage within one to one and a half years in the Seattle area. This, of course, would completely negate any advantage to share existing frequencies for the next five years under the FCC's new proposed rules change.

The implications of this expanded commerical activity cannot be unique in Western Washington, and the near term immediate problems this expansion poses, especially by the end of 1982, could be far reaching.

It is imperative that AMA establish a means of instant communication to all R/C clubs in the U.S., so that immediate notification of frequency assignments in a given area may get to all modelers in that area. And because many hobby dealers are either unaware or are unconcerned about it, modelers should at least try to inform their local dealers about recent frequency losses, so that no more radios on the "dead" frequencies will be sold to unsuspecting customers.

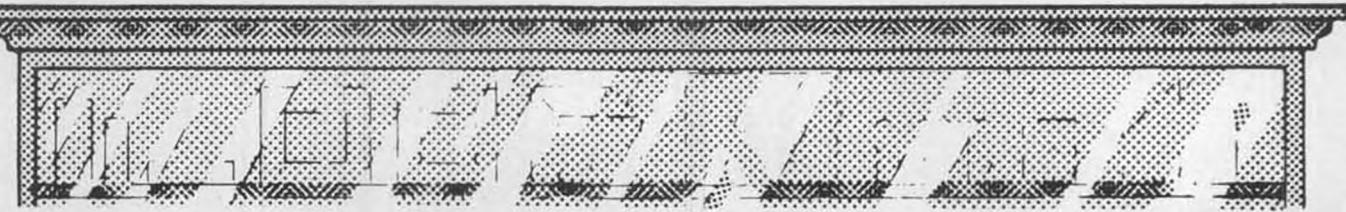
PLAN SEARCH

Sometime back in the '60s, we believe, when Ace Radio Control was publishing its magazine "Grid Leaks," there appeared a set of plans for a Golden Era biplane, the Krieder Reisner. The version shown had constant-chord wings. Full-size plans were available for the model, and I obtained a set. Off and on over the past year or two, I have searched in vain for this plan.

If someone out there has this plan, I'd like to borrow it long enough to make a copy. Drop me a note if you have it, but don't send the plan. If I get too many, it becomes a burden to return them. If you

Continued on page 70

OVER THE COUNTER



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

- The gang at Kraft Systems has been busier than one-armed paper hangers, turning out new products for the radio control modeler.

In the radio department, there's the five-channel KP5K system, with two full-range, externally adjustable, dual rate switches for variable aileron and elevator control sensitivity. The transmitter's modular RF section permits quick and painless frequency conversion when the new frequencies are authorized by the FCC. Four channels are on two-stick controls, while the fifth channel is switch operated for flaps, retracts, etc. Including double-tuned miniature receiver with plug-in crystal, all NiCd power with LED charger, four KPS-21K servos with carbon button wiper pots and five-pole motors, it's quite a bargain at \$279.95.

Already the most popular transmitter at any R/C car activity you attend, and a sure bet to do equally as well at any power boat pond, is the new KPT3KW/B "Staple Gun" unit. It's available in a complete system with two KPS-23K servos, and KPR-3KW receiver, for \$219.95. However, the car nuts who are really into rough-and-ready racing prefer the Kraft "Car Pack" air...er...groundborne system featuring Bob Novak's bullet-proof receiver and servos. This pack sells for \$169.95, and then you can buy the "Staple Gun" transmitter alone for \$119.95.

The "Gun" features C.V.S.S. (continuously variable steering sensitivity), adjustable exponential on steering and throttle, end-point adjustments on



Kraft KP5K R/C system.



Kraft KP3KW "Staple Gun" car/boat radio.



Kraft fuel tank holds 24 ounces.

are some non-radio items that are now available from 450 W. California Ave., Box 1268, Vista, CA 92083.

If you have a real thirsty glow, gas, or diesel engine in your big model, or you just like to hog your frequency when



Kraftkit Four Seasons "40".



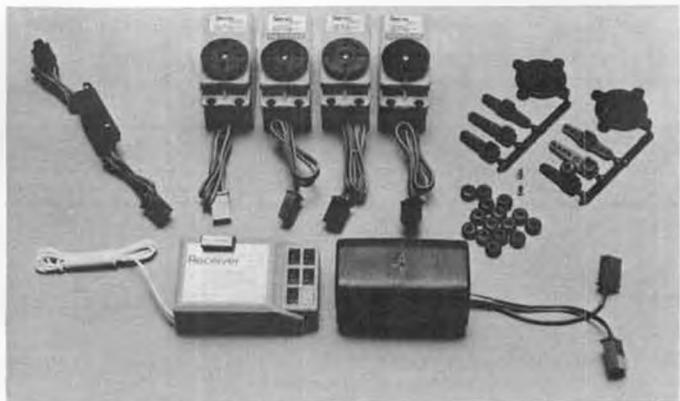
Kraftkit "Wind Surfer".



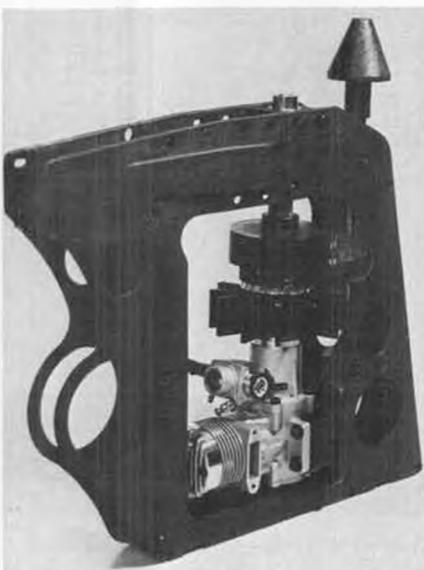
Kraftkit "XLT".



Kraft KAP-6 airborne system.



Kraft KAP-4 airborne system.



Cone-starter add-on for Mantis and SuperMantis, by American R/C Helicopter.

you get the chance, Kraft now has a 24 ounce fuel tank! In the well-known "Lantern-Jaw" shape, this tank measures 2.57 inches high, by 3.14 inches wide, by 7.56 inches long, and weighs 3.8 ounces empty. Price is \$6.49.

At Toledo this year, three model aircraft were suspended over the Kraft booths. These were the first of a new line of kits being introduced by the company, in conjunction with Joe Bridi, whose former line of model kits were well



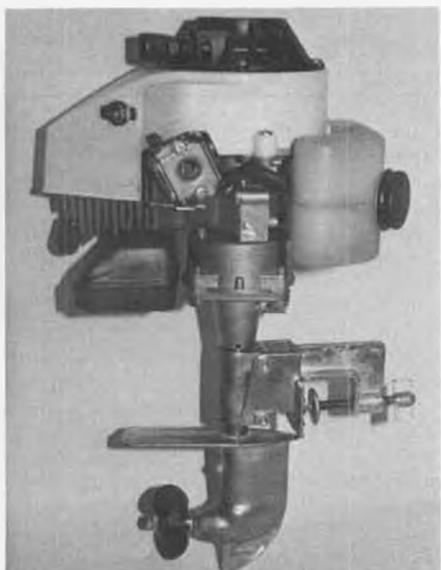
Taibi's 1/2A Spacer, by Campbell's Custom Kits.



New "Hot-Wind" armature for Astro 10 electric motor.

known all over the world and are now marketed by Great Planes.

The new Kraft kits include the "Wind Surfer," a two-meter size sailplane; the "XLT," a large size contemporary pattern bird for FAI and AMA competition; and the "4-Seasons 40," a cabin-type, semi-symmetrical winged, intermediate sport/trainer ship. Prices are \$46.95,

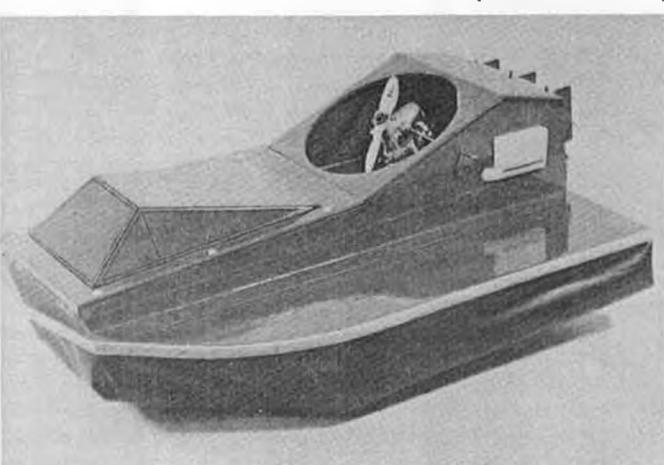


Outboard motor with Quadra power, from J-5 Enterprises.

\$119.95, and \$64.95 respectively. Take a look at this month's Kraft ad for more information.

★ ★ ★

American R/C Helicopters, Inc., 635-11 North Twin Oaks Valley Rd., San Marcos, CA 92069, (714) 744-7533, is now offering a cone start system for its Mantis and SuperMantis helicopters. This device permits use of a normal spinner cup on your electric starter, obviously



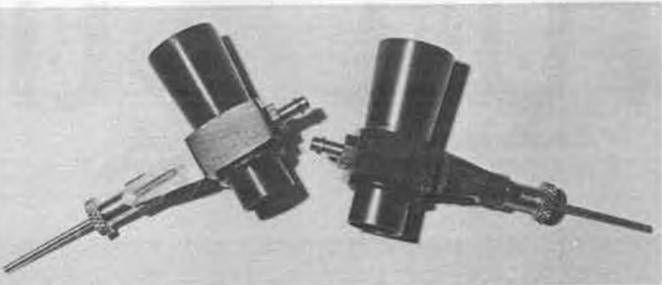
Venture Aero-Marine Hovercraft line available again from Adventure Model Craft.



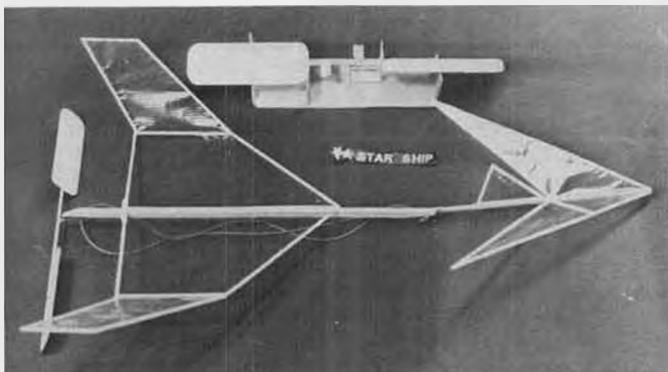
MRC-Tamiya "Blazing Blazer" 4-wheel drive off-road vehicle.



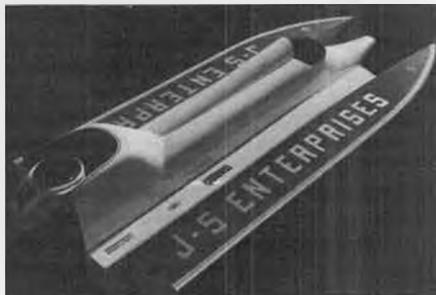
Cowls for large Pilot kit line, by T&D Fiberglass.



Venturi for K&B 7.5 Outboard, from R-C B. Products.



The "Star Ship", from Indoor Model Supply.



Giant Outboard Tunnel hull, from J-S Enterprises.

eliminating the somewhat awkward belt-type system.

The non-drag cone start system needs no special extension, and is easily installed in about two hours. No special tools required for installation. Price is \$54.95.

★ ★ ★

The Chevrolet "Blazing Blazer" is MRC-TAMIYA's latest 1/10 scale, four-

wheel drive, R/C off-road electric vehicle. Paddle type treads on the tires were designed for excellent gripping in soft sand, with sponge inserts for more shock damping. All parts of chassis are metal, including duraluminum ladder frame, stainless steel leaf springs, die-cast axle housings, and brass universal joints. Mounting points are provided for optional shock dampers.

The Blazer features a servo-controlled three-speed transmission that is factory assembled. Driver can shift gears and select two or four-wheel drive while on the move. Front wheel hubs can be locked and unlocked by hand as on the prototype 4x4's.

The R/C and battery compartments are sealed from all terrain and weather conditions. The servo operated speed control provides three speeds forward or reverse.

For more information on the Blazer, contact Frank Ritota at MRC, 2500

Woodbridge Ave., Box 267, Edison, NJ 08817, (201) 985-7800.

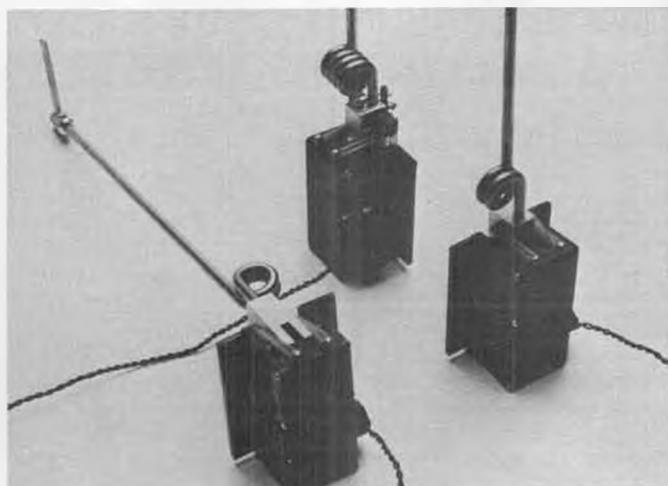
★ ★ ★

The "Star Ship," by Indoor Model Supply, Box C, Garberville, CA 95440, (707) 923-3500, is a beginner's 10-inch span pusher canard for outdoor, but mostly indoor, duration. The kit is very complete, including select indoor quality balsa, mini washers, tiny formed double prop shaft bearing, super light covering, Pirelli rubber, prop alignment jig, and step-by-step illustrated plans. Finished model weighs a whole 1/20 of an ounce!

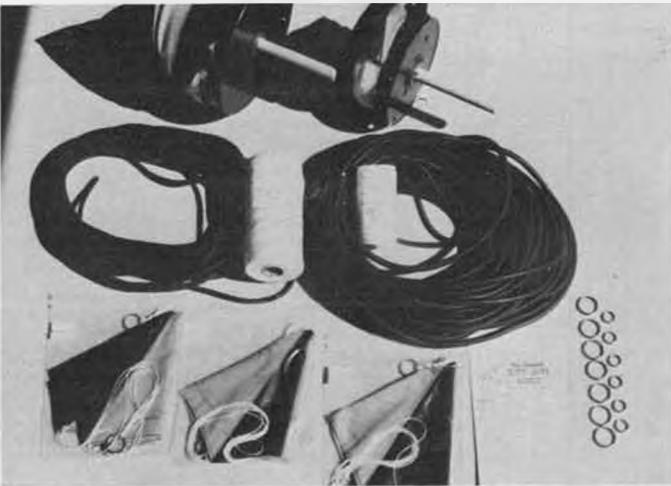
Model Builder readers can receive a free 16-page catalogue listing all sorts of kits and supplies by sending \$3.95 for the Star Ship kit plus \$1.05 for box, postage, and handling (\$5.00 total). Be sure to tell Lew Gitlow that Model Builder sent ya.

★ ★ ★

Continued on page 70



Extra Heavy Duty retracts for biggies, from Giezendanner USA.



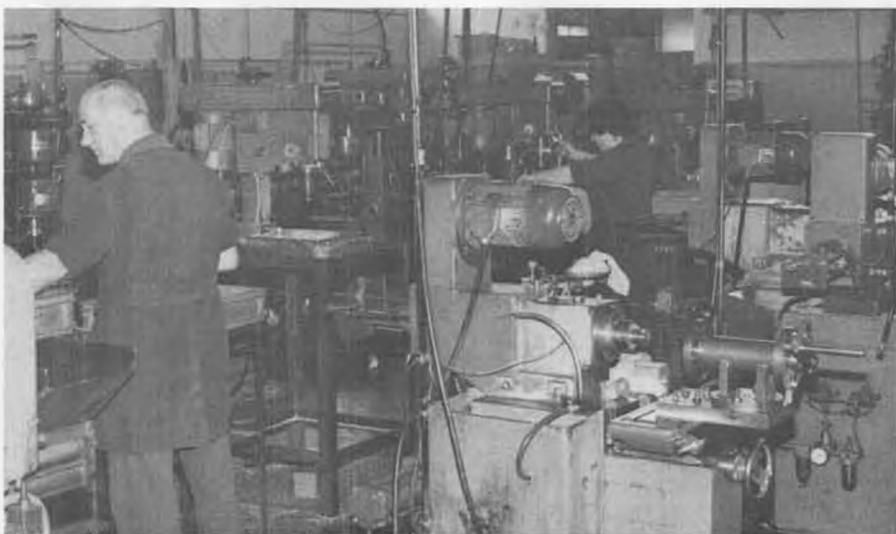
Variety of hi-start equipment from Kitty Hawk Models.

FUEL LINES



JOE KLAUSE

P. O. Box 2699
Laguna Hills, CA 92653



General view within the Super Tigre factory. Obviously, it's quite large.

• A few months ago, on a beautiful day, I had the pleasure of driving from Venice to Florence, Italy. Along the way, about 50 miles north of Florence, is the ancient Etruscan city of Bologna. Naturally, renaissance art is an important part of its culture, but it might also be noted that a certain sandwich delicacy also was originated here. You guessed it, that most popular U.S. luncheon meat, which we call baloney, was invented here.

What's that got to do with fuel or engine? Guys, I happen to have an answer for you. Quite nearby to Bologna, there just happens to be a factory . . . a Super Tigre factory! Now, you well know that I couldn't pass up an opportunity to visit such a premier model engine company . . . and I didn't.

Sometime prior, I had written a letter to Mr. Jaures Garofali, the president and owner of Super Tigre. I simply asked his

indulgence for a visit. On arrival, I received a warm welcome. Then, for the next several hours, Mr. Garofali patiently and meticulously explained and demonstrated how Super Tigre engines are produced. I was most impressed! For example, all significant administrative business functions have been computerized. In an accompanying photograph, you can see Mr. Garofali pointing, with justifiable pride, to a video display unit. Great for expediting the paper work! But, how about the important things, such as the engines? Guys, I am not given to exaggeration. But, simply said, Super Tigre is a most modern manufacturer. All operations that can be economically and feasibly accomplished on computer, numerically controlled machines, are done that way. Many other operations have dedicated machinery. For example, a basic die-cast carburetor body is installed in a fixture.



Mr. Super Tigre, Jaures Garofali, with Model Builder opened to the "Fuel Lines" column. He might be saying, "Joe, surely you can do better than this!"



An automatic screw machine. It's complex and precise. Fascinating to watch.

About six automatic operations later, a complete carburetor body is removed from the fixture . . . all machining, drilling, and tapping, etc., having been completed. That's professionalism.

It is also important to note that Mr. Garofali constantly strives to develop new techniques for extraordinary quality. In this regard, I was fascinated by his three new ultra-precision internal and external diameter grinding

Continued on page 72



Another multiple operation machine. This one machines crankcases, attended by skilled female operator.



In the area where quality control inspectors check partially completed engines.



Al Feeley and Arlie Kline built this Stinson Model "U" from plans by Fred Kouka, in eight months. At 3" scale, it spans 16-1/2 feet, weighs 99-1/2 lbs., two Quadras, one 2.4 Kioritz. Two radios, Super Coverite, enamel, seven flights, red and blue. They're from Jacksonville, Florida.

IMAA / IDA GROVE FUN-FLY FESTIVAL

By BILL NORTHRUP . . . IMAA's Second Annual Fun Fly Festival could also be called "Byron's Big Bird Bonanza", as it was both of these rolled into one. Ida Grove, Iowa has only one year to recover . . .

• Two weeks after returning from the IMAA Fun Fly Festival in Ida Grove, Iowa, home of Byron Originals, the hosts for this historic occasion, I finally had the opportunity to see for the first time, flights of some of the more spectacular model aircraft in attendance . . . on VHS tape, recorded by Randy Bloom, of San Clemente, California.

This is one way of pointing out that the Festival was like a multi-ring circus, and it was almost impossible to take in everything that was going on . . . hundreds of beautiful scale models to look at . . . as many as seven in the air at any one time . . . historic World War II

aircraft to walk around, touch, and photograph . . . spectacular low altitude fly-bys of these and some classic, Golden Era aircraft, including the EAA's replica "Spirit of St. Louis" . . . a huge tent full of manufacturers/exhibitors showing the latest in modeling equipment . . . tours of the Byron Originals Factory . . . tons of barbecued beef, being cooked outside, within smelling distance of everyone . . . close-in and relaxing, smooth, precision aerobatics by Duane Cole in his clipped-wing Taylorcraft, and more spectacular, smoke-enhanced, aerial stunts by Joe Schumacker, in his Christen Eagle . . . plus meeting and reminiscing with many old acquaintances.

The only way to tell it all without becoming incoherent, is to take it one item at a time.

THE TOWN

Ida Grove and its less-than-2500 residents, is located at the far west end of Iowa, about halfway between the state's north and south borders. Sioux City is one hour's drive northwest, and Omaha, Nebraska is about two hour's drive almost directly south. All of this driving is on mile after mile of straight-as-an-arrow, two-lane highways connecting other small Iowa farm towns. We ain't



The two "Downstairs gods" . . . Byron Godbersen and Don Godfrey, representing Ida Grove and IMAA respectively. Good news . . . It's on again for next year.

never going to be out of corn!
GETTING THERE

Unless you fly privately to Ida Grove's municipal airport, with its 3000 foot paved runway, getting there by plane means flying either to Omaha or Sioux City commercially, and then renting a car. We (Anita and I) flew directly from LAX to Omaha non-stop on United, and were fortunate to catch a weekend special National car rental for \$18.95 per day (as long as we returned the car by noon, Monday . . . which we did!).

As predicted by Bruce Godbersen, the drive from Omaha was relaxing and pleasant . . . lots of rolling, green countryside, and absolutely straight roads that made passing (if there was anyone to pass) very easy.



Douglas "Skyraider" makes a pass during Warbird demonstration.



The EAA's "Spirit of St. Louis" passes in review. It would still be an amazing flight . . .



Brrrr! The chilly chow line for breakfast at about 7:30 am. Wind 15 knots, temperature about 65, and look at the guy in shorts . . . just like me behind the camera! Byron hangar.



Shots of the pit areas show an interesting variety of giant model aircraft. Most are scale, about half from kits, half from plans or scratch designs.

ACCOMMODATIONS

Probably the only weak point about having a large gathering of outsiders for a big weekend in Ida Grove, is the lack of nearby motels. There is only one small motel in Ida Grove, and all others are at least a half-hour away in other towns.

Remember that with about 40 to 50 industry exhibitors, plus over 380 registered modelers, plus their families, there had to be well over a thousand people who came to stay through the weekend. And there was very little time between the end of daily activities and the beginning of the evening picnic (Friday) and banquet (Saturday). What you put on in the morning, you wore till you went to bed that night!

THE FACILITY

The festival site was located on the vast acreage belonging to the Godbersen family, including homes of Byron and LaJune Godbersen, and their sons, daughters, and in-laws. Lake LaJune is next to the airport, which also includes an airport hangar built to resemble a medieval castle. And on the lake floats a half-scale replica of the H.M.S. Bounty.

The model flying field, pit areas, exhibitor tents, concessions, and parking facilities were all located on the crest of a hill overlooking the airport, lake, and the town, about two miles away. The entrance to all of this, from the highway leading to town, is a huge concrete arch (big enough to accommodate about

four 18-wheel tractor trailers side-by-side) with a castle-like tower at each end.

THE SCHEDULE

With so many things going on at the festival, it's obvious that a pretty tight schedule had to be maintained.

Friday started with a buffet breakfast at the Midwest Hangar, 7:30 to 10:00 a.m. At 9:00 a.m. the main gates opened for spectators, who were charged \$4.00 per head; 12 years and under, \$2.00. Also at 9:00 a.m., the manufacturer exhibits opened. And registered pilots could start flying their models at 9:00 until 12:00 noon.

At noon, there were special opening ceremonies, including singing of the



Highly detailed Fly Baby Bipe by Rick Quintan, Blue Mound, Ill. Smoke, 30 pounds.



Blue and white Waco CTO from MB plans (Nov. '81) by Phil Maxwell, Wheeling, West Virginia. Powered by 3.15 Kawasaki.



How about this, Don Foster, Gee Bee Line? A 25-pound, Quadra powered Dreamer. Has been flying for two years.

national anthem, and a short address by Iowa's Governor Bob Ray. From 12:30 to 1:00 p.m. there was a special demonstration of Byron Originals aircraft followed by registered pilot fun-flying until 3:00 p.m. From 3:00 p.m. until 4:15, the full-scale aircraft took over, with fly-bys of the Warbirds, and aerobatics by the Christen Eagle and Taylorcraft. Skydivers also got into the act.

Fun-flying again took over at 4:15 p.m. until 6:00 p.m., while the spectator ticket sales closed at 5:00 and the exhibits closed at 5:30. Just in case you thought you could catch a breath, the R/C pilots and exhibitors' picnic started at 6:00 p.m. until 8:30, followed by fireworks at 9:00 p.m.

When we spotted the long line forming for the picnic, we opted for the Orchid Room Restaurant, remembering the super steaks from the night before. We were not alone, counting at least 30 or 40 others enjoying a leisurely sit-down dinner. Just spoiled . . . I guess.



Nice looking Bearcat in the pits.



There were actually two of these Mitsubishi A5M's. Not sure if from the same plans.

Oh, hot-air balloons were scheduled from 6:00 to 7:00 p.m., but the windy weather might have prevented that . . . we're not sure.

Saturday's schedule was much like Friday's, except for no opening ceremonies, replaced by a half-hour more of fun-flying. And, of course, the banquet procedures began at 6:00 p.m.

As our General Manager was pretty well beat after a day at the exhibitor booth, we hit the Orchid Room again . . . again not alone, and still made it to the banquet with time to spare before Don Godfrey began his stint as emcee

for the evening's activities. We'll leave a full description of that to Don in his own column for M.A.N.

As for Sunday . . . well, Sunday was **supposed** to be like Saturday, except that the whole show was to close down at 6:00 p.m. However, a cold front had other ideas. After moving in and freezing everyone for two days, it decided to start off again on Sunday, complete with

Continued on page 101



F86H Sabre in the lobby of Byron Originals. Retract gear could be operated from small switch box.



Another display area in classy Byron Originals factory lobby. Hidden spotlights on models in arched alcove.



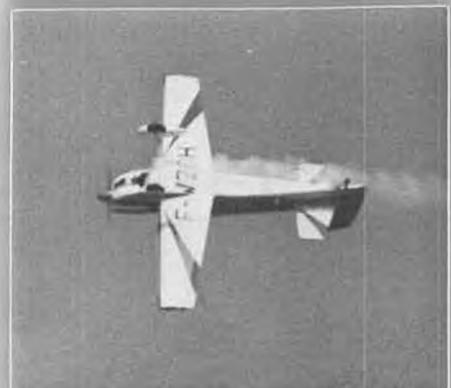
Nice looking Curtiss SB2C on display in pit area at fly-in.



Another view of Stinson "U" airliner. One radio operates Quadras and steerable tail wheel. Other radio operates Kioritz and controls.



Winners at the Scale R/C Championships, from 1st through 5th (l to r): Kent Walters, Don Lien, Art Johnson, Tom Cook, and Garland Hamilton. Johnson's was the only Giant. The P-43 will be a construction feature soon.



Dean Copeland snap-rolled his Byron Originals prototype CAP-21 on every takeoff. Pilot and plane are a real crowd-pleaser.



R/C WORLD

JOHN ELLIOT

The 1982 R/C Scale Masters, or, The Best of the Best!

The professional manner in which this Masters Contest was assembled and conducted was a tribute to the members of the Southern California Scale Squadron. Harris Lee stepped in as CD when Bert Baker earned himself a slot during the regionals. Bert Ayers performed yeoman duty as contest manager. Paper work, tabulation, and a million small details flowed like fine wine, attesting to the skill of the workers involved in making it happen.

In the first ten places were warbirds of two world wars, plus a police action or two! Mechanical options with the hoped-for attendant high scores seemed to be the order of the day. Dean Copeland, flying a prototype CAP 21, had appeared to have 8th spot nailed with some fantastic flying that included a snap-roll on take off. Needless to say, the crowd loved it. Chuck Fuller was another crowd pleaser, performing rolling circles with his big Stearman, as were the fast, low passes of Tom Cook's F4 Phantom. In the final tabulation, Chuck wound up in 8th spot.

The score boards were placed in such

a way that it was possible to follow the drama as it unfolded, with scores being quickly posted after each flight. The contest wasn't wholly decided even well into the 6th round. Pilots and spectators alike appreciated the opportunity for the many flights possible.

As an aside, each of the Master's flyers found a bonus in their contestant's package in the form of a new, crisp \$100 bill to help with the expenses, hopefully to be improved upon for the 1983 R/C Scale Masters.

The final order of 'battle' was as follows: Kent Walters was first with less than a two-point lead over Don Lien and his FW 190. Art Johnson, all the way from Florida, was third with his Republic P-43 (the highest finishing Giant Scale model, and a future MB construction article), and Tom Cook (more on him later) "jetted" into fourth with his F4 Phantom. Garland Hamilton, always a threat, had dorked his Hellcat, but placed fifth with his MK 24 Spitfire, and Jerry Ortego flew his new 'long nose' FW 190 D-9 into sixth. Bob Frey talked and flew his way into seventh place with a well done MK 9 Spitfire while being stalked by the spectacular flying of



Larry Scott's original Waco CTO Taperwing (Nov. '81 MB). Very realistic in flight, therefore not spectacular enough for high points.



The Byron Originals Pitts is still in there! This one flown nicely by Olen Trenary.

Chuck Fuller and his (Giant) PT 17. Mike Mann's F4-U Corsair was ninth, and Jack Aycock netted tenth with his Proctor Nieuport 28. Incidentally, Jack had tied for static honors with Dave Platt and his prototype P-51, both excellent examples of the scale modelers art, at 92 points each!

The Saturday night banquet was an excellent get-together of contestants, judges, officials, and members of industry. After dinner, the efforts of the



Kent Walters' ground support equipment includes a steel shop tool model stand and one, large field box bucket!



Joe Dolan, with his Balsa U.S.A. Fly-Baby Bipe.

people involved in bringing this Masters Class competition together were recognized. During the days activities, all of the flyers were asked to vote for a special award, called "Pilot's Choice." The huge trophy was presented to Tom Cook's F4 Phantom, and it was obvious that Tom was quite moved by this honor. During a second test flight late Friday afternoon after static judging had been completed, Tom had the misfortune of having his R/C actuated canopies open up, causing the Phantom to become uncontrollable and crash heavily, with much damage. Scale Squadron members gathered up the bits and pieces, and Tom, with help from Larry Wolfe of Jet Hangar Hobbies, worked until 4 AM Saturday morning, effecting repairs. A quick test flight early Saturday morning had Tom back in the air.

To wind down the banquet, Frank Tiano, the One-Eighth Air Force's answer to Don Rickles, roasted quite a few of the flyers and judges, some not too gently!

After dinner, Harris Lee chaired a meeting of many interested parties regarding the future of the Masters, the integration of "Sport" and "Giant" being of prime interest. After much discussion, it was stated vehemently that the Masters contest was to produce only one overall Masters Champion, not one for each category. R/C Scale Masters class competition is now just that . . . the best of the best in these United States, and, if present plans continue to unfold and materialize, in time it may also become international in scope.

Minimal complaints were heard about static and flight judging during the



Junion meets Pop! The P-47 (Bert Baker) was the highly reknowned offspring of Republic's (Ex-Seversky) first fighter, the P-43 (Art Johnson).



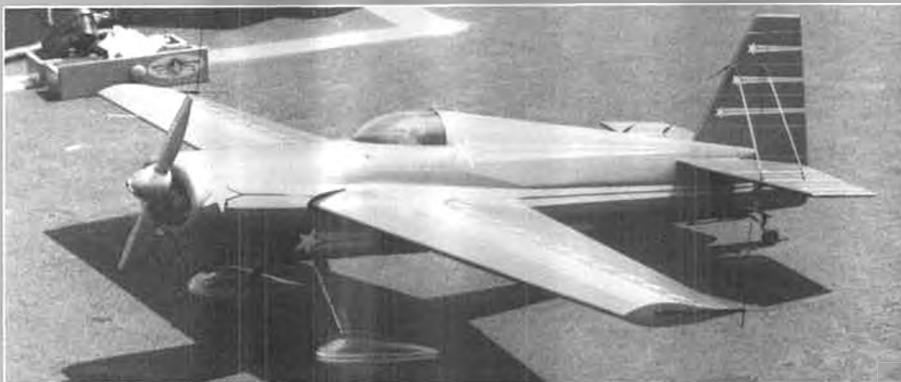
Jack Aycock's Proctor Nieuport 28 tied with Dave Platt's P-51 for highest Static points.



Chuck Fuller's Giant, Kawasaki powered Stearman. He's an expert pilot.

weekend, although many contestants asked for and received inputs about the judging of their models. Along these lines, a few thoughts will be tendered

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One of MB Editor's old DCRC flying buddies, Joe Solko, is campaigning with this beautiful Mallory Models Laser 200.



Art Johnson makes an adjustment on the P-43's left leg. Dropped wing tanks in flight.



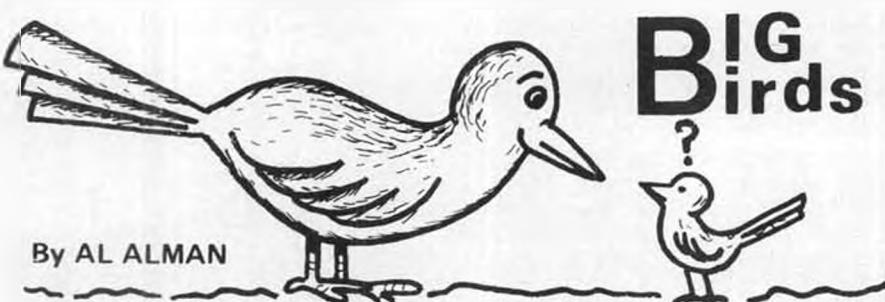
Tom Weemes' Gee Bee model "E". Real pretty!



Dave Platt begins a flight with his prototype P-51. Yes, another P-51, but Dave says this one is right!



Quadra powered Bleriot, by Bud Moix. First in Best of Scale at Little Rock Arkansas Jumbo Fly-In, last spring. Photo by Don Langer.



PREFACE

For you dear, gentle readers, who up to now have been blessed with an orderly and sheltered life, a little explanation is in order: unlike the universally accepted Mode II/Single Stick, where aileron and elevator are on the same (right) stick, the Mode I transmitter features aileron and (of all things) throttle on the right, and elevator and rudder on the left. Mode I fanatics claim this separation of the two primary flight controls allows for more precise input from the pilot, which they swear makes them better flyers.

Not only is there no documentation to back up these heretical statements, but there's reason to believe that some of the more radical groups, like Hawaiians

and Southern Californians, resort to flying BIG Birds via Mode I in a very blatant attempt to attract more tourists. Locals, however, remain unimpressed.

MODE I: THEORY OF EVOLUTION

I have no idea whether the chicken or the egg came first, but, thanks to my 2-1/2 year-old, Adam, I've got the evolution of Mode I nailed down.

This all came about because I get to eyeball a lot of the same quality programming that Adam watches, namely Sesame Street, Vegatable Soup, Electric Company . . . and, of course, the overly benign MisteRogers. In fact, it was a recent MisteRogers show that acutally brought the true story of Mode I to light.

During this particular half hour, Fred Rogers was visiting a local construction

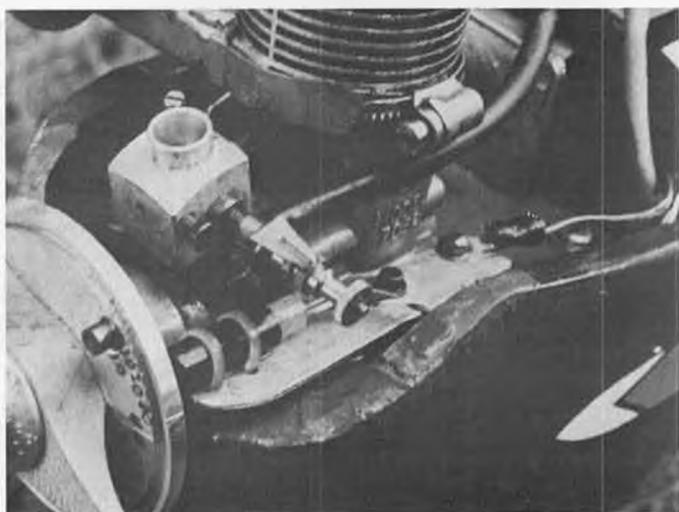
company and having the backhoe explained to him. Understandably, at 0630 I was more interested in my first few cups of coffee than in some scroungy looking backhoe . . . until Fred started to play with the controls. Suddenly I was wide awake and almost knocked the coffee over as I bolted upright in my recliner. Those levers! They reminded me of something, especially the way MisteRogers was bumbling around with them. But what did they remind me of? I felt a faint tugging at my memory strings, but just couldn't pin it down . . . at first.

Then, for a split-second, a picture of fingers trying to manipulate the levers on a ten-channel reed transmitter flashed through my mind. Just as suddenly that image faded . . . and the whole Mode I story came to me in a mind-boggling revelation. In that one blazing instant of truth, I'd become privy to something not even Mode I people were aware of . . .

But with that knowledge came an overpowering feeling of shame . . . because (as you well know) I've never missed a chance to needle Mode I flyers (I've felt that anyone who chooses to be so weird as to fly with ailerons and elevator on separate sticks, was just asking for it). What I hadn't known, till that morning, was that all the time I've been having fun at their expense, these



These backhoe controls set Alman off on an unbelievable expose on the origins of Mode I fliers. See text!



C. H. Electronics CDI System. Works on anything from a .19 on up to a chainsaw engine. Lots more in text.



Al misplaced the caption info on this photo by Don Langer, taken at Arkansas Jumbo Fly-In. MB's Editor guesses it's a trike-gearied, twin-finned Custom Cavalier.

poor unfortunates have not been able to defend themselves. They couldn't "come out of the closet" and be recognized . . . but not because of what they are. No friends, our Mode I brethren have had to bear the humiliation of not knowing how they got to be the way they are . . . so different from us normal stick-twirlers. They've known nothing about their origin, so in a sense had no past . . . and therefore had none of

"our" glorious and colorful traditions to celebrate and to sustain them in time of need. The poor wretches! (Boy-oh-boy! Wait'll Eloy sees this! wcn)

Although the quest to find an answer to "the chicken or the egg" dilemma will probably go on forever, the evolution of Mode I is absurdly simple (some would claim that the evolution is simple, but it's the flyers who are absurd): since backhoes have been around long before

R/C, it stands to reason that Mode I types were either sired by backhoe operators, were backhoe operators themselves, or had families who were very intimately associated with backhoe people up to, and during, their early formative years (in many cases reeds were a stepping stone from backhoe to the infamous Mode I set-up). If you've ever watched a backhoe operator work, you know exactly what I'm talking about. But if you haven't, do take the time to observe one in action whenever you're near a construction site, or where underground power, telephone, or TV cables are being laid.

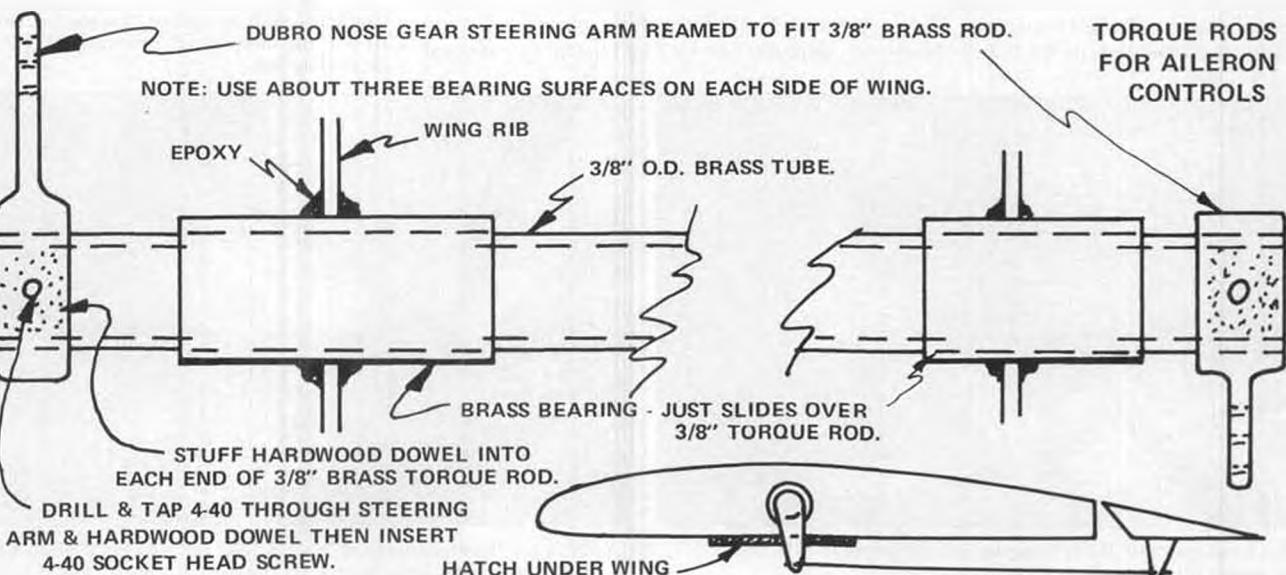
After the machine is stabilized by the outriggers, our brave backhoe operator must control the boom (up and down/left and right) which is connected to the backhoe, the dipper arm (in and out) which is connected to the boom, and the bucket (in and out) which is connected to the dipper. Now all of this was originally done with four levers (sort of like working the lever-switches on a great big reed transmitter); but life for the backhoe man has been made somewhat easier within the past decade because two "wobble sticks" (we call them control sticks) have taken the place of those four levers on most modern machines. Now the boom's up and down/left and right are controlled by the left wobble stick, and while the right stick's fore and aft movement takes care of the dipper, its sideways movement controls the in (curling) and out of the bucket. Truly a movement that, once mastered, would be of immense value only to a potential Mode I pilot.

I must confess to having much admiration and respect for operators of older, four-lever controlled backhoes. To watch those deft, nimble fingertips dance on and off the levers is to be hypnotized by poetry in motion; like two quick and sure spiders engaged in a strange, but beautiful courtship, the two sets of fingers flit around, caressing the tops of the levers . . . sometimes syn-

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German-built B-17 taxis at IMAA's Ida Grove Fun-Fly Festival. Photo by Don Langer. More about Ida Grove, beginning on page 11.





GRIFFIN III AND VI

By BILL CANNON . . . A two-for-one construction article for a couple of very spry, pocket sized, full-house R/C sport aircraft. Full size plans are available for both sizes, though only one plan is shown here.

- These .03 and .061 Griffin Models offer something a little different for small aircraft buffs. Different only in size (and weight), both models provide outstanding performance for their engine displacements.

Engines specifically recommended are the G-Mark .03 R/C and .061 R/C, both of which are equipped with throttles and mufflers and are ideal for R/C applications. Other small engines may be used, but with some loss in versatility.

Wind penetration for both models is excellent, and with all four channels of control plus steerable nose gear, both fly and handle much the same as larger pattern ships.

Although not beginners' aircraft, both the Griffin III and Griffin VI are relatively easy to build and fly. Speed is great enough to insure full control even in windy or gusty conditions, and for performance of practically all maneuvers you might wish to try. Built-in wing tip washout is largely responsible for the unusual stability of both aircraft.

Plans include details of a full, four-

channel installation using the Cannon Super-Micro System. Two or three-channel versions can be built by making minor plans modifications. For rudder control, without ailerons, we recommend that you double the amount of wing dihedral shown. Be careful to maintain the balance at the point shown. Radios other than the Super-Micro may be used, but be careful to keep the flying weight within 10% of that recommended or performance will suffer.

Separate plans are available for both the Griffin III or Griffin VI, so take your choice or try 'em both. Neither one will disappoint you.

Instructions herein are generalized to be applicable to both versions of the Griffin. Where significant differences occur, they are noted in the text. Otherwise, the individual plans provide specific details as required.

CEMENTING INSTRUCTIONS

Construction of all Griffin prototypes was accomplished solely by use of Hot Stuff as the adhesive. Net result is a very strong but light airframe.

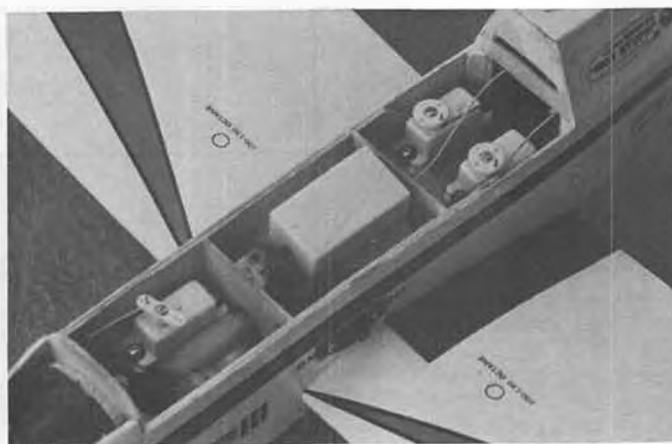
Regular fast-drying Hot Stuff was used



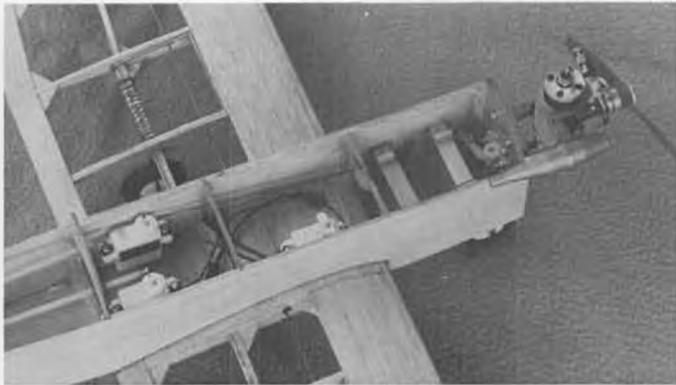
Camera angle is deceiving! The smaller Griffin III is in the foreground. Spans are 28 (III) and 36 (VI) inches.



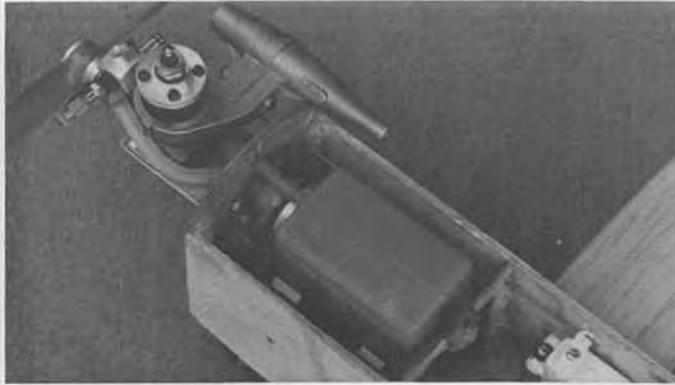
Radio, nose gear and .03 R/C engine installation in the III. Small radio makes it look spacious. It is!



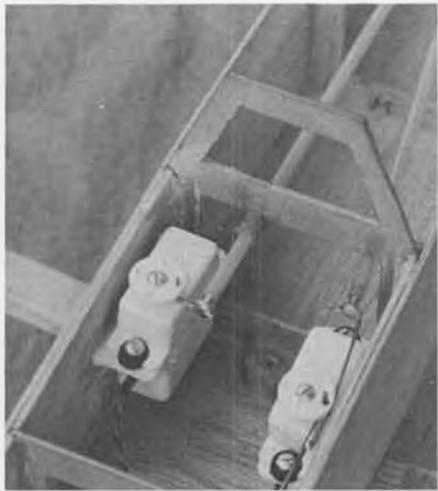
Can't say the equipment isn't accessible! MB's editor flew both ships. Both very stable. Surprisingly, III is easier, and VI is "hot"!



Servo installation, tank supports, and engine mounting in Griffin VI
Engine is G-Mark R/C .06. Lots of power!



Tank installation in VI. Note throttle servo and pushrod. Both
planes built entirely with Hot Stuff.



Note tube/rod connector. Wire solders on to
2-56 screwed into inner tube. Easy adjust.

primarily for most glue joints; "Super T" was used in several instances where more filler was needed or where parts needed positioning after cement was applied. All joints were "dusted" with baking soda before Hot Stuff was applied. A generous application of baking soda should be used in all high stress areas, such as firewall and landing gear attachment, dihedral joints, corner braces, etc.

Once the framework has been cemented together, we strongly recommend a second application of adhesive to all joints to insure maximum strength.

FUSELAGE CONSTRUCTION

1. Copy or trace the fuselage side patterns from the plans on light cardboard. Carefully cut out the patterns, then pin them over sheet balsa of the proper thickness. Make certain that the fuselage sides match perfectly. Mark fuselage sides at bulkhead positions shown to facilitate assembly. Cut out fuselage doublers shown.

2. Make both a left-hand and right-hand fuselage assembly by cementing two doubler pieces on the inside of each fuselage side. Be sure proper allowances are made for clearance of firewall "H" and bulkhead "K," which cements in the slot formed by the front and rear doubler sections.

3. Trace and cut firewall "H" and bulkheads "J" through "Q" from material of the thickness recommended. A bandsaw and/or jigsaw is very helpful in cutting out the plywood pieces.

4. Cement firewall "H" and bulkheads "J," "K," and "L" in place on the right-hand fuselage assembly section. Use a true 90 degree angle made of cardboard or balsa to insure that they are installed correctly. See Cementing Instructions.

5. Cement the left hand fuselage assembly to these same bulkheads, making certain that both fuselage sides are in perfect alignment. It is recommended that a perfectly square piece of balsa be cut and positioned between firewall "H" and bulkhead "J" to assure fuselage squareness while completing



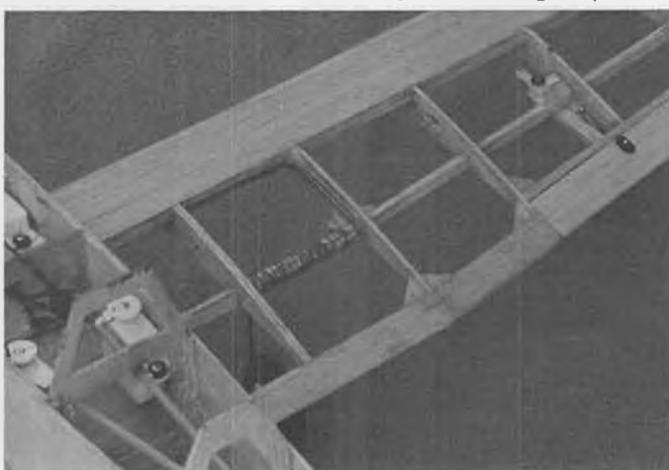
Tatone No. 22 half-A mount just right for the
G-Mark .06.

assembly. Another square balsa piece should be inserted in the fuselage between bulkheads "K" and "L." These balsa squares are to be removed after fuselage is completed.

6. Install bulkheads "Q," "P," "N," and "M." Make certain fuselage centerline alignment is maintained.

7. Install and cement 1/32 crossgrain balsa to fuselage sides between bulkheads "J" and "L" above wing position. This forms the wing seat.

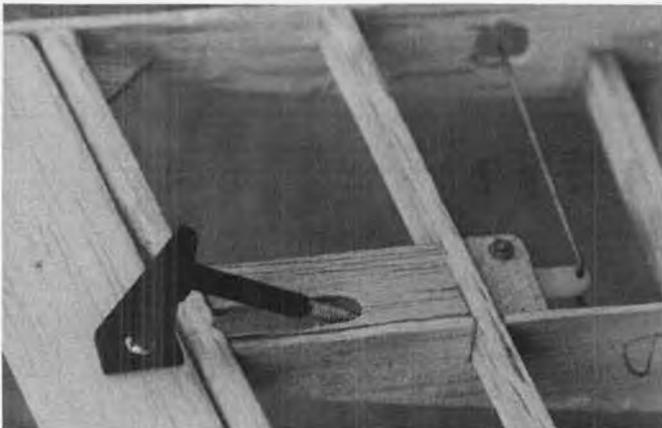
8. Cement 1/16 sheet balsa (cross-grain) between bulkheads "L" and "Q," on bottom of fuselage.



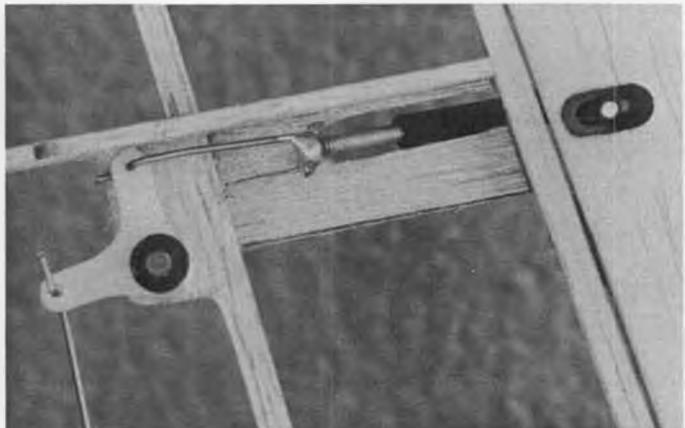
Complete servo-to-aileron linkage seen here. Landing gear bound and Hot Stuffed, using baking soda for extra strength.



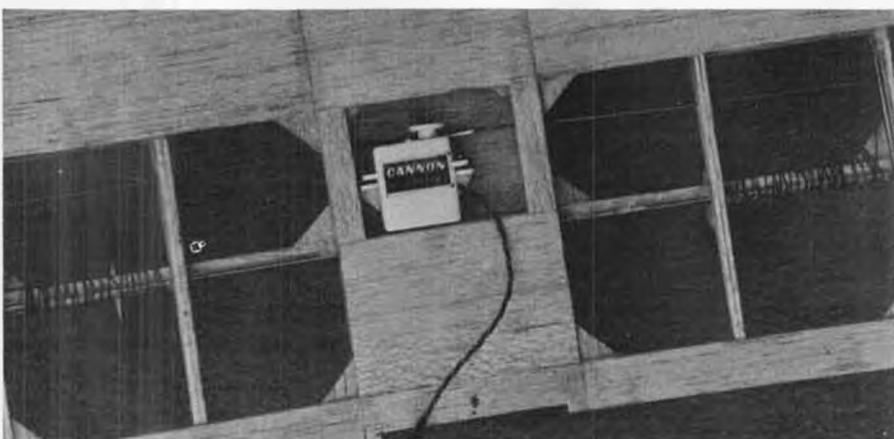
Close-up of throttle servo installation. Aileron servo mount glued to fuselage side.



Close-up of typical aileron linkage, bottom view. Goldberg 1/2A fittings.



Top view of aileron linkage. Screw threads into clevis. Short wire pushrod soldered into screw-head slot. Nifty!



Aileron servo installation and landing gear attachment shown here. Simple and direct. No gimmicks.

9. Likewise, cement 1/16 sheet balsa on bottom between firewall "H" and bulkhead "J."

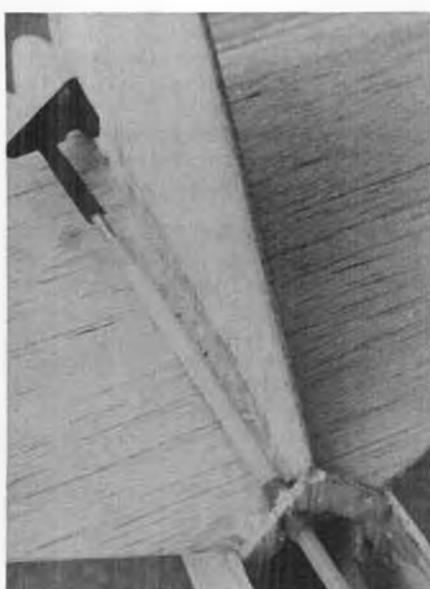
10. Sand these bottom pieces so they are a smooth fit with the fuselage sides.

11. Add corner braces behind firewall "H" and both sides of bulkhead "L" as shown. Use plenty of Hot Stuff and baking soda to insure maximum strength joints.

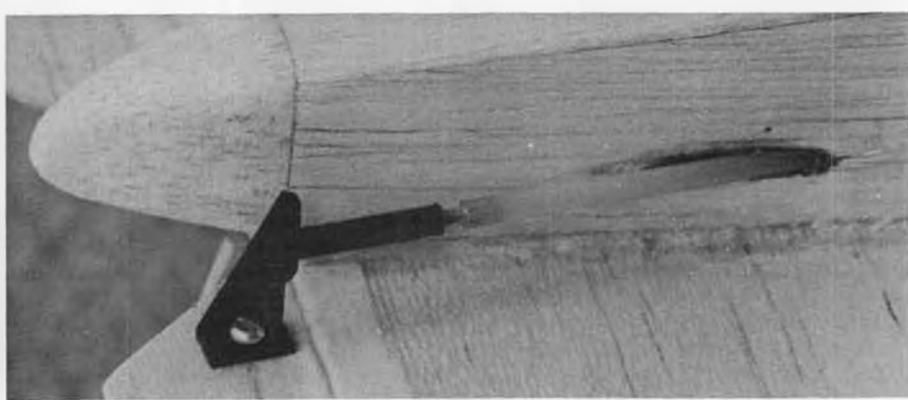
12. Cement soft balsa tail cone block to rear of fuselage and sand to desired shape.

13. Cut out and cement the 1/16 horizontal stabilizer platform in place between bulkheads "P" and "Q." Sand sides to fit fuselage. Please note that matching slots must be cut in both the stab platform and the horizontal stab to accommodate the 3/16 tabs extending from lower side of vertical stabilizer. These slots assure proper stab alignment plus necessary mechanical strength. Be certain platform is well attached to fuselage.

14. Leave aft end of fuselage open until after empennage, engine, controls, etc., are installed.



Tubing pushrod to rudder. Threaded fitting allows much adjustment.



Elevator rod and linkage, bottom view. All photos on this page of Griffin VI construction. Plans for either size available. Only the III plan is shown.

15. Cut bulkheads "R" (and "S" for .03 model) and hatch spar to size.

16. Set bulkheads in place on forward section of fuselage. Install hatch spar, align parts, and cement spar to bulkheads.

17. Cut hatch cover from oversize sheet balsa of thickness indicated. Soak for 15-20 minutes in a pan of water with 10% ammonia added.

18. Remove sheet balsa hatch cover, dry with paper towel, then bend over the hatch bulkhead assembly. Use rubber bands over hatch and fuselage to hold cover in place until dry.

19. After cover is dry (overnight), trim to fit fuselage and bulkhead assembly. Carefully cement cover in place so that the complete assembly is removable and is not cemented to lower fuselage.

20. Cement small hardware block to upper side of bulkhead "J." Drill hole through hatch to accommodate 4-40 nylon hold-down screw. Drill and tap the block to match the 4-40 screw.

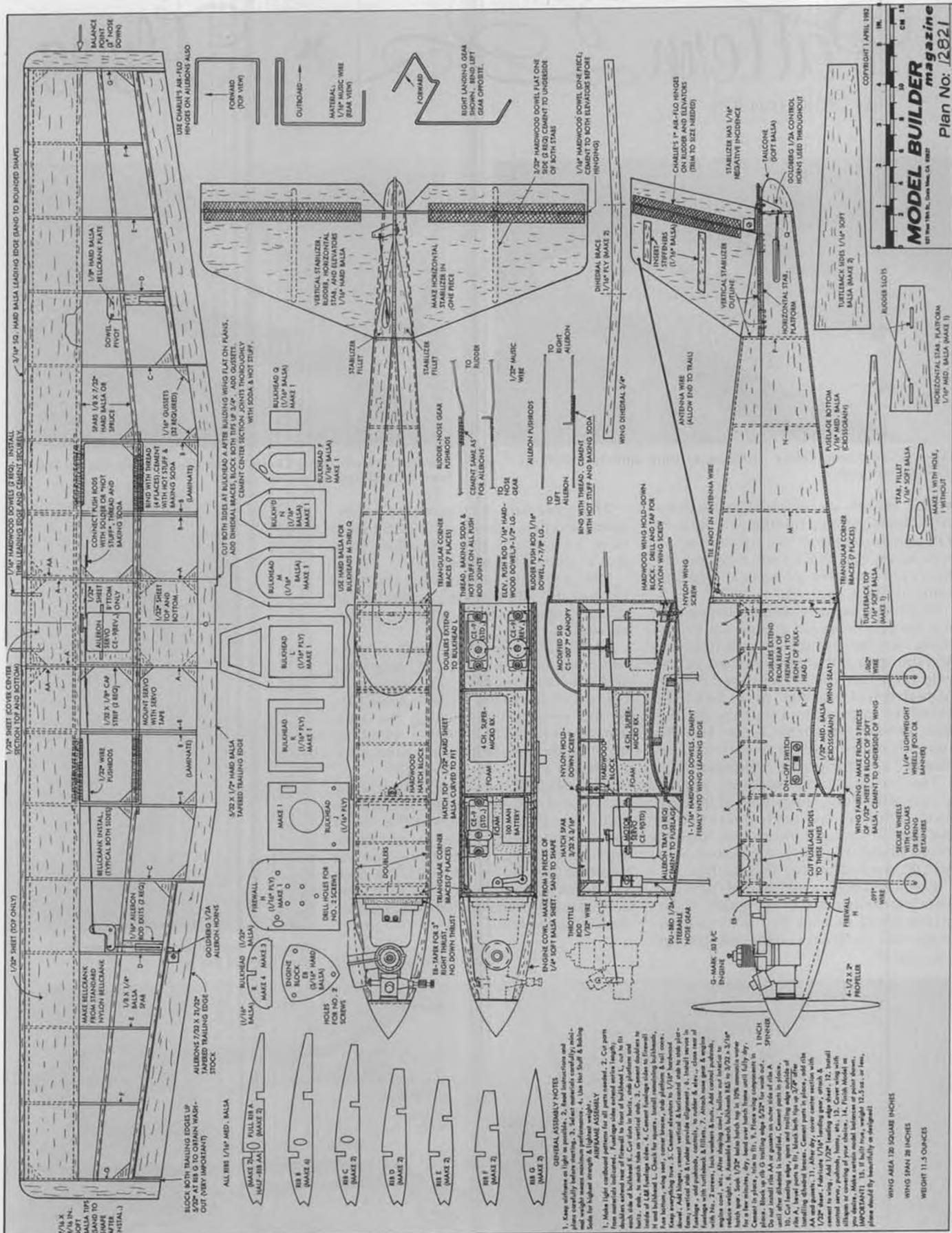
EMPPENNAGE

21. Cut both horizontal and vertical stabilizers, rudder, and elevators from hard balsa of the thickness shown.

22. With sandpaper, round the leading and trailing edges of both stabilizers, rudder, and elevators.

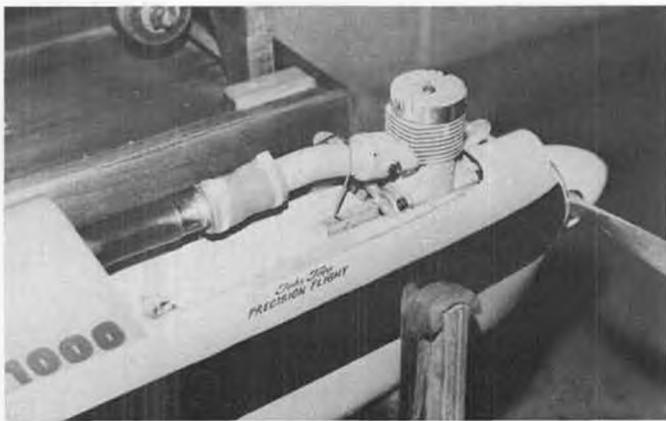
23. Cement both elevators to a 1/16 or 3/32 dowel of the correct length to match the horizontal stabilizer. Be certain elevator halves are perfectly

Continued on page 77

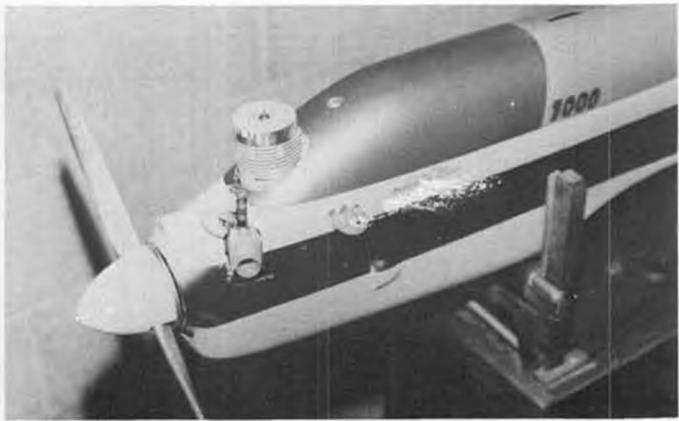


Pattern *D* + Flying

By DICK HANSON



John Tapp's "Outer Limits", 1000 sq. in. wing, with the OSVF .61 gear-box engine.



Another view of "Outer Limits." Gear box has been rotated 180° from setup shown on the test stand.

• This month we would like to share with you our initial findings on the new OS gear-box engine. We are not engine specialists, but the information should be representative of typical applications of these engines.

The first thing we noted upon examining the gear-box, was the quality. Everything was beautifully fit and finished, and the apparent engineering effort was extensive. Particularly, we noted the use of sealed ball bearings, roller bearings, excellent castings, and machining. The gear fit seemed a trifle loose, but the smooth running characteristics and absence of wear proved otherwise.

The manufacturer suggests adding grease after every 10 gallons of fuel are used. It doesn't say which grease to use, but specifies a good instrument quality. (Short fibre?) High speed grease should be OK; we will pursue this further.

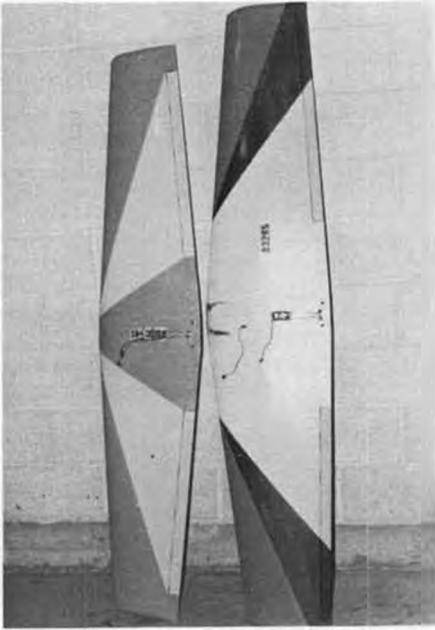
We noted no transfer of fuel from the front crankshaft seal to the gears, this is interesting, in that the Webra gear engine we used relies on fuel transfer for lubrication.

The gear box disassembles easily, using an allen wrench; you don't even have to remove the propellor. Now that's customer engineering!

We have both side-exhaust and rear-exhaust .61 ABC engines, so we had an opportunity to check relative performance.

First, we assembled a side-exhaust ABC engine, using the 7.D carburetor and the stock muffler. The gear ratio being tested was the 1.4 to 1. A few flips of the prop while choking the carb instantly primed the engine. Hooking up the plug and slapping the prop once produced a smooth-running idle.

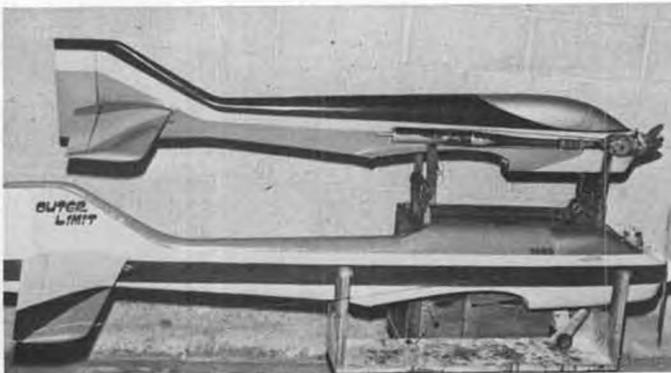
The 14x8 Zinger prop idled very nicely, and adding throttle, the engine easily accelerated to 9000 RPM (prop speed). The needle valve was extremely broad and simple to set. Using our old Heathkit tach we could watch the even variations between four-cycle, rich two-cycle, and dead lean running. No peakedness was observed.



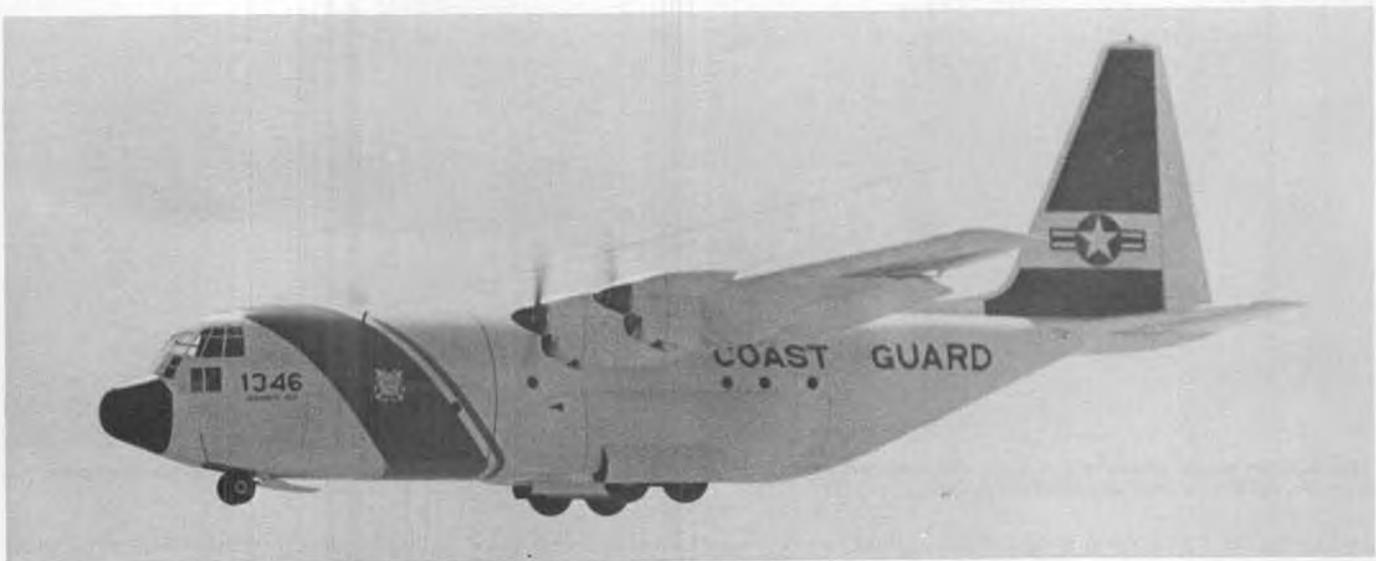
Wings for the "Outer Limits" (right) and the Tipo 825 (sq. in.).



Gear-box engine with C.M.B. pipe installed, which added about 1000 rpm on each test prop used.



Tipo 825 (top) and "Outer Limits" fuselages, giving idea of relative sizes.



Skip Mast's C130 settles in. If Skip can put it on a small diet, it will be eligible for FAI competition. Sure would like the wheel concession!

1 TO 1 SCALE

By BOB UNDERWOOD

• Shame on you! You missed it! There was great weather, an excellent site, and good, healthy competition at the Nats in Lincoln. Our new schedule worked very nicely and we could easily have handled twice the entries with little hassle, using Thursday and Friday to judge precision and Friday only to take care of Sport Scale and Giant. (This included control line as well.) The only minor complaint of the drastically shortened schedule came from the "lookers" who didn't have an extra two days to photograph and look at the models. Actually, most of these people hung around the headquarters display area and judging circles most of the day to get what they wanted. The modelers then benefitted by not having two extra days of expenses.

We flew four rounds, by choice. (I

asked those entered whether they wanted a relaxed four or a slightly pushed six.) Last year, we had a very minimal attrition rate, contrary to some comments made in a column. This year it was very close to a perfectly crash-free event. We lost one model during the two days of flying! That loss resulted from problems such as engines on a twin not quite coming up together at the bottom of a loop, and perhaps a little too much elevator, resulting in a snap. A couple of others suffered skinned chins, dinged gear, etc., but it was a remarkable event with some really excellent flying, particularly takeoffs and landings. The guys have really been concentrating on those maneuvers, and the practice is really showing up.

The judging was consistent for the

most part. There was a slightly high set and a slightly low set, but in general, a genuine effort was made to be fair in both the static and flying judging. One flying judge tended to be somewhat lower than the other two in the set, however, the level of scoring remained consistent throughout the two rounds judged.

With the static judging, the models were all previewed, by classes, and at the conclusion of the class judged, the scores were reviewed and the first three models judged considered a second time. This was of particular value with the control line sport scale, as in that class there was a wider range, with junior, senior, and open entries to consider.

One interesting and almost unfortunate event occurred, which almost affected the outcome of the Sportsman class. When the scores were finally "toted" up, Jack Fortney had won by just .012 of a point over Dale Arvin. Those of you who have been competing for a while would be inclined to say, "Wow! How close!" Those who are mathematically inclined might say, "Wow, not possible!"

The dummy C.D. didn't catch it. What had happened was that in the press of beginning the flying on Saturday, Cathy and I quickly accepted the volunteer who would post the scores for us. Cathy and Suzi Stream, as they have always done, carried the scores to the second decimal place. The scores on Saturday were posted in a rounded form to one decimal place (.7 instead of .66 or .3 instead of .33) On Sunday, Cathy and Suzi posted them and, as a result, the little .012 crept into the score showing Jack as the winner, when actually the two were tied to the third decimal place. When the tie breaking procedure was used (static plus highest single flight) Jack was still the winner.

I learned a very valuable lesson, in that those figures to the right of that little bitsy dot sure make a difference! Cathy



Harold Parenti's Bearcat won Expert Class. It was prototype for Top Flite kit.



Charles Baker cranks up Skylane in Sportsman class, with assistance from Dr. Jim Wood. They're from Tyler, Texas.



Cliff Tacie's Spezia, one of FAI competitors, making a low pass.

and I went back and recomputed all the scores through the first six places to see if any other problems developed as a result of this. Fortunately, they did not.

While it didn't occur in R/C, one event was most interesting. Early in the week, the judges, Bert Dugan and Bob Adair, along with the FF Event Director Bill Pepin, were judging the Peanut Scale entries. We had a chuckle when one entry had included a couple of small bags of salted peanuts with the presentation. The kidding among the four of us centered on whether it was really a big enough bribe.

When the very next entry was considered and the presentation was opened, there was an unmarked envelope inside the cover. Just as a normal course of action, it was opened, and wham, inside there was \$186.00! We all grasped our chests and caught our breath. When the modeler returned to pick up his model that evening, Bill Pepin held up the envelope and asked him if he knew what was in it. Another gasp! What had happened was that he had decided at a very last minute to make the Nats, and had gone to get a couple of items copied for his presentation. In haste, he had slipped his expense money, which was just taken from the bank, inside the cover. Two things are important to note; first, he

didn't win the event, and second, it takes more than \$186.00 to fix the scale judges at the Nats.

The winners this year were:

Precision: 1st - Bob Wischer, Piel Beryl
2nd - Cliff Tacie, Spezia Tu Holer
Sportsman Sport Scale: 1st - Jack Fortney, PT-17

2nd - Dale Arvin, F4U Corsair
3rd - Jewel Ness, Mig 15

Expert Sport Scale: 1st - Hal Parenti, Bearcat
2nd - Fred Hulen, YAT-28

3rd - Skip Mast, C-130
4th - Cliff Tacie, Citabria
5th - Dean Copeland, T-34

Giant: 1st - Mike Gretz, J3 Cub

2nd - Len McCoy, Dornier 23G
3rd - Dean Copeland, CAP 21

Best Military Award: Skip Mast, C-130
Flight Achievement: Dean Copeland, CAP 21

We had a great turnout of spectators again this year, and a very relaxed event. I hope more of you can join us next year. To end this section, I would like to thank the gentlemen and ladies who made scale happen this year:

Bill Pepin, who was the event director for FF scale, both indoor and outdoor.

John Preston, who was CL event director and chief precision scale judge.

Bert Dugan and Bob Adair, who were the free flight scale static and flight

judges, static judges for RC and CL Sport Scale, and CL flight judges.

John Guenther and Bill DeVerna joined John Preston with the precision judging chores. Bill also flight judged.

Dave Abel, Bud Atkinson, Cliff Tacie, and Skip Mast, who static judged RC and CL.

Cathy Underwood handled the static and flight scores.

Suzi Stream worked tabulation at the RC line.

Betty Stream and Dick Sonheim were on hand if needed.

Frank Broach coordinated the flight judge set-up for the 12 persons necessary.

One editorial aside to end this section. I have worked diligently to cut down on expenses and personnel necessary to run the scale events. Instead of five persons filling the top positions, we used three due to the time sequence. You can see by the use of Bert and Bob that we received multi-duty. (Thank heavens for more or less unified scale rules.) A number of our static judges were competitors in other events.

The one comment most frequently made to me concerned the economics of attending events such as the Nats. The cost of motels, meals, gasoline, and entry fees is a significant consideration in selecting activities. I hope that we can



Mike Gretz with first place Giant Scale J-3 Cub. Of course it's Sig!



While the men play . . . Betty Stream and Cathy Underwood crank out the scores.



Len McCoy's Dornier attempts to make gentle contact with its shadow.

find ways to cut down even further on these during periods when our economy is rubbery.

CONTEST BOARD AND RULES PROPOSALS STUFF

The deadline for rules proposals for the next cycle is now past. There are, as I understand it, not too many this time around. I do hope you'll study them carefully and contact your scale contest board member.

At the Nats, I had an opportunity to talk with Irv Searl, who has replaced Claude McCullough as the chairman. Irv was competing in Sport Scale. I feel certain he will continue in Claude's tradition by leading the board to make careful, considered judgements relating to rules proposals.

The one proposal I am most aware of is the one I submitted. It was alluded to in an earlier column in this magazine. Basically, what it suggests is that the circle be replaced with two lines fifteen feet apart. The judges are placed behind one line and the entire model behind the other. In this way the model is always at least 15 feet away. A large model with, say, an 8-foot span, will, when viewed from the side profile, have the fuselage almost 19 feet away. A small model will be correspondingly "closer."

Some models, like 1930s racing planes with short spans or powered sailplanes with long spans may mess up the equation a bit, but, in general, it helps to equate model scales to some degree. Actually, if you read the rule book on



Dean Copeland flew the prototype Byron Originals CAP-21 to 3rd place in Giant Scale. Also won NASA Flight Achievement award.

page 82, Section 5.1, you discover we have never complied to what it actually says in the first sentence: "Static judging shall be done at a distance of 15 feet from the model." We may have been 15 feet from the center of the circle but not 15 feet from the model. Give it your consideration. Actually, I have no big ax to grind. I just thought it might help to equalize model sizes somewhat without any complicated formulas, and help to minimize detail somewhat. I know it's not much, but it's something.

TEAM SELECTION 1983

A poll was taken among the competitors in both CL and RC Scale at the Nats concerning the possibility of developing a team selection program for FAI. The immediate proposal consisted of a special selection event the last of June, 1983. This would be a strictly FAI event utilizing that section of the rule book.

Any proposal of this type must be approved through AMA and requires a formal presentation. NASA is working on this, and in an effort to get input from as many as possible, please consider the following information and forward ASAP to me . . . 4109 Concord Oaks Drive, St. Louis, MO 63128.

"The possibility exists to utilize a Masters type tournament to select the 1984 Scale teams. (CL, Stand Off, and Precision RC). A site exists at Louisville, Kentucky, at Sawyer State Park; the Southern Indiana RC group, with years of experience with the Mint Julep, is

willing to host it; a number of qualified persons have volunteered their services; and a suggested date developed. (Last weekend in June, 1983) We would like the following input from you as a bona fide scale competitor."

I (do, do not) approve of developing a special Masters Team Selection program for scale.

- () 1. I have participated on prior FAI teams.
- () 2. I have participated in earlier team selection programs.
- () 3. I am interested in participating in future programs.
- () 4. I am not interested in participating.

Area of Interest (Circle)

RC Stand Off Precision CL
Please include your name and address as well.



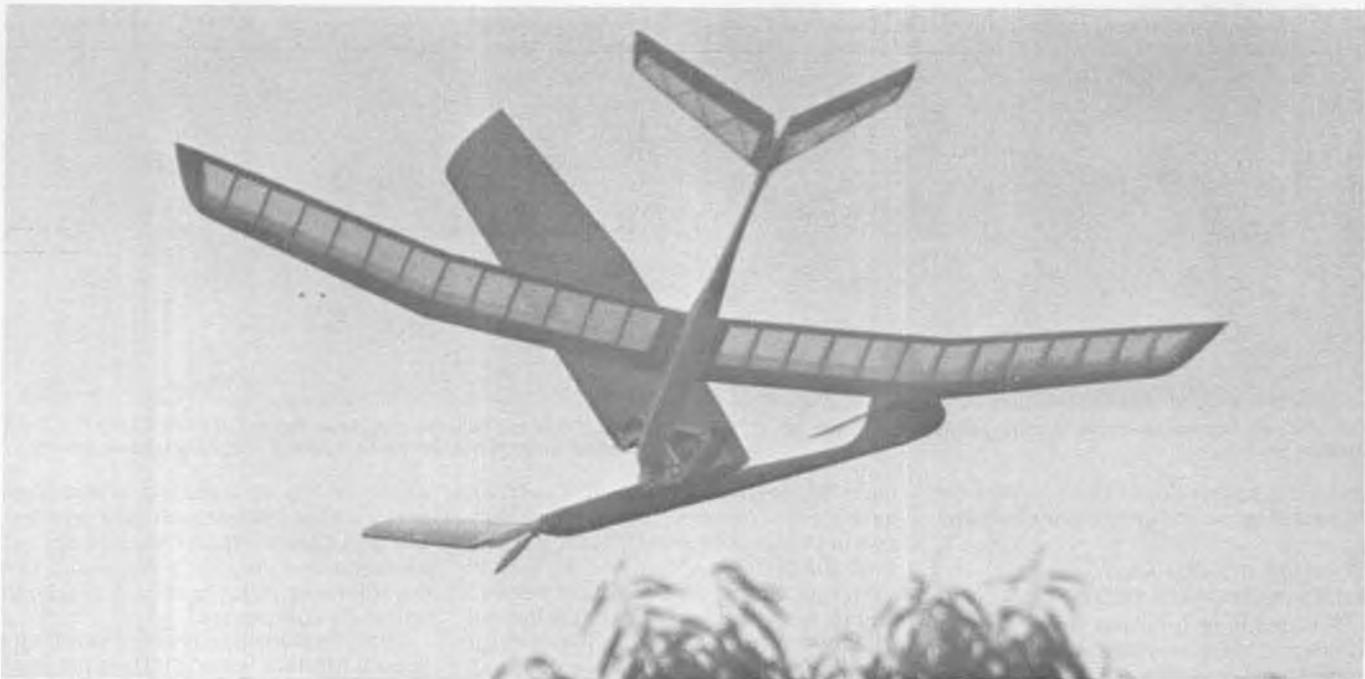
"Don't you think you should finish up that AMA Cub before you start the giant Pitts, Mr. O'Malley?"



Another shot of Cliff Tacie's Precision Scale Spezio.



Len and Peggy McCoy with one of their two Dorniers frame Fred Hulen's YAT-28 on taxi.



Roger Roth and Jim Nikitopoulos combine forces to see if two electric powered sailplanes really are better than one. Olympian 05 and hybrid Electro-Lite became hopelessly entangled as a result. The two planes are seen here harmlessly "helicoptering" to earth.

R/C SOARING

By BILL FORREY

Photos by the author.

FLASH! U.S. TEAM SELECTED

I just received word this evening (September 9th), that the United States F3B Team will consist of Mark Smith, Alex Bower, and Don Edberg. I don't have all of the details yet, more will come, but I will pass on to you what I do know through reliable sources.

Mark Smith, yes the Mark Smith, (San Marcos, California) took first place by means of his superior flying skills and tremendous consistency. He flew a European design known as the Samun. Made in Germany, the Samun is a really high-tech item featuring molded fiberglass everywhere. I saw one once in Wilshire Model Center (3006 Wilshire Blvd., Santa Monica, CA 90403) and was

impressed by the quality of the ship. It has ailerons, flaps, T-tail, and features the Eppler 214 section.

Alex Bower (Westwood Village, California) flew a ship which looks very similar to Gary Ittner's TAI-PAN (see November column). He and Gary both flew this design known as TAI-TAI (supreme of the supreme) throughout the contest. TAI-TAI qualifies as a standard class, rudder/elevator only, barebones airplane. You wouldn't believe how sweet an aircraft it is to fly... like a fast Paragon.

Alex rather handily managed the fastest speed run of the contest, a 21.0-second scorcher using this sailplane. It features the well-known MB-253515

airfoil, which is 15% thick, and which is proving itself as a respectable section.

Alex also turned in an *incredible* 19.9-second speed run which was disqualified because a wingtip crossed the centerline. Had this flight been good, it would have qualified as a world record for four-lap speed. However, Alex's 21-flat did qualify him for an official AMA national record for speed in the Senior class.

Don Edberg (Palo Alto, California), flying his contest-proven design, the Hustler, qualified for third man on the team. Don is a very good pilot who flies consistently well in competition. Surely, he had the most experience with his ship of any of the top three finishers, and the old "know your plane" adage must have been at work for him.

The Hustler features an Eppler 205 section, ailerons, releasable tow hook, and spoilers (*if* it is the same Hustler he flew last year).

I know that Don was working on a fiberglass skin, foam core Hustler before the contest, but I don't know for sure if it was flown in competition. More on this later.

The contest began with a protest at the pilots meeting. It appears that the "weak link" supplied by the contest organizers that was *supposed* to break at 100 pounds, was breaking at about 50. When it was brought to the attention of the CD, it was tested with a 90 pound weight, which it was unable to hold... result, NO WEAK LINKS were required during the contest.

As expected, the "Gorilla" winches of the Californians (see October MODEL BUILDER Soaring Column), pulled their masters' planes to incredible launch heights. The San Fernando Valley Silent Flyers Alex Bower, Gary Ittner, Mike Reagan, and Dick Odle used their "twin



Leisure Summer Classic sponsor, CD, and contestant, Roland Boucher, launches his Playboy. Frank Heacock is timing him.



Before ... during ... after a successful hand launch flight at a local field, Mike Reagan practices his winning technique. He recently logged a five hour flight from a hand launch using this modified Mirage. See text for a description of his HL method and Mirage modifications.

everything" winches to great advantage during the contest. Except for a few line breaks, they were "just the ticket."

Also worthy of note: the 15% thick sectioned planes flown by the above noted pilots DOMINATED the speed events. Not hard to see why.

Also worthy of note: true to his style, Alex Bower finished building his TAI-TAI in the Winnebago **on his way to the contest**, covered the wings with Mono-kote **on Thursday**, test-flew TAI-TAI **on Friday**, and went on to place **second** in the contest, setting a national speed record in the process! I believe in miracles, but this is ridiculous.

Dwight Holley decided to drop out of the contest on the last day, before the top fifteen fliers were to be flown against each other. This allowed Casey Goeller (also California) (16th place after two days) to compete for team placings. I'm not sure just why Dwight did this, but the story will come out later, I hope.

Anyhoo . . . tune in next month for further details.

★ ★ ★

For many of us the greatest thrill of radio control soaring is still the simple

act of hooking into a big thermal and defying terra firma with higher and higher circles. I suppose there is nothing more satisfying than working a thermal to a successful climb-out. How much sweeter is that sense of accomplishment when the climb begins at 40 feet or less!

Hand launch R/C soaring is the most satisfying of all forms of thermal flying. It should be. It's the most challenging! To start out at ground level, heave your HLG into promising air, and to work your controls at maximum ability until that glider begins its steady ascent is gratification and excitement enough for any glider guider.

Mike Reagan flies more HLG than any other form of R/C flying. He is your basic HLG fanatic. Mike really enjoys that challenge of conquering the elements with his favorite glider. He has become so proficient at HL that he rarely needs more than three throws to "get out" on any given day. On the fourth throw, "I pack up and leave!"

Mike has flown a lot of different HLG designs, but the one he has liked the best so far is the one you see him flying in this column. If you think it's a Mirage,

you're at least partially right. Mike started out with a rib kit and built the rest from plans. He very carefully picked his wood for lightness and strength and took extreme care to build it accurately.

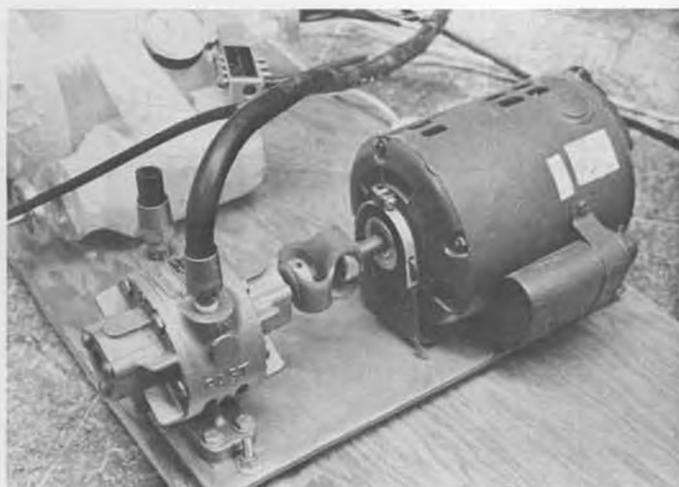
Several things are changed on Mike's



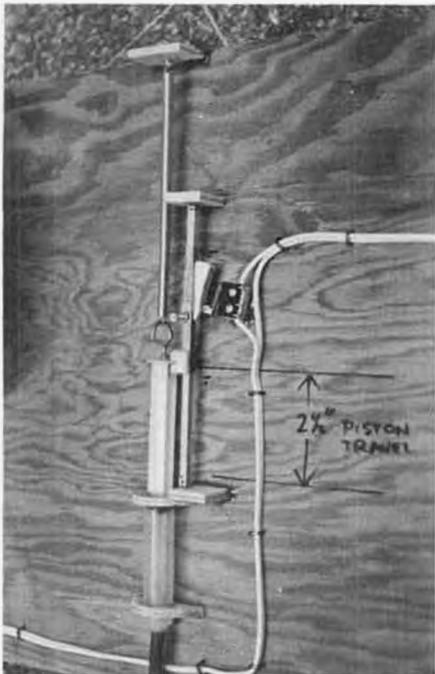
A close-up shot of vacuum gauge and T-fittings showing solder fillets.



A top view of vacuum pump system showing (l to r): pump and motor, guage, secondary and primary reservoirs, and regulator.



The heart of the system is the vacuum pump and motor. This pump was purchased at a surplus store for 36 bucks in 1981.

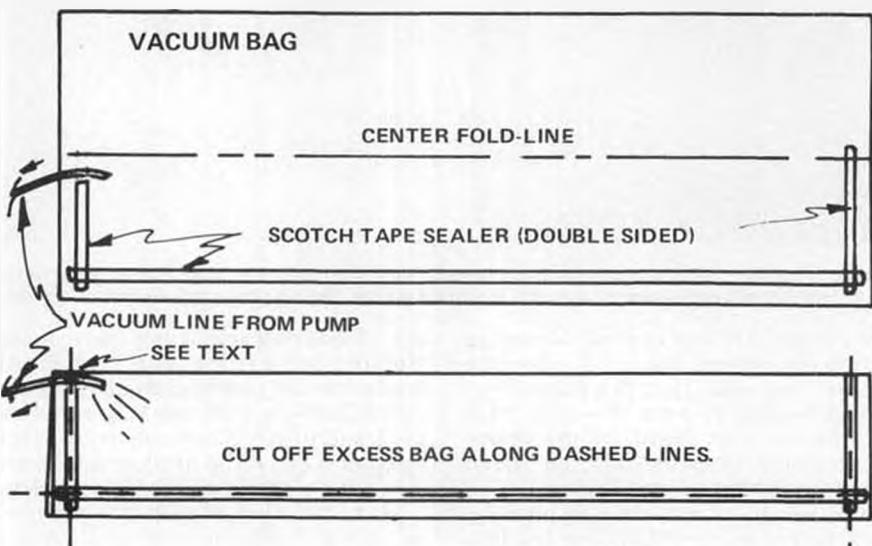
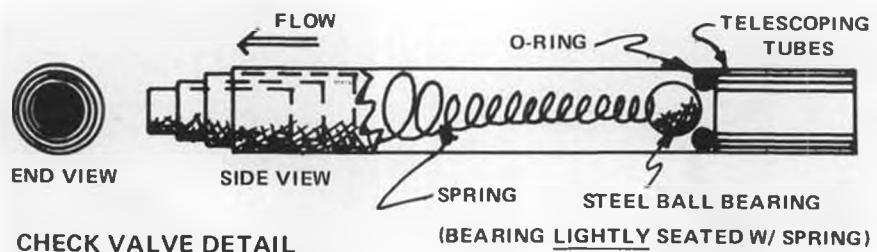


Vacuum regulator details: Monojet glue syringe, return spring, sliding ramp, and roller switch.

Mirage from the stock version. He shortened the center panel to 36 inches from the original 48, and shortened the tips to 30 inches each for a span of 96. The fuselage has been narrowed down to one inch for its entire length, thus necessitating tandem servo mounting. The tail group was scaled down to 80% of its original size to maintain good handling characteristics, and finally, holes were punched in ribs and fuselage sides to drop that last ounce or two.

The all-up weight for this remarkable sailplane is 22 ounces. Twenty-two ounces works out to a four-ounce wing loading, which is ideal for this type of glider.

You might ask if a four-ounce Mirage is capable of a broad speed range... In this case it is. It can cut penetrate a lot of ships in the 5 to 6-ounce wing loading range pretty consistently. I know from first-hand experience. I have flown against Mike and his Mirage in competition, using a 5-ounce Drifter II, and the performance difference was very noticeable.



Mike has a really good system or technique for successful HL flying. I have watched him fly his Mirage on and off for months, and think his system is worth passing on.

After a few warm-up throws, Mike is ready to get down to business. First, he checks out the sky for other sailplanes that may have already found lift and therefore marked his thermal. If there are planes working lift nearby, he launches into the lift.

If there aren't any planes marking the thermals for him, he looks for signs that will tell him the same thing. The obvious signs would be swirling leaves on the ground, a change of wind direction or temperature such as a warm gust of wind, bits of trash that have been sucked into a thermal and are swirling upward, dust devils, hawks circling overhead,

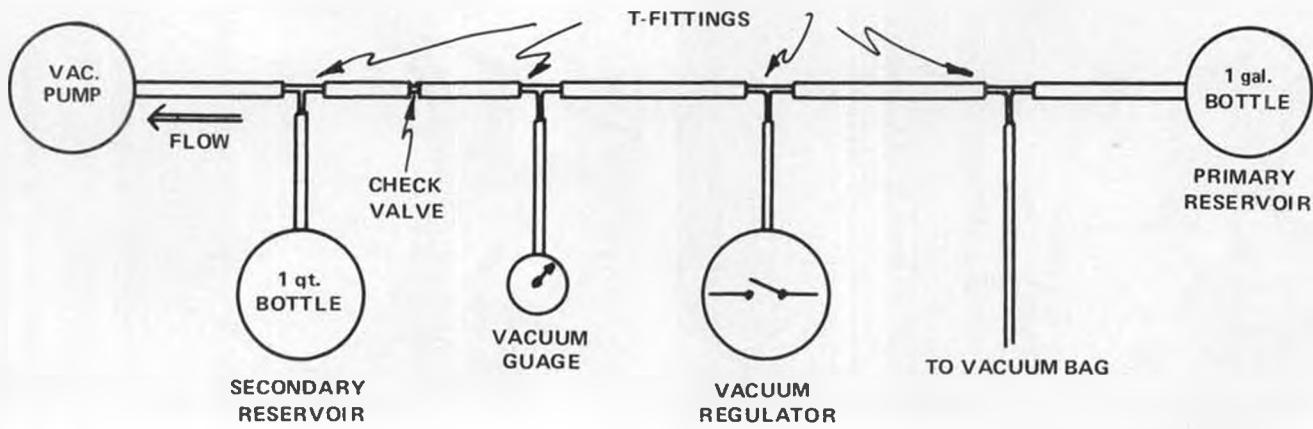
etc.

In the absence of any of the above signs, Mike searches the field with his HLG. He sometimes has to throw three or four times to cover a good size flying field to determine whether or not lift is present.

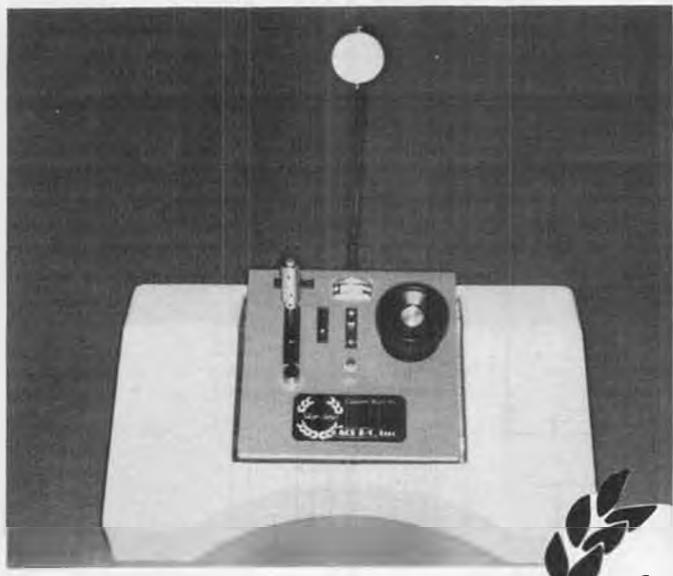
In a contest, there is almost always another glider being flown at the same time, so if there is lift around, it will be found. That's when Mike's strategy takes over.

In a typical HL contest, there is a given time period in which to score as many two-minute maxes as possible, and sometimes this time period (usually 10 to 15 minutes) is coupled with a limit on the total number of throws (again, 15 to 15) per round per contestant. This forces the

Continued on page 82



VACUUM SYSTEM SCHEMATIC



Silver Series

MAREZ THREE

By ELOY MAREZ . . . Eloy steps out of his "Electronics Corner" to show you how you can customize an Ace Silver Series transmitter to your exact needs. This is the first of two parts on a detailed construction article. Conclusion next month.

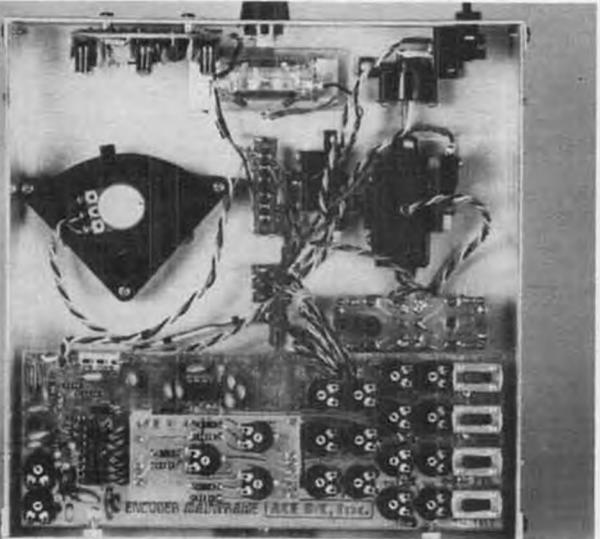
• A couple of weeks ago, as this was written, a friend invited me out to watch him run his new boat. It being a typical warm, sunny Southern California January day, and the park he mentioned being pretty, green, and full of nice scenery, I agreed to meet him there.

The boat ran well . . . but how he drove it is beyond me! He uses a Futaba 2F, the one with the wheel, which he holds in his right hand, in some way playing the throttle with thumb and forefinger, steering with his left. Looks awkward and uncomfortable as can be! He manages, but then he does not drive in competition, I seriously doubt if this arrangement would afford the necessary precision.

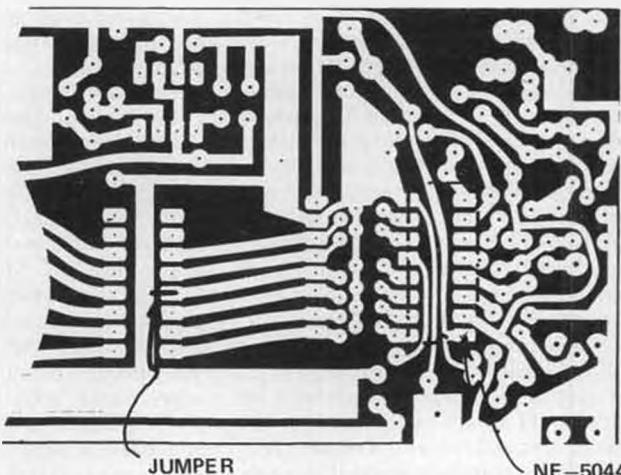
There are currently three basic choices in the transmitter control configuration for land and water vehicles. It all started off with the traditional two-stick transmitter, borrowed from the airplane flyers, and was the only way available in the early days. Normally, the left hand controls the throttle, and the right is used for steering. There are many competition drivers now using this method with great success, however, for a rank beginner, it seems a bit difficult initially in that he finds it odd to mentally associate a stick's left/right movement to a vehicle's direction. From past association, most of us find it easier to complete a mental picture of steering an R/C surface vehicle with a wheel.

This lead to the development of two wheel-type transmitters by one of the pioneers, Orbit Electronics. It had a conventional box, steering wheel-equipped transmitter known as a "Cobra," and later a pistol grip type, also with a steering wheel, complete with a trigger throttle control. Presently, there are a number of wheel-equipped transmitters available, the Futaba mentioned is one, as well as a modern version with recently developed features, called a 3FG. Airtronics has a similar transmitter, as does Cox/Sanwa.

All of these transmitters are equipped with a throttle control on the left side, which is supposed to be operated with the index finger as the transmitter is



With the back off, we get a look at the completed three-channel car/boat transmitter. Still a Silver Seven in spite of controls.



This is the reverse side of the far left part of the encoder p.c. board seen in photo at left, showing jumper which reduces number of channels from seven to three.



Angled antenna recommended fits Ace R/C base. Allows vertical positioning.

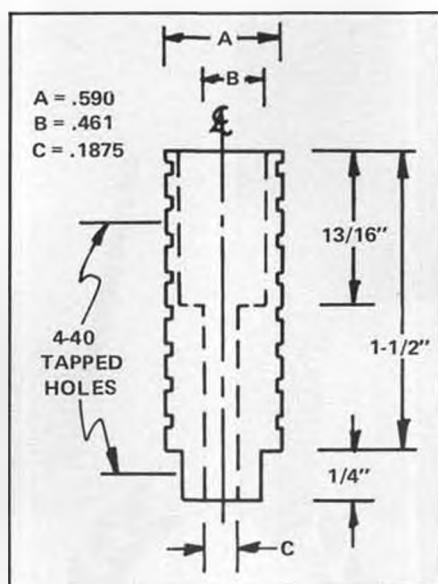
cradled in the left hand. Apparently, this is not precise enough for the fine power adjustments necessary during close competition; many car/boat drivers add a pistol grip throttle control, adapting a slot car controller for the purpose. Various home made handles and adaptations are seen at every track and lake; there is also a commercially available tape-on grip called a Trans-Grip, made by Kimbrough Products. It does not provide linkage to the throttle; it merely positions the hand comfortably and naturally.

In the past year or so, a number of physically different transmitter configurations have appeared, the development of which was no doubt spurred by the tremendous growth of both the 1/12th scale R/C car, and glow engine power boat racing. Kraft Systems has its KP-3KW, a rather unorthodox looking transmitter which was quickly nicknamed the Kraft Staple-Gun, which it vaguely resembles. It is loaded with features demanded by the competition drivers.

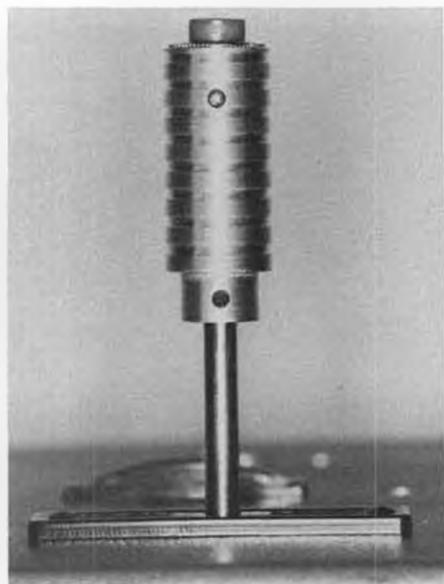
The other approach to control precision in racing is available from MRC (Model Rectifier Corporation), in the form of its Grand Prix System. It features a separate frequency module and battery case, supposed to be belt supported, thus keeping the hand held controller as light as possible. Two options are available, one, a wheel-equipped pistol grip called a Speed Handle, and a conventional two-stick equipped model for those preferring this system. Both feature some of the late developments, such as servo reversing, dual rates, etc.

Into this jungle, racing along at full throttle, comes the Marez Three . . . three channels designed specially for R/C cars and boats, with some of the features described as commercially available, plus some not previously seen.

Why? Well, it seems that with all the options, there are still some personal requirements that are going unfulfilled.



Throttle stick knob holds switch for pre-set throttle positioning.



Throttle stick knob mounted. Pre-set throttle positioning switch mounts in top of knob.

There are still adaptations, and odd ways of holding the transmitters, which you see in most every driver line-up. I even remember a photo somewhere in which one of the drivers has the transmitter upside-down, with the antenna pointing backwards, between his body and arm. It all boils down to one fact, when the micro-seconds count, whatever control method you are using, if it is not one hundred percent automatic, if you have to stop and think about it, you are doing it wrong. These guys with their funny equipment and ways have found their own method, within the limitations of the available equipment, to control their machines in what to them is the most natural way. The transmitter presented is not claimed to be the ultimate, or one hundred percent original. It is a basis on which you can design and build a system compatible with yourself. It incorporates some ideas of my own, some borrowed from manufactured equipment, and some suggested by some of the local car and boat drivers. If it has one single most distinguishing feature, it is the fact that since you are going to design and build it, you can do so to fit all of your requirements and idiosyncrasies . . . even completely reversed, for you southpaws.

Wait, wait! Don't stop here and go back to reading the ads just because we said "build it." Let's say instead that we are going to "assemble" it . . . the hard work has already been done for you. The heart of our new customized transmitter is the Ace R/C Silver Seven transmitter kit. Yes, it is an airplane radio, as offered, and it remains a Silver Seven through-and-through. We are going to use the well proven electronics, which, by the way, come with excellent fool-proof instructions, and change only the mechanical means by which some pot shafts are rotated.

True, there will be some building involved . . . all mechanical, depending on your chosen options. There is a little

bit of lathe work on the model shown, but there are many modelers so equipped if you yourself aren't. Other than that, the rest is all sheet metal work, for which the only requirements are a drill, some files, and a helping or two of patience.

We'll describe the transmitter as pictured, and then discuss some of the options available to you. To start with, this is a three-channel . . . just in case I have some use for the third one in some future installation. Naturally, if you feel that your interests will never require more than two channels, you can build yours in that manner. On the other hand, if you are into scale boats or something that requires more than three operations, you can have all you want, as long as all you want is no more than seven. One or more channels can be added at any time you decide to do so.

The original features of the Silver Seven which make it attractive and which we will retain are:

Servo Reversal Switches. By simply flipping a switch, the servo travel direction of each channel can be reversed.

Independent Throw Adjustment. One for each channel, the amount of servo travel can be controlled independently by adjustment pots accessible from the rear. Ideal for adjusting your model for just the right amount of control response.

Trim Authority Programmability. You just dial in the amount of total servo travel you want when the trim lever is moved.

Dual Rate. Switches and adjustment pots are furnished to provide Dual Rate on up to three channels. The amount of throw change effected by flipping the switch is adjustable from approximately 50 to 95% of total throw.

Battery Condition Meter. An expanded scale voltmeter is furnished to monitor transmitter battery condition.

The features that we have added or

expanded in this application are:

Wheel-type steering control.

Longer throttle stick for more precise throttle control.

Choice of original mechanical steering trim or remotely positioned electronic trim.

Positionable top-of-throttle, programmable speed control button, which automatically resets the throttle to any desired preset position regardless of throttle stick position. It can be set for optimum throttle setting for critical turns, thus assuring that the entry and turn speed is always the same.

Throttle 'kill' button; a trim over-ride which can be used to shut off a glow engine by pulling the throttle past idle position without upsetting the running trim.

Automatic high to low steering rate changeover as the throttle is advanced. Can be set according to driver's preference to activate at any position of the throttle control and can be switched out when not required.

This is an extremely versatile system, and most personal preferences you may have can probably be worked in with little effort.

From the description and the photos, it is immediately obvious that this is a strap or tray supported transmitter. For the former, you can add a simple metal

fitting under the low rate switch, as seen in the photos. Should you decide to omit the low rate feature, you can attach a fitting in that location with a small screw. However, to fully realize the capabilities of this system, you will need a tray, the additional precision available almost has to be experienced to be believed. The one shown in the photographs is from Kraft Systems, and fits the Marez Three transmitter like it was molded around it. The transmitter is secured in place with a couple of pieces of Velcro, and is easily removable for charging. The tray is molded from beige colored plastic, and is contoured to fit the body. Well, most bodies! The straps are furnished, and can be adjusted for length as well as angle. Ask your dealer for a Kraft Transmitter Tray, No. 200-142, at \$24.95.

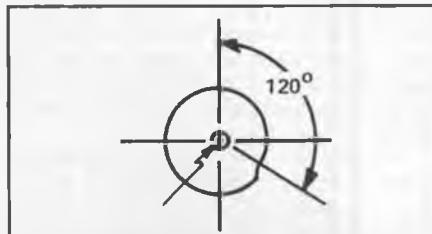
Another nice-to-have, though not absolutely necessary feature, is the angled antenna, which serves not only to get it out of the way of the others in the driver lineup, but actually provides a better radio link with the vertical antenna often used in ground or water-borne vehicles. The one seen in the photos is a replacement portable AM/FM antenna, readily available from electronic suppliers. It is made by Russell Industries, Inc., 3069 Lawson Blvd., Oceanside, NY 11572, it's Part No. PAS-4H. You'll have to use a base screw

compatible with the antenna thread . . . I used 8-32 hardware for best rigidity, which required re-tapping the antenna base.

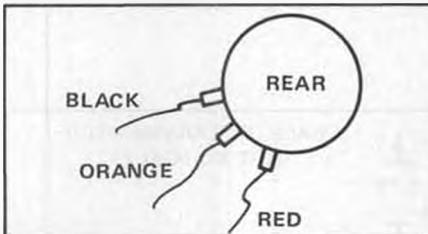
The antenna mount has to be rotated so that the antenna extends out at just the right angle . . . straight up! This is done by loosening the screw, adjusting the antenna angle, and re-tightening the screw. Though this antenna is actually 3-1/2 inches shorter than the one originally furnished, the reduction in transmitted power is almost unmeasurable on a field strength meter, and will not affect the system operation at the distances necessary for boats and cars.

Now that you are convinced, let's go shopping! We will need an Ace R/C Silver Seven Experimenter's Special kit, which includes an unpunched case, batteries, antenna, hardware, all of the electronics, in fact everything needed to complete a transmitter except the control mechanisms. It is Ace No. 11G247, and is priced at \$124.95.

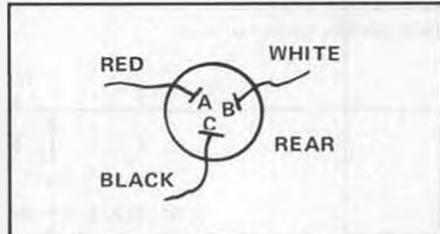
We will need a D&R Single Channel Stick Assembly, Ace No. 15K33, at \$4.75. This is the one used for the throttle, it can be used with spring loaded centering, ratcheted, or adjustable drag. It comes set up for centering; to change it, merely remove the spring. On the rear, opposite the pot, there is a thick plastic washer held with a No. 2 screw. This



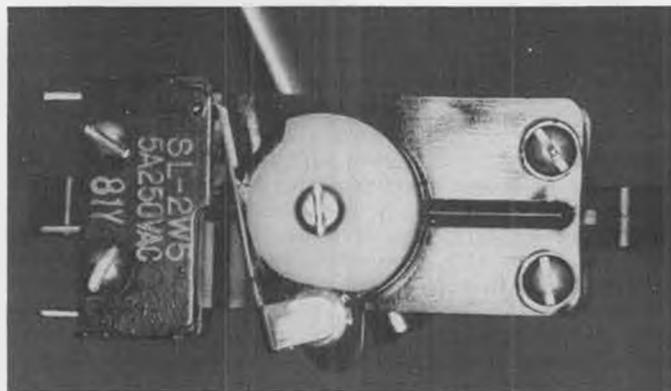
Throttle micro-switch operating cam. Tapered portion from 9/32 radius to 15/64 in 120°.



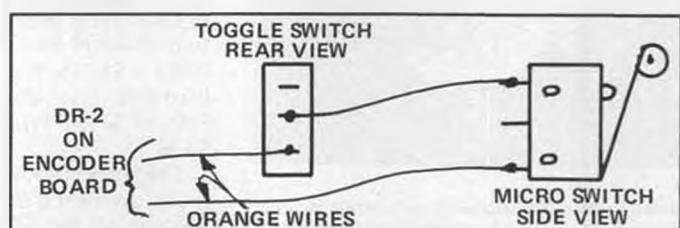
Wiring for wheel control pot.



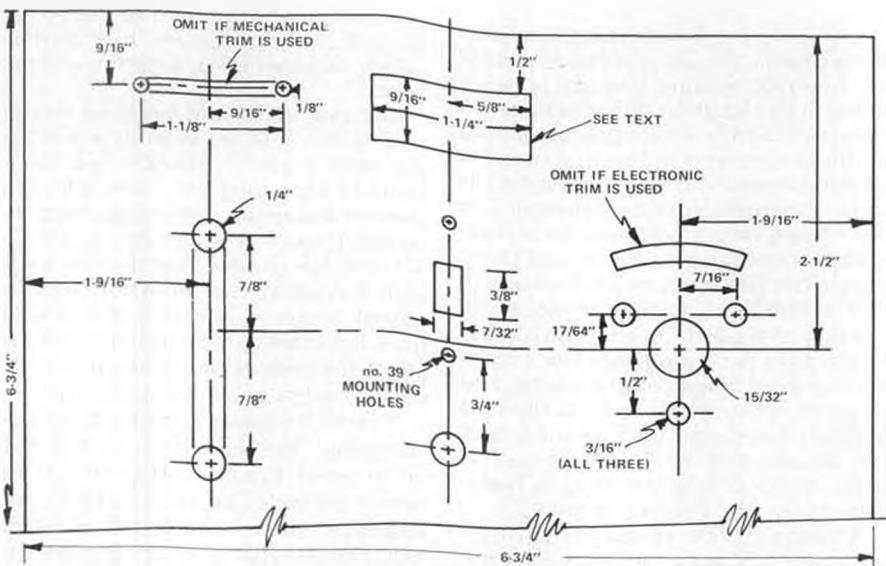
Wiring for stick mounted pre-set throttle positioning switch.



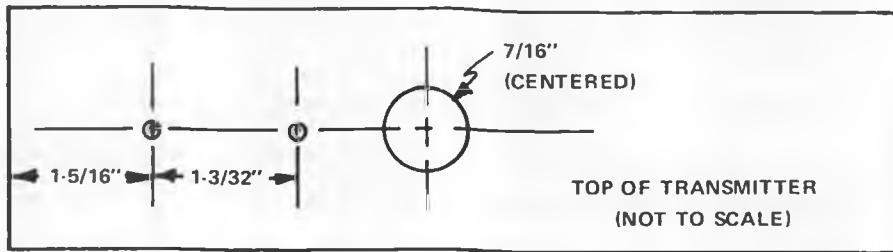
Cam operated micro-switch mounted on throttle assembly automatically switches steering to low rate as throttle advances to higher speed. Cut-in point and low rate are adjustable. Switch open at left, in low, closed at right, in high.



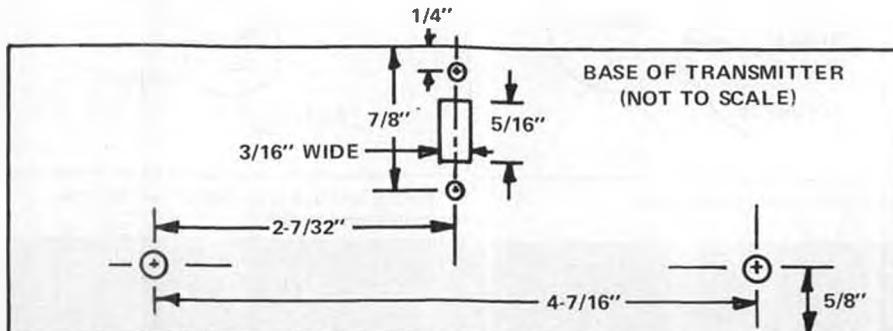
Schematic and pictorial diagrams of low rate switches. Toggle switch can be omitted if throttle switch is always to be in circuit.



Locations of holes to be cut in upper front face of transmitter case. See text about possible variations.



Hole pattern for top of case.



Hole pattern for bottom of case.



Small bracket for use with neck-strap, if desired. Mounts on low rate toggle switch. Tray is recommended for better support of transmitter, and better control.

washer is serrated on one side, plain on the other. The manner in which it is installed determines whether or not you have ratchet action. The amount of tension is determined by the pressure applied by the screw. Install as desired.

You will need some of Ace's Programmable Push Buttons. If you want only the top-of-the-stick throttle setting button, or the engine 'kill' button, you will need a No. 11G510 PPB1 one-channel button. If you wish to build in both of these options, you will need a 11G511 PPBII two-channel kit. The PPB1 is \$8.95, the PPBII is \$11.95. If you are installing both buttons, you also need an Ace No. SW033 SPDT Push Button Switch, at \$4.50.

The stick mount switch is to come from an electronic supplier; it is a Switchcraft No. 903, which is also marketed in blister packs under the Sprague Q-Line Components name, Part No.

QSP-1512-01, and General Cement CGC 35-415. If you have difficulty in locating one locally, inquire from Switchcraft, at 5555 N. Elston Ave., Chicago, IL 60630, (312) 792-2700, for the closest supplier.

For each auxiliary proportional channel or trim function desired, you will need one Dunham Auxiliary Function Assembly, Ace No. 15K34, at \$3.50. This can also be used positionable or proportional. In most cases, we use it in the latter mode, which requires the removal of some plastic stops inside the assembly. They are readily identifiable once you have the assembly in front of you. For ease in centering these controls during the final channel alignment, leave these stops in until that step is complete.

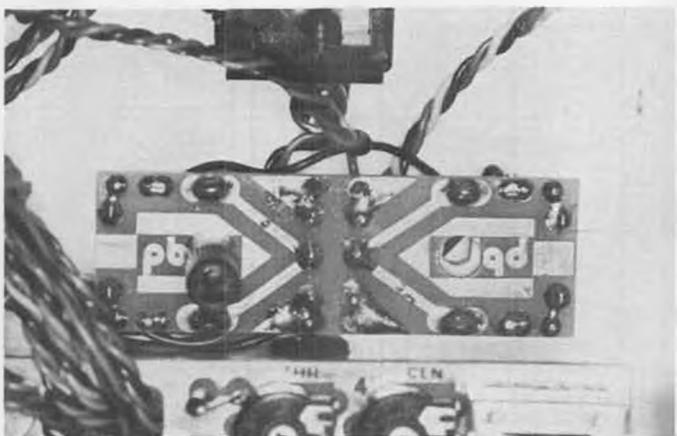
For the throttle assembly, and for each aux/trim assembly, you will need one 5K pot element, Ace No. RV034, priced at \$3.00 each.

There are some other optional items to be obtained from Ace if desired. One is the switch guard shown in the photos, which helps to dress up the hand-cut switch opening. There is a guard furnished, but it is of the flip up type, which has a nice feature in that the transmitter has to be 'Off' before you can close the guard, but in the open and 'On' position, it tends to get in my way, and I don't like it. Thus the replacement. The kit includes a meter, a half-incher already connected up as an expanded scale voltmeter. I happen to prefer the large meters, and have made the change to one. If you agree on either count, the Switch Guard is No. 50L509, at 59¢; the large meter is Ace No. MT001, priced at \$7.28.

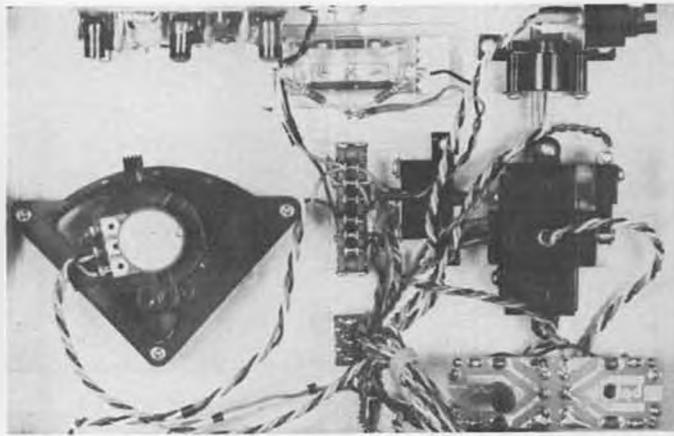
And last but not least, we are going to need a steering knob assembly, which must be obtained directly from Futaba Corporation, 555 West Victoria St., Compton, CA 90220. Address your request to Mr. Glen Toma, Service Manager. The cost is \$12.50, enclose a buck or so for UPS, and if you are a Californian, don't forget the 6%. Ask for a "2F" steering wheel assembly.

After everything has arrived, and you have spent enough time familiarizing yourself with all the different pieces of hardware, also take some time to briefly study the instructions so as to have an idea of the sequence as recommended by Ace R/C. You've been furnished with instructions covering all of the different types of aircraft transmitters which can be built from the kit, some of which you don't need in this application. To make the instruction booklet easier to handle and refer to, remove pages S/S 12-13 (P1); S/S 14-15 (P1); S/S 12-13 (M1); and S/S 12-13 (M2).

You are now ready to start cutting up that nice red case. I strongly suggest that you study every move before you make it. After all, if you drill a hole in the wrong place, you are stuck with it. The location of some of the case openings, such as those for the meter, antenna, and charger plugs, are basic. Everything else can be mounted how and where you want it, providing that the necessary external and internal clearances are



Printed circuit board as required for positionable throttle and engine-kill features, as described in text.



Close-up of top, controls portion of inside of transmitter, showing equipment locations. Mirrored version for left-handers would be easy.

maintained. The sketches furnished are to be used as a guide if you build yours exactly like mine. It is also recommended that you draw or tape on the outline of the battery cases inside and out, so you don't plant an auxiliary channel lever or something right where part of a case is.

As usual, Ace R/C has provided the ultimate help for this chore; a sheet of drawings has been provided that gives all the necessary dimensions for the mounting of the Silver Seven mechanical components.

In my version, the battery cases are installed outwards, leaving enough space between them so that an aux lever assembly could be installed between them if desired, coming through the case below the low rate toggle switch. If desired, both cases could be installed toward either side, making room for one of these assemblies on the opposite side. In this case, the charge socket would also have to be moved off-center.

One decision that has to be gotten out of the way early has to do with the Futaba steering wheel assembly. As it comes, it has a built-in mechanical trim, which may or may not be used, depending on your choice. I left it off, preferring instead an electronic trim which has the further advantage of being operated with the left hand while the right one is busy keeping you on course. If you chose the mechanical trim, you'll need to cut out the curved window right over the main assembly mounting hole. If not, leave it off and cut out the trim assembly slot right over the throttle assembly.

If you are leaving off the mechanical trim, the lever has to be removed. It is a slip fit at right angles over one of the other internal pieces and can be easily pried off with a sharp bladed screwdriver.

The wheel assembly itself comes apart in three sections; it is a lot easier to do this than to explain it. You first remove the nut holding the wheel from the front, then two sets of three screws each from the rear, and you have a handful of plastic pieces. Reassemble on the case in the reverse order of disassembly.

Still taking the mounting of the components in the order of size, let's mount

the throttle assembly next . . . after we make the modifications desired. It is decision time once again! If you like the idea of the positionable throttle button, you'll have to make, or have made by your lathe-owner friend, one of the stick tops shown in the photo and sketch. If your plans don't include this switch, you may want to try a slightly longer stick, such as Ace R/C No. 15K21 at \$2.25. It slips over the throttle stick and is held at any desired position by a small set screw.

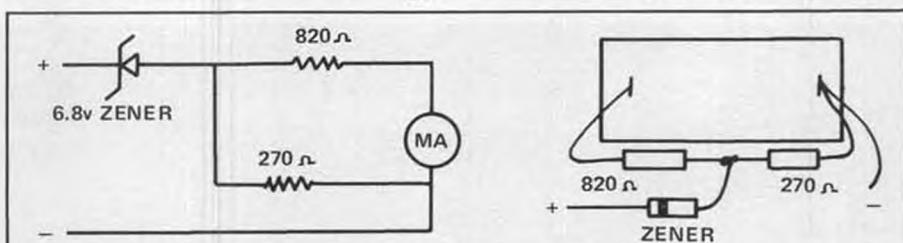
Instructions for the wiring of the stick mounted switch are given later in the proper sequence.

The other stick mod that has to be made has to do with the other optional throttle feature, the automatic low-rate cut-in as the stick is moved toward the high throttle position. This too, requires a little machine work, but unlike the stick top, can be done entirely by hand if necessary. First off, run out to the nearest Radio Shack store and purchase a No. 275-017 Lever Switch, with roller bearing; a "Micro" switch. By a happy

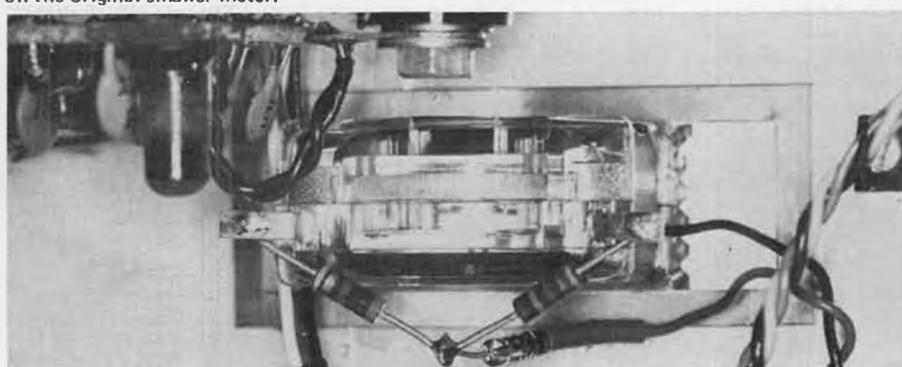
coincidence, its mounting holes are the same distance apart as those on the side of the stick assembly . . . you merely have to add two 5/32-inch spacers between the two, use longer screws, and the switch is secured in place. Next, you have to make the actuating cam, which is merely a 1/8 inch thick piece of plastic first made into a washer of the same diameter as the ratchet/drag washer on the assembly. I have a Unimat, so I turned mine out of white acrylic; the color was chosen simply so I could get good contrast on the photos. Next, you machine or file off a section around its circumference, per the drawing, Fig. 1. If you didn't earlier, at this point you will begin to get the picture. Attached as it is to the assembly, the switch roller rides on this cam; at some positions of the stick, the switch is open, at others it is closed.

The cam is attached to the plastic washer with your favorite C-A glue, but

Continued on page 85



Schematic and pictorial diagram of larger ESV described. Connect to same points on switch as on the original smaller meter.



Larger meter installed and wired as shown above. It's easier to read, and there's plenty of room for its installation.



Mike Cook, Houston, Texas, won Best Scale Award with his 36 pound, Kawasaki powered Corsair.



Waco YMF-3 by Garland South, Cleveland, Oklahoma. Has 10 foot span, powered by 5.6 Kioritz, turning 32x10 prop!

JUMBO FLY IN

By AL ALMAN

• After 20 years in the Air Force, I should have learned not to volunteer for anything. I should have . . . but I didn't.

So by the time this 5th Jumbo Fly-In was only three hours old, I was sorry I'd opened my big mouth and offered to help; sorry because even though there were three of us making the IMAA Airworthiness Inspections, there seemed to be no end to the line-up of BIG Birds. They just kept crowding in, anxiously waiting their turn until my keen, hawk-like eyes would verify that they, too, were worthy of flight. Actually, by 1100, my poor eyeballs were neither keen nor hawk-like, but fit more into the irritated and sunburned category . . . which reinforced the feeling that I alone had inspected no less than 200 airplanes; my

knees, on the other hand, insisted that the inspections numbered closer to 300.

When I finally had a chance to check with Fly-In Director Chuck Cunningham, I found out why my eyes and knees felt so abused; there were no less than 135 BIG Birds in residence at Ft. Worth's Thunderbird Field on July 17, which figured out to be a tad over two airplanes for each of the 68 registered pilots. I had inspected one helluva lot of aircraft, and I'd felt crowded because it was crowded; the turn-out had been tremendous.

And it was obvious that the spectators loved it. In spite of the 98 degrees, thousands showed up throughout the weekend to gawk, ask questions, and shoot countless thousands of pix (Foto-

mat must have had a banner week).

There's an interesting aspect to this spectator thing: five years ago, when Chuck held the 1st Annual Southwestern Jumbo Fly-In, he went out of his way to get maximum media coverage for his "new baby" . . . and why not? After all, who wouldn't want to do well the first time out, especially with something as different as a BIG Bird Fly-In.

Well, Chuckie will be the first to admit that he goofed in trying to drum up "trade," because T-Bird Field was literally over-run by a sea of humanity that whole weekend; in fact Sunday was even worse, if possible, 'cause Channel 5 ran some footage of the fly-in during their Saturday night news show which prompted the fence-sitters to c'mon out



Nosen Mustang, 30 pounds, a bit marginal on Quadra power. By H. W. Barnum, Del Rio, Texas.



Byron Mustang in all black, by Keary Hunt, Houston. Flew extremely well at 24 pounds. Quadra power package.



And as always, a Byron Pitts. Very much flown, 19 pound bird by Ron Ables, Dallas, Quadra powered.



Sheber Pitts, by C. B. Horton, Waco. Elevator link let go, it went straight in! Kawasaki survived, and C.B. is rebuilding plane.



Another shot of Mike Cook's big Corsair. It features retract gear and folding wings. Real tail wheel strut much longer.

the next morning.

So, in order to avoid similar overcrowding, Mr. Cunningham has since kept from spreading the word about upcoming fly-in's to anyone except modelers, and it's helped . . . a little. The curious, the interested and the non-believers still come in droves and stay a surprisingly long time; the difference is that the droves have diminished somewhat. Traditionally, Ft. Worth has long been a very aviation oriented town, and the natives will flock to any kind of show that has to do with airplanes.

Because I was smack dab in the middle of getting ready to move to Washington, I didn't bring any of my own planes along; but I did take advantage of the opportunities to fly other birds when the transmitters were offered to me. Besides, I was so busy with inspections and taking pictures that I really wouldn't have had time to care for my own flying machine.

And because of this, I was able to stand back and observe the very happy and humongous crowds. It took a while, but I finally figured out why they were so happy; part of this mood has definitely been picked up from the pilots who



Here's one out of the attic! The Duke Fox, 12-foot span Buzzard glider, with trike gear and motive power. Mercy!



Random shot of people and planes. Note the Big Joh . . . er . . . Lazy Ace at far left.

were thoroughly enjoying the low-key, uncontested atmosphere and the friendly, relaxing social side of the fly-in . . . but an even larger part of this exuberance was due to the field itself being festooned with happy and bright-colored BIG Birds. This was a festival . . . an airplane festival, and a time for enjoying and having fun . . . and as far as I could see, everyone was doing just that.

In fact, it was such a pronounced festive air that although spectators easily noticed the difference in craftsmanship, they showed no distinction between

beauty or beast once a bird was airborne. Almost as one, the huge crowd reacted to the stimulus of flight by giving each and every pilot a hand after he landed. Even the "entrepreneur" who was trying to sell sunglasses at three bucks apiece got caught up in the spirit and spent more time applauding and encouraging the pilots than hawking his wares . . .

"My God, they're beautiful . . . and they look so real in the air," was what I overheard most from that "cast of thousands." What so many of these people were finding out is exactly what we've been telling the world for years: that BIG Birds do look and fly better. Quite a few of these onlookers were awed, if not downright intimidated, by the number of BIG airplanes begging to be looked at; it reminded me of the many times I used to stand in the middle of an old-time candy store, just dying to spend the few pennies clenched in my fist . . . but so overwhelmed by the myriad of candies that I didn't know where to start looking.

But a lot of shoeleather did get worn off that weekend. Even though there were so many birds, and it was a long



Handsome, modified Nosen "Jug", earned Most Outstanding award for Gail Phillips, Houston. Kawasaki 3.15, forty two pounds, retracts, flaps. Piloted by Ted White.



Balsa USA Fly-Baby Bipe, by Paul Taylor, weighs 21 pounds, with Quadra.



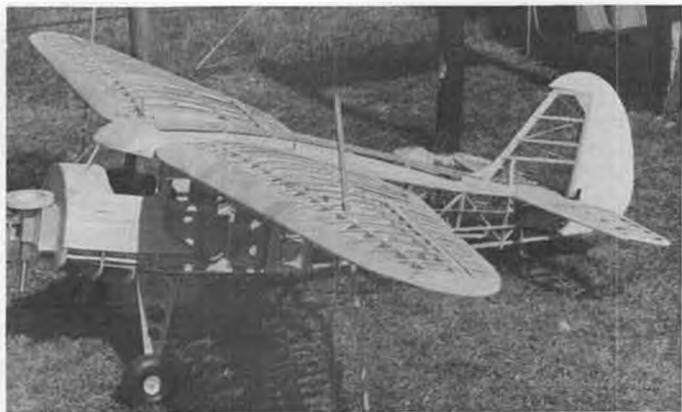
Regular Fly-Baby, by Restee Hawkins, Dallas. Quadra, 20 pounds, flew well.



"Walnut Tree" original by Paul Devries, Dallas. Flew very well. Specs coming.



Wendell Roberts and Randal Snow (Air Tech) are producing (l to r) Eagle, Pawnee, and Blazer. Non-scale, 16-17 pounds, for Quadra.



The bones for a Stinson SR-9, by Ken Long, Dallas. Masking tape-modified Super Hustler up front.



Rearwin Speedster by John Westbrook, Little Rock, Arkansas. Flew well at 16 pounds, with Quadra.



Charles Stevens, Pasadena, Texas, built this J-3 from Balsa USA kit. Suevia powered.

walk to see what was on display at the other end of the field, people sojourned back and forth a number of times to make sure they hadn't missed anything. And virtually all of the aircraft . . . the good, the bad, and the ugly . . . received their fair share of the curious and the crowding. As one couple with a five-year-old told me, "We came out to see all the airplanes."

Three aircraft, in particular, were obvious spectator favorites, and also happened to be the judges' choices, too: Houston's Mike Cook once again took home the Best Scale Trophy, only this time did it with his great looking and flying scratch-built Ziroli Corsair. It features retracts and carrier-type folding wings, and was powered by a 2.4 Kioritz. The Most Outstanding Award went to Gail Phillips, also from Houston, for his 42 pound, 3.15 Kawasaki-powered, much-modified Nosen P-47, with retracts and flaps. And Paul Devries, of Plano, Texas, walked away with the Best Non-Scale Trophy for his original "Walnut Tree." This 24-1/2 pound clean machine was hauled around by a 2.4 Kioritz and really "grooved."

Mustn't forget about the Longest Distance Traveled trophy that was won by Don Downing. He came all the way up from Brownsville, Texas, which if I remember correctly from my cadet days at Harlingen, is in an area called the "Magic Valley."

There was a lot of flying on both days, but as always, most of that air time was logged by relatively few people. I'd say

that no more than 25 percent of the 135 aircraft got off the ground; the rest of the birds were "Hangar Queens" for that weekend, which is okay 'cause IMAA sanctioned fly-in's are uncontested social affairs and you fly only if you want to.

I know that many of you are chompin' at the bit for some "real" information, so let's get to answering questions like: Were there any trends? Which design or kit seemed to dominate? Which engine was favored? And for the morbid . . . how many crashes, and why?

Here's what I saw in regard to trends: 1) more than ever before, each BIG Bird lover is doing what comes naturally and putting his heart and soul into what appeals to him . . . with little or no regard for what others are building. I think this is because the average age of

your everyday, run-of-the-mill BIG Bird buff is in the forties, which means that this guy is mature and secure enough not to worry about being out of step with his peers; 2) an increasing number of R/Cers and non-modelers are moving into our beautiful world of BIG, as evidenced by the larger turn-out this year; and 3) because of trends one and two, we're now seeing more non-scale. The majority of these new BIG Bird people want fast building, good flying ships that look enough like an airplane without having to be a miniature of anything . . . and they're not necessarily looking for "full-bore" aerobatic capability, either.

That's why I was so pleased to see Air Tech's line-up of sporty flying machines

Continued on page 86



Sopwith Pup from Balsa USA kit, by Ken Meek, Houston. Kawasaki powers this 36 pound model. Lotta shade under those wings!



Ron King poses for the camera with his SuperMantis which he modified. See text for details.

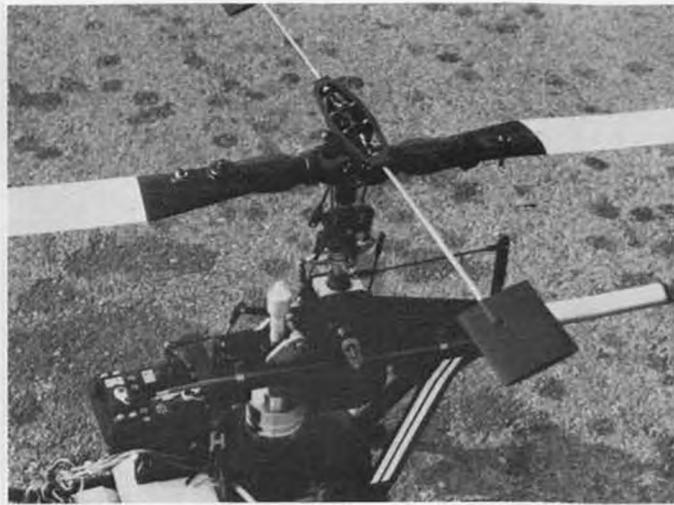


Photo No. 1

CHOPPER CHATTER

By RAY HOSTETLER

PHOTOS BY THE AUTHOR

• To start off this month, I received a nice letter a few days ago from Ron King, of Beltsville, Maryland. Ron and I had talked about SuperMantis modifications earlier, and he sent me some nice photos along with his latest notes. The first photo shows Ron and his SuperMantis all set for a day's flying.

Some of the important changes Ron has made to his SuperMantis include:

1) Used an old Revolution II bell housing and gear set to increase the main rotor speed from 5.6:1 to 7.5:1. This lets the engine run at 11,000 with a M/R speed of about 1500.

2) A 10 oz. tank was fitted for longer engine runs as more power (from the gear change) resulted in a larger fuel draw.

3) A new aluminum follower was made for the upper swashplate, as the

original "pull around" follower mixed controls just slightly.

Ron also developed an easy way to level the SuperMantis flybar. I have used it myself and it is neat and very simple. Do it as follows:

1) Drill and tap two 4-40 holes in top of the M/R hub, one on each side of center above the flybar.

2) Take two 4-40 x 1/2 bolts and run nuts up on them.

3) Screw bolts into the holes... hand tight is fine.

4) Your flybar is now locked level for head set-up. Be sure to remove before flight!

Special thanks to Ron for his contribution to the column. Now to pick up where I left off. Last month I showed the basic rotor head configurations. This month a little more detailed explanation

of how each type works.

BASIC OPERATION OF THE HILLER SYSTEM

Refer to Figure 1 for Hiller operation. There is only one pushrod from the swashplate to the head in a Hiller-only system. This rod controls the angle of incidence of the paddles. With control deflection, one paddle increases and the other paddle decreases incidence. This differential of lift moves the flybar up or down which in turn "levers" the seesaw. (For an example see Fig. 1 inset.) The seesaw action puts more pitch in one blade and takes pitch out of the other. These cyclic pitch changes in the blades can be referred to as "feathering" the blades. Once the main rotor blades have been feathered, there is a lift differential in the rotor disk causing it to tilt in a certain plane, depending on where the



Photo No. 2



Photo No. 3

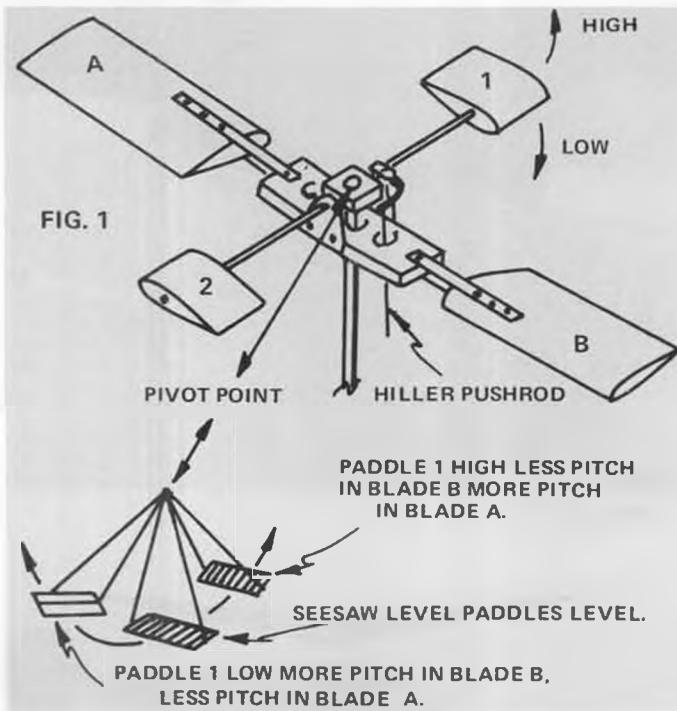


Figure 1 shows how the Hiller system works in fixed-pitch heads. Flybar movement induces pitch changes to blades.

initial control was put in.

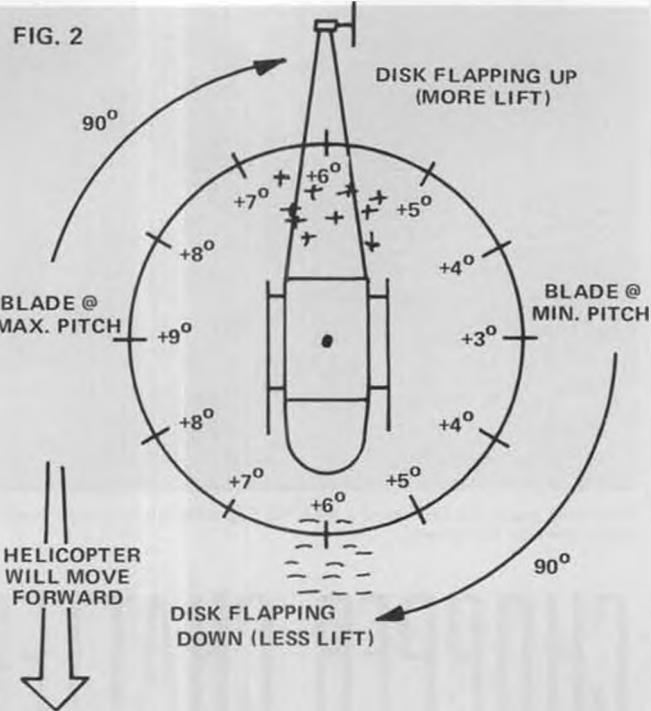
These control changes take place every rotor revolution, or one cycle. Hence the name cyclic pitch. A few months ago I gave a simple illustration of how the Hiller system actually controls the rotor disk. For those of you who missed it, I'll run through it again. But before I do, I want to explain gyroscopic precession and how it affects rotor head operation.

Every rotating body wants to react perpendicularly (or approximately 90 degrees) to any force put into it. (Try to push a rotating toy top forward and it will go off 90 degrees to the direction

you pushed it.) What this means to the rotor is that a control we put in will take effect 90 degrees later in the plane of rotation. Basically, the maximum pitch angle of a paddle or a rotor blade will generate maximum flapping 90 degrees later. In the Hiller system, pitch is put into the flybar paddles. Then 90 degrees later, the flybar flaps. (Up or down depending on the particular input...) The flybar movement levers the seesaw, which feathers the blades to maximum pitch. At this point we pick up Fig. 2, where the blade has been levered to maximum or minimum pitch, depending on blade location in the disk, and 90

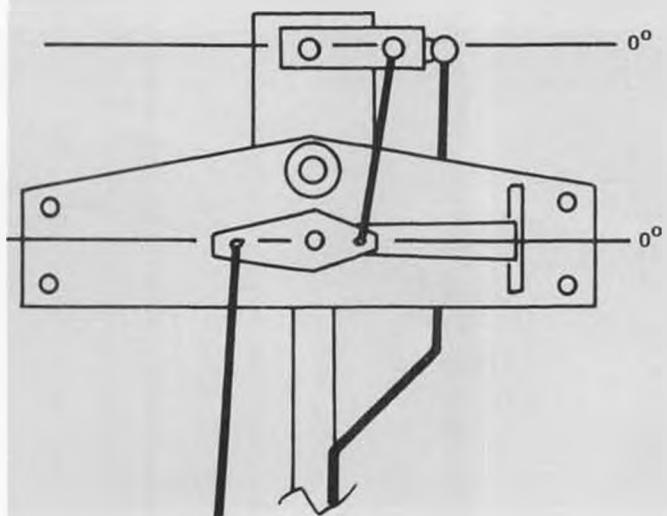
degrees later the maximum flapping of the rotor blades occurs, which displaces lift to move the helicopter in the desired direction.

O.K., now correlate Figure 2 to photos 1, 2, and 3, a real life example. Let's say we're hovering, and we want to go into forward flight, so we push in forward cyclic. This immediately puts a control deflection in the paddles. (Photo 1). The paddle nearest us loses lift, the far one gains lift, and 90 degrees later (Photo 2) the flybar has flapped down in front and up in the rear. This flapping has induced feathering into the main rotor blades. The blade nearest us has a reduced pitch

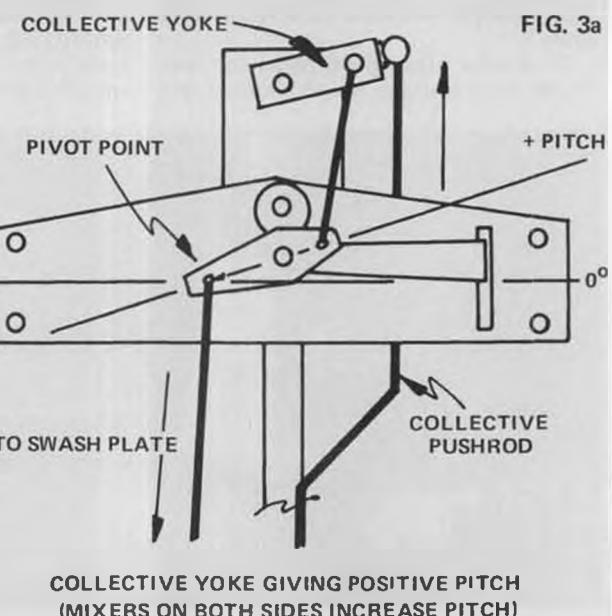


A forward cyclic input causes the indicated cyclic variations of the rotor blades. Note how lift lags pitch by 90 degrees.

FIG. 3



Collective system properly set for hover. Mixers, collective yoke, pitch arms, all must be level.



COLLECTIVE YOKE GIVING POSITIVE PITCH
(MIXERS ON BOTH SIDES INCREASE PITCH)

Collective inputs through collective yoke movements.

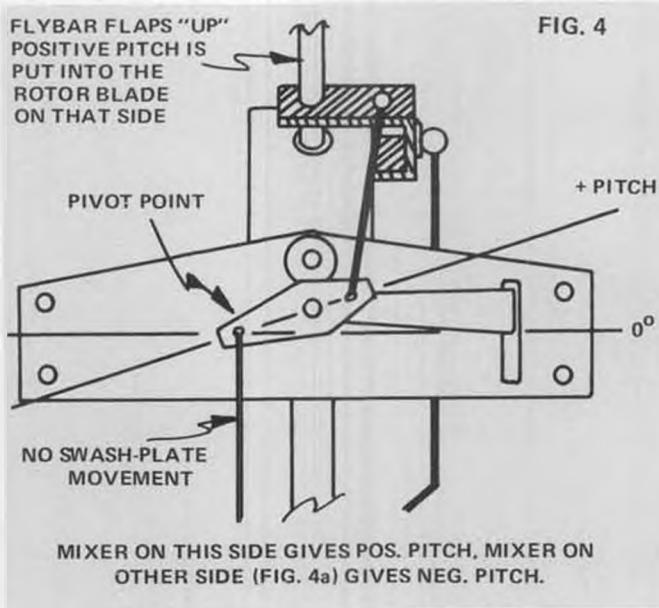


FIG. 4

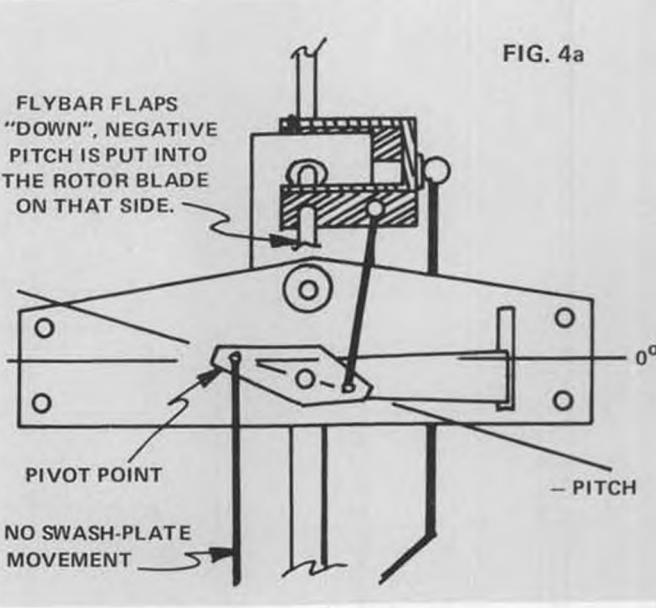


FIG. 4a

Hiller system inputs through flybar movement. Mixer on left side gives positive pitch, mixer on right side (Fig. 4a) gives negative pitch.

angle, the far one has an increased pitch angle. In Photo 3, 90 degrees later, the blades have reached maximum flapping which gives us a lift differential. Less lift in front, more lift in back. The helicopter moves forward.

Notice how the paddle in Photo 1 has moved 180 degrees to Photo 3. It takes half of a rotor rotation for the Hiller system to induce helicopter movement.

BASIC OPERATION OF THE BELL SYSTEM

I've shown how the Hiller system moves the rotor disk via the flybar. The Bell system is simpler because the swashplate feathers the blades directly without using a flybar. If you give forward cyclic, the rotor blade on the right side of the helicopter feathers to

more pitch, the blade on the left feathers to less pitch. Exactly as in Fig. 2, refer to it again. Sure enough, 90 degrees later maximum flapping occurs, so when the right blade moves aft (on clockwise rotor rotation) it delivers more lift, causing the disk to flap up in the rear. At the same time the left blade moves to the front of the helicopter with less lift, causing the disk to flap down in the front. Just as in the Hiller system, the differential of lift in the disk moves the helicopter forward. All clear? If not, read it over again.

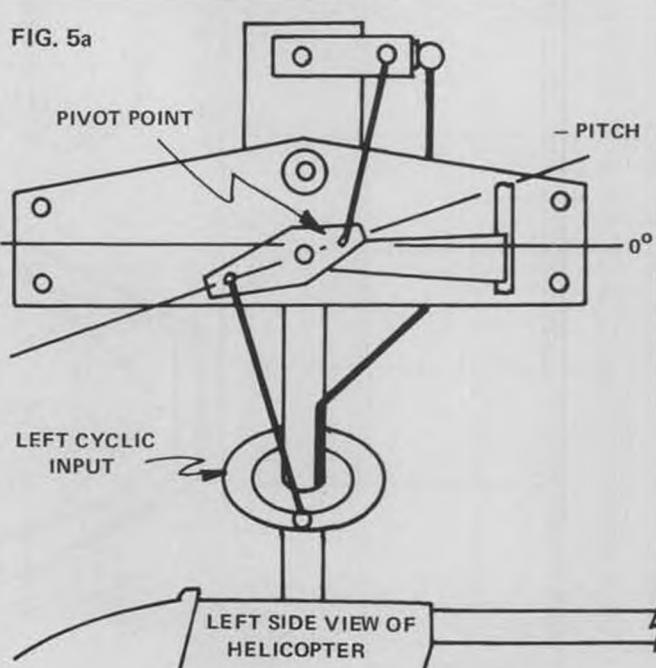
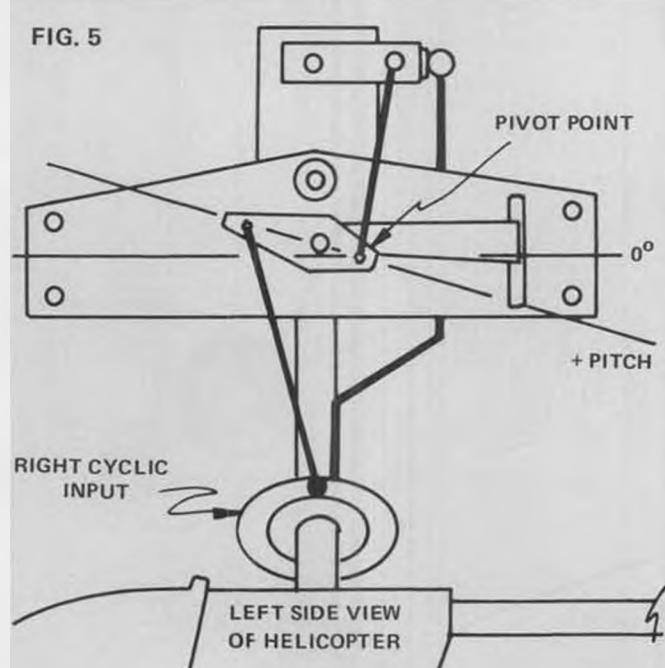
BELL-HILLER SYSTEM AND OPERATION

The more sophisticated helicopters incorporate both the Bell and Hiller systems. It gets tricky in operation because each works with the other.

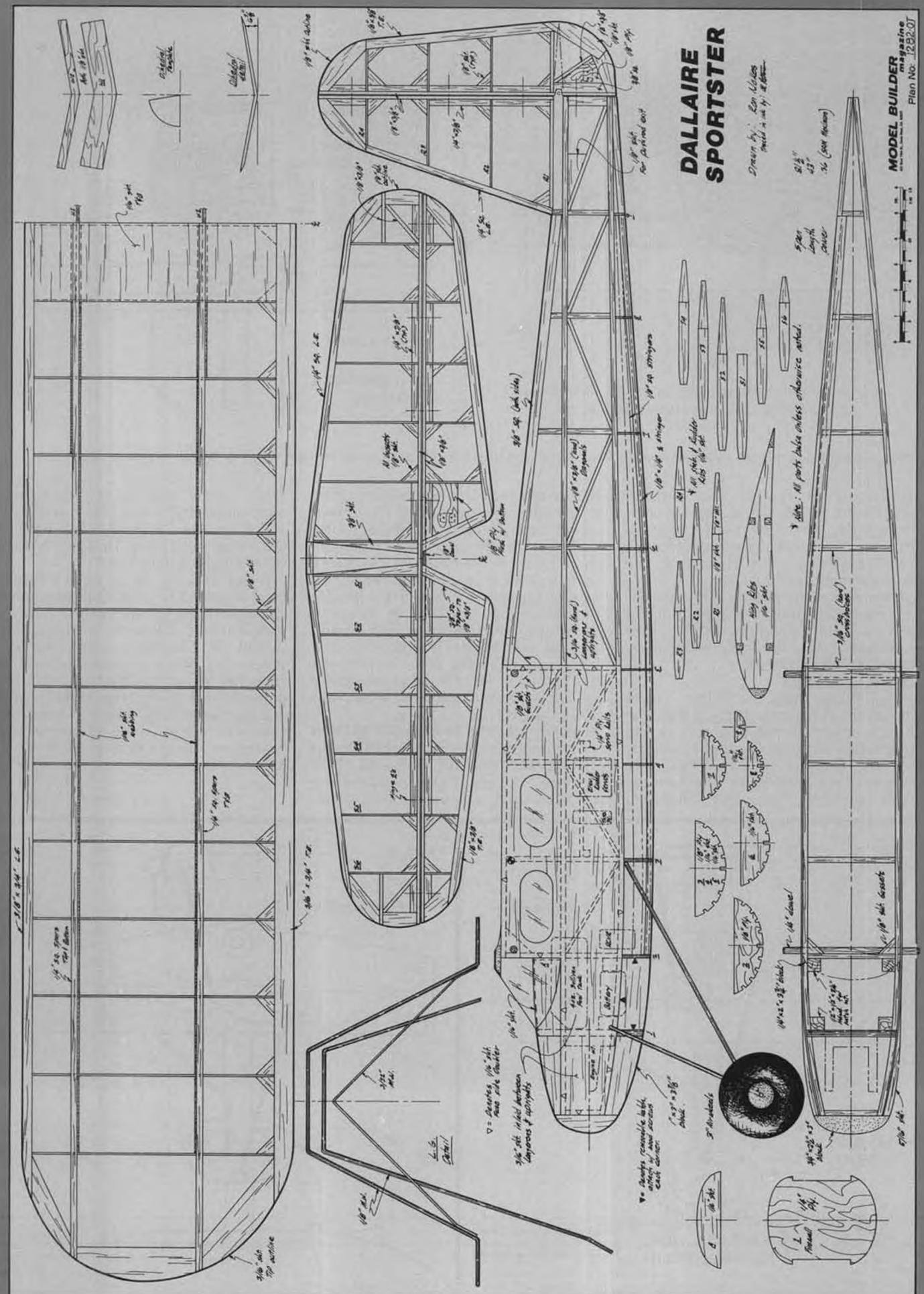
What I have done is to isolate each movement (collective, Hiller, and Bell) and show how the input is delivered to the rotor head. The Heli-Boy/Mantis style of head will be used.

Figure 3 shows everything as it should be at a hover. The collective yoke, pitch arms, and mixers should all level. Check your machine. If they are not level they should be adjusted so that they are. When you give a collective input, the collective yoke moves up or down for more or less pitch, respectively. Note that the swashplate does not move for collective inputs, so the left side of the mixer arm acts as a pivot point. See Fig. 3a for a positive pitch input example.

Continued on page 87



Bell system inputs through swash plate movement. Figure 5 shows right cyclic input, Figure 5A shows left cyclic input. Note that the right side of the mixer acts as a pivot point.





Dallaire Sportster

By RON NOKES . . . The original Dallaire Sportster is a popular full-allotment old-timer competitor, but its 9-foot span can create a transportation problem. Try this 81-1/2 incher for size!!

• I have thoroughly enjoyed this smaller version of the famed Dallaire Sportster. It is a fine sport airplane with a flight that can only be described as majestic. My Dallaire is powered by an Enya .29, which has proven entirely satisfactory (.35 is the maximum engine displacement under SAM rules for this version of the Dallaire).

I would be remiss if I didn't credit John Pond for recommending the Dallaire to me. John and my local hobby shop owner, Leo Gates, were very helpful in this, my first attempt at constructing an old-timer. Aircraft modellers truly are an exceptional breed!

CONSTRUCTION NOTES

Construction of the Dallaire is relatively straightforward, but certain fea-

tures need additional emphasis.

WING: The aft lower spar and leading edge will require shimming as the wing is laid out over the plans. Shims should also be placed under the outer portion of the trailing edge to provide approximately 2° of washout in the outboard wing panels.

The plans show the layout for the left-hand wing semi-span. The right-hand wing layout can be obtained by oiling the plans and constructing over the reverse side of the plans.

The dihedral braces (W1 and W2) should be installed and the wing halves joined before the upper 1/16 sheeting is added. Note that W1 and W2 are sandwiched between 1/16 sheet spar webbing on the forward and aft sides of

each spar.

FUSELAGE: Careful selection of longeron material is critical. I considered substituting 1/4 square spruce for the 3/16 hard balsa, but elected to stay with the balsa construction. The 3/8 square deck longerons, uprights, and cross-pieces are added after the fuselage sides are joined to form the basic fuselage box. Careful construction techniques and judicious use of jigs should assure straight and square assembly.

The landing gear is attached to the firewall and bulkhead No. 3 using copper wire. The landing gear must be attached to the fuselage before the 1/8 square and 1/8 x 1/4 stringers are added.

Continued on page 87



Power for Ron's "reduced" Dallaire is an Enya .29. SAM rules will allow up to a .35. No thrust offset.



Author/designer Nokes is very pleased with his first old-timer. Span of this reduced version is 82 inches.



1. Line-up of old time controlliners at the Lincoln, Nebraska Nats.



2. Father-son team of Jim Lee and Jr., helped each other on official flights.



PLUG SPARKS

By JOHN POND

• All this writer has to do is to take off for several large contests and does the mail every pile up! We have a flock of news and happenings to report, so let's get with it.

First on the agenda is a report of the three days of old timer flying at the AMA Nationals, held this year at Lincoln, Nebraska, on the first week of August.

Probably the most disappointing thing about the Old Timer Events (and also the SAM Champs at Westover AFB) was the noticeable falling off in entries. This columnist ascribes this problem to the fact that money is tight, unemployment is high, and prices continue to increase. The latter was an eye opener, as the gas prices had raised fifteen cents a gallon on the road, while motel prices ranged from \$35 to \$48 a night (for two). This is truly a shame, as many deserving

modelers were unable to attend. This, incidentally, was predicted several years ago. There is no joy in Mudville over this development.

Regardless of the foregoing, there are enough dedicated modelers who come every year to warrant the running of the old timer events. Actually, the old timer get togethers resemble a country club affair more and more. The comradery among the modelers is something else to see! That in itself makes the trip worthwhile!

Wednesday, August 4th, saw the start of the old timer activity at the Bear Lake Park, Omaha, Nebraska, home of the Omahawks R/C Club. This cozy bandbox is located about 45 miles from Lincoln AMA Headquarters. Credit for setting up the field and advising this writer of the whereabouts should go to Rod Ross.

The club members made things so nice, C.D. Pond actually had time to fly Class ABC Event. Certainly couldn't

complain about lack of help! One of the names that keeps popping to mind was Frank Fisher. A good man!

Although the Omaha boys failed to send photos as promised, a description of the activity is in order. Most surprising to this columnist was the number of entries in the Class ABC Combined Event, sometimes called The Limited Engine Run Event. Would you believe 18 on short notice of two weeks?

Weather had a great deal to do with the winning and losing, as those who flew between 11 a.m. and 12:30 found conditions quite windy. When the wind began to subside, it was then that Olie Olson flew Pond's Dallaire to first in both the Antique and Texaco Events. For those unaware, there is no BOM rule in radio assist, and when this C.D. found he was unable to find time to fly his models, the only logical thing was to turn them over to that most amiable hobby dealer and club spark plug, Olie Olson, of Hobby Center.

Besides, the model simply had to be flown to redeem itself from a "switch-off" situation three years ago at the same site, where the Dallaire pulverized itself after three spectacular loops. We can't go around all the time acquiring Switch-Off Awards!



3. Jim says, "Now what?" as Pond troubleshoots electric starter. Not fair with old-timers, anyway!



4. Jim Walston, Atlanta, GA, with .020 version of little known "Stormer". Good flyer.



6. Two rubber power event sponsors, George Perryman (left, Stick) and Bill Baker (right, Twin Pusher).



7. Junior Rubber Power Event sponsor, George Perryman, awards trophy to J. Ulibarri. Coach Jim Mummery approves.

Although the contest was all over by 3 p.m., no one could say they didn't get their flights in. The contestants were quite considerate in watching the time on their frequency. Things like this make a contest move right along and best of all . . . make it enjoyable!

Class ABC Combined

1. Art White	17:43
2. Ray Van de Walker	14:19
3. Ed Konefes	10:54
Antique	
1. Olie Olson	20:31
2. Ray Van de Walker	15:33
3. Art White	13:38
Texaco	
1. Olie Olson	17:37
2. Frank Fisher	14:10
3. Art White	12:12

THURSDAY, AUGUST 5th.

The scheduled old timer controlline events ran into a snag on this day as all circles were in use; truly a surprise to this writer as generally, there are at least two circles available. The earliest available circles were not ready until 1:30 p.m. This made for a rather long day, as things did not wrap up until after 6:00 p.m.



8. Ray VandeWalker came to fly all kinds. This is .020 version of Mk II Comet Clipper.

Real credit for a smooth running competition should be given to Mark Overmier and Terry Meidroth, for their excellent briefing of the contestants to the type of pattern flying expected. This columnist thought they were strict, but very fair. (Huh! Even the writer got run out of the circle for taking longer than five minutes to start!)

Photo No. 1 gives the reader some idea of the number of entries in the controlline events. Very pleasing to this scribe was the increase in models with ignition engine power. Three actually entered and flew! I don't feel like the Lone Ranger anymore!

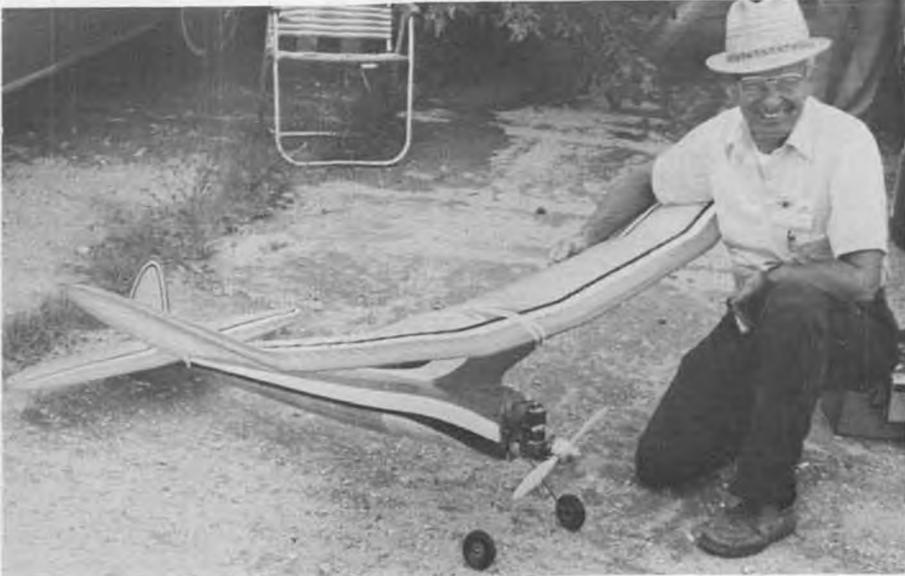
Photo No. 2 shows James Lee with son, Jim, Jr., working over their model prior to takeoff. Actually both can fly the model, but only dad could enter officially. This writer thinks it is simply great to see the younger set participate in the old timers, especially when they are being exposed to ignition engines!

Perhaps the most unusual pattern flight was made by Jim Lee, flying a Go-Devil with an OK 60 for power. Onlookers, along with this writer, were

willing to make bets the model would never make it through the pattern, as the OK appeared to be running rather poorly. Poor as it was, the engine never faltered or changed note, and Jim put in a complete flight. He had done his homework!

Photo No. 3 shows more frustration at the starting circle as the electric starter appears to be giving trouble (actually found it was an intermittent worn electric cord). Most fellows who saw this Yates Dragon model commented on the red-case Orwick 64. Don't you believe it! Although Hank Orwick did produce some oddball colors in his engines, this engine was painted red as heat resistant green paint was unavailable at the local auto parts house.

The spectators didn't know it at the time, but by the time the first three contestants had flown, first and second places by Windy Urtnowski and Jim Renkar were won on those first flights. This is not to detract from the regulars who have been coming to all of the O/T controline events over the last four years. To mention a few, the following



5. Willard "Buck" Zehr and his well painted Comet Sailplane. Orwick 64 proved troublesome.



9. Dave Ramsey, SAM No. 1, with HLG. Just look at that field and horizon.



10. Nicely decorated Shulman Skyrocket built by Les Payne, SAM No. 1 proxy. With that name, he should be a dentist.

repeats made official flights: Don Hollfelder, Jim Lee, Jim Renkar, and Jim Casale.

Again, this writer was absolutely flabbergasted at the tremendous sportsmanship exhibited by the contestants. Jim Lee, first man up, had no sooner landed, than everyone gave him a round of applause. It was like that all afternoon!! Let's see what the day's work wrought.

Glow Engine Stunt Event

1. Windy Urtkowski	269
2. Jim Renkar	245.5
3. Karl Siefert	243

Ignition Engine Stunt

1. Jim Lee	208
2. John Pond	33.5
3. Doug Dahlke	DNQ

FRIDAY, AUGUST 6th.

This was the big day for free flight. Up to now, the weather had been rather good, with temperatures hovering in the high eighties, and fairly reasonable humidity. Friday dawned with fog that persisted until 10:30 a.m.

Actually, this was a break, as it enabled C.D. Pond to select a spot suitable for takeoff (a requirement for old timers)

and actually time to test his twin pusher, which had not been flown since 1978!

Things got off to a quick start, with Sal Taibi typically getting off one of the first flights. He narrowly missed crashing his Dodger, as something went amiss and had the boys scrambling for cover.

Jim Walston, who can be seen in Photo No. 4, came with a truckful of models. No kidding! That camper top of his was absolutely jammed with free flight models, both modern and old timer. Jim is an excellent craftsman, as can be seen on his creation of an .020 size Stormer. Best part is that it flew as good as it looked!

Of course, there is always the recalcitrant engine that simply won't run right no matter what is done to it. Such was the case of Willard "Buck" Zehr, seen in Photo No. 5, with a hard starting Orwick 64. The Sailplane was a gorgeous model, and when he finally got the engine running (not at any great rpm), the model was really able to show off its superlative gliding ability. He just did squeeze the winning flight in before closing time.

Rubber events: what can you say

about these in view of the fact they were the most heavily entered. Let's hear what Bill Baker has to say:

"We had a good time, didn't we? Rest assured of my continued sponsorship of the twin pusher event. It will grow!"

"One of the most fun things I did, second only to maxing out in Rubber Cabin, was to help Ed Konefes catch up with his Buzzard Bombshell (Ed was on foot! Bill was very gracious to use his motorcycle). The model went five miles because he didn't trip the dethermalizer. I then helped him get in the rest of his flights."

"I had admired the hand carved mahogany propeller so much that Ed took it off and gave it to me. My best trophy of the week!"

In that line of thought, maybe we had better run Photo No. 6, of the two event sponsors, George Perryman for Junior Rubber, and Bill Baker for Twin Pusher. As can be seen, the Mead Missile Base is fairly flat but loaded with scrub oak. Makes things interesting!

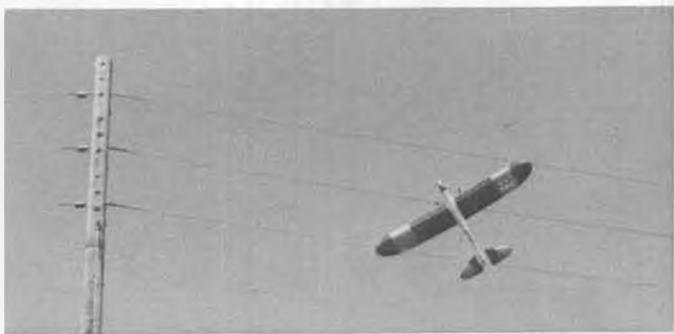
We try to promote the interest of the Junior members all we can in this column, but Perryman puts his money



11. Marion Knight's good looking 10% scaled Simmons Gas Champ. A real performer.



12. Ace old-timer Bert Streigler back again, this time with a Jerry Brofman "Sunduster".



13. The supposed advantage of R/C is to avoid situations like these! Tom Vincent's Cumulus was retrieved without a scratch.

where his mouth is . . . right on the line. This makes about the sixth or seventh year he has sponsored the Junior Rubber Event. Photo No. 7 shows Perryman congratulating the winner, J. Ulibarri, with his trusty coach, Jim Mummary.

One more shot of the free flight activity and we'll quit. We'd like to acknowledge Ray Van de Walker (Photo No. 8) of Norwalk, California, who really came to fly, competing both in radio and free flight. To top it off, he placed in all events entered.

Some humor arose on Wednesday at the R/C Assist events, as Ray had Harry Gould, a former free flighter of "Harry C" fame, as his mechanic. Upon being asked why he didn't fly old timers, Harry said, "I don't fly that crap." It wasn't an hour later when some of the boys found out that Gould was a proficient R/C pattern man. Knowing that Van de Walker assists Harry, he was queried why he didn't participate. Looking Harry Gould straight in the eye, Ray said, "I don't fly that crap." Haw-w! More darn fun!

Well, we yakked about the activities. Just a shame we ran out of space to talk about the Victory Banquet and all the great comradery, but we simply have to get your name down as a winner or this columnist will never hear the end of it.

Free Flight Events

CLASS A

- | | |
|-----------------|------|
| 1. Jim Walston | 5:52 |
| 2. Merle Shammo | 4:45 |

CLASS B

- | | |
|-----------------|------|
| 1. Sal Taibi | 7:38 |
| 2. Merle Shammo | 6:40 |

CLASS C

- | | |
|----------------|------|
| 1. Buck Zehr | 8:21 |
| 2. Ed Konefes | 7:32 |
| 3. Jim Walston | 1:48 |

ANTIQUE

- | | |
|----------------|------|
| 1. Sal Taibi | 8:13 |
| 2. Jim Walston | 3:47 |

.020 REPLICA

- | | |
|-----------------|------|
| 1. M. Martin | 7:37 |
| 2. Merle Shammo | 6:43 |
| 3. Tony Haliano | 5:53 |

RUBBER CABIN

- | | |
|----------------|------|
| 1. Bill Baker | 9:00 |
| 2. G. Perryman | 7:31 |
| 3. J. O'Reilly | 1:37 |

RUBBER STICK

- | | |
|----------------|------|
| 1. G. Perryman | 9:00 |
| 2. J. O'Reilly | 7:48 |
| 3. Bill Baker | 7:46 |



14. Bruce Lester shot from early Nats. Can you I.D. this Berryloid entry? Interesting design.

JUNIOR RUBBER

- | | |
|----------------|------|
| 1. J. Ulibarri | 2:40 |
|----------------|------|

TWIN PUSHER (LAST MAN DOWN)

- | | |
|------------------------------|------|
| 1. Walter Rozelle (Perryman) | 2:09 |
| 2. J. O'Reilly | |
| 3. J. Pond | |

ENGINE OF THE MONTH

"Nothing succeeds like success" could well be the motto of the Tlush engine, as it was comparatively unknown, even on the East Coast where it was being manufactured by the Tlush Brothers.

The "success" this writer is referring to is the win at the 1936 National Model Airplane Championships, held at Wayne County Airport, located about twenty three miles southwest of Detroit.

Francis Tlush entered his 9 ft. model, somewhat resembling a Cavalier, and rode to victory in the Texaco Event (age limit 16 to 21) with a beautiful flight of 45 min., 34.5 seconds. According to some of the eye witnesses at this meet, Tlush's model was on its way down around the twenty minute mark when it encountered another gorgeous thermal that carried the model to victory.

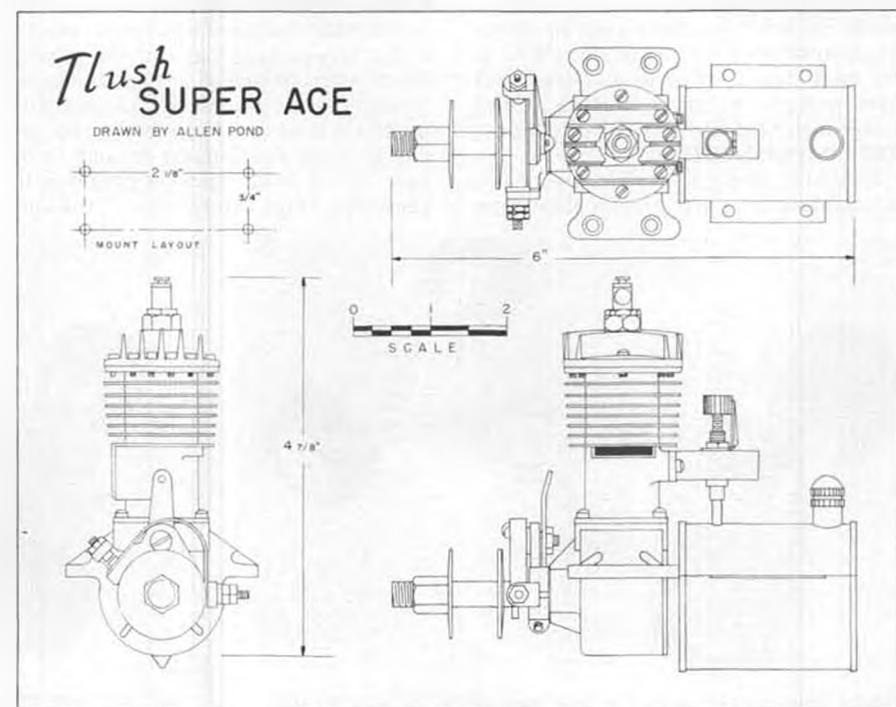
Up to this point, most of the information surrounding the performance of

the Tlush engine was extremely sparse, as little or no advertising was done. The results of the Texaco Event on page 45 of the September 1936 issue of *Model Airplane News* was opposed on page 44 with one of the first advertisements extolling the virtues of the Tlush "Super Ace." Interestingly enough, the engine was priced at the same level as the Brown Jr., \$21.50. Only one more ad followed, in the November issue, and little was heard from the plant thereafter.

In spite of the non-advertising, the engine was produced until the war shut off material in 1941. In defense of the Tlush brothers, it must be pointed out that the reaction to their ads was rather poor. Estimates have been made by Francis that no more than 500 units out of the 7000 castings were sold in the United States.

Sales abroad were quite another story, as the majority of their motors went to South Africa, and particularly, Australia. As a matter of fact, the Tlush engine was so popular, an identical copy was produced in Australia, called the "Whirlwind." Some of these have come through the U.S. customs, and a few of

Continued on page 87



R/C AUTO NEWS

By DAN RUTHERFORD

PHOTOS BY AUTHOR

THE TEST OF THE ASSOCIATED RC12i (FINALLY!)

When you have been racing RC cars for any length of time you can look back at certain cars, accessories, hot motors, or trick setups with a certain amount of fondness, as these were the items that helped win a race, a big series of races, or just plain worked well. That is how I look at Associated's series of 1/12 cars. In my case it was the RC12E that helped me do a number on the boys (and gals) that first year it was available. When the RC12E came out, it was without doubt at all the best 1/12 car around; it was stable on the straights, turned inside of all other cars, and was super tough. Sure, it could be broken, mine broke once, but you had to hit something immovable and do it at top speed. And the RC12E had handles. Other cars would hop through the corners, the RC12E would slice through, the advantage was so pronounced that the Associated car could be driven off-line and still blow by the opposition.

Yes, the RC12E was amazing at its introduction, but since then there has been a lot of pressure on Associated to come up with the next step in chassis development. It turns out the RC12i is the next step, and while this step isn't anywhere near as long as the first, at least it seems to lead in the right direction.

FIRST IMPRESSIONS...

The first thing noted is the really outstanding box art, presumably done



Associated's new and very clean RC12i all wrapped up in a Lola T-600 body. The car is classified as a GTP, but runs in Can-Am class per ROAR rules.

by Chris Chan. Yes, I know that we aren't racing the boxes the cars come in, but there are those who don't know anything at all about RC car racing, who may be persuaded to buy a car just because of attractive packaging. And it indicates a healthy state of affairs in the RC car biz when a manufacturer springs for the bucks to do the wrapper properly.

Inside are a whole bunch of parts, all bagged according to sub-assembly, the tire/wheel sets are there, racing rubber on the wheels, with the rubber glued and trued. And that famous instruction manual that details how to build the car and then at least gets you started on fine-tuning. The RC12E had the first instruction manual that was worth reading, at least in the RC car business. It isn't quite as notable today, as the other manufacturers started doing a decent job with what is, admittedly, a difficult piece to write. Still, awkwardly worded sentences (a few) and misspelled words (more than a few) aside, Associated's manual will help a lot in getting the car built right the first time through and then carry you into initial setup.

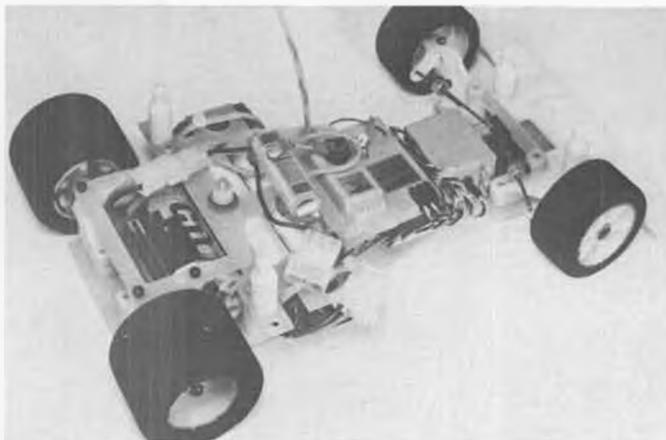
ASSEMBLING THE RC12i...

Not much to building the car, most of it just screws together; all the molded plastic parts fit fine, no need to use that hammer even once. The countersinks for the screws common to the pan and chassis parts aren't deep enough in the pan, but that has been a problem for years. No, I don't know why...the fairly

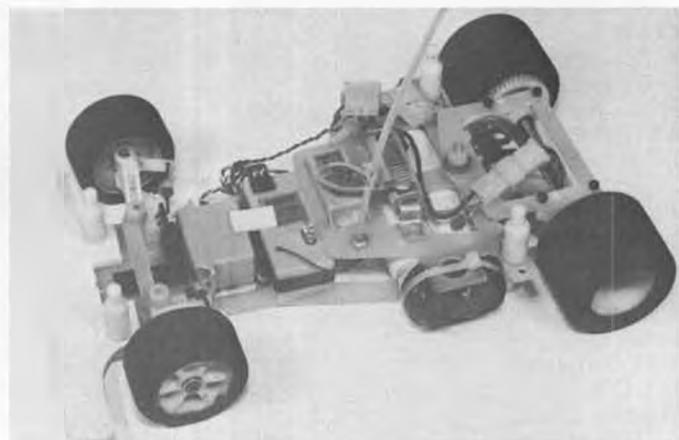
easy cure is to just buy a countersink tool and finish the job yourself. The only other problem was running those two long aluminum screws into the suspension arms. By the time the first one was halfway in the untapped hole (the screw cuts its own threads) the head of the screw was stripped out... And my wrist was quickly tiring. To speed things up, I just chucked a spare screw in the drill motor and ran the screw through all the molded-in holes in the chassis parts.

The chassis part itself is an interesting design, intended to get the effects of suspension but without all of the suspension pieces. Huh? Yeah, I know... it sounds a little strange. What has been done is to cut the front of the pan just inboard of the front suspension arms. This cut is made so that the suspension arms attach to the rear of a "tab" and so can operate somewhat independently of each other. As a suspension system, it has to be regarded as rather crude, but remember that Associated was more concerned with how it worked than how sophisticated it might appear at first glance.

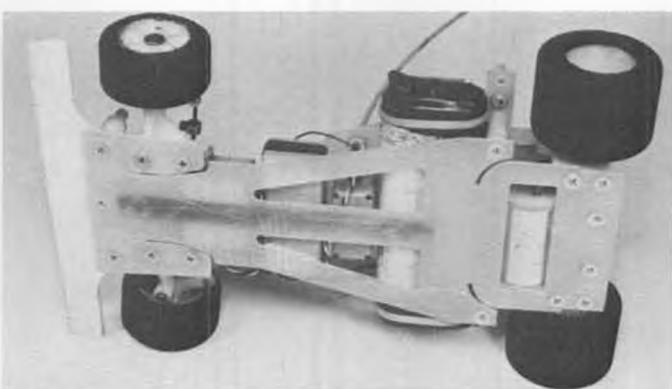
At the rear end, the same technique of cutting the pan to isolate a component of the car is used, only here it is to provide a pivot point for the rather heavy rear section of the car which carries the motor, differential assembly, axle, wheels, etc. To keep all of this stuff from flopping up and down wildly, it is more or less counter-balanced by the



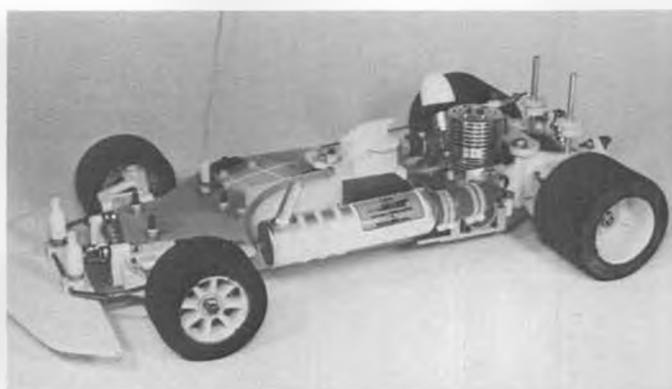
Beauty is not just skin deep. The Lola body of the RC12i hides the Kraft Road Pack for 1/12 cars, and 05 motor.



Left side view accentuates the RC12i's simple and logical radio layout, also its fiberglass chassis and battery pack.



Bottom view of the RC12i shows cuts in the fiberglass chassis to give suspension effect. Dark stripe is Kydex doubler which aids damping.



Next month's 1/8 scale test car, the Associated RC500. Features: Kraft radio; K & B engine; McCoy carb, header, and pipe.

battery pack, which is hung from a radio tray that has its support stand-offs bolted to the main body of the pan and on a line that crosses the mentioned pivot point.

If that was as far as the design went, it wouldn't be very effective, in fact, it would probably pogo itself all around the track. To eliminate this, a damper is needed, and it comes in the form of a friction damper. A 'glass piece bolts to the tops of the rear blocks and extends forward of the motor. Directly underneath this forward end is an aluminum screw that is mounted solidly in the rear part of the radio tray. This screw extends up to and through the previously mentioned 'glass piece, the hole to accept the bolt being oversize to allow for plenty of flex. But to control this flex, a fiber washer, a spring washer, and a nylon nut are fitted to the screw. The nut is tightened until it just slightly compresses the spring washer, which gives some friction to the friction-type damper. Turn the screw in for more damping, back it off for less.

And it seems to work. Well, I'm not convinced the treatment given the front end is the final answer to the problem, but as far as the rear end is concerned, it does do a good job of smoothing out the bumps, and helps a lot in keeping the car hooked up and cookin'.

Hmmm, guess we were actually supposed to be talking about building the car, and still are, in a way, as the effort at getting a suspension effect did not unnecessarily complicate the car, it all still goes together quickly.

The new radio layout is also easy to work with and pretty much eliminates the problems the RC12E had when it came time to mount certain bodies. There are still a few bodies out there that won't fit, but not near as many as before. The mounting of the throttle servo is neat and clean, ditto for the receiver. But there has to be a better way to mount the steering servo than just sticking it in place with servo tape and then running a piece of strapping tape around both servo and chassis pan. The tape is always getting chewed up on the bottom of the pan, and, well, it just plain looks tacky. One almost expects to see a chunk of baling wire backing up the tape...

All of the wiring is straightforward and easily accomplished. Still used are those Amps plugs that have proven to work very well; they very rarely come unplugged (and then only if not pushed completely home to begin with), will stand up to constant, hard abuse, and are effective conductors of electricity.

Assembly of the differential is probably the only thing that will give the novice any trouble at all; not because it is difficult or complicated, but because the instructions could be a little better and these ball diffs are strange little contraptions. (First time I had one explained to me, I told the guy it couldn't possibly work . . . And now they are relatively common on 1/8 scale gas cars!)

I can still remember back when Associated was developing their own version of a ball diff and how frustrating it was waiting for them to finally release production parts. They very nearly developed the thing into the ground and were months late in releasing them. The catch is that the wait was worth it. When new, Associated had the best 1/12 scale diff. Even today they still have the best, although at least a couple of manufacturers have improved theirs enough to be in the almost-as-good class. And another couple still suffer along with diffs that are just barely good enough to race with. This is getting off the subject of this test, but many of you who are not racing Associated cars

ought to at least consider using their diff. It's that good.

The radio installed is a Road Pack available from Kraft. Yes, those sure look like Novak's Bantam Midget servos and his own receiver, don't they? Well, they are. Kraft Systems wanted in on the RC car market, and having had a car radio system that didn't offer anything special, figured that this time around they had better come up with top-of-the-line stuff, preferably pieces that were already highly popular. Novak had the popularity and wanted to expand his market, and so a winning team was created.

Good stuff it is, as shown by almost every 1/12 RC car actively being raced. Look around . . . almost every one is using Bantam Midget servos and quite a number also have the Novak receiver. The receiver works well and is generally easier than others to mount in a 1/12 car. I hear there are some tricks in the receiver, mainly to make it more suitable for use in RC cars. All I know is that mine has worked very reliably. The servos are great; real fast, good-enough centering, strong gear sets and small enough to be mounted in any 1/12 car.

The advantages that Kraft can offer by marketing these pieces are a very wide dealer network, established service stations, a toll-free ordering system so your dealer can order that new system right now, today so you can get to

Continued on page 90



Dirty Racing Team's latest GT racer, MRP Silverbird body mounted on Delta Eagle chassis. Simple, no-nonsense paint job with lots of stickies.



District 19 Outboard Championship Series winners: (kneeling, l to r) John Brodbeck, Joe Monohan, Norm Teague, and Jack Garcia; (standing, l to r) John Cochrane, Jerry Roman, Cathie Galbraith, and Richard Hazelwood.



Winners of .21 Mod. Tunnel: Norm Teague (top l), Joe Monohan, Jerry and Paul Dunlap.

R/C POWER BOATS

By JERRY DUNLAP

DISTRICT 19 OUTBOARD SERIES

During the month of August, my son Paul and I took advantage of low airfares and made a quick trip to the Los Angeles area to participate in the District 19 Outboard Championship Series. The event we attended, hosted by Norm Teague's Model Marine, was held at Legg Lake, on August 21 and 22. Legg Lake was the site of the 1982 NAMBA Nationals conducted in early July. For the model outboard racing enthusiast, this series of races is a dream come true. To the best of my knowledge, I know of no other area that gives model outboard racing the type of treatment it receives

in Southern California. A series of two-day races, devoted entirely to model outboard hydroplanes, deep vees, and tunnel boats, the District 19 Outboard Championship events have shown steady growth during its three year period of existence.

The six different classes contested during the 1982 Championship Series were: .21 Stock Tunnel, .21 Modified Tunnel, .45 Stock Tunnel, .21 Hydroplane, .21 Deep Vee, and .45 Deep Vee. The .45 Outboard Classes are new to the Championship Series in 1982. The racing activity consists of four enduros, each five minutes in duration, for all classes.

Winners are determined by total accumulated laps after twenty minutes of racing. This makes for an easy-to-manage race format.

The race course featured a three-buoy lefthand corner, and a single-buoy righthand corner. This makes the course more triangular in shape instead of the typical oval course used in heat racing events. I experienced some difficulty in adapting to this type of course layout. After many years of driving parallel front and back stretches, driving a diagonal backstretch just didn't seem natural. The single-buoy right turn can create some rather interesting cornering situations. If



John Brodbeck, second place .21 Deep Vee 'winner, and caller Jack Garcia.



Winner of 3 of 6 classes and Dist. 19 Champs sponsor, Norm Teague with Jerry Roman.



Richard "Rhino" Hazelwood took top honors in .21 Outboard Hydro class.



Diane Semler's Prather 40 Tunnel rounds single-buoy right turn on her way to .45 Tunnel class win. Embarrassing "S" turn evident from the looks of the wake.

you drive straight to the buoy and then turn, you tend to slide out in the corner. For my boats, I found the most effective method of handling the single-buoy turn was to imagine there was a buoy about twenty feet out from the existing buoy, and begin my turn out from the imaginary buoy and use the real buoy as an exit buoy rather than an entrance buoy. This strategy worked fine as long as other boats weren't on the outside of your boat and driving straight at the buoy. As I mentioned, it did make for some interesting turns.

Having participated in numerous types of enduros, I found the starting

method different from anything I'd experienced previously. At the beginning of the Championship Series back in early spring, Al Prather, of Prather Products, suggested they try using the staggered start employed in model pylon racing. Before the beginning of each enduro, participants draw for a starting position. A fifteen second pre-start time is given, during which boats can be started and taken down to the edge of the water. At the expiration of the fifteen seconds of pre-start, the starter flags off each of the boats at one second intervals. The boats head to the single-buoy right turn, round the buoy using a right turn, and head down the front straightaway.

There were a few entanglements at the start as the boats were launched and some mishaps at the right turn. It seemed to me that many of the problems that occurred at the first turn were caused by participants who tried to win the race during the first ten seconds. When one considers that the event is twenty minutes in duration, winning the battle of the first turn is a rather inconsequential victory.

Some might question the fifteen seconds of pre-start as being somewhat brief. This, however, was not a problem as most heats had all boats ready for the starter's flag. Together, my son and I participated in twenty races, and never once were unable to start in the fifteen seconds of pre-start. There are provisions for those unable to make the start. If the engine has not started by the time



Fourth place winner, B Tunnel class, Ellie Tom. This photo would make a nice cover shot!

the boats were launched, the boat could be launched toward the left corner and no laps would be counted until the late starter made one complete lap.

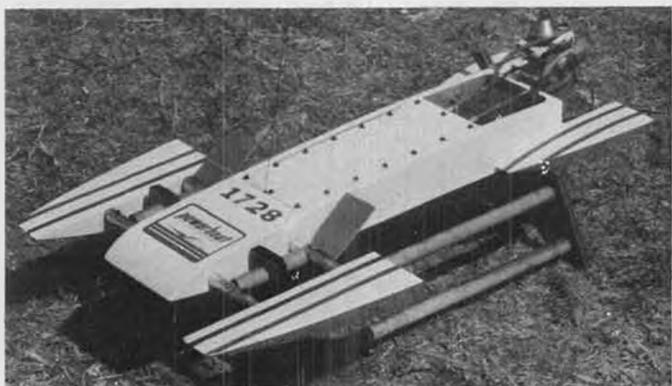
It was apparent to me that some of the participants didn't really understand the game plan for enduro racing. In discussing the starting procedure, I mentioned those who tried to win it all in the



Five .45 tunnels awaiting flags for sequential start. Boats were launched pylon-style at one second intervals after 15 sec. engine start.



West Coast Lee Craft distributor Jim Johnson holds .45 powered tunnel, Jim Johnson, Jr displays .21 version.



Richard "Rhino" Hazelwood's .21 Outboard Hydroplane that took top honors in its class.



Norm Teague raced this .21 Deep Vee 48-1/2 laps to win the A class Deep Vee event. Magic Boats Outboard with Futaba controls. WD-40?



Winners of B Stock Tunnel: (standing, l to r) Roger Wiechman (2nd), Diane Semler (1st), John Cochrane (3rd); (kneeling, l to r) Ellie Tom (4th), George Campbell (5th).

first corner and only created problems for themselves and other racers. Enduros are won by those who complete the full time limit. You are not actually competing with anyone but yourself in an enduro race. Too often I observed racers making just plain dumb decisions by driving their boats faster than was really necessary. This caused many boats, especially the tunnels, to dump while there was still racing time remaining. You're not going to accumulate laps when your boat is upside down.

Saturday's racing action consisted of .21 Hydroplane, .21 Deep Vee, and .45 Deep Vee. On Sunday, the .21 and .45 Stock Tunnels and .21 Modified Tunnels turned in their laps. The class that surprised me most was the .21 Hydroplane division. The speed of these .21 outboard powered outriggers was very impressive. Many of these outboards would be very competitive in the .21 Inboard Hydroplane class. Equally impressive as the speeds these boats were obtaining was the excellent handling many of the boats displayed. The major drawback to the class was the very high attrition rate. Most of the boats were unable to keep up the torrid pace



Legg Lake racers Judy Hazelwood, Jack Garcia, and Norm Teague prepare to launch their .21 Deep Vees while Cathie Galbraith and Bob Jones try to fire up Bob's engine.

for a five-minute heat of racing. The two most popular outrigger hulls were the "Crapshooter" and "Wing Ding."

The Deep Vee classes were of interest to me, as I've messed around some with both .21 and .45 outboard deep vee boats. The .21 Deep Vee event was almost a one-design, with the Magic Boats' Outboard Deep Vee being raced

by almost everyone in that class. A couple of these boats ran very well and would give many .21 inboard vees a good race. Their performance was much more reliable than the .21 Hydroplanes. There were only two boats entered in the .45 Deep Vee Class and both were Steve Muck "Streaker" hulls. There appears to be lots of room for further development in this particular class.

Sunday's competition became of utmost interest, as Paul was entered in both .21 tunnel events, and I decided to try all three tunnel classes. We were allowed to enter our "stockers" in the Modified Class, as in theory, a boat with a modified engine should do better than a "stocker." Theory didn't prove out on this particular weekend, because three of the top four boats in Modified Class were "stockers." Lack of reliability proved the downfall for many of those running modified engines. My son, Paul, drove a very steady race with his new Model Racing Products plastic tunnel, to take a third place. I managed a fourth place finish after losing three minutes in one heat when I managed to blow the boat off the water. Norm Teague used his "stocker" Prather 29 to win the class.

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Norm Teague and his "WD-40" special races neck-and-neck down the front stretch with "Rhino" Hazelwood's .21 Deep Vee. Boat driving can pump up your adrenaline in short order!



Norm Teague won both .21 Stock and .21 Modified Tunnel events with this Prather model. Norm, in addition to being a good racer, is NAMBA Outboard Chairman.



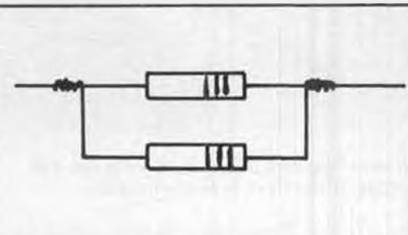
"Big Al" Berry holds his twin Picco 80 powered, "mid-engine," low profile outrigger. Octura 1667 props do the pushing.



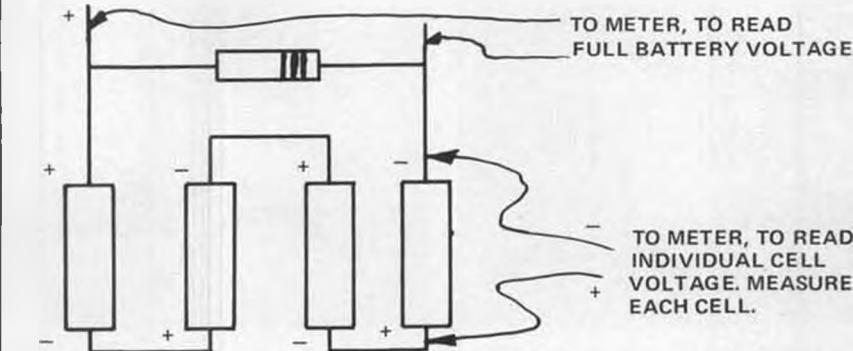
Top .21 Stock Tunnel: (l to r, top) Mike Boundy (3rd), Norm Teague (1st), Jerry Dunlap (2nd); Deb Wiechman (5th), Judy Hazelwood (4th).



Resistors in series. Total circuit resistance is the sum of individual resistors.



Resistors in parallel. Total circuit resistance for two resistors of equal value is half that of a single resistor.



Testing a four-cell pack under load. If the full pack voltage is low, test across each cell to locate defective cell.

Electronics Corner

By ELOY MAREZ

INTERFERENCE ANYONE?

No, we don't have any to spare, but we may be able to help you locate your own.

We have been fortunate enough to obtain a copy of a listing prepared by a frequency search service, containing all stations licensed by the Federal Communications Commission, to operate in the 72.02 to 77.62 MHz range. This list includes frequency, type of service, power, hours, type of modulation, exact location . . . in short, everything you need to know to be able to pinpoint local interference on a specific frequency.

This list is much too long to publish,

This list is much too long to publish, and even too long to offer copies, being 59 pages long. Actually, all of it is not of general interest, so we will do the next best thing, and offer to look through it for you to see if it includes any stations operating in your area on any suspect frequency.

Notice that I said any suspect frequency. The list is by frequency, followed by random location listings, it would take an impossible amount of time to search through it for all stations operating within a certain city. The best I can offer is to spot check any frequency on which you may be having permanent or sporadic interference, to see if it is being caused by one of these stations.

It should be remembered that whether we as R/Cers approve or not, these are government licensed stations, operating under the law, and simply because you know they are there, does not mean that you will be able to get them to cease and desist. All you can really do is be certain that there is a local occupant of the frequency, and not use it. Spread the word

throughout the local clubs, and to the hobby shops, so that they will avoid selling equipment on those frequencies.

Please send a SASE along with your request.

TALKING TRANSMITTERS?

I recently read about a new copying machine that talks to you, having a verbal capacity of nine sentences. It is capable of reminding you to "check the paper size", when it needs paper or toner, and if you walk off leaving material in it, it yells at you to "remove the original." I think I would like it more if it also said "please" and "thank you" in the proper places, but I guess we have to start by teaching them how to talk before we can teach them courtesy and good manners.

Anyway, this leads me to thinking about the future in R/C transmitters. We have some pretty sophisticated equipment, let's face it, but probably, "we ain't seen nothing yet!" I wonder if these voice synthesizers will ever find their way into our equipment, and if someday, our favorite transmitter will reward our efforts with, "You're a little jerky on the elevator today, old boy," or maybe it'll be something like, "Have you ever seriously considered stamp collecting?"

In a more serious note, I can see such features eventually being used to tell us such things as the approaching end of the battery charge, and reminding us that we'd best be headed for the runway. It could be programmed to measure system parameters and verbally remind us that the "output is below an acceptable minimum", or that the encoder is malfunctioning in some manner. It could further be used to remind us of

elapsed flight time, or to give us a count down during timed events.

I'm sure if we put our collective heads together, we can advise our R/C manufacturers as to what we want our talking transmitters to tell us when that day comes, probably to include such phrases as, "pull up, you fool you'll kill us all", and at the proper time, with just the right degree of sadistic semiconductor sarcasm: "Well, ----, back to the drawing board!"

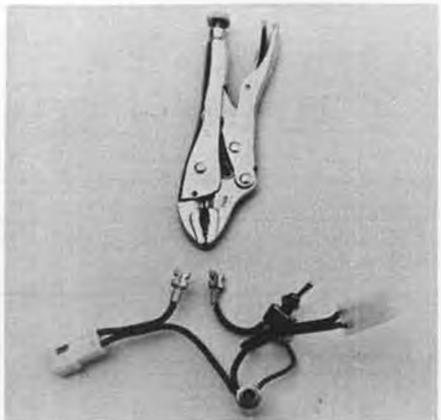
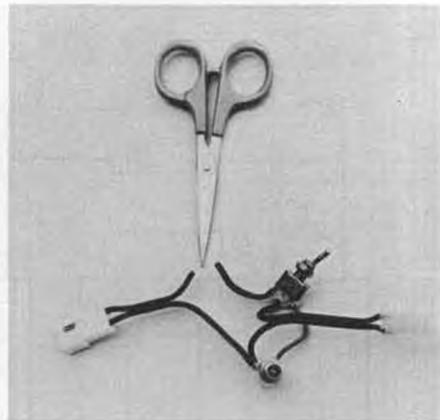
FOUR BAND RESISTOR COLOR CODE!

I recently had a request from a friend, who, having all of a sudden seen the error of his ways, asked me to change his Mode Two transmitter over to the better way. It turned out to be one of those programmable pattern transmitters, not simply a matter of switching a spring and ratchet. In fact, for a while I thought it was going to be a career, instead of just another service job, but then, what are friends for, huh?

Anyway, while I was gingerly working my way through this Japanese import, I ran into something I had neither seen, nor previously read about in any of the many electronics publications I get. It seemed that all of the resistors had one too many bands; there for a while I couldn't even decide which end to start reading from. But the mystery cleared itself up, as soon as I unsoldered one end of a resistor and clipped on the leads from a digital volt-ohm meter. The resistor maker is using four instead of the usual three color bands to designate the resistor value. The color code itself remains the same, for which we can be thankful! Changing that would create almost as much confusion as reversing the direction of Formula One racing. . .

Referring to our "Bad Boys Rape Our Young Girls But Violet Gives Willingly" color code (See "Electronics Corner", March 1982), simply use one more digit in the calculation. For example, a 12K (12,000) Ohm resistor, which we are used to seeing marked with Brown, Red,

Continued on page 93



There probably isn't an easier method of installing a fuse in your electric system than the one shown here: cut one power lead, strip off 1/4 inch of insulation, slip terminals over the wires, crimp on with vise grips, and plug in fuse. Could be done at the field in ten minutes!

ELECTRIC POWER

By MITCH POLING

- Ready-to-fly planes fascinate me, despite the fact that I usually design my own planes and scratch build rather than use kits.

My first attempts to fly R/C were with a ready-to-fly plane, the Testors rudder only plane, and that ended in failure, despite the plane's billing as a trainer. Just to act as a counter balance to that, my first successful electric flights were with the Mattel SuperStar, which was one of the best ready-to-fly planes I have ever seen, and, in fact, is one of the best planes I have ever flown. Unfortunately, Mattel didn't make enough money on it, and quit making them.

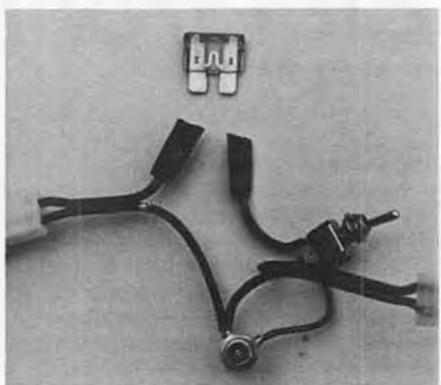
Larry Jolly, in the October issue of MB, described an all too frequent conclusion to the ready-to-fly scenario. I think one of the fascinating things about ready-to-fly, as an old veteran of the scene, is whether the styling/packaging people or the engineering people won before the plane is put on the market. So far, I have seen two ready-to-fly planes that I feel are pretty good, the Airtronics Kitty and the Kraft Cardinal . . . though the

initial climb of the Kitty is slow, and the Cardinal needs more dihedral and a larger (sub-C) battery pack.

Cox has a new entry on the ready-to-fly scene, the Fibrini, which looks attractive and is billed as an O5 plane, so I got one to test and to see whether it could join the list of good ones. I wound up doing a lot more testing than I had expected, so let's share the results.

There is no doubt at all that Cox has met the first objective, the plane is easy to assemble, even with the decals, assembly took only an hour. I particularly like the way the rudder and stabilizer plug in, and can be removed for easy transportation. The assembly manual is excellent, with photos to help out. I also liked the motor mount, very simple, with rubber bands holding the motor in. This gives the motor a lot of shock protection in the case of a crash.

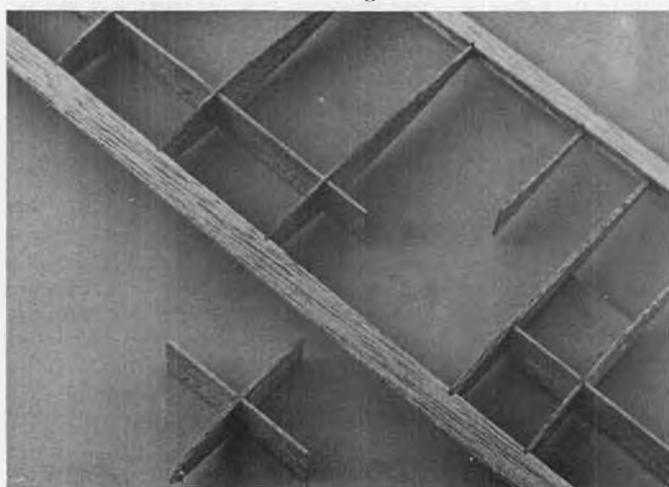
I did not use the servo tray, instead I used servo tape to install the Bantam Midget servos. The servo tray would be better if you have servos that stand more than 1-1/2 inches high, as the fuselage



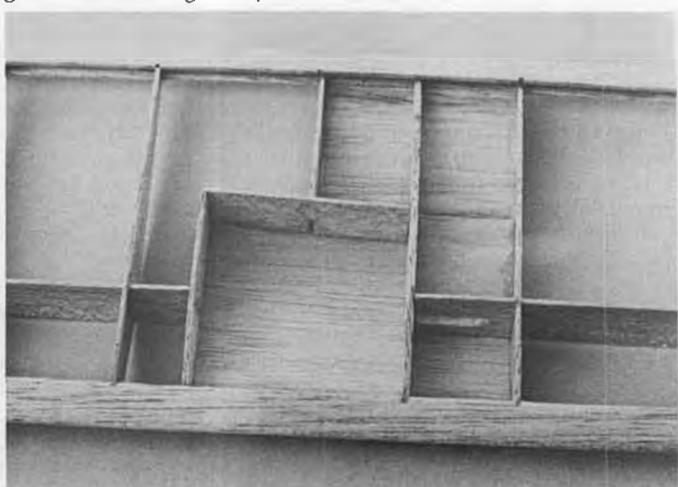
John Szary's clever, motor-saving fuse system ready-to-fly. Uses GM-type auto fuses.

sides slant, and don't allow much room for servos mounted on the sides.

I also substituted a push-on, push-off switch for the toggle switch provided, so that I would have on-off control with full down elevator. The switch is servo taped so that its push-button is just touching the servo arm, as in the photo. I had to splice in about 3-1/2 inches of extra wire



Battery installation for Baby Flight Streak. Cut away the spar and rib on the outside (right) panel as shown.



Use the cut off rib and spar along with some sheet balsa to make a box to house the battery pack and fuse.

to do this, so everything could reach. I feel, very strongly, that there should be a provision for on-off, and I wish manufacturers would use the push-on, push-off switch as a standard, but none do. They are available from Radio Shack or Astro Flight.

Another point in the instructions that I disagree with is step 3P, in which only one wing rubber band per side is used. Use at least two per side!! One rubber band (provided) promptly broke when I put it on. If that had happened in the air, the plane would have crashed. I use three bands per side to be sure, then if one breaks, the plane is still safe.

The all-up weight with a Cannon receiver, two Bantam Midget servos, and a 250 mah receiver pack, was 33-1/2 ounces, a little less than the 35 ounces stated in the instructions.

The plane is 39 inch span, area 290 sq. in., with a 600 mah six-cell pack (most likely Sanyo), and a Mabuchi 540S (05 size) motor. The prop is a 7x3-1/2 Cox black nylon. I am glad to see that Cox is making this prop again, it is ideal for the 05 motors, especially in gliders and old timers. Unfortunately, there is no part number for it in the instructions, so ordering it may not be easy.

NOW FOR A VERY IMPORTANT POINT!! BREAK IN THE MOTOR AND BATTERY! There is absolutely no mention of this in the instructions, and it is critical for good performance. I didn't and had a couple of scary, under-powered flights before I realized what was wrong.

I recommend that you charge up the pack fully, then run the motor with a 6x3 prop (this is a light load, and will not overheat the motor and battery) all the way down. Do this three times. The difference this makes is really significant. The motor turned out 11,000 rpm at 9 amperes before break-in, and 12,000 rpm at 12 amperes after break-in, on the 7x3-1/2 prop, and the same on a 6x4 Cox gray. The latter rpm is quite impressive, very close to the performance of the Astro 05 XL, which I consider to be one of the top 05 motors.

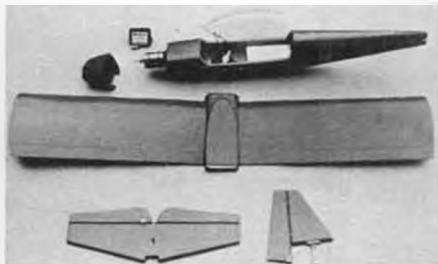
I think Cox has done an excellent job on the power pack in the Fibrini. I

decided to check on the charger that Cox supplies with the plane. It has a timer, but no amp meter or voltmeter, so you cannot tell how much has gone in. After the fifteen-minute charge using the Cox charger, I connected a digital charger to the pack, and checked to see how much more charge the battery pack would accept. The pack peaked at about 10.5 volts, in one minute, at a charge rate of 3 amperes, so the pack was really fully charged in the first place by the Cox charger. Again, a good job by Cox. The charger puts in charge at about a two-ampere rate.

Well, on to the flying! As mentioned, the first two flights were underpowered and scary, and I don't recommend that anyone prove that for themselves . . . break in the power system! After that, the climb was much better, and I could even throw in some loops and rolls. The usual flight time was between three and four minutes, with altitudes between 200 to 400 feet. The plane does good snap rolls to the left, and very wide loop-rolls to the right. All of these require a little dive to build up speed first.

However, two things were quite bothersome. One was the feeling that the plane was not flying at the best speed, that the prop was holding it back. I put on a 6x4 Cox gray prop, and this helped a lot; the plane speeded up, and generally felt better in the air. The other was that the climb was quite odd, very slow, considering the power the motor was putting out, and that any attempt to improve climb with up-trim resulted in high drag and near stalls.

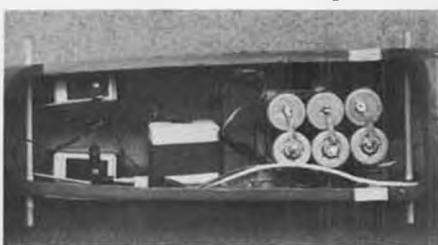
There was a strong impression that pitch was "touchy". I finally put a 1/8 inch shim under the leading edge, which improved the climb a great deal and solved a lot of the pitch problem. However, the pitch remained peculiar; the plane felt as though it was balanced on a knife edge and very abrupt pitch changes would occur, very unexpectedly. This is not a problem if you are an experienced flier, because elevator control is excellent, but a beginner couldn't handle it. A sudden nose down



Cox Fabrini ARF assembles in about one hour and radio installs in two to three.



Bright red Fabrini weighs 33-1/2 ounces with Cannon radio and two Bantam Midget servos.

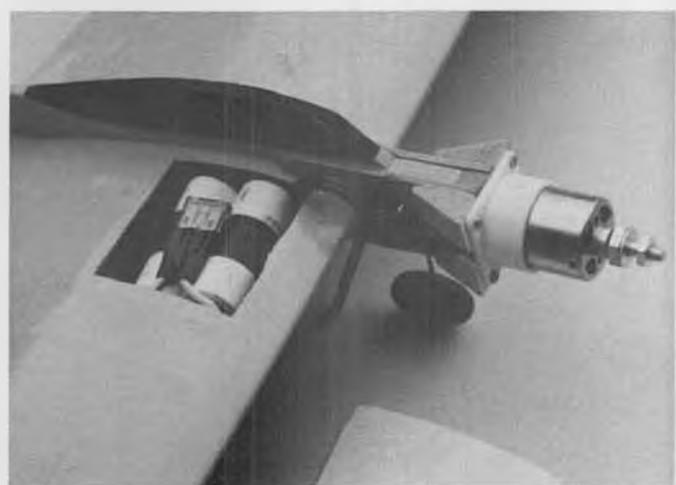


Interior shot revealing 1200 MAH battery, receiver, servos, and push on-off switch.



Motor is mounted with rubber bands allowing it to take inevitable beginner's hard knocks.

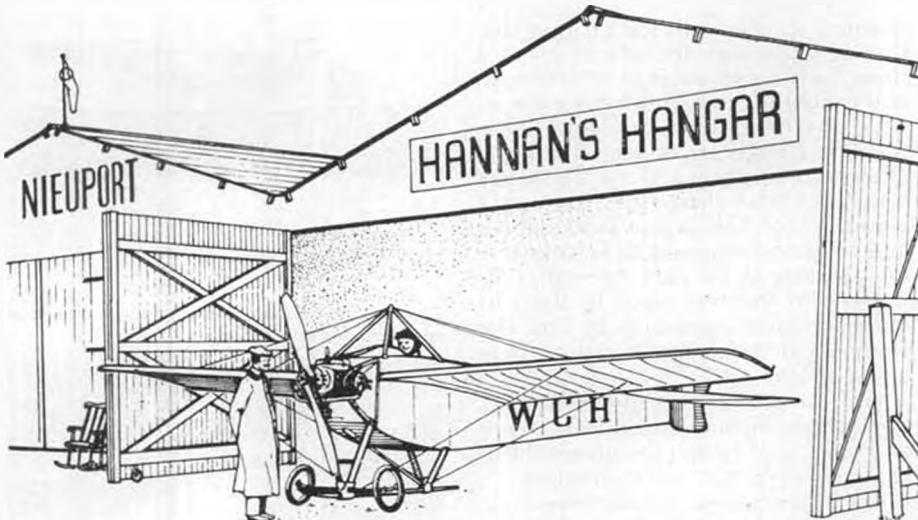
Continued on page 95



Power pack rests in its place with John Szary-type fuse holder on top. Cover is made from discarded Clorox bottle.



A rubber band holds everything in place . . . simple! Wires exit top, front corner of box near fuselage and motor.



"We live in an age when unnecessary things are over any necessities."

- Our lead-in line by Oscar Wilde may carry more implications than we realize. Certainly we should feel no need whatever to justify our "childish" pursuits. Which leads nicely into our next subject, contributed by Dr. Phillip Dzus:

"MODELING IN SPITE OF INFLATION"

"These days most of us must take a long, hard look at all of our expenditures, in an effort to make financial ends

meet. Some might think that hobby items would belong strictly in the 'luxuries' category, but I would strongly disagree. During these turbulent times, it seems to me more important than ever to have some sort of mental 'sea anchor' . . . something to look forward to and count upon. Thus one's hobby may represent a very real form of emotional stabilizing system, helping to offset the



Remarkable Focke-Wulf Stosser Peanut by Mike Hetherington, England, made mostly of paper. Has gearbox drive in nose and weighs 6.2 grams without rubber motor.

frustrations primarily brought about by political stupidity.

"We must look within ourselves for ways and means of continuing with our favorite pastime, model building, even if we have less money to spend. Most budgets have some flexibility in them, if we are willing to reexamine our priorities. As an example, how about food. At a glance, this seems to be an impossible place to economize, and indeed it can be difficult. But at least consider the possibilities. How about eating a bit less? Insurance company surveys insist that many people would be physically better off if they were more careful about their eating habits. Presto, the 'model builder diet'. Let's face it, certain foods are not good for us. Why not cut them out of your diet AND budget? Not only will you be reducing calories, but increasing the dollars available for model supplies!

"And, perhaps there are some beverages which could/should be eliminated altogether or at least moderated? You know the ones. Remember, this is not only personal well-being we're talking about, but more funds available for one's hobby!

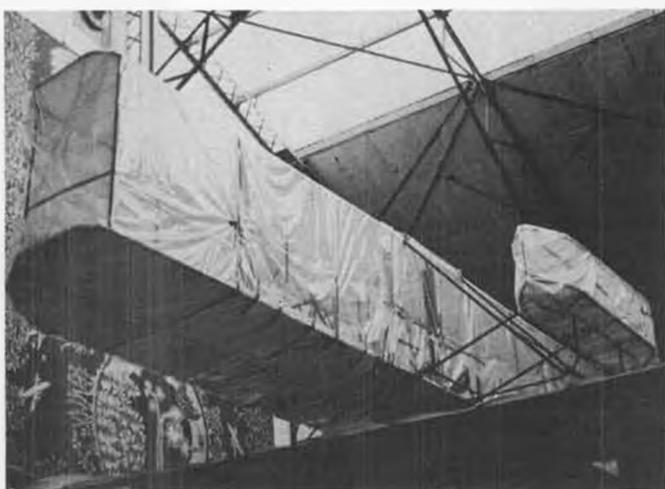
"And, if you like to eat out, why not try simpler fare, and simplicity in 'atmosphere', instead of eating in one of those pseudo-sophisticated, upholstered caves, where you pay for decor and snobbish service? The money saved in one meal might easily finance a Peanut kit! Well, you get the idea. The same sort of reasoning can also be applied to other facets of everyday living, if you care to do so."

TIME

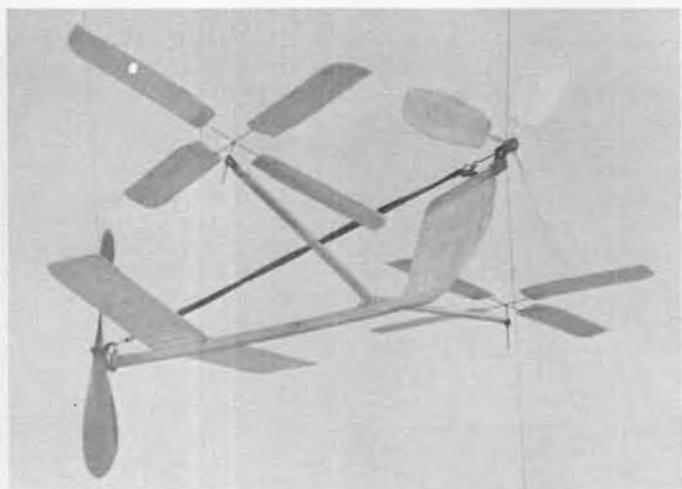
A shortage of this commodity seems a universal problem among model builders, unlike some "civilians" who claim to be bored with life. We don't have any time to spare either, but thought these quotations appropriate: "I'm always quarrelling with time! It is so short to do something and so long to do nothing." - Queen Charlotte.

"Our problem is not how to find what we like, but how to choose wisely, and with economy of time, what we like best." -Sydney Clark.

Continued on page 96



Reproduction of Wright Flyer wrapped in plastic for move to Le Bourget airport, near Paris. Georges Chaulet photo.



Tupropo-Canardorotovic canard autogyro by Fritz Mueller, Columbus, Georgia. Proves most anything will fly . . . if it does!

FRED

By SIEGFRIED GLOECKNER, Nöttingen, West Germany . . . With a name like FRED, it has to be cute! Not only that, there's lots of useful wing area jammed into its 13-inch wingspan.

NOTE: In order to "maintain the flavor" of English translation by our interesting overseas contributing authors, we do not "over-proof" the original text as received, unless for clarity, it is absolutely necessary. wcn

FRED stands for Flying Runabout Experimental Design. The prototype flew in 1963. The construction is still being modified by its designer, Eric Clutton, for improvements.

FRED can be towed behind a car. The horizontal tail and the rudder (no fixed fin) are detachable. The rudder fits inside a smaller car, the horizontal tail to a roof rack. We are in Europe. An American (Detroit) station wagon perhaps can contain the whole empennage. With the wings folded alongside the fuselage, the plane can be towed on its own wheels behind a small car and kept in the owner's garage.

The aircraft is not a fast cross country plane; it is a safe and stable flyer just for fun flying. It has a high-lift wing section (Goettingen 535), giving no bad stall characteristics. Except for high stressed parts like cabane struts, landing gear, hinges, etc., the aircraft is built from wood. Recommended engine is a 1500 ccm Volkswagen engine or equivalent power plant.

The Model: The Peanut FRED construction is conventional, and needs no extra description. Some perhaps unorthodox construction sequences are described.

Fin and Stab: They are built up from 1mm square balsa sticks.

Wings: Nothing strange here. Note thicker ribs W2 at center sections with holes to be drilled for cabane attachment. The wingtips are advised to be laminated from balsa or basswood, to be light but strong. The center section is planked with thin balsa, 0.4 mm thick, forward from the spar, to simulate the wing tank. Do not forget rigging point reinforcements.

Fuselage: The left side is built on the right side, to get two equal sides, from 1mm square balsa. Note the front end: The top longeron goes all the way to the nose former; the rest is filled with 1mm sheet balsa cut to size. Do not forget the rigging point reinforcements. Glue the fuselage sides at the front, adding F1, and at the rear together. Then add the formers F2 to F6 on top and the spacers at the bottom. The fuselage top is planked

with 0.4 mm balsa. Note that the fuselage formers do not run till the outer edges of the top longerons. They are slightly undersize so that the planking will be flush with the fuselage sides. Cut the planking slightly oversize. Glue the planking on top of the formers at first, then fold around. Take a sharp (!) knife (*über skiver!* wcn) and cut along the top longeron so that the planking will fit to the formers with no overlap at the fuselage sides. Then glue to top longeron. The headrest is formed by adding F7 and a planking of 0.4 mm balsa, cut to fit.

Landing Gear: The struts are built from bamboo. The L.G. fairing is glued to the lower strut. The wheel axle is bent from 0.8mm glued to the lower strut. The wheel axle is bent from 0.8mm dia. wire and glued to the strut with epoxy or high viscosity CA glue. Insert the reinforcing to the fuselage to the spacer under the former F3 for L.G. attachment. Form the noseblock, wheels, and engine from balsa. I cut and bent the exhaust pipes from plastic tubing.

Finishing: Cover the airframe with your preferred paper. Paint cabane and L.G. struts if desired. Epoxy lower L.G. struts at first at correct angle in place. Then epoxy upper L.G. struts (bracing

struts). Paint wheels and engine. Glue engine to fuselage. Install wheels and secure with a drop of glue.

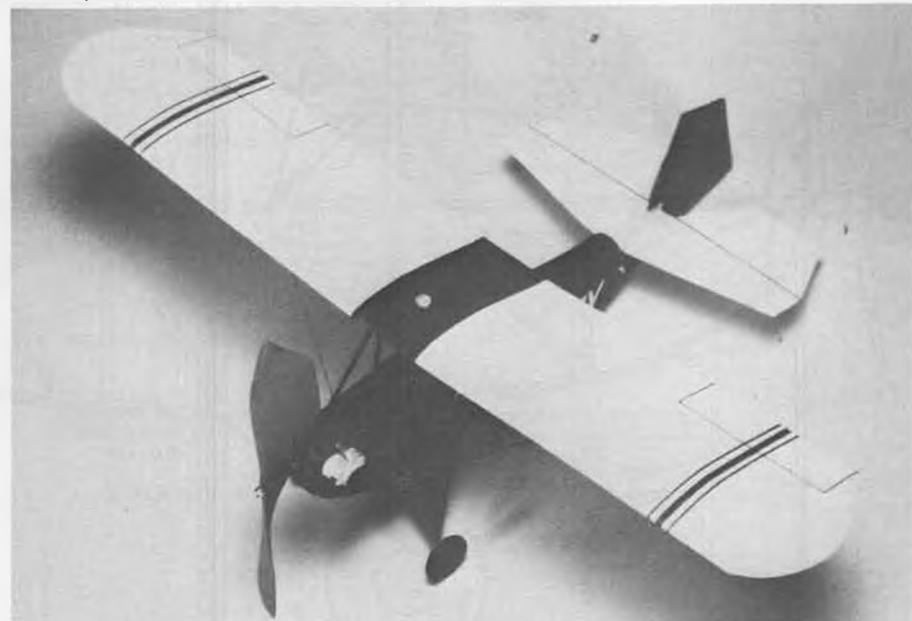
Install windshield, cut from thin transparent material. If immatriculation (markings) have not been added to the model yet, it should be done now.

Install rudder and tail. Do not use too much glue, perhaps they have to be reset for trimming.

Glue wing to cabane struts. Bend hooks for wing rigging points from thin wire. Fuselage rigging points are small holes drilled. Use silk thread for rigging. Glue rigging at one point to fuselage, lead through hook at wing and glue to second point at fuselage. Hold thread till glue has set.

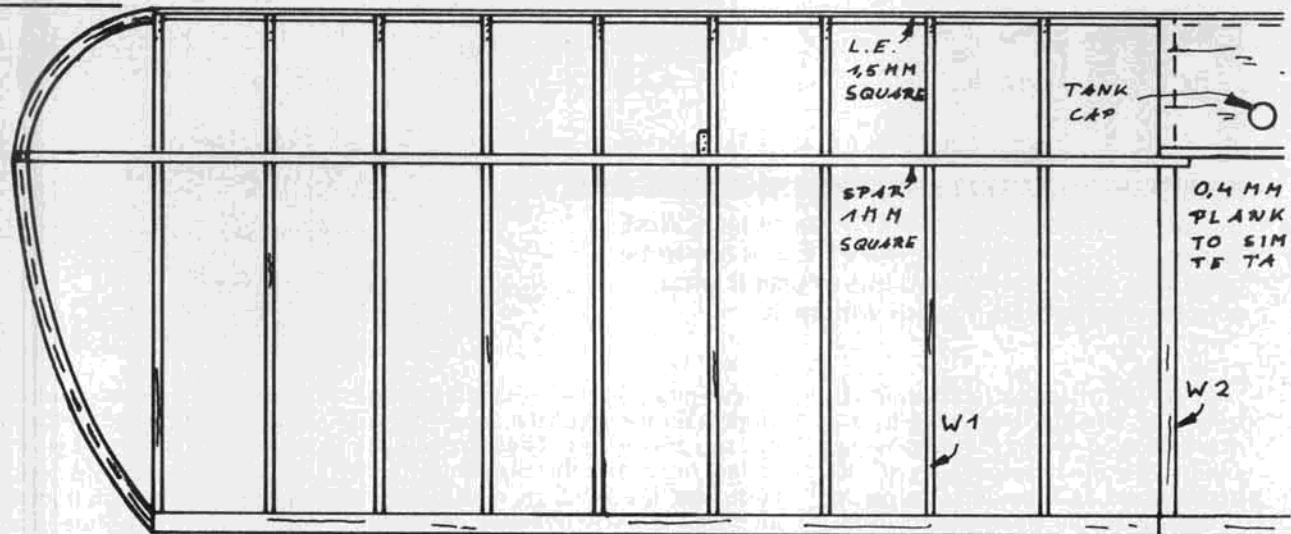
If you do not intend to carve your own prop from balsa, use a North Pacific Prop. I used one on my first FRED, which weighed 17 grams (!!) and was very content with that prop. My second FRED weighs 6.8 grams. That first heavy FRED managed to fly 35 seconds with 1/8 inch Peck rubber, so I am sure the new one will be a potent flyer. Like the original, the model is a stable flyer and easy to trim.

If you intend to build a FRED, I wish you a lot of fun and many happy (long) flights.

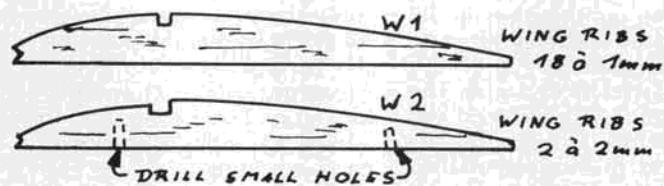


With all of its horizontal surface area, FRED, could certainly give the Flike a run for its money. Slow flight performance of full-scale aircraft is amazing.

MM	IN
0.4	1/64
0.8	1/32
1	1/25
1.2	1/20
2.5	1/16
2	1/12
3	1/8



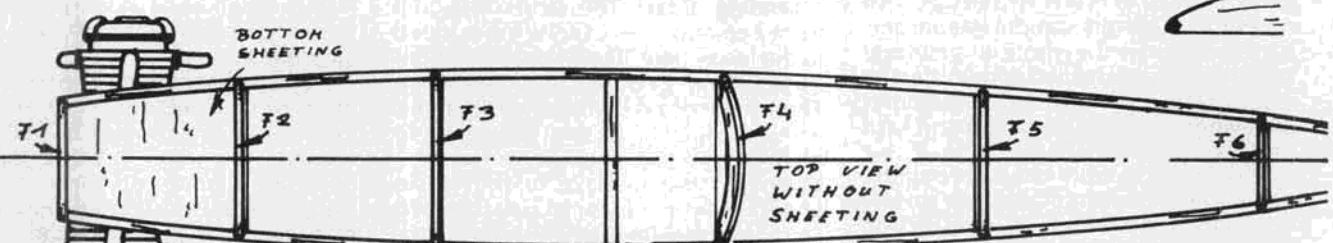
SECTION THROUGH
WING TIP



SPAR A
FOR DIM

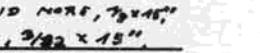
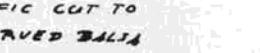
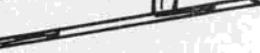
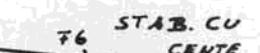
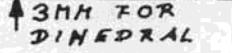
-W2 -

TYPIC

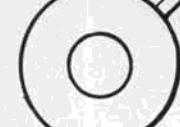


VW ENGINE
SHOWN

WING CENTER SECTION



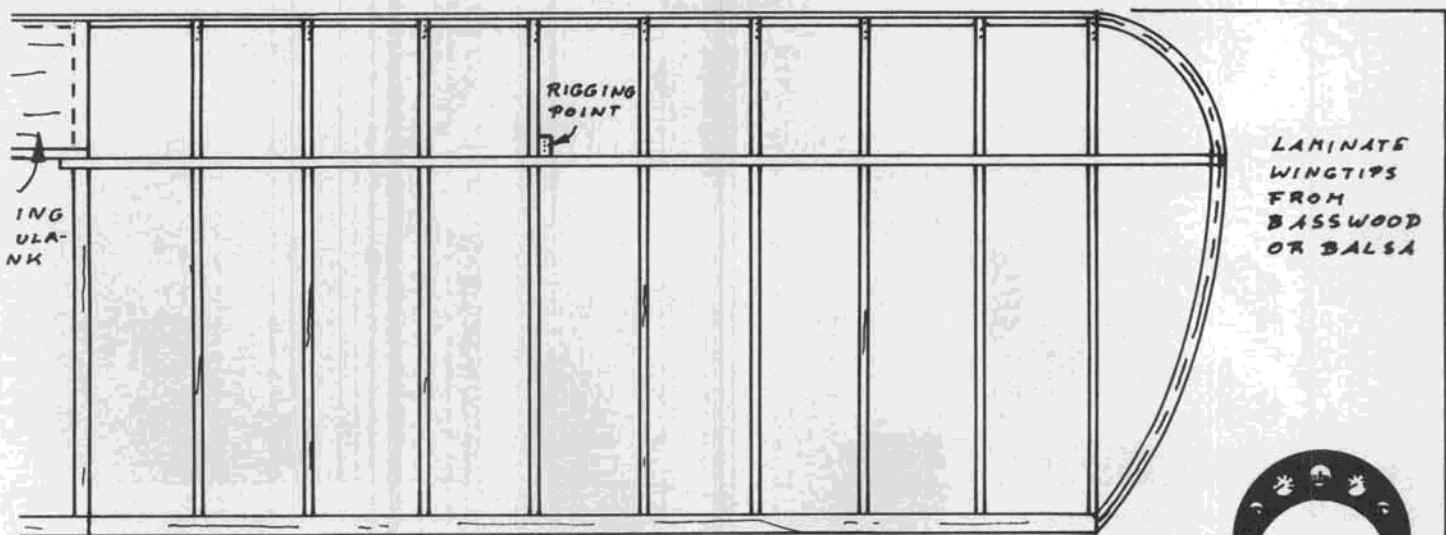
2° SIDE THRUST
2° DOWN THRUST



WHEELS
Φ 21 MM
MAKE FROM BALSA

ALL WOOD BALSA
EXCEPT OTHERWISE
NOTED.

PROP: NORTH PACIFIC CUT TO
SIZE OR CARVED BALSA
MOTOR: 10 GRAIN AND MORE, $\frac{7}{8} \times 15"$
6 TO 10 GRAIN, $\frac{3}{4} \times 15"$.



ASSEMBLY
EDRAL



AL WING SECTION



RIGGING POINT CUT FROM
1MM BALSA



F1
0.8MM
PLY



F2



F3



F4



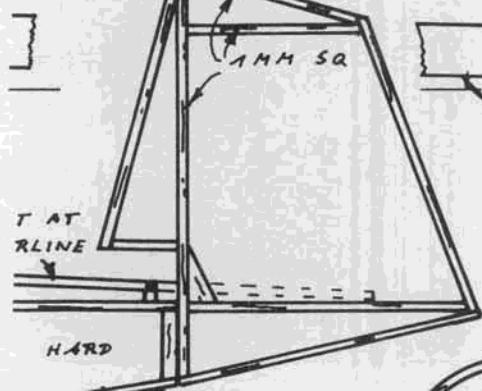
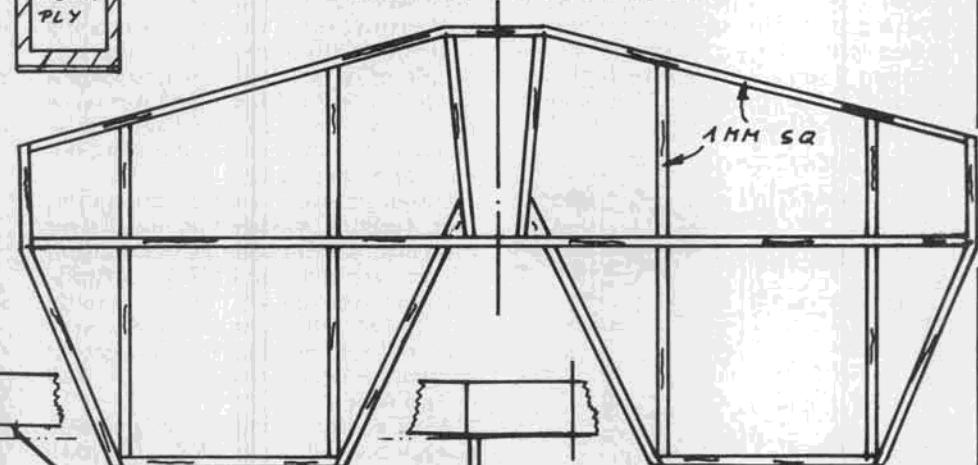
F5

DASHBOARD
GLUE TO F3



F6

FORMERS F2 TO F7 0.4 MM



TAT
RLINE
HARD

SKID: 0.3 + 0.8 WIRE

MAKE
RIGGING
FROM THIN
THREAD

CABANE STRUTS
CUT FROM
BAMBOO

ALTERNATIVE
RUDDER SHAPE

REINFORCING

F8

STRUT
FAIRING

1MM O

BAMBOO
WHEEL STRUTS

1MM O

AXLE

0.8MM

L.G. FAIRING
1MM

FRED

VW-ENGINE POWERED
HOME BUILT. DESIGNED
BY BRITON ERIC CLUTTON.
PEANUT SCALED BY
SIEGFRIED GLOECKNER



First place in Sr. Precision Scale, Joe Kirn, with veteran TB-25N. Space Hoppers .049s.



Steve Fauble, Dallas, Cox .15 FAI combat. Very fast! Design coming soon in MB.

CONTROL LINE at the Nats

- All of the control line events (except combat) were flown off a huge concrete parking strip. The tie-down holes were filled with plaster, but some of the asphalt joints were quite high and caused a few problems. The combat events were flown off a grass field which

was well mowed. The majority of the flyers were quite satisfied with the flying sites. However, the Nebraska winds were quite strong, especially the first couple of days. It was very gusty when the Jr and Sr Precision Aerobatics were flown. Also, the 1/2A speed and Mouse racers were bounced around a bit, but most of them survived.

Entries in several events were up this year. Formula .40 speed planes all over the place. Lots of scale planes, most of which were in the Sport Scale category. Carrier, Aerobatics and the racing events (FAI, mouse, rat, and scale) were also well represented. Very few entries by Junior and Seniors, except for Jr. 1/2A mouse racing.

A new special interest organization was announced at the NATS. The North American Speed Society (N.A.S.S.). All interested speed flyers should contact Chris Sackett at this address: North American Speed Society, Box 82294, Burnaby, B.C., Canada V5C 5P7.

Every year there are a few unofficial control line events flown. The number of entries is usually quite low, but many were surprised to see 40 entries in 1/2A



Rossi .15 powered CI. A Speed, by Jim Rhoades, S.L.C. Utah. Tuned pipes dominate.



Leon Ryktarsyk's Class II Carrier Douglas Skypirate. Webra .61 and 10 x 8 prop.

combat. Rich "von" Lopez has been promoting this event for sometime, and it appears it is really catching on. The amazing thing about this event is the number of planes that actually survive full power crashes and are airborne again in less than a minute. •



Jim Lee and his original 1/2A stunter. Foam wing, full flaps, TD, 12 oz., 34" span.



Winners of 1/2A Mouse Racing (l to r): Cary Minor, 1st; Ray McPherson, 4th; Andy Minor, 2nd; Jim Ricketts, 5th; and John Holliday, 3rd.



Sport Scale B-26 by Bob Simmons, Hosington Kansas. McCoy 35's, flaps, bomb bay doors.



If C/L is dying, someone forgot to inform 1/2A Combat fliers! This is some of over 40 entries at Nats, before matches began. Dick Stubblefield came out on top.



Strong supporter of C/L Combat and CD of 1/2A event at Nats, Rich "von" Lopez.



Windy Urtnowski's ST .60 powered "Executioner", 70" foam wing, 70 ozs. Held by Sue.



Rich Siefert, Phila, PA, 3rd in Sr. Aerobatics. Enya .49X (.295 dia venturi), Rev-Up 13 x 6.



Well stocked station wagon full of combats. They are expendable!



Les Pardue and Phil Shew, 2nd in FAI Team Race, 8:27. Nelson .15, orig. prop.



Teresa Kirn, Anaheim, CA, won Sr. 1/2A Speed, 94.70 mph. TD with LH crank & prop.



First place in Open Precision Aerobatics, Ted Fancher, and his "Intimidation."



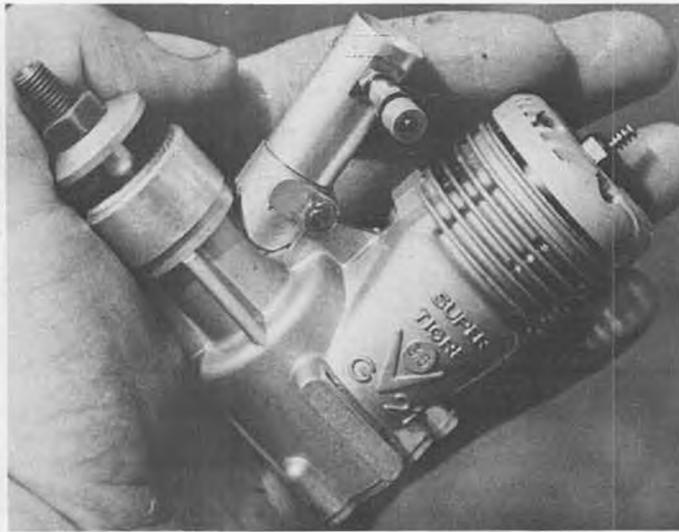
Ron Sears, Pontiac, MI, won Open Precision Scale with PT-17, ST .60, 11-1/2 pounds.



Dennis Adamisin, OS .25 powered Eclipse, 63" foam wing, weighs 49 ozs.



The Stinger, designed in 1955, with Torp 40, lugs cut off and radial mounted. Fuel pod behind engine, very low aspect ratio. Light at 15-1/2 ounces, makes for fast acceleration, but won't turn with modern designs.



Dodging the rules! Make venturi long enough, and stick spraybar outside tank, and you get same effect as an inboard tank with all advantages, like using .320 venturi.

control line

By "DIRTY DAN" RUTHERFORD
PHOTOS BY CHARLIE JOHNSON

As many of you know by now, this here CL column is often filled with some very off-the-wall material, partly to give wcn something to worry about on a monthly basis (like I ain't got enough to worry about already! wcn), also to have fun with what is basically a very fun-type of activity, that of flying models controlled by wires.

But this column will at least start out a little differently. First, the latest from Dr. Laird Jackson. And I expect you to read it, even if you have seen it published elsewhere...

The National Control Line Coalition is a developing organization intended to provide a representative body for all control line fliers. The use of the word

coalition is meant to convey the temporary nature of the present arrangement. The presidents of the control line speed, stunt, combat, carrier, and racing groups constitute an executive board which has the power to direct the growth and activity of the coalition (including changing the name if they so desire). The intent is to provide the means for all of control line to have the ability to speak with one voice of authority to AMA or anyone else in matters of interest to any control line group or flier. With all of the groups represented, no one interest needs to be left out of any control line matter and can receive the benefit of increased numbers of members behind any deci-

sions or request of any group.

The newsletter, the Gazette, is to carry news, technical information, and reports of interest and achievement recognition for control line. All groups are to contribute to its content with fair distribution of coverage of interests. Much of the concept depends on the availability of contributions. Eventual editorial policy should be determined between the editor and the Executive Board.

The newsletter has an international audience but needs new subscribers, as the list has not yet recovered from the gap in publishing which occurred in 1981. The newsletter will achieve a



Matt Rodriguez, Rich Lopez, Bill Hirsch, and promotor/runners of contests, Tom Zon (l to r). Note engine in Rich's Half A ship.



Myles Lawrence launching Slow Combat at Whittier Narrows. Not listening to 'Walk Man', he's protecting his ears.

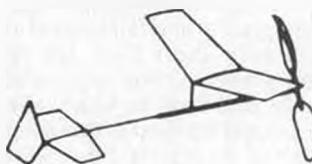


Beautiful Polikarpov R-5 biplane built by Allan Schanzle, of the Washington, D.C. Maxicutors club. Excellent craftsmanship. Photo by Tom Schmitt.



Earl Hoffman launches his Pennyplane at Taft Indoor Champs meet. High humidity necessitated plastic covering on models.

INDOOR



By KEN JOHNSON

WHAT'S INDOOR WITHOUT A FLYING SITE?

Control Line modelers can fly their planes in any school yard, ball field, or parking lot. The only problem might be if someone complained that the engines were too noisy. Flying fields for Radio Control are somewhat more difficult to obtain, but the radio people are many and have much clout to find and hold their model flying areas.

We indoor modelers have it a little tougher. Our models must fly in an enclosed area where the air is undisturbed. The room must be large enough for the planes to fly in circles without running into the walls. The ceilings should be uncluttered and high enough to allow the models to log a decent flying time.

Easy to find an indoor site, you say? Just go to the nearest school gym and fly there. Perhaps you have tried this with no success. What's the problem,

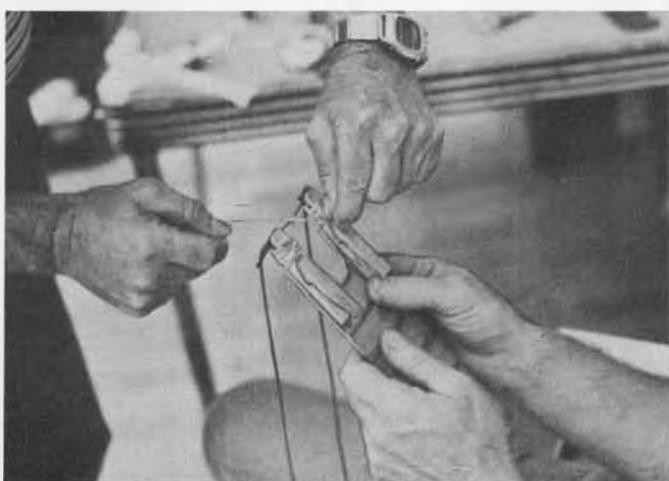
partner? Here are some of the responses I have received to inquiries for a place to fly indoors: "The gym is being used by the basketball team." "They are playing volleyball in there and the Aerobics class is coming in next." "Even if no one is scheduled to use the room, there MUST be a paid janitor or custodian there at all times." "How can we ask 25 basketball players to get off the floor so that 9 indoor modelers can fly their toy airplanes?" Or, "Sure we can let you use the gym this evening for a rental fee of only \$200. After all, the card club and the ladies auxiliary paid that amount."

We recently went to an open house at my son's high school. I cornered the school coach (who knew our family) and asked him if my model club might fly some indoor models in the gym. Without allowing me a chance to explain, he said, "Do you want to be responsible for damaging a \$125,000 floor with those gas engine airplanes?" I tried to explain that

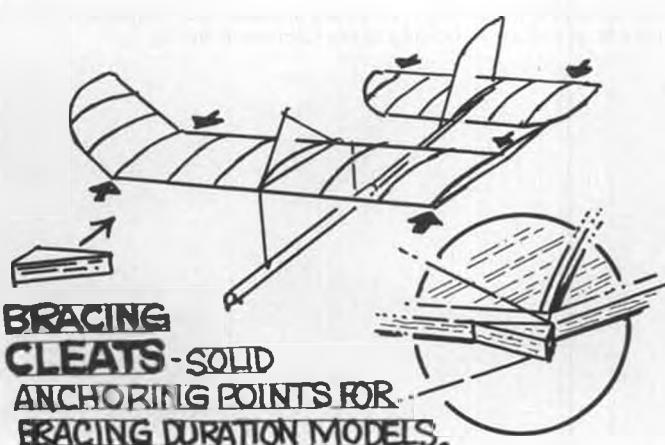
the planes were rubber powered and would hurt nothing. He kept shaking his head from side to side and telling me that the building was in use every minute of the day and night. My wife got me out of there before I could say anything really nasty to him.

If you have a good friend who is a teacher, coach, or principal of a school, there's a good chance you'll get to fly there. If not, here are my suggestions on obtaining a building in which to fly your models. Take a few of your planes with you, when you go to make a pitch for the room. Perhaps you could write a nice letter to the school telling how your group is working with kids to promote wholesome hobby activities. Explain how indoor modeling teaches youngsters patience, dexterity, and skill using their hands. A working knowledge of aerodynamics comes with building and flying indoor model airplanes. Point out some examples of leading citizens who were modelers, such as: Paul MacCready, Jimmy Stewart, Donald Burnham (president of Westinghouse), etc.

If you get a NO answer, go to another school, and another. Perhaps there is a National Guard Armory in your area. Call the Commanding Officer and give



Clothespin jig designed by Earl Hoffman aids in tying thread knots to rubber knots. Ken Johnson photo at Taft Champs.





Dick Obarski's Easy-B climbs to ceiling of Opa Locka Hangar (Fla.). Features torque-control device. Bob Andrews' photo.

him your "pitch." Seek out an influential ex-modeler in city government or in the military (an officer) to go to bat for you. Most reserve units want to project a good public image, so they will be sympathetic to hobby requests. Above all, don't give up!

Perhaps your group is growing stale from flying in a "too small gym." Search for a larger site this way. Sometimes the local airport will have a near-empty hangar. Who could be more sympathetic to modeler's needs than aviation people? The worst they could do is say no.

Often times building owners will ask for a demonstration of indoor model flying. This is a good way to make friends and gain supporters.

My model group in Pittsburgh, Pa.

once put on flying demos every evening for a week at the local indoor shopping mall. The shoppers and the owners of the mall loved it.

If you are lucky enough to have a giant potential site in your area, GO FOR IT! A blimp hangar, civic auditorium, or convention center is sometimes there for the asking. There are good buildings if you search for them. The reward is certainly worth the effort. Good Luck!

MODEL OF THE MONTH

This time I have chosen a 9 inch Peanut version of the glorious Gossamer Albatross to zero in on. This little beauty measures a mere 34 inch wingspan and a huge 9 inch length. It's a natural for the 9 inch Peanut rule.

With the U.S. Freeflight Champs meet

Dick Obarski and his experimental Easy-B. Dick is a long time

modeler and Indoor winner. Bob Andrews' photo.

fast approaching, I decided to build two Peanut models for indoor. The 9 inch Albatross was to be my No. 1 entry and a Newsmit Cougar, the backup.

After framing up both models, I got off on another project and fell behind in time. With only a short time left to complete the planes, I took stock and decided I only had time to finish one Peanut. The Cougar seemed as though it would complete in shorter time, so I opted to go with it. The Albatross was shelved till after the Champs. As fate would have it, the Cougar turned out well. It was quite light and flew right off the board. It won Indoor Peanut at Taft.

After the dust settled, and I got back to the building board, the Albatross again became the center of my attention. Our indoor annual was fast approaching, so I covered, strung, and detailed the little canard. The finished model was very lightweight (being covered with Mike Mulligan's ABSOLITE transparent plastic) and tested well in the living room.

The first flights at the contest revealed that the 9 inch Peanut wanted to loop repeatedly. There is no way to adjust the thrust on a model with a motor stick. I changed the incidence angle on the front plane and added stab tilt. Why didn't I just tweek the rudder? Because the vertical fin (rudder) IS the cabin area. How can you "tweek" a fuselage?

The adjustments mentioned above did the trick; the most effective being the stab tilt. The next flight saw the model turn nicely to the right and climb toward the ceiling. As fate would dictate, the .040 Pirelli motor used for the test flights was the right choice. The Albatross went into its cruise just under the 18 foot ceiling, and came down with just over one minute showing on the clock. I did not try to push up the time, being satisfied with the performance for the time being. I suspect that two minutes is possible under this ceiling with the Albatross.

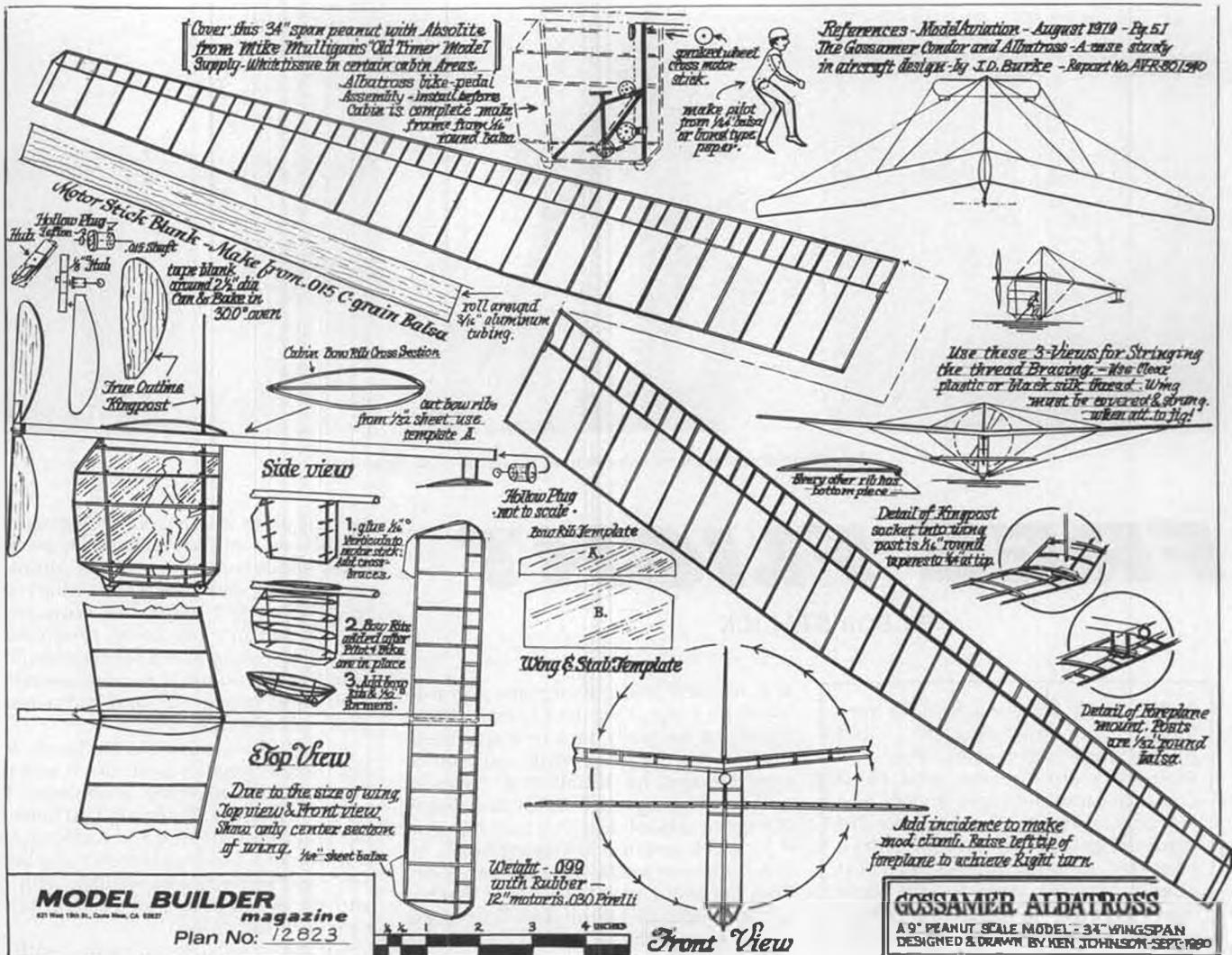
One interesting observation on the flight of the Albatross Peanut was made by one of its designers. My good friend, Bill Watson (chief design-engineer on the channel-crossing Albatross), happened to be there and related, "This is probably the only time the propeller on a (rubber powered) scale model traveled faster than the one on the real airplane."



This Junkers D1 is all paper, including propeller, and weighs a mere nine grams. Model comes from Great Britain and climbs to the right when flying.



This columnist just loves canards. Here's a fine looking Bleriot 25 by east coast modeler, Don Sull. I'd be willing to bet it flies as good as it looks. Tom Schmitt photo.



FULL SIZE PLANS AVAILABLE – SEE PAGE 100

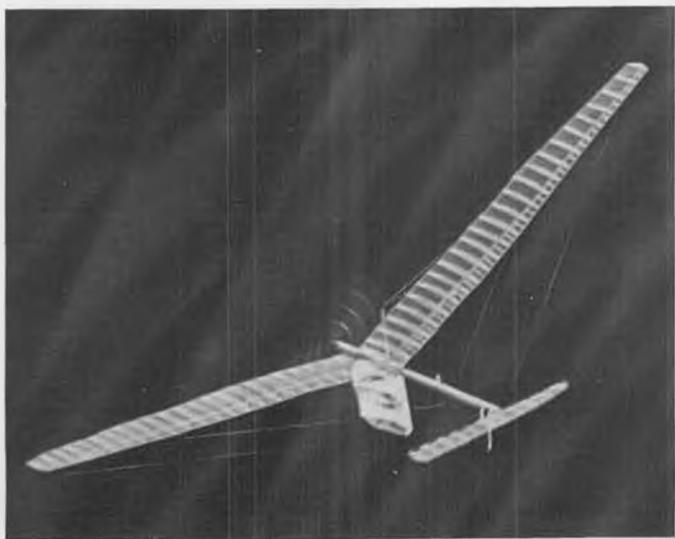
I am sure this statement is 100% true and accurate. And, of course, Bill was wearing his Gossamer Albatross T-shirt at the time.

The model is not super hard to build.

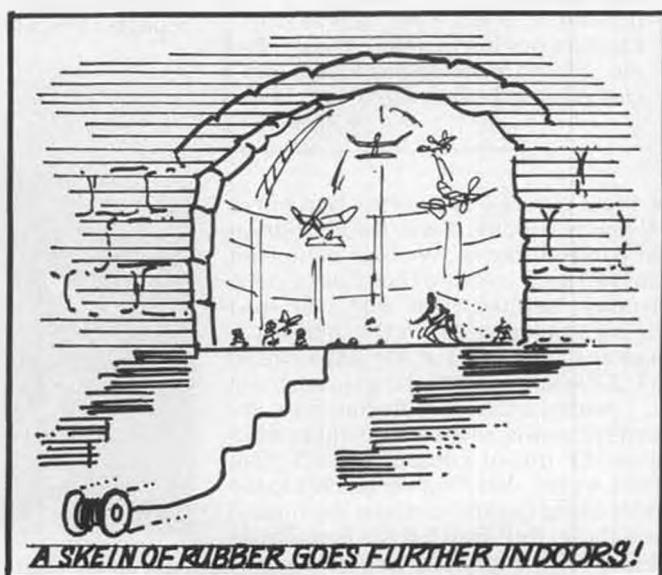
Rolling the motor tube may be new to some of you. Covering a light, high-aspect wing with transparent plastic may be a little tricky. Stringing the wings with thread may be a challenge for you, but

believe me, when you finish this Peanut and fly it, you'll know you have done something worthwhile. It's very lovely in

Continued on page 103



Author's Gossamer Albatross design built by 12-year old Billy Yang. It's a lovely sight in the air. Bill Warner photo.





.... Tom Hutchinson at Harts Lake Prairie, flying his 1/2A Maverick

FREE FLIGHT

By BOB STALICK

• We didn't know each other very long . . . not long enough . . . but during those short years, Tom and Rosemary Hutchinson and their family became our close friends. The Hutchinsons and the Stalicks did many things together: attended plays, concerts, dinners, picnics, and just visited. We also went to free flight contests and talked about the state of the hobby, recent events, new developments, and the like.

Less than a month before he would have been 42, Tom Hutchinson died. I guess it shouldn't have come as a surprise, because he had been ailing for nearly three years. The world lost a good man, who happened to be a modeler and a columnist. His two young sons lost a caring father. Rosemary lost her devoted husband.

It's difficult to speak about friendship, because I don't think it can be defined . . . it just exists, and all of us measure our loss in different ways. To me, I lost a good friend when Tom Hutchinson died on August 16, 1982.

Bob Stalick

and his new bride, Rosemary, came to try his luck at making the FAI team. It was there that we really became acquainted. I found that he was a math and science teacher, and he found that I was in charge of hiring teachers for the Albany (Oregon) school district. I told him that if he was interested in moving north, he should let me know. He did, and soon, Tom became a math and science teacher at North Albany Junior High School. He quickly became a favorite with the students . . . teaching Talented and Gifted kids, remedial math, and a Science of Flight class. From 1976 until 1980, Tom was a member of the Willamette Modelers Club, and a positive force in N.W. F.F. circles. He flew a bit of everything . . . indoors and out. I don't know how many kids became interested in aviation because of him. My two sons learned to fly U-Control under his tutelage.

Our families became very close. Their youngest son, Mike, is our godchild; just

as their older son, Mark, is the godchild of Bob and Toni White. Birthday parties, trips, modeling bull sessions, dinners, and the like, made the relationships very special. In 1979, when the pressure of the job became too great, I regretfully gave up the assignment of Model Builder Free Flight columnist. I was pleased that Tom took it over . . . and did a really great job with it.

In 1980, Tom moved to Hillsboro, to a high school physics position. It was the kind of ideal teaching assignment for him. Meanwhile, Rosemary had finished her counseling degree and had located a position in a nearby elementary school. The next two years were filled with off and on discoveries and treatments for cancer of the colon.

For the month preceding his death on August 16, 1982, Tom Hutchinson was in intensive care nearly full time. Although his death did not come as a surprise, I thought he might have a little more time to share with us. His funeral was attended by modelers, students, friends, relatives, and family.

His work with youngsters and oldsters alike was always the same . . . patient and understanding. He never made the U.S.



Gene Jensen, assisted by son, Blake, preps and launches his Galaxie 1/2A. A Wakefield flyer, this project took 10 years. Won Nor' Westers Annual. Zonked it on this flight.



• I first met him at the 1967 Nats in Los Alamitos. I think it was Dave Linstrom who introduced us. We both competed for the newly initiated Dick Black Coupe Trophy. Neither of us won. The next time I met him . . . Tom Hutchinson . . . was at Caddo Mills at the FAI Finals in 1972. We shared some things in common . . . neither of us were flying very competitive power models . . . neither of us won the trip to Europe. In 1973, Tom came to the Semi-Finals at Tacoma to see if he could qualify to attend the finals. I was there, too! Tom left a Dragmaster in a tree, where it finally deteriorated. . .

Once again, in 1975 at Tacoma, Tom,

team, but he was always in there trying. The man and the spirit were always together. At age 41, the man died . . . I believe his spirit will continue in all of us who were touched by him.

Tom Hutchinson Memorial Postal Contest

Recently, the leaders of the five active N.W. F.F. Clubs met to discuss how best to commemorate Tom Hutchinson. Our plan is still in the formative stage, but it appears that a direction has been set. Since Tom and Rosemary's boys are very young . . . kindergarten and first grade, it is our belief that some help to provide for their educational future is in order. Consequently, the plans are formulating to sponsor an International Postal Contest for A/2 Glider, Wakefield, Open Gas Power, and Hand Launch Glider. The initial event will be held in the Spring of 1983. A fee would be charged to all entrants. Prizes would be certificates to the winners. Proceeds from the event would be invested for Tom's kids. The event would be an annual affair.

If any reader has thoughts or suggestions, please forward them to Bob Stalick, 5066 N.W. Picadilly Circle, Albany, OR 97321.

Mystery Model for November

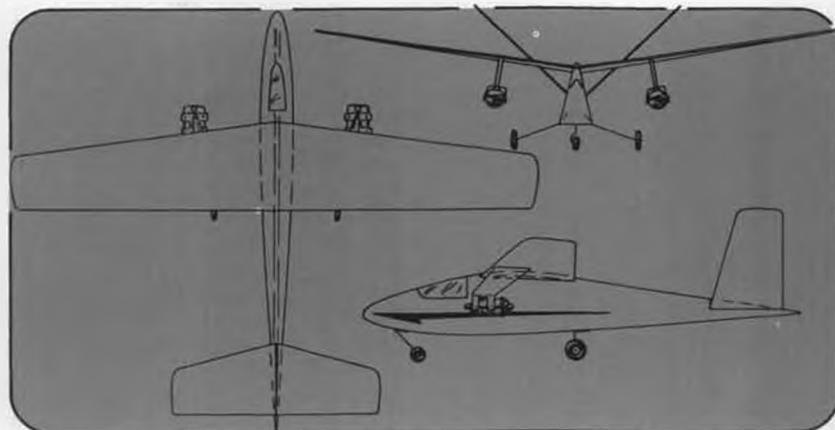
I've always had a soft spot in my head for Jetex models. Recently, while thumbing through an old issue of *Air Trails*, I came across this gem. It has two (2) . . . count 'em . . . two (2) Jetex 50 motors. I could never get one started consistently, but two just blows me away. Anyhow, since no picture accompanied the article, I wonder if the designer ever built one. Regardless, it did appear in an old magazine . . . so it qualifies as a Mystery Model. If you can identify it and get the name to Bill Northrop with the earliest postmark (using the patented but little understood Northrop postal dating system), you can win yourself a free year's subscription to *Model Builder* . . . quite a prize in itself!

December Three-View:

Simplex A/1 Glider.

Way back in the 1970s, I designed an A/2 glider that was intended to maximize use of available balsa wood sizes. This model was subsequently published in *Model Builder* as the Simplex A/2. The full size plans and article are still available from *Model Builder*. Ask for plan #5763. Tell 'em, Bob sent you.

The Simplex was named such because it was very easy to build, and it cost very



DECEMBER MYSTERY MODEL

little in materials and supplies. It was intended as a first model for beginners getting into towline glider. That it flew very well was a by-product of its original intent. My sons, Ted and Tom Stalick, and Josh Chamberlain of Vancouver, B.C., have built numerous versions of this model. It is perhaps the most forgiving and fine performing model of its class. Ted won many local meets with it . . . against much older competitors. He also qualified for the Taft finals with it . . . at age 14. Josh Chamberlain recently beat most of the Canadian A/2 team with his.

Fellow Northwest flier, Steve Riley, built a Simplex, and was so impressed, that he asked me for parameters for an A/1 version. Steve built the A/1 and has used it for several small field meets in the N.W. He says it flies like the A/2. Don Zipoy, of the Strat-O-Bats drew up the nifty three-view that appears in this issue.

One note: The three-view mentions the Chamberlain towhook . . . don't be misled. This towhook is a bent piece of 1/16 piano wire. So much for sophistication!

If you are looking for a nice, easy-to-build A/1, try the Simplex A/1. In fact, if you are looking for a good, competitive A/2, order a set of plans from *Model Builder*. You won't be disappointed in the Simplex.

November Darned Good Airfoil

... A 93B17

Back in the 1950s, this was THE hot airfoil for FAI Power. Granted the rules for FAI Power were different then . . . wing loadings were less and the power



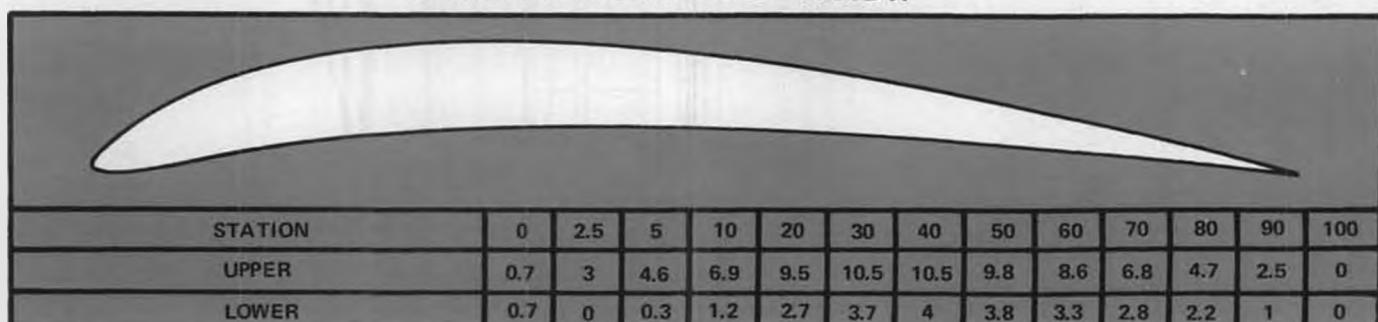
Clarence Bull points way, Ron McBurnett launches Country Boy into thermal.

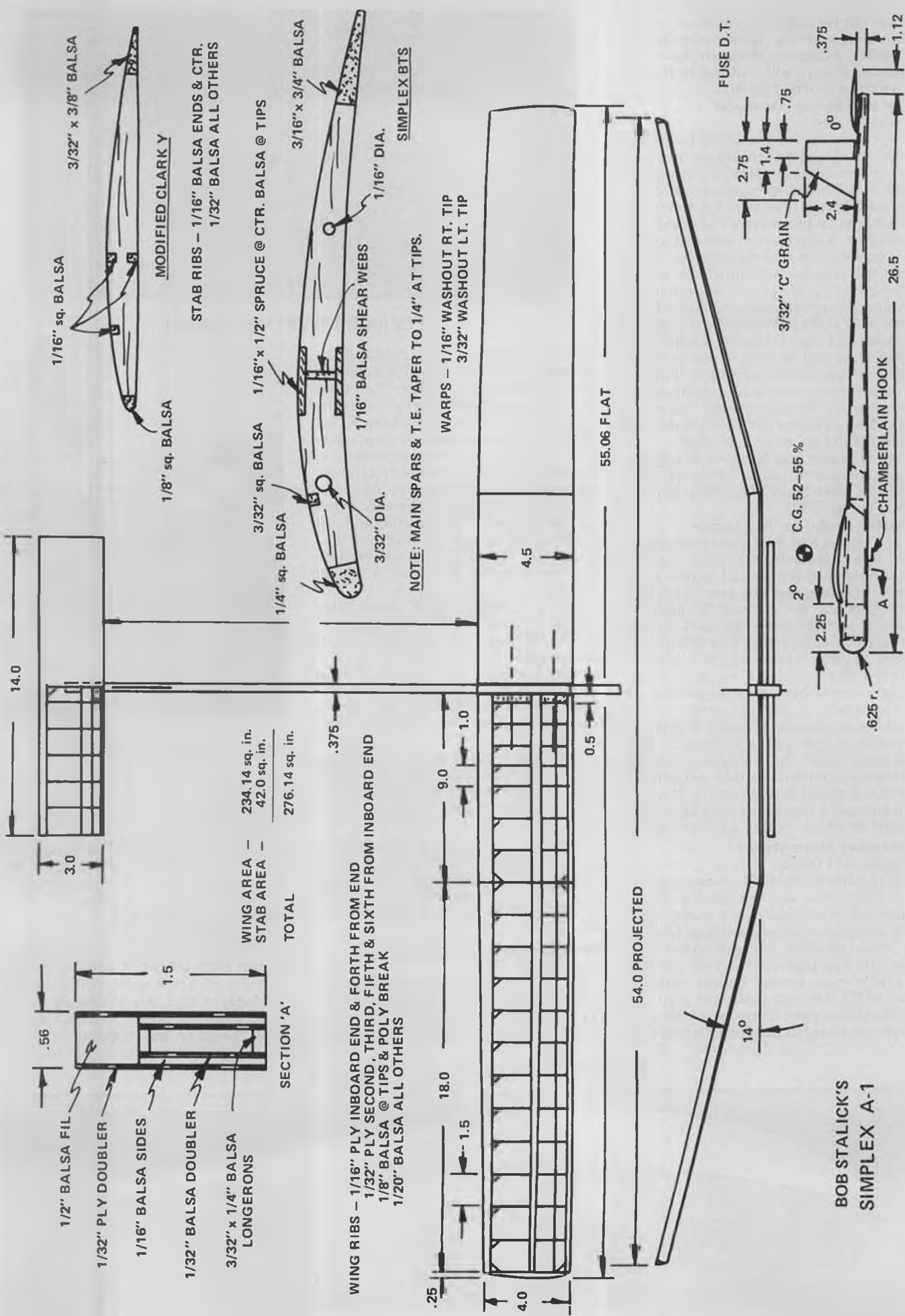
was less, too. It would seem to me that this section would be the ticket for a heavy AMA gas model. It flunks the Eppler test with flying colors, but has enough of the right look to be worth a try. Use a thinned Clark Y on the stabilizer and the balance up around 65-70%, it should be good and stable.

Installing a Landing skid on a Kraft engine mount

Bill Giffen, of Vancouver, B.C., passed on this little tid-bit. If you are using a Kraft-Hayes type engine mount on your AMA gas model, this is a simple way to install a landing skid. The sketch should be explanatory, but read on.

DARNED GOOD AIRFOIL – A-93B17





First, drill a hole through the backplate of the mount . . . drill it vertically from top to bottom. Install a brass washer or wheel collar on the landing skid and insert into the drilled hole. Next, bend the top of the skid at a 90 degree angle and heat the wire. Using pliers, draw the wire down against the top of the mount. The heated end will melt the mount material and the bent leg of the wire skid will have imbed itself into the top of the mount. This keeps the skid from turning. Finally, solder the washer snugly against the bottom of the mount. If you use a wheel collar, you can just set the screw tightly to hold the skid from moving up and down. Presto, there you are.

Bill recommends 1/16 wire for 1/2A types, 3/32 for up to 14 oz. models, 1/8 for up to 27 oz., and 5/32 for larger ships. Skids are available from NFFS Supplies. Buy the ones with the unbent upper section. Contact Manny Andrade, at 1602 Encanto Place, Walnut Creek, CA 94596, for skids.

Sympo, 1982

The 1982 version of the NFFS Symposium report is out. There are 167 pages of free flight information; 21 articles, the top Ten Models, and other tid-bits jampack its pages. If you are like me, it's the kind of book that will take a week of evenings to look through . . . causing more procrastination from the building board. Well worth the price at \$10. Order from Fred Terzian, 4858 Moorpark Ave., San Jose, CA 95129.

Overheard at the Flying Field . . .

Modeler (trimming new power model): "I guess that will do it. Time for the launch."

Sound of Schnuerle engine starting, model launched into the air, engine stops followed by sickening crunching sound.

Modeler: "Gee, I hit that car. Hope I didn't hurt the model."

Modeler looks over ship and notices no damage. Starts engine, launches, engine stops, sickening crunch follows.

Modeler: "Gee, I hit the same car. Hope I didn't hurt the model."

Owner of Car: "Hey you, stupid . . . That's the second time you've hit my car. What are you going to do about it?"

Modeler: "Well, I was thinking about adding a bit more left thrust!!"

Thanks for bearing with me for another issue. Next time you go out to fly . . . put one in a thermal just for Hutch, he would have appreciated it.

Tom's Last

The following material was Tom Hutchinson's last writing effort for Model Builder . . . and for free flyers. Typed by Tom for the October issue, it was being done literally days before he succumbed. wcn

I spent the major part of this month traveling though my old haunts in southern California, home of amusement parks, gray skies, fabulous hobby shops, and lots of old free flight friends. So, in order to keep this column from turning completely into one of those

BILL GIFFEN'S SUGGESTIONS ON MOUNTING L.G. SKIDS ON KRAFT-TYPE ENGINE MOUNTS.

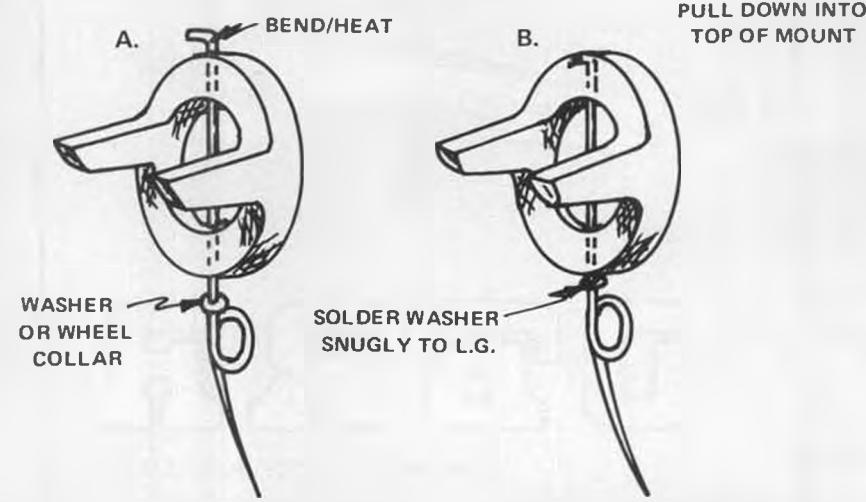


Fig. A: Drill hole through mount back plate. Place washer or wheel collar on L.G. Insert in hole, bend a 90 degree angle in top of L.G., heat, and pull down into top of mount. Fig. B: Solder washer or tighten wheel collar snugly against bottom of mount.

"travelogues with the Round Man," I'll try to keep you filled in on some tidbits I picked up along the way.

First friend I visited was Jim Quinn, who's been retired for several years, in Escondido, which is becoming a hotbed of model activity. At least four major model manufacturers are located in the area, and Jim can count on at least half a dozen Wakefield flyers to join him for a Sunday flying session, every weekend. Jim claims he's probably doing more Wakefield flying than anyone else in the world, as he's able to make it out to his local field (only three miles from his home) three or four times a week.

Next stop was to visit Bob Isaacson, who was in the midst of starting to

construct a new Nordic to replace the one he lost at the USFFC. His latest variant of his "Wishbone" series has quite a few interesting innovations in construction and building techniques. He'd just finished constructing the wing jigs before I showed up and was busy laminating carbon fiber to his spars. For those of you who've tried fooling with the stuff, it can be pretty hairy to handle at times. Bob Hot-Stuffs an overlength piece of spar stock to his building board, then tapes down a bundle of carbon fibers. . . (Tom stopped here. It seems as though there might have been more. Check Bill Forrey's November "Soaring" column for additional ideas on carbon fiber reinforced spars. wcn)



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Hostetler in the August '82 issue, the copy read, "I am sure that I will be very popular."

We're not about to deny Ray of any popularity, but the copy really said . . . "it will be very popular," before the typesetter made a slight unplanned omission.

THE CR-3 RETURNS!

Just as Mark Fineman was putting the finishing touches on his second Cessna CR-3 (Nov. '82 Model Builder), to replace the one that flew away at the '82 FAC Nats, he received word that No. 1 had been found.

"I just received a letter from Mr. Russ Weeks in Pennsylvania: He found the Cessna CR-3! It seems that the model had been picked up by a man who owns a concession stand on the perimeter of the Johnsville NAS. This guy didn't know what to do with it and just let it sit for a month until Russ spotted it and connected it with the meet held the month before (he had attended as a spectator). The man at the stand gave him the

model and he wrote me; I just called him and had a very pleasant conversation. The model will be shipped back to me in a week or so. It suffered relatively little damage: some tissue tears and two broken formers as well as having the cowling knocked off. I should be able to repair it in short order.

"Naturally, when the letter arrived I had just finished covering the framework on the replacement ship. Now what do I do?"

FOUR-QUARTER SCALE

Tom Williams, of Craft Air, usually kits everything he builds, but this time is an exception. Tom is getting started on a full-scale "Long Easy"! A former military pilot, Tom has already put in a bunch of refresher hours so that he'll be ready for the L.E. when it's finished. We'll keep you posted on his progress.

Wonder how many R/C gliders he can carry as baggage?

JOHN ELLIOTT LEAVES MB

As of September 1, 1982, John Elliott is no longer with the office staff of Model Builder. He will continue as a contributing editor, primarily on radio control activities. Any information in this regard may be sent to his attention, addressed to the home office.

Counter Continued from page 9

Wanna drive your R/C formula or off-road buggy after dark? Pick up a set of RAM (RAdio control Models . . . Old "Round Ralph" Warner rite phunny) headlights, install them, with a 9-volt alkaline battery, in your favorite R/C sporting auto, and have at it! The focused reflectors make these diminutive lights sprakle with efficient brightness. Price is \$10.95, completely wired, with 9-volt battery clip installed.

If local hobby doesn't have 'em, try Radio Control Models, 4736 N. Milwaukee Ave., Chicago, IL 60630, or phone (312) 282-1015 . . . you may get to talk to "Round Ralph"!

While you're at it, check out another RAM product. Like Ralph says, "It's kinda simple to buy an extra charger just to own a battery cycler. You already bought a perfectly good charger with your radio!" So for \$19.95, RAM offers the "Simple Cycler," which discharges your transmitter and receiver packs to the recommended safe level and then gives you an audible warning when it's time to disconnect and recharge them with your radio system's charger. Oh . . . you'll need to purchase a set of connectors to match your radio.

★ ★ ★

Campbell's Custom Kits, Box 5996, Lake Worth, FL 33461-0181, phone (305) 968-1045, is offering a kit of Sal Taibi's 1/2A Spacer, a free flight model for use in Nostalgia or AMA gas events. Kit features pre-cut fuselage sides, rudder, ribs, and pylon. Tissue and various fittings are also provided. Price is \$15.98 at hobby shops, or order direct.

★ ★ ★

From T&D's "Cowl Pasture," five

Workbench Continued from page 6

have one, let me know, and I'll give you a call and pay all postage to have you send it.

FOUND . . . AND LOST

In a letter from Bob Hawkins, Lt. Col., USAF Retired, Somerset, England:

"You may be interested to know that the designer of a large number of the plans you publish from Miniature Aircraft, passed away a few months back in New Jersey. I had known Frank Roberts since 1929, when he wrote me for plans of a Curtiss Robin I had built. We became good friends, and in late 1935 and early 1936, I worked with him in New Jersey, building models for Mr. Pouch, of Miniature Aircraft, to sell at Abercrombie and Fitch, in New York. He also did building and design work for Cleveland over the years."

THE EGOTIST

Well, not really. In the American R/C Helicopters' Mantis Review by Ray



PHOTO PIOTR ZAWADA

BOB HUNT,

**flying
models**

Managing Editor says:

"ADHESIVES?

HOT STUFF™ & SUPER 'T' ARE THE ANSWERS!"

Dear Bill and Bob,

After thirty years in controline, the R/C bug has finally bitten me, and I love it!

My experience in the C/L Stunt event has straight and strong airframes. Your products, Hot Stuff and airframe weight, while adding measurably to strength. Once achieved, Hot Stuff adhesives allow a quick bond more accurate, easier to trim planes.

The speed of assembly allowed with Hot Stuff and Super 'T' has become my favorite feature. I can now build as fast as parts can be assembled!

Now that I'm building R/C planes, more uses for this fantastic duo of adhesives are being realized. I've found Super 'T' great for kit building where parts don't always fit perfectly. Hot Stuff is great for positioning glass cloth when joining foam core wings. I simply tack the cloth at the edges as I work the wrinkles out, then fill the weave completely with Hot Stuff.

Whether C/L or R/C, Hot Stuff and Super 'T' are the answers when the question is which adhesive!

underscored the importance of light, Super 'T', have helped me to reduce perfect alignment has been between surfaces resulting in



Bob

Bob Hunt,
Managing Editor, FLYING MODELS
1978 World C/L Stunt Champion

PHOTO JACK RUSSELL

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more one-piece epoxyglass cowls. These are made to fit the Pilot Line of large scale aircraft, and include the Pitts S2-A, Decathlon (slightly modified to fit the Quadra), Christen Eagle, and the Buckner Jungmann in two versions . . . Hirth engine or Lycoming engine. Fenders for the Buckers, and one-piece wheel-pants for the Pitts and Decathlon are also available.

For more information, write to Tom Keeling at T&D Fiberglass Specialties, 30925 Block St., Garden City, MI 48135, phone (313) 421-6358.

★ ★ ★

For \$25.00, you can turn your pussycat Astro 10 electric motor into a TIGER! This amount will get you a new Astro Hot-Wind Armature that will turn a Rev-Up 7x4 prop faster and for a longer time, on seven cells, than the previous Astro 10 armature could do on 12 cells!

The new armatures are wound with seven turns of #20 wire, instead of 20 turns of #24 wire as previously used. Whether that means anything to you or not, the results speak for themselves.

Using 12 GE 550 MA cells, the standard Astro 10 turned a Rev-Up 7x4 at about 13,000 RPM. With only seven 1200 MA cells, the hot wind armature turns the same prop at 15,000 RPM and runs it longer.

At your dealer, or order direct from Astro Flight, stock no. 5017, 13311 Beach Ave., Venice, CA 90291, (213) 821-6242.

★ ★ ★

K&S Hobby Solder is 1/16-inch Diameter Organic Acid Flux Core Solder. It is for general use with brass, tin, and plain steel metals, however, the special organic acid flux even allows the soldering of electrical parts without the usual corrosive action from acid-core solders. Retail price is \$1.50 for a 1/2-ounce quantity.

★ ★ ★

Adventure Model Craft, Box 255, Youngstown, OH 44501, phone (216) 783-0934, has purchased the entire Venture Aero-Marine model hovercraft line.

The company is preparing its initial run of all five model hovercraft kits, ranging from .049 tethered craft to large .60 powered R/C models. All kits include pre-cut plywood and pine parts, special skirt material, full-size skirt patterns, and complete building and operating instructions. Replacement parts and skirts for older Venture model craft will also be available.

Contact Stanley Sykes, President, at the above address, for dealer and product information.

★ ★ ★

R-C B. Products, by Al Berry, Route 5, Box 45-A, Chickasha, OK 73018, phone (405) 222-1106, has just released a new venturi to fit the K&B 7-5 Outboard engine. The Venturi is designed to be run only on a modified K&B unit that uses an exhaust throttle. It features an anodized aluminum body and the

famous twin-hole spray bar, giving greater efficiency and peak power to the engine.

R-C B. Venturi's have been in winning and record setting boats for years. They sell for \$24.95 ppd anywhere in the USA. Write for further information.

★ ★ ★

J-5 Enterprises, Box 82, Belmont, Ontario, Canada NOL 1B0, phone (519) 644-0375, has announced availability of its Giant Outboard Tunnelhull. With a 4'-9" length, and 2'-4" beam, the boat is designed to handle another new J-5 introduction, the 2 HP, aircooled, outboard motor. It's actually a Quadra motor, and the unit sells complete for \$199.50. The boat kit, with 1/4-inch ply bulkheads, 1/20-inch ply transom, 1/8-inch mahogany ply sheeting, and including a fiberglass molded, one-piece cockpit and engine cowl unit, sells for \$129.50. The combo of motor and kit sells for \$309.50, and if you already have a Quadra, you can purchase the lower unit (clutch to propeller) separately. Call or write J-5 for more information.

★ ★ ★

Giezendanner USA, Box 818, Pottstown, PA 19464, phone (215) 337-1231, has the new, extra heavy duty, giant scale retracts, designed and manufactured by Bruno Giezendanner, top world-class competition flier from Switzerland. They feature 1/4-inch struts, can lift 5 and 6-inch wheels, use large transmission gears, extra heavy duty slip clutch to prevent jamming, slow (scale) transit time, positive mechanical up-down locks, will handle up to 50-pound aircraft and add about 1-1/2 pounds total weight, without wheels.

Want a sturdy, glass-filled fiberglass, three-bladed prop that stays together? Giezendanner USA carries these hand-crafted props made by G. Metterhausen and G. Hoppe of West Germany's FAI Aerobatic Team. Eleven sizes range from 9x6-1/2 for a 40, through 10x7, 10x7-1/2, 10x8, for 60's up to 20x10-3/4 for 3.6 to 6.0 cu. in. and prop-drive units. Two-bladed props in the same materials range from 14x6 up through 24x10.

Write or call Dick Penrod, and if you mention Model Builder, he'll smile and send you a complete brochure of these and other Giezendanner items.

★ ★ ★

Paul Clements' Kitty Hawk Models, RR#2, Paoli, IN 47454, offers a complete line of Hi-Start items, including cord, parachutes, rubber tubing, rings, and reels. Write for complete information and prices.

Fuel Lines Continued from page 20

machines! Obviously, they are complex, but in simple terms, they will enable Super Tigre to produce precisely round cylinders and pistons. That's essential to power performance.

What's new on the horizon from Super Tigre? Well, by now, you probably have heard about the latest designs

SETTING The STANDARD

Leading the way for years with innovative and trendsetting designs American R/C Helicopters has set the Standard of Excellence with the introduction of the Mantis. Very popular, this .40 powered R/C helicopter offers a whole lot more than its modest price would indicate. Precision craftsmanship and high quality provides performance that can't be beat!

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in the .61 size engines, but you may not know about another new engine. Mr. Garofali has been developing a new .21 engine that has been designed specifically for R/C car racing. About the time you read this, you just might see some advertisements about it! On past Super Tigre performance records, it should be most competitive.

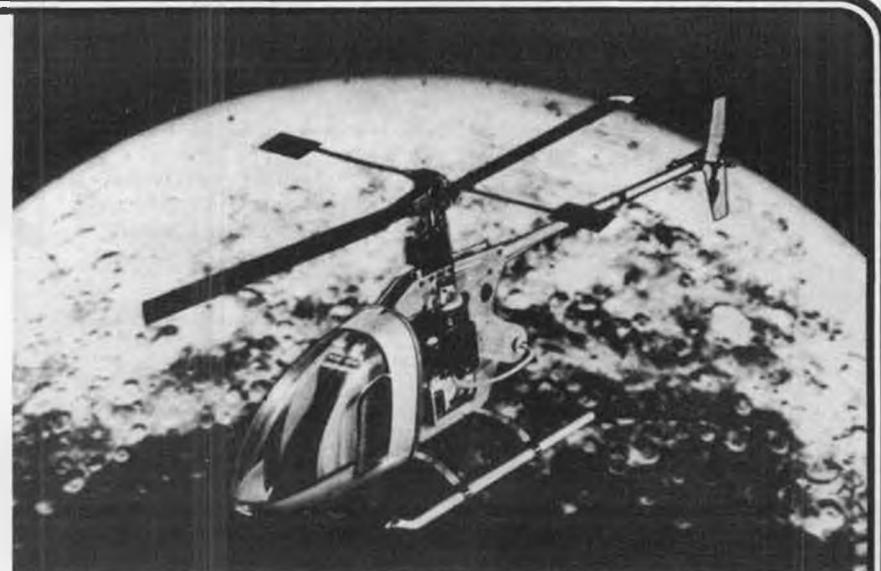
I've rambled on somewhat, but hopefully you enjoyed the brief photo tour of Super Tigre. Personally, my visit with Mr. Garofali was a pleasure. My impression, in every sense of the word, was that he is a gentleman, and a brilliant, innovative engineer.

Thank you, Jaures, you were a most gracious host. . .

Big Birds Continued from page 30

chronized . . . and sometimes each finger does its own thing. . .

Anyhooooo, now that I've spilled the beans, perhaps you'll find it in your heart to offer some empathy and understanding to your Mode I friends . . . and to convince them to become more social and to stop hiding their transmitters between flights (according to Mode I pilots, their transmitters are always in the impound area). Why not go one step further and encourage them to take part in club functions, and even to run for an elected position . . . like Sergeant-At-Arms, or something equally important.



At the same time, we must be prudent and vigilant and not allow Modelers to become instructors, insuring that this obtuse manner of controlling BIG Birds will not be perpetuated.

And all of this about different transmitter controls leads me to another revelation, this one being. . .

SINGLE STICK SUPERIORITY

You know the story about the 97-pound weakling; he lacked confidence (and muscle) and led a miserable life getting sand kicked in his face . . . until he decided to do something about it.

Well, even though my 250 pounds certainly couldn't be mistaken for a lesser amount, and I've never had sand kicked in my face on purpose, my confidence factor (flying-wise) has not been the greatest these past few years. The reason: my eye-hand coordination and timing are not what they used to be, so trying to string rolls together, coordinate rudder and ailerons and cross-control to slip into landings, had become one helluva chore.

I've been a diehard Mode II flyer since '67, but can't figure out why I opted for dual sticks in the first place. Having been a pilot most of my life, S/S would seem like the obvious and practical choice . . . especially since I had a ball flying Galloping Ghost in the mid-sixties (thanks to the Rand Acutator), while most guys were trying unsuccessfully to educate their thumbs to pulse reed

switches. But having two sticks to coordinate became harder to cope with till, like the 97-pounder, I just had to do something . . . and like the skinny weakling, I needed "muscle" to help instill confidence.

So, after 11 years of delivering first class service, my Heath GD-19 transmitter has been semi-retired and replaced by an Ace Silver Seven Single Stick, which was custom made (it took me almost as long to decide where I wanted to install all the trims, switches, and auxiliary functions as it did to build the new transmitter). The box did feel a bit strange at first (you have to sort of cradle a S/S rig in your left arm), but I had no problem making the transition from Mode II.

And as the saying goes . . . "the proof is in the pudding" . . . or in this case, the transmitter; I'm flying better than I have for a number of years. As elevator, aileron, and rudder are all controlled by the same hand now, I find my overall flying is smoother and that coordinating and cross-controlling are an absolute pleasure. In fact, I'd have to say that S/S enhances coordinating and cross-controlling so much that anyone should be able to do well right from the start; then, after that first flight, it's just a matter of refining the way you twiddle the rudder knob. Scout's honor, guys . . . this S/S is making me look good and feel 20 years younger! And the overall boost in confidence has me back flying the same



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aerobic birds I've been shying away from for awhile.

So, if you're having the same kind of problems with coordination I had, or you just want to improve your flying and your enjoyment, why not seriously consider S/S; its superiority not only looks good on paper, but proves itself in every way where it really counts . . . in the air.

I'm gonna stay on this same subject of transmitter controls 'cause I'd sure like you to be able to . . .

SAVE-A-PLANE

And you can, many times over . . . but to do it you've got to become a better and safer pilot. I am, of course, referring to practice and discipline; and please don't tell me you don't need any discipline, or that a little time spent on practice is gonna take all the enjoyment out of the hobby . . . because that's a bunch of horse-puckey! What's really gonna take all the enjoyment out is hitting somebody because your piloting wasn't up to snuff . . . when it should have been.

Every time one of our BIG Birds gets cranked up, we've got a potentially dangerous situation; the spinning prop and the weight and speed of the airplane make it so, and only a fool would ignore this. It makes good sense to plan ahead and to use a few minutes out of each flight (or every other flight) for practicing different manuevers, like touch-and-go's, to become familiar with

your bird. It makes good sense, because sooner or later you're gonna have to rely on that practice (meager as it may be) to keep from crashing and possibly causing damage . . . or worse, injuring someone.

So far this summer I've seen five fine looking BIG Birds prang because none of the pilots knew how to coordinate or cross-control. Three of these aircraft lost aileron control in the air, and all the pilots could think of doing was to keep shoving hard on full aileron. Had they practiced using rudder and ailerons, they would have already had some rudder cranked in, or at least been able to automatically come in with rudder when the ailerons crapped out. And I can't believe that some rudder wouldn't have either saved those planes, or at least minimized the damage considerably.

The fourth pilot tried to take off without hooking up his ailerons, and in less than 30 seconds, wiped out two year's work. When he realized he was in deep trouble, he just leaned on (and bent) that right stick . . . but never thought to help with rudder. Had he known how to coordinate, he most probably wouldn't have spent the rest of the day in tears (had he preflighted, he certainly wouldn't have had any problem to start with).

The fifth pilot was having a ball . . . till the wind suddenly shifted and became a 15-20 knot crosswind. This unnerved him 'cause he was very low on fuel and the wind was blowing from the pit and spectator area. The poor guy tried hard to slip that Pitts in, and was doing a good job . . . until he lost confidence because he'd never slipped before and didn't know what to do next . . . and made scrambled eggs out of that pretty, yellow bipe.

Even with dual sticks, the average flyer can learn to slip into a full stopper. And not only does slipping take the sweat out of landing, a) in a crosswind, b) on a short runway, c) over high obstacles, d) in an unknown area, or e) all of the above . . . but it's a beautiful looking manuever (especially when done with a bipe) and can be used most any time you'd want to lose a lot of altitude in any given distance.

For the many who don't know how to slip, or have never tried it, here's something you can sink your teeth into; this is really quite easy (more so with a S/S) . . . just start practicing at a higher than normal altitude!

If you've got a quartering crosswind from the right (front), you'd lower the right wing with right aileron, which would slip and yaw the bird to the right; so to keep the airplane pointed straight down the runway, your cross-control would be with left rudder. And you've got to remember to lower the nose a bit, otherwise she'll come back out of the slip.

Normally, with a taildragger, you can make two kinds of landings: a "full-stall" (three-point) landing or a "wheel" (on the mains) landing. If the crosswind is pretty stiff, you'd want to try for the wheel-type landing so your control surfaces would remain effective longer. And you'd want to keep at least the same (if not more) aileron and rudder cranked in through touchdown and during rollout . . . otherwise you're liable to spoil it all by wandering off the runway and/or groundlooping. As for throttle, after a reduced power setting, you'd come back to idle just about the time for flare, which should be pretty close to coming across the runway threshold.

If you go to S/S, this, and most other manuevers will be much easier to learn and execute. But even if you stay with your dual stick transmitter, don't be afraid to learn by putting in a few minutes of practice here and there . . . practice that's gonna definitely save your BIG Bird from destruction, and may very well save you from a lawsuit!

AILERON TORQUE RODS

"I use brass tubing torque rods for aileron control in all my BIG Birds and find it provides the best positive action," sez Dick Igaz, of Cupertino, California.

Dick makes it sound great, but seeing as how it's his own idea, you certainly wouldn't expect him to say anything else, would you? However, Dick Igaz isn't prone to lip service, and being a very active flyer, he's proven this torque rod control system over the past few years. He's an exceptionally prolific builder, with a stable full of well-flown, good flying BIG Birds . . . and has never

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34K40—FFC, Kit \$29.95
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C.A. Set

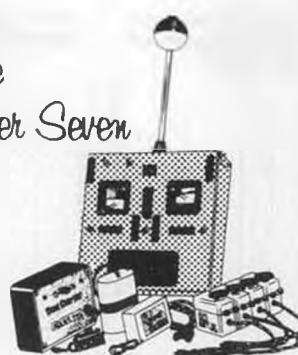
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had any problems with this set-up.

A few notes came along with the drawing: "I use 3/8 inch brass tubing for the torque rods; the 1-1/2 inch long brass bearing pieces just slide over the torque rods. Then I buy DuBro steering arms, discard the small brass bearing, and ream it out to snug fit over the 3/8 brass torque rods...using one arm at the servo end and one arm at the aileron end."

Don't forget to use at least three bearing surfaces to support each torque rod; if you don't, whipping and flutter are going to make you v-e-r-y unhappy.

IGNITION CONVERSION

I can never lay claim to being a "Speedy Gonzales." Like most people, I've found a speed range that's comfortable to me, and plod along at that particular Mach Number...give or take a knot or two. So by planning ahead a bit, I can usually stay out of trouble...and sometimes I've even been known to plan ahead a lot (strange, this always seems to coincide with threats of bodily harm from the always hysterical editors).

All of this intricate timing and planning of mine was really messed up by the on-again, off-again move to Washington (State). The first deal on my house here in Arlington fell through (one scant week before our planned moving date), so we had to put the house back on the market...and subsequently lost out on the house in Puyallup. Of course, all changes of address had gone in, plus we

had pretty well packed everything...so the hasty unpacking made for one helluva convoluted mess, and one broken tach.

This (hopefully) explains why my address has vacillated back and forth between Texas and Washington these past few months, and why, among other things, I've been so late letting you know how Bill Carpenter's (C.H. Electronics, Inc., P.O. Box 1732, Riverton, WY 82501) Capacitive Discharge Ignition System checked out.

I couldn't have been happier; it worked as well as Carpenter promised it would. There are five basic parts to this CDI system: the spark plug, the ignition unit (which includes the on/off switch), a 4.8-volt battery pack, the pulse switch, and the pulse wheel (with magnet that turns the pulse switch on and off). And they're all simple to install, as is setting up the timing.

The pic shows Bill's system hooked up to my ancient Enya .60 while it was residing in a Dallaire. You can see the pulse wheel (and magnet) right behind the prop, the pulse switch secured to the engine mount, the ground strap on the rear engine mounting bolt, and the high voltage wire going to the plug. Notice that there's no mechanical or electronic spark advance on this system; the timing is fixed and Bill claims the KISS principle works just fine. My flight tests bear this out...

Using the marking on the pulse wheel,



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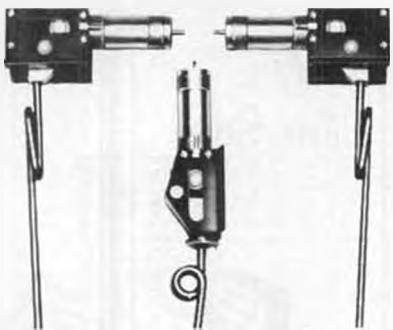
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NICK ZIROLI 29 Edgar Drive, Smithtown, N.Y. 11787

you ball-park the spark advance to somewhere between 20 and 25 degrees, check-run the engine, and then refine the setting (if you want to) a degree or two to suit yours and the engine's needs.

I've put a little over ten hours on this CDI system, and its performance has been flawless. The first six hours were in the Dallaire firing up that old Enya, and what a nice combination that was (for my kind of sport flying, a forty would probably have been more than enough). Even with that old-type Enya carburetor, and hardly any tinkering, she started on one flip and idled reliably well below two grand. At full throttle, the sixty seemed to put out the same amount of power swinging a 14x4 as she did with

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that same prop on glow fuel.

And what can I say but "Ahhh" and "Ooooh" about the N-I-C-E sound and fuel economy. My wife, Dee, who's only heard the Enya run as a glow, remarked how "subdued" the engine sounded (she thought it was still at idle or some low throttle setting). As I couldn't fit anything else in, I ended up using a Perfect 3-3/4 ounce rectangular ukie tank to hold the recommended five parts gas to one part Klotz oil. Even running on the rich side, I got a consistent 12 minutes from that small tank.

I had originally planned to flight test the Fox Eagle III with this ignition

conversion right after finishing up with the Davis Diesel head installation on the same engine (BIG Birds, June '82) . . . but I ran into a snag; the Eagle wouldn't work right with this CDI system of Carpenter's. It literally drove me nuts, but I was too stubborn to call Bill. Since he'd stated that his ignition would work with any engine from a .19 to a chainsaw-type, and it's so easy to install, I figured I must have screwed up somewhere along the line. So, again and again, I'd remove the plug, v-e-r-y carefully find Top Dead Center, and set the pulse wheel at about 22 to 23 degrees. The engine always started on one or two flips, but never delivered any real power

before quitting . . . and then becoming almost impossible to start. After too many hours of swearing, frustration, and anger, I was ready to call both Duke Fox and Bill Carpenter to let them know what they could do with their respective products.

But then, minutes later, while slamming down a Rondo (I'd needed something to restore my macho and self-confidence), I realized what the problem was (yet another revelation): unlike most other engines that have their thrustwasher keyed to the shaft, the Eagle III's thrustwater is a tapered fit against its wedgelock, making it impossible to find, and keep, any consistent settings in relation to the crankcase . . . which is the basis for this ignition system.

After talking to the nice guys at Fox, I had to chuckle at the irony of the situation. It seems that Fox had received so many complaints about the early tapered thrustwasher being so hard to remove, that they came up with a newer, easy-off version . . . and naturally, because I didn't need it, my Eagle came with one of those easy-off types. They did send me an older thrustwasher (#26009) and thrustwasher wedgelock (#26005) . . . and that combination did the trick; they're locked on so tight you'd think the thrust washer was keyed in some way.

So that's why I never got a shot of the Eagle as an ignition engine, but did get a good four hours air time in my C-3. The Eagle couldn't handle quite as large a prop as she did when diesitized; however, I got really good performance out of a 14x6 and a 15x5 . . . along with ease of starting, realistic sound, and great economy.

There's really nothing not to like about this CDI system: it works reliably, sounds as real as any chainsaw engine, and yields three minutes per ounce (on a sixty), using a low-cost mix. A robust sixty (like the Eagle III) or a ninety converted to ignition will do an outstanding job of flying something like the BIG Sig, Nosen, or Balsa USA Cubs. And at the usual 14 pounds, these BIG Birds will actually be overpowered from a scale standpoint.

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If you're interested, don't waste your time waiting for any C.H. Electronics ads to appear; according to Bill Carpenter, they're almost overloaded now just because "the word" got around, so he's not planning on using ads for awhile. Write, or call, (307) 857-6897, and tell Bill "Big Al" (and Model Builder) sent ya... **WHAT'S LEGAL ACCORDING TO AMA?**

That's a damn good question, and had you put it to me three days ago, I couldn't have given a suitable answer...

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But thanks to the letter I got from John Worth two days ago, I can now pass "the word" onto you. I thought anything and everything in the AMA rule book had an effect on the insurance coverage... but it ain't so. According to Mr. Worth, it's the Safety Code, and only the Safety Code, that determines whether or not insurance coverage is provided. Sooooo... "Other than the weight limit of 55 pounds that AMA has specified, coverage is not a matter of what you fly, but rather how (and where)."

As I mentioned in an earlier column, a weight limit by itself is dumb because there's no sanity to it. You can use a wing loading limit, like IMAA's proposed 48 oz./sq. ft., and at least have a reasonable idea how your BIG Bird stacks up probability-wise. But there are too many guys out there who, given just a weight limit, are gonna turn out a whole bunch of very lethal lead sleds (our birds are lethal enough even when they meet sensible parameters).

Mr. Worth stated in his letter that AMA did not go for a wing loading limit because "the measuring process would be too cumbersome to use on the field; so they prefer some simple means of checking for compliance, such as a scale to weigh models."

What does he mean, too cumbersome? If they're planning on having the scale there anyway, all they'll need is a measuring tape and a five dollar calculator; it would take very little time to

really play it safe and do it right!

The Executive Council has left me with the very definite feeling that they really don't care that much about our safety; what we don't need is lip service.

And for all you IMAA members who got severely bent out of shape after reading IMAA's proposed guidelines, and then started ranting and raving about not having anyone tell you how to build or what equipment to use... pull in your horns and think. We've closely paralleled EAA's ways and means because much of what they do and how they do it applies to us. They live with rules, inspections, and certifications, and it's made them a better and a safer organization.

I'm more than willing to live with reasonable rules and guidelines that make everyone a lot safer... just as I'm willing to pay more for a radio that is truly interference-free, and on a band that isn't shared with other users who have a thousand times more power.

I'm hoping that by the time you read this, IMAA will have aligned itself (or about to) with EAA. We can learn much from them.

IMAA'S SECOND FLY-IN FESTIVAL

Got word from Don Langer, who took over (from me) as IMAA's District VIII Director, that the fly-in up at Ida Grove was indeed a humdinger. In spite of the cool weather Friday and Saturday, and the wind and mist that prohibited flying on Sunday, most everyone had a smash-

ing time. Even though Bill Northrop will have coverage of the BIG Bash elsewhere in this issue, I am including Don's shot of the German-built B-17 taxiing out for takeoff. (*Glad you did. I missed it. wcn*)

When I asked Don how he felt about the Festival, he grinned and gave me the kind of answer I was looking for. "If they were having another fly-in next weekend, I'd jump into the car and head toward Ida Grove again."

TIP OF THE MONTH

In case the plans are in error, or you just happen to make a dumb mistake while building a really BIG Bird, don't forget to... "Burn your way in... Braze your way out!"

Al Alman, 2609 Burningtree Ct., Arlington, TX 76014 (and don't forget those cards, letters, newsletters, pix, and fly-in dates). ●

Griffin Continued from page 20

aligned with each other, and that they are securely bonded to the dowel with Hot Stuff and baking soda.

24. Attach the rudder and elevator assemblies to their respective mating surfaces. We recommend the Charlie's Air-Flo hinges because of the ease of assembly and light weight. Make certain hinged surfaces work smoothly.

25. Cement a dowel stiffener to the underside of each horizontal stab, as shown. This is to add strength and

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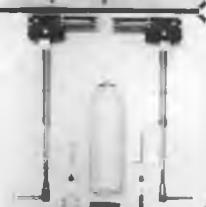
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prevent warpage.

26. Unless vertical stabilizer is of very hard, warp-free balsa, add the inserts shown on the .03 drawing. These should be 1/4 inch wide and of the same thickness as the stab.

27. Fit the elevator and rudder assemblies to the stabilizer platform. Note that the two lower tabs on the vertical stabilizer fit through slots in the horizontal stab and into the stabilizer platform to insure proper alignment and add extra strength.

28. Once you are certain everything fits and aligns properly, cement the horizontal stabilizer in position. Use plenty of Hot Stuff, together with generous sprinklings of baking soda to obtain a maximum strength glue joint. Be sure correct alignment is maintained and that stab is positioned solidly against the stab platform.

29. Cement vertical stab assembly into place, front edge against bulkhead "P" and tabs fully seated through slots in stab and platform. Before adding cement, position vertical stab so it is perfectly 90 degrees in respect to the horizontal stab and in alignment fore and aft with the fuselage centerline.

WING CONSTRUCTION

When building the wing, follow these directions precisely and exercise extreme care in assembly, since proper wing construction is the key to optimum performance of the Griffin airplanes.

30. Lay wing plan over a flat construction board, such as a soft wood plank or half-inch celotex.

31. Cover plan with a layer of wax paper or thin plastic film. Use thumb tacks to hold both items in place.

32. Make precise cardboard templates of all wing ribs. Carefully cut the required number of ribs (including half ribs "A") from 1/16 medium grade balsa. All parts must be cut accurately. Sand ribs to conform exactly with rib patterns.

33. Cut center section of lower spar so it extends precisely from the outermost side of LH rib "B" to the outside of RH

rib "B." Pin spar in place over wing plan.

34. In like manner, cut center section trailing edge to extend to outer sides of both outermost "B" ribs. Pin in place.

35. Position both "A" ribs over rear spar, extending to trailing edge. Shim both ribs, front and rear, up 1/32 to allow for 1/32 sheet covering to be added later. Cement in place with Hot Stuff.

NOTE

When installing ribs, make certain all are vertical and perfectly aligned.

36. Cut outer sections of lower spar to fit from outer "B" ribs to outside of "G" ribs. Cement to spar center section.

37. Laminate two sets of "B" ribs using "Super T" Hot Stuff and cement in place to spar and trailing edge. Install the two outer "B" ribs.

38. Cement the remainder of all ribs (C through G) in place on spar. Before cementing, block up rear edge of both "G" ribs as shown on plans to provide needed wing tip washout. Note that all outer ribs progressively taper upwards to provide this washout. To insure this, be certain that the forward portions of all ribs, except "A," rest flat against the planes.

39. Position upper spar in rib slots, making certain it fits all ribs properly and is perfectly straight. Cement in place.

40. Do the same with wing leading edge.

41. Cut two short sections of trailing edge and cement between ribs "B" and "C."

42. Carefully cut to size and length the two partial spars which fit just ahead of the ailerons. After proper fit is determined, cement these spars to ribs "C" through "G" on both sides. Be certain to maintain correct wing washout.

43. Cut and install all corner gussets except those on outer sides of both "A" ribs and forward inner sides of "A" ribs where the rear wing doublers will be installed. Do not install the short "A" ribs at this time.

44. Cut two dihedral wing braces

from 1/16 ply. Note that they are designed to provide 3/4 inch dihedral in each wing tip on the Griffin III and one inch on the Griffin VI.

45. Carefully cut through the two wing spars, leading and trailing edges flush with the outer side of both center "A" ribs. This will leave you with two outer panels and a center section, when sections are removed from the plans.

46. Check for proper fit of dihedral braces in matching rib slots, top and bottom, at both top and bottom spars. Edge of brace should fit perfectly flush with top edge of upper spar, and with bottom edge of lower spar.

47. Check wing sections carefully for proper fit of all ribs, spars, leading and trailing edges, etc. Cut off the outer ends of these parts if they extend beyond "G" ribs. Sand flush with ribs. Also sand or touch up any spots where parts do not fit perfectly, or where excess glue may have accumulated.

48. Pin wing center section in place on board with bottom dihedral brace installed (but not cemented).

49. Bevel the inner ends of the spars, leading and trailing edges of both outer wing sections so they provide exactly the correct dihedral when placed against the matching points on wing center section.

50. Place a block of correct height (3/4 or 1 inch) under each "G" wing rib. Mate wing panels with center section and lower dihedral brace. Slip upper dihedral brace in position ahead of upper spar.

51. Adjust positions of wing elements until absolutely correct, then cement in place with Hot Stuff. For maximum strength, we definitely recommend use of baking soda at critical strength points.

52. When cement is dry, cement short "A" ribs to outside of long "A" ribs. Add remainder of wing gussets.

53. After all glue joints are thoroughly dry, detach wing structure from wax paper and plans. At this point, we recommend that you double-cement all

wing joints for security.

54. Bend both LH and RH main landing gears from wire material shown to size and contour on plans. Be sure both sides match.

55. Attach each gear to rear side of rear spar with thread, Hot Stuff, and baking soda (very important!). Forward section of landing gear may be attached to rear side of forward spar in same thread manner, or 3/32 square hard balsa may be cemented above and below landing gear wire to rear side of forward spar. Very strong cement is needed for landing gear installation.

56. Next step is to plank the upper leading edge of wing with 1/32 sheet balsa. Cut material to fit precisely between aft side of leading edge and aft edge of forward spar.

57. Install forward top center section sheet covering first, then sheet each forward outer panel of wing.

58. Cement 1/32 sheet on top of both outer wing panels between aft sides of leading edge and rear of rear spar, sheet extending from "A" ribs to "G" ribs. Sand outer ends of sheet flush with "G" ribs.

59. Add wing tip blocks, then sand tips to shape, and leading edge and upper sheeting for a smooth section.

60. Drill holes through center section leading edge, as shown, to accept the hardwood retaining dowels. Secure these with ample cement to hold them in place. After completion, install 1/32 sheet on bottom side of center section (ribs "A" to "A") between leading and trailing edges. Also cover top center section between trailing edge and rear spar. Add cap strips as shown.

61. Cut and sand ailerons to fit, from stock specified. Round leading edges of ailerons and trailing edge of matching outer spars. Attach ailerons with "Charlie's" hinges or method of your choice. Make sure ailerons hinge freely.

62. Fabricate and cement bellcrank plates and aileron rod exits in place.

ENGINE AND NOSE GEAR INSTALLATION

63. On the Griffin VI, holes in the firewall are drilled to match a Tatone No. 221/2A Metal TD engine mount, with no down or side thrust. Any other engine mount, even wood beam type, will serve as well, provided the engine is properly aligned and positioned as shown. On the Griffin III, the .03 engine tank is bolted directly to the firewall on the thrust block shown. Angle of this block is important; it must provide three degrees of right thrust, but no down thrust.

64. We suggest that you break in the engine on a test block before installation in the airframe. Both the .03 and .061 R/C G-Mark engines are built to extremely close tolerances and will require considerable break-in time . . . approximately twice that shown in the instruction sheet. The longer these engines are run, the better they idle, and the better their top end RPM's.

65. After break-in, bolt engine in

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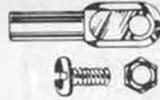
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place, using hardware noted. Make certain engine mounting screws are securely locked in place to prevent loosening under vibration.

66. Steerable nose gear brackets can be mounted at this time. Nose gear axle must be bent (later) to provide correct landing gear height with nose wheel centering.

67. The Griffin III can use the built-in tank (gives about four minutes flight time), or a separate tank if desired. On the prototype Griffin VI a Simple Stopper 1-3/4 ounce tank was used (flight time 10-15 minutes). Details of tank supports are shown on plans. (Note: It is suggested that tank supports be installed after controls are installed.)

CONTROLS INSTALLATION

68. Simplest installation for motor, rudder, and elevator servos is to attach aileron servo trays to fuselage sides at positions indicated with Hot Stuff and baking soda. Hint: Excess tray material may be trimmed off to reduce weight.

69. Bend 1/32 music wire to length required to fit between throttle servo

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and throttle arm on engine. Be sure linkage does not bind on bulkhead or engine cowl when servo is operated.

70. Simplest method of attaching rudder and elevator servos to their respective control surfaces is shown on the Griffin VI drawing. Push-rods are made with Sullivan gold rods; using 2-56 screws fitting each end, plus 1/32 wire soldered to screws and mating with the servo arms. This arrangement provides complete adjustment of control surface positions.

71. A piece of 1/32 music wire connects rudder servo to nose gear control arm. Use care to insure smooth operation without binds.

72. Griffin III controls employ 1/16 push rods terminating in 1/32 music wire. Construction is lighter but more critical because very little adjustment of control surfaces is possible. Add stabilizer fillets after controls are installed.

73. Wing bellcranks are reworked from Goldberg standard 90 degree bellcranks. One 1/32 wire push rod, bent slightly in the center, connects both aileron bellcranks. A slightly offset,

1/32, 90 degree wire soldered to center point of the push rod engages the servo arm to provide aileron control. Details of aileron rod connections are shown on the plans.

74. On the Griffin III prototype, the aileron servo was attached to bottom center section sheet with servo tape; an aileron servo tray holds the servo securely on the Griffin VI. Install side cap strips after wing servo installation is complete.

AIRFRAME COMPLETION

75. After controls are installed, add turtleback top, then sides, and two stabilizer fillets. Sand for a smooth fit.

76. Drill two holes in bulkhead "I" to match precisely the wing hardwood leading edge dowels. Wing should fit snugly against fuselage seat. Install hardwood wing hold-down block inside fuselage; use Hot Stuff and baking soda. Drill and tap for 4-40 nylon wing screw; match with hole through wing trailing edge. Make sure wing fits securely against wing seat.

77. Modify a standard canopy to fit configuration shown on plans. Canopy can be shaped to size after soaking in hot water. Trim to fit contours, then attach to hatch with Hot Stuff, after fuselage is painted.

78. Cement two side cowls to front side of firewall. When proper angle is established, add bottom cowl block.

79. Carve cowl to shape to obtain smooth flow between fuselage and engine spinner. Make cut-outs and adjustments as necessary for exhaust, needle valve, and control rod.

EQUIPMENT INSTALLATION

80. This involves installation of battery, switch, and receiver in fuselage. Final installation should be done after model is completed and painted.

81. Use receiver, and especially battery, to achieve model balance at point shown. Be very careful to balance as shown. An aft balance point always results in stall, loss of control, and CRASH!

82. Use plenty of foam plastic around receiver and battery for protection. Make sure control rods are not obstructed.

83. Mount battery switch on left side of fuselage so that ON position is FORWARD.

FINISHING THE MODEL

84. For all balsa surfaces, we recommend several coats of balsa filler, sanding between coats, then painting with your choice of finishes. Keep finish as light as possible for best performance.

85. Wings can be finished with any covering you might prefer. Just keep it light. Original models all use Silkspan (talk about being old-fashioned!). But they sure fly great!!!

FLYING THE GRIFFINS

86. Before trying the first flight, check wings and stab for warps, incorrect alignment and, especially, correct wing tip washout, equal on each tip. Adjust anything that is not correct.

87. Recheck model balance; it must

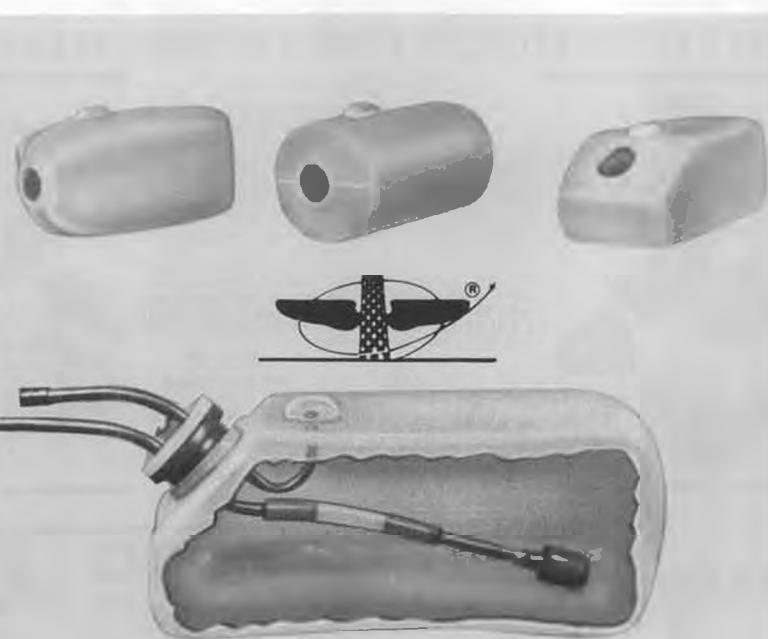
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be as shown.

88. If engine is broken in properly and operates reliably, and if model is within weight limitations, all signals are GO!

89. If you are a newcomer, please get an experienced flyer to help on your initial flights.

90. As with any first time aircraft flight, check need for trim corrections. Make these changes as soon as possible before continuing flight.

91. If initial flight trims are zero-zero . . . just enjoy yourself! These models will take off realistically from any reasonably smooth surface; handling is snappy but not critical. Here you can really experience what you should ultimately expect in the way of small aircraft performance!

We already know that these basic engine units (O.S. ABC .61) will respond readily to good hop-up techniques, so there is more power there if you know how to "tweak" them.

For what it's worth, these engines have a very broad range of useable RPM and can operate well with pipe lengths as short as 11-1/2 inches. This setup works well at RPM's in the 15,000 to 16,000 range (Engine RPM). A 15-inch pipe setup produces good pulling power on larger props, where engine RPM is 11,000 to 12,000.

The manufacturer is a little vague on prop sizes for these new gear-box engines, but that's understandable, because you really have to match the RPM and thrust to the particular aircraft.

The planes in the photos are the Tipo 825 and John Tapps "Outer Limits." The engine in the big plane is an OSVF .61 C-1 gear-box model. The gear-box is rotated 180° from the setup shown on the test stand.

We were interested in seeing what the gear-box engine would do in a very similar airframe to the T-825, which was designed for the same size engine, but with direct drive.

The "Outer Limit" is a 1000 sq. inch model, and the layout is basically the same as the M.A.N. Curare. John also scaled the airfoil directly from the M.A.N. Curare plans, which produced a very thick wing.

The photo shows that the relative moments differ from the Tipo 825 in that the tail moment is considerably longer.

The balance worked out quite well though, and the entire aircraft weighs 10.25 lbs. As a comparison, our 825 weighs just 8 lbs. 2 ozs. Neither aircraft has built-up or hollowed-out surfaces, just light building techniques.

The big question was . . . will the gear-box model fly competitively? The answer is "yes," but the speed difference from existing 700 sq. in. models is quite noticeable, and some judges, quite frankly, are prone to add points for speed. We think a thinner wing will help.

For those of you who are "Doubting Thomases," thin airfoils on these larger designs does not produce "hunting" or any other bad traits, as often mentioned by modelers who equate stability with wing thickness. The key, of course, is the low wing loading and the wider chords. John originally tried the Webra gear-box engine in this plane, but the 1.66 gearing and the props tried just didn't produce enough power. The 1.4 to 1 O.S. seems much better suited to this size model, but the prop necessary is not yet decided. The 14x8 Zinger, clipped a little, seems best so far.

In talking to Tony Frakowiak about his new 1100 sq. inch pattern plane, he mentioned that the 14x8 Zinger worked nicely and the engine could deliver about 10,000 prop RPM on the ground.

We have not yet checked out the 1 to 1.9 gear box engine, but that's next, and we are presently building a plane for it. The model is a quarter-scale C.A.P. 21, but designed specifically for these

Pattern Continued from page 21

Switching to a 16x6 prop, we got about 200 RPM more, but our calculator and past experience said this propellor would not produce enough speed for good pattern flying. (But pay attention, scalers! wcn)

The next test was to see if a tuned pipe would help the power output. The setup as shown in the photo was a very mild pipe arrangement, about 13 inches from plug to high point on pipe. The pipe shown is a C.M.B., which is essentially a Rossi design. As expected, we got about 1000 more RPM on each test prop using this setup.

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GRAPHICS

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engines. Projected weight, based on lots of similar projects, is under 9 lbs. Construction is laminated foam, ply and balsa, and the weight-to-strength is very good. We are going for a complete Monokote finish (except the cowling) to keep weight down.

We have another project which we will show you next month. This one is for rear exhaust .60's using standard pattern props. The performance is much different from John's "Outer Limit", as the goal was to get a model which could rapidly change from low to high speed and vice-versa. The "Outer Limit" was intended to hold a constant flying speed by using a large lightweight airframe and a big, slow-turning prop with lots of thrust.

We will keep in touch.

Thermals drift downwind, taking sailplanes with them. If you can't get upwind with enough ground speed to get you back to the field for a landing, you can have your flight disqualified.

With this fly, search, and re-launch method, sufficient penetration is needed, not only to get you back to the field, but to get you far enough upwind to find a thermal that will be of some use to you. A thermal that is already close to the field boundary will take you too far downwind at the end of two minutes.

If you have some thoughts or ideas on R/CHL flying, or you have a good HL design, write me at **Model Builder** and send me a couple of photos, I'd be glad to mention it in this column.

* * *

R/C electric powered sailplanes are becoming more and more popular these days, and will no doubt continue to become more popular. It makes sense. They are clean, quiet, and in the long run, cheaper to operate than conventionally powered aircraft. For the soaring enthusiast, electrics provide another benefit: no launching equipment to lug around, find room for, and then set up.

Have you ever "discovered" a flying field in your neighborhood that was too short to set up your hi-start or winch in the direction of the prevailing wind, yet was suitable for a little fun flying? I have. They are usually vacant lots in residential areas that could be used for soaring if one used caution and common sense, but they are almost always too small for anything but hand launch flying.

Electric powered sailplanes are ideal in these situations. If flying time and convenience are more important to you than being a soaring "purist," then you should give electrics a try.

If you enjoy competitive flying, R/C electric sailplanes have something to offer you, too. I recently was a spectator at an electric contest here in Southern California, and was pleasantly surprised by what I saw.

The comradeship, cooperation, and friendly exchange of ideas that glider buffs are accustomed to will not be missed at electric contests. In many cases, the people will be the same people you know from soaring contests.

The contest I went to was hosted by Roland Boucher of Leisure Systems. About twenty-five people entered the contest, which featured old-timer aircraft as well as sailplanes. Roland ran a fine contest with the help of a few fliers from the Soaring Union of Los Angeles, and the Society of Electric Aircraft Modelers. He supplied trophies and prizes to the top fliers and actually managed to get in a little competitive flying himself, with his Playboy.

Rarely is there a flying contest held that doesn't have its tragedy. This contest surely had its tragedy. Roger Roth and Jim Nikitopoulos were in the middle of their 90-second climb-out when their ships collided (they were working the same thermal), locked together, and "helicopterized" down for a pancake

Soaring Continued from page 33

contestant to make the most out of his throws.

Mike's method is really simple and effective. He uses the altitude gained on any previous flight to look for the lift he is going to need on his next flight. He then runs over to the new thermal, which isn't far away, hopefully, and hand catches his Mirage. This allows him to get back into the air in the shortest amount of time and to practically ensure another max.

This technique demands that you fly a sailplane with a good speed range.

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landing.

Damage to Roger's Olympian 05 was pretty much limited to the left wing panel, and hardly present at all in Jim's V-tail hybrid which could have been instant-glued and flown in the next flight group.

* * *

That odd-looking contraption you see in some of the pictures this month is the subject of the rest of this column. It's a vacuum pump system. It is very useful in a number of modeling applications. Its function is to apply an even amount of pressure over the surface of an object placed in the vacuum bag. If you are skinning a foam wing with balsa, plywood, or fiberglass, for instance, you want to use as little epoxy as possible to keep the weight of the panels down to a minimum. However, you do not want to sacrifice bonding strength by failing to apply enough pressure on the skins to get them to press tightly against the foam core while the epoxy sets up. Solution: vacuum bag it!

If you are laminating carbon tow and epoxy into a molded spar as described last month in this column, you will need the evenly distributed pressure to produce even thickness spars that aren't over-saturated with epoxy.

This vacuum pump system was invented by Michael Bame. I think it is really ingenious. Without a whole lot of money, equipment or even materials, you can assemble this device in very

little time.

The heart of the system is the vacuum pump. The one pictured in this article was an actual vacuum pump that I found in a surplus store in Van Nuys, California (Art's Surplus). However, the pump from an old refrigerator will do also. I suggest you look for a vacuum pump at a similar surplus store first, then try an appliance repair store as a second alternative. Once you have this item, the rest is easy.

The basic system consists of a pump, two reservoirs, a vacuum regulator, a vacuum gauge, and a check valve.

The reservoirs in this system are merely glass bottles covered with a combination of strapping and masking tape. Their purposes are different from each other. One reservoir, the smaller one, allows the vacuum pump to get up to speed before it has to pull against a heavy load. The larger reservoir is in the system to prevent the pump from over working. It allows the vacuum bag to leak a little bit without turning on the pump. This is especially nice if you have to let something cure overnight and don't want to be awakened every two or three minutes by a noisy pump. Of course, the masking tape on the glass will prevent the glass from going all over the place in the event of an implosion.

The regulator is a rather simple device. Basically, as the vacuum increases, a piston moves. The piston is attached to a sliding ramp. As the ramp moves, it

comes into contact with a switch lever which shuts off the pump until the vacuum drops off a little. The pump comes back on . . . and the cycle repeats itself, always staying within a couple of inches of mercury of where it was set.

The regulator is made up of several readily available items. The heart of the regulator is the Monojet glue syringe. It is mounted to the board with plywood brackets which are epoxied in place.

The sliding ramp device consists of three consecutively larger size, square brass tubing pieces which are assembled as shown in the photo. Two small tabs are soldered onto the two moving tubes. One is a tab that holds the piston's handle and forces this tube to move with the piston. The other is a small tab that is soldered to the tube that the ramp is glued onto. Its function is to allow adjustment of the amount of vacuum you want to pull. It has a small nut and screw attached to it. See the photo.

A return spring is anchored to the base board and attached to the end of the piston by means of a small cup hook. This resists movement of the piston that is caused by the vacuum. Without it, the piston would slam into the top of the syringe and never return, and the pump wouldn't turn on or off again depending on the shape of the ramp.

The roller-lever switch is wired in line to the pump. Place it in the position shown so that the ramp will open and close the circuit when it moves with the

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piston.

The check valve is also a home-made item. Materials for it can be purchased in two places. The brass tubing is usually carried by hobby stores. The small spring, O-ring, and ball bearing can be purchased in a hardware store.

You need four consecutively sized brass tubes (12 inch length), the largest of which fits tightly into the main vacuum line. The sketch depicts this device as it looks cut-away.

The O-ring is instant-glued in place at one end of the valve and the spring is glued in at the other. The ball bearing is in between the two and is held against the O-ring very lightly.

The tubes are glued together using

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thick instant glue, so that air doesn't leak through them. Be careful not to cement the ball bearing to the O-ring!

The vacuum gauge has two functions. The first and most obvious is to tell you how many inches of mercury you are pulling. The second is to allow you to adjust your regulator to the desired setting. It can be purchased at an automotive parts store.

Finally, the fittings are very simple to make. If you are going from a large inside diameter rubber hose to a small one, you will need the appropriately sized outside diameter brass tubes. To make the T-fittings, simply drill a hole the size of the smaller brass tube into the larger one. Then, take your soldering gun or torch and solder the small tube into the large one. Don't leave any holes in the solder or you are inviting leaks.

The fittings on the glass bottles are also very simple to make. If the bottles you use have airtight metal lids, simply drill a hole in the lids and solder a brass tube into them. If they don't have a metal lid, take a scrap of brass sheeting, drill the hole in it, and epoxy the plate onto the mouth of the bottle. (Sand the mouth first or the epoxy won't stick very well!)

You can add an on-off switch to the line cord if you wish or simply plug-in and unplug the pump as needed.

The vacuum bag itself is, again, simple. Take a sheet of thick polyethylene (5 mil is fine), cut it more than twice as wide as the object you are bagging and about 8 inches longer. Apply 1/2 inch double-sided (double-sticky) tape to half of one of the short sides and all of the adjacent long side. Now fold the sheet in two lengthwise so that you have a bag that is open on one end. Slip the wing core or whatever into the bag and continue to seal it.

When you get to the last 1/2 inch or so of the open end, don't bother with the scotch tape. Insert the vacuum line into this hole in the seam and let it stick in about three inches.

Next, use some caulking compound or similar thick, gooey substance to cover the inside of the opening around the vacuum line. When this is done, use baling wire to wrap the plastic bag

tightly around the vacuum line and you should have a leak-proof setup.

Now you are ready to tackle that molded skin whatever you've been meaning to tackle.

VACUUM PUMP PARTS LIST

QTY	DESCRIPTION
1	vacuum pump with motor (\$35 approx.)
1	gal. drinking water bottle
1	qt. juice bottle
1	3"x12" sheet of 1/32" brass.
2	12" brass tubing (b.t.) 13/32" o.d. to fit i.d. of vac. pump hose
3	12" b.t. 7/32" o.d. to fit vac.line i.d.
1 ea.	12" b.t. - 3 consec. smaller from 13/32" o.d.
1 ea.	12" sq. b.t. - 3 consec. smaller from 5/16"
1	Monojet glue syringe
1	3/8" o.d. O-ring to fit i.d. of 13/32" b.t.
1	ball bearing 11/32"
1	small spring no. 152 or similar
1	large spring no. 116 or similar (experiment)
2	small eye screws
1	12' extension cord (120V)
1	120V in-line rocker switch for extension cord
12'	automotive vacuum line 5/16" o.d.
1	vacuum gauge - reads 0-30 in/Hg
1	Radio Shack sub-mini roller with lever switch - catalog no. 275-017

MISCELLANEOUS MATERIAL AND TOOLS NEEDED

One roll of masking tape, solder and soldering gun (high wattage), 5-minute epoxy, Hot Stuff or similar, brass tube cutter, drill motor with 7/32" bit, sandpaper, small nut and bolt, 1/4-inch plywood, and a mounting board 3/4inch plywood approximately 2x4 ft.

★ ★ ★

If you would like to have me write about your favorite form of R/C soaring, drop me a line care of Model Builder Magazine.

I have moved since the last issue, so just use the Model Builder address to write to me: 621 West Nineteenth St., Costa Mesa, CA 92627.

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Marez 3-ch . . . Continued from page 33

do so with both removed from the main assembly, we don't want everything bonded together forever and ever. When set, place it back on its shaft, and the whole thing becomes clearer. The cam is free to rotate along with its backing washer, and can be adjusted to actuate the switch at any desired point along its travel. This in turn will switch you from high to low rate just where you want it to do so. Once you've set this point, tighten the screw snugly, and the switchover point is there to stay, until you decide to readjust it any time in the future.

The micro switch sticks out past the top of the throttle assembly two to three thousandths of an inch, and keeps it from mounting flush against the case. You can gain the necessary clearance to obtain proper mounting by inserting a No. 2 washer between the two halves of the assembly, on the screws which hold them together.

Only after the wheel and throttle assembly openings and a trial fit have been made should you cut any more holes. Since their location is somewhat critical, they more or less determine where everything else will go. Make the proper openings you will need for the devices you have chosen for your design. Clean off any pencil marks and aluminum filings, and get ready to start

permanently mounting things. Referring to the manual, pages 8 and 9, mount the batteries, switch, charging jack, and meter. If you are using the small meter furnished, simply wire it in place following the instructions. If you have opted for the larger meter, the following applies:

To your shopping list from Ace R/C, add the following:

- 1 - MT-001 Transmitter Meter, w/mounting clip \$7.28
- 1 - R4-271 Resistor, 270 Ohms, 1/4 Watt .20
- 1 - R4-821 Resistor, 820 Ohms, 1/4 Watt .20
- 1 - SS-130 Zener Diode, 6.8 Volts .75

Make the proper size opening as shown in the diagram, mount the meter using the clip provided. The connections are identical to those on the small meter included in the kit, only the resistors value have changed, Fig. 2. And as in the case of the small meter, the components are mounted right on the meter itself, facing downwards and away from the antenna mount located right above the meter. Use an alligator clip, needle nose pliers, or something similar as a heat sink on the meter terminals when soldering to it, and do a fast job. The heat can travel up the terminal and melt the plastic into which it is embedded.

The new ESV is connected as is the original, positive to the Zener, and negative to the negative meter terminal. It will read from 7 to 10.5 volts, which is about ideal for this purpose.

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The pot and wiper of the throttle assembly are assembled and adjusted per Ace's instructions "Systems that use D&R Plastic Sticks," Page S/S 10 and Figure D-1.

While you are there, also install and adjust the pot and wiper of the trim and third channel assemblies, following the instructions and Figure D-2, on the same page. Note that both assemblies require electrical centering of the pot at mid-position, re Page S/S 10.

Now, on to easier things; the wiring of the printed circuit board for the encoder. The RF (Output) board comes completely finished and tested, which leaves only the above and a minuscule Trim Adjust Board to do. There is nothing that I can say about or add to the Ace R/C instructions for their assembly, they are EXCELLENT! Follow them carefully, and you can be assured of success. Since it is easier to do so, we will build in all seven channels. Follow the instructions, Section E, "Mainframe Encoder PC Board Assembly," Page S/S 12.

There is one small mod to be made to the encoder board . . . that of reducing the number of active channels from 7 to 3. To do so, we have to ground the first unused input to the 4055 encoder, pin 4. Mechanically, the easiest place to do so is past the 100K input resistor, at the jumper under the plug-in trim board. Simply solder a short piece of resistor lead from the lower jumper land, on the side of the 8-pin female plug, to the wide land which runs between the jumper

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me a benevolent smile and seemingly shrugged off my "harmless threat," I couldn't help but notice that they took turns camping v-e-r-y close to that Eagle the rest of the weekend. By the way, these guys will have every one of their planes designed to take the Quadra Cosmocon Supercharger, which they will also handle.

As for which design or kit dominated, the answer is . . . none. For example, out of 135 airplanes, only four of them were Pitts . . . and of those four, three were Byron's; the other being a Sheber Pitts. That's one helluva contrast to just a few years ago when almost a third of the entries were (mostly Byron) Pitts. Another surprise was the one and only CAP 20 that stood out like a sore thumb; they've always been plentiful at earlier fly-in's.

In the engine department, no one powerplant had the edge. There are so many good, different-sized engines available now that modelers are taking advantage of the opportunity to match engine and airframe, they're learning not to get caught behind the power curve (the next step would be to try different props until the best one for that engine/airframe combination is found).

And for the crash-conscious: nine birds bit the dust, and none because of frequency-related problems. Most of them went in because their pilots weren't too "swift," like the two guys handing the transmitter back and forth to each other as they took turns flying a Balsa USA Sopwith Pup. Well, wouldn't you know that one of the dummies knocked the transmitter's power switch off . . . and rekitted Rusty Allen's beautiful Pup. A few pranged because of mechanical problems, such as sockets popping off of ball joints (and 2-56 ball joints at that . . . tsk! tsk!) and throttles hanging up. A mid-air turned a nice-looking yellow and black Byron Pitts into minute pieces of foam, while the Air Tech Pawnee suffered very minor wingtip damage. And as always, there was someone who lost his bird because of an aileron problem. Had this pilot learned to coordinate, he would have automatically come in with rudder and possibly saved that Rearwin.

As usual, Jan and Cindy Cunningham did an outstanding job of running the fly-in. They were on top of things, nipped all problems in the bud, and kept the paperwork from becoming scrambled eggs. The gals did receive some "help" from hubby/father, Chuck, who many people have been led to believe is the one in charge. Now you know the real story. . .

A most welcome addition to the flight line was a Flying Safety Officer. As can be seen in one of the pix, he sat near the pilot's box, keeping everyone on their toes and everything running smoothly. It was a great idea, and in order to insure that the FSO would be effective, Chuck asked Helmer Johnson to fill the slot. As so many people who've never even met him know, Mr. Johnson is not exactly shy or bashful, and has even been known to vent his spleen upon occasion. All of these outstanding personality traits, coupled with his years of R/C experience, made Helmer the perfect choice for FSO. Future fly-in directors should pick up on this FSO idea and have their flight lines safer (perhaps Helmer can be contracted out to those who need his specialized talents).

If you can visualize a big flying field blanketed by BIG Birds, you'll have a feel for how it looked to those of us who were able to make the 5th Annual Jumbo. As predicted, it was bigger and better, although no one expected to see so many airplanes. And for the first time, Chuck didn't have any forgotten transmitters or lost cameras to ship back to their owners . . . nor were there any of the usually unique and delightfully different craft, like the Beta Bird with its well-articulated Snoopy, or the crazy, spindly-looking Sweet Sixteen that had just about become a tradition at these Jumbo fly-in's.

Of course, Chuck Cunningham is already starting to plan for 1983's 6th Annual Southwestern Jumbo Fly-In, so make a note to keep that third weekend in July free for fly-in fun. Unfortunately, I may not be here, as I'll probably be living in Puyallup, Washington, however, if the amiable Mr. Cunningham is truly amiable and offers to take care of my round trip tickets, I'll throw caution to the Texas winds and volunteer for fly-

lands, it is a ground land. The designers of the chip do not recommend that it be operated at less than three channels, so if you wish to build your transmitter with just two of them, you can simply omit the third channel control, thus transmitting three channels, but only using two. In this case, the channel should be terminated with a 5K, 1/4-watt resistor across switch No. 2, at the points where the red and black pot wires for the third channel would go.

Well, this completes all of the mechanical and most of the electronic assembly. In our concluding half of this article, you will wire the encoder to the pots and to the RF section, and make the final control alignment. In the meantime, if you haven't already done so, take advantage of any time left to cycle the batteries.

Jumbo Fly-in . . .Continued from page 36

at the Jumbo. Right now they have the Eagle, Pawnee, and the Blazer (see photo), with more designs lurking in the fertile minds of Wendell Roberts and Randal Snow. All of their birds are fast and easy to build, weigh in at 16 to 18 pounds (with Quadra), and are durable and capable. Although I'm drawn to the Pawnee (I used to do some cropdusting), I fell in love with the Eagle and threatened to sneak it home in my VW van. Although both Roberts and Snow gave

in duty, again.

Choppers Continued from page 39

Figure 4 shows how the Hiller system (movement of the flybar) affects the mixers. I said that in the "Hiller-only" system the flybar levers the seesaw to feather the blades. In the Bell-Hiller system the flybar moves the mixers which feather the blades. The seesaw does not swing as it does in the Hiller system. (Refer back to the Figure 1 inset if necessary.) Again, the left side of the mixer remains stationary and acts as a pivot point.

Figure 5 shows a right cyclic Bell input to the mixer. This input comes directly from the swashplate, so the right side of the mixer acts as a pivot point. Figure 5a shows a left cyclic Bell input to the rotor head. As I said before, and will emphasize again, the collective, Bell, and Hiller systems all influence the mixer position in normal flight. Next month I'll continue with control effectiveness, or control authority. Which is more powerful, the Bell or Hiller system? Lots of factors influence this one as we'll see.

A few tips to close out. If the Hiller paddles are not set perfectly parallel with the swashplate, the systems will fight each other and a vibration will result. You can also get vibration from a stiff Hiller flybar or control arm because it can't keep up with each cyclic variation. Just another point to prove that smooth, free action and linkages are vital for successful helicopter flight. See you next month.

Dallaire Continued from page 41

The removable hatch between stations No. 1 and 2 can be constructed from balsa with hardwood inlaid at the corners to accept the screws used to attach the hatch to the fuselage.

EMPENNAGE: The leading edge of the rudder must be trimmed as shown on the plan to allow clearance for the 1/8 dowel used to join the elevator halves. Also, both sides of the leading edge of the rudder and elevator should be sanded at a 45° angle to prevent binding of these control surfaces.

The leading edge, tips, and trailing edge of the vertical fin and stabilizer must be shimmed as they are constructed on the plans. Shim thicknesses are: 1/16 inch (leading edges) and 1/8 inch (tips and trailing edges).

LANDING GEAR: The landing gear parts are joined by wrapping with copper wire and soldering.

FLIGHT ADJUSTMENTS: The wing and stabilizer are set just as shown on the plans. The stabilizer has an incidence angle of 0°, and the wing, because of the angle of attack inherent in the airfoil, needs no additional shims.

I set my engine at 0-0 (no down thrust, no side thrust), which has proved satisfactory.

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Plug Sparks . . . Continued from page 45

the engine collectors have this particular version.

Actually, the design of the Tlush motor was taken mostly from Louis Loutrel's engine of the same name, Loutrel, until taken over by G.H.Q. Model Airplane Co. In 1934, the first Tlush engines were tested locally and found to be as good if not better than the Brown Jr. The main drawbacks to the Tlush was the weight of the engine, 16 ounces with all ignition gear. This discouraged local sales, but did open the door for export sales, where weight was of no particular importance.

It was during the old timer events held at the Willow Grove Nationals in 1969 that enough engine collectors were able to convince Frank Tlush to put together another hundred engines from the few castings left. These were priced at \$125, and were quickly snapped up by the MECA members. However, to this day, this writer has been unable to find anyone who is presently using a Tlush engine in his O/T pride and joy.

For the technically minded, the Tlush Super Ace engine featured a 7/8 bore and 1 inch stroke, giving a displacement of .60 cu. in. Horsepower rating was the same as contemporary engines of its day (Brown, Loutrel), at 1/5 H.P. Power ratings were rather vague, as specifications gave 900 to 12,000 rpm speeds

without mention of propeller size. Total weight, with coil, condenser, and mount, was given at 16.5 ounces, while the bare motor was rated at 7 ounces.

The Tlush Super Ace featured an aluminum head, alloy (magnesium) crankcase, cast iron piston and cylinder, with an SAE alloy steel crankshaft, heat treated and ground to fit. The coil, made by the Tlush people, was quite light, being only 1-1/2 ounces, when compared to contemporary coils of Bunch, Brown, etc.

An interesting gas tank was fitted to the Tlush, the lower end being made in triangular form with a round top. No question of the gas feeding in a steep climb!

All in all, the Tlush was a good engine. Just another well made gas type that was passed up by the competition.

SAM CHAMPS 1983

At the 1982 Annual SAM Business Meeting held at the Rodeway Motel, Chicopee, Mass., the membership voted to accept the bid of SAM 1 to run the 1983 SAM Champs.

The Rocky Mountain Vice President, Jim Thomas, 1365 Logan #204, Denver, Colorado 80203, reports in a letter that the Model Museum SAM Chapter #1 is presently discussing with the city officials of La Junta, Colorado, the possibility of staging the Champs at the old B-25 Air Force Base presently owned by the city.

Jim says this is the best flying site he knows, as the terrain is flat with no trees,

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and excellent chase facilities. Weatherwise, the La Junta base, during World War II, established the record for more flyable days than any other continental base. Typical July weather is clear, temperature in the nineties in the afternoon, with humidity around 25% and booming thermals.

La Junta is located on US 50, in the south-eastern portion of Colorado, not too far from the geographic center of the state. The field, only two hours from the mountains, is located about three miles from town which in itself, possesses more than adequate lodging and food facilities. Sounds simply great, doesn't it?

Thomas was also kind enough to send several photos of the local modelers and typical Colorado fields. Photo No. 9 is a shot of Dave Ramsey, considered the local HLG hot shot. He ought to be, he seldom fails to win this event!

As noted in the photo caption, take a look at the surrounding area! This field is large enough to stage the almost forgotten Fuel Allotment Event, which is very similar to the Texaco Event. Get your models ready, as there is absolutely no excuse for not registering all the long flights you want!

Photo No. 10 also shows Les Payne, SAM 1 President, with a well decorated Shulman Skyrocket that he plans to fly in the '83 Champs. Certainly is neat to have large fields like this so readily available.

05 ELECTRIC

The latest craze to hit California is the geared or belt drive 05 motor size of electric power, as promoted by both Roland Boucher of Leisure Electronics and Bob Boucher of Astro Flight Inc. Twin brothers on a dual mission!

Based on the tremendous success of the Jack Alten's provisional rules for 1/2A Texaco, he has graciously consented to again "de-bug" the rules for old timer electric. Actually, we couldn't have picked a better man for the job, as Alten works for Hewlett-Packard, a large electronics firm in "Silicon Valley."

With all the equipment available to analyze motors, batteries, electrical power output, etc. Jack has tentatively

listed the following rules:

1. Any S.A.M. approved old timer is acceptable for this event.
2. Scaling is allowed (Jack recommends about 600 sq. in. for 05 electric).
3. Minimum wing loading: 8 oz. per sq. ft. of wing area.
4. All current SAM rules pertaining to construction apply.
5. Only two battery pack configurations will be permitted:
 - (1) six-cell Sub-C 1200 MAH pack,
 - or
 - (2) seven-cell 1/2 Sub-C 550 or 600 MAH power pack.

Some comments by Jack Alten are in order: Sanyo batteries have proven to be better than the presently available GE batteries. Both (six or seven) battery packs have about the same performance. The trade-offs are size, weight, capacity, and ease of charging. Best setup at present is the six-cell pack.

Propellers are a matter of choice. As of now, the best performances, based on the 3 or 2-1/2 to 1 reduction drives, have been obtained from 11x6 and 12x6 propellers. The best charging source is your own 12V car battery. Better yet, buy a small car battery for strictly electrical charging.

A full dress rehearsal will be held in the form of an Electric Contest featuring 05 electric powered models and hopefully, one event for those motors over 05 size. We will report results and if satisfactory, will recommend the rules be added to the present SAM Rule Book as a set of provisional rules.

TEXAS TEA PARTY

Things are really popping in Texas these days, as the third SAM Chapter has just been organized, this time in Houston, where the club will be called SAM Houston '82. The latter number refers to the year it was organized and of course, Texas' national hero!

Also got a letter from Dr. James "Bo" Buice, chortling over the fact that the Ft. Worth Planesmen took 50% of the total R/C Assist trophies at the recent SAM Champs in Massachusetts. We gotta do something about those Texans!

Over at the San Antonio end of the state, George Aldrich, 12822 Tarrytown, San Antonio, TX 78233, reports that the SAM Chapter 1836 first old timer (and AMA F/F) contest came off in great style on the 4th of July weekend at Seguin AFB. In re-reading the circular, the meet was actually called the Tri-City F/F Team.

George reports that the R/C O/T portion of the meet was dominated by Marion Knight (Photo No. 11), with a 10% enlarged Simmons Gas Champ scoring 18:24. The inevitable Playboy took second for Jim Reynolds, while third place was taken by a Sunduster (Photo No. 12) built by Bert Striegler.

An interesting fact about the Eastern States Gas Champ was that regardless of which of the Simmons boys flew, one of them generally won. Sal Taibi recalls these boys very well, as they would always come to the contest dressed in their Sunday best. (Evidently, they came

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direct from church). All the boys would kid Russell Simmons about his fancy dress, but at the end of the contest there was a considerable silence in the heckling as he invariably received the first place trophy.

On the free flight side of things, the .020 Replica event was dominated by Playboys, Swooses, and Streaks. Duke Horn nosed out Frank Parmenter with his usual Swoose. Gene Simpson almost caught Frank at the end with another Swoose! Ain't that awful when your own stuff starts to haunt you?

The regular old timer gas event was won by George Aldrich, using a K&B 29 ignition in a Shulman Skyrocket. Talk about squirrely flying! First to the left for ten seconds, then a loop and the balance of the flight corkscrewing to the left. Wild! Don't laugh, it won!

Among the unusual combinations was the Megow Ranger by Jim Propst, employing a Rogers 29 on glow. Wonder how that engine ever stayed in one piece? Don't knock success, Jim was third.

Mulvihill rubber: who else but C.C. Caldwell with his Slick Stick. That design looks modern when put alongside of today's Wakefield models.

George concludes by saying that an outstanding flying site, good weather, and super management contributed to the success of this meet. The initial comments from the competitors indicate the San Antone Club is on the right track, due largely to the planning efforts of Russ Snyder and C.D. Jim Summerset. Also worth mentioning: Russ Snyder received the Sportsmanship Award for his tireless efforts. Nice to see the hired help get some recognition.

"FLY FOR BUCKS"

This is the name popularly ascribed to the Colusa Herald Annual sponsored by Henry Swaney. Prizes total \$500 cash for Class ABC Comb., Antique, Texaco, and 1/2A Texaco; two events per day.

Surprisingly, you would think everyone would be out for blood, but such has not been the case in all the contests. The money is regarded as just another prize. Talking about prizes and winners, this year's contest should have been called the "Kynce" Benefit, as Jim won three out of four events. Wow!

One of the more hilarious things that developed during the meet was Tom Vincent sticking his Cumulus very neatly in the high voltage lines. As can be seen in Photo No. 13, the model just hung there in the light breeze until the power maintenance man could come out.

Using a long wooden pole with a suitable hook, the maintenance man made it look so simple to remove the model from those 6000V lines! Tom was extremely lucky; not a scratch on the model!

Tom Vincent took quite a bit of kidding, as the flight was scored a "zero" official (rules say model must land on field).

Swaney, a former free flighter from Long Beach, has more than proved

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himself to be a capable R/C contest director. The meet appears to get better every year. We could go on indefinitely but we are rapidly running out of space. Look at what Kynce did:

Class ABC

1. Jim Kynce
2. Nick Sanford
3. Ed Solenberger

Antique

1. Jim Kynce
2. Jack Alten
3. Harry Johnson

Texaco

1. Jim Kynce
2. Tom Vincent
3. Karl Chulick

1/2A Texaco

- *1. Paul Forette
- *2. Don Carll
- *3. Jack Alten
- *3-way fly-off in 1/2A Texaco!

OBIT NOTICE

For all those fellows who have enjoyed those 1937-39 photos taken by Bruce Lester, shed a tear, there will be only what is in the file.

Peter Mana, of Guelph, Ontario, writes to say that Bruce Lester, of Toronto, finally succumbed to a blood disease in the middle of July. When Lester caught pneumonia two years ago, he developed myelofibrosis, which is an incurable blood condition.

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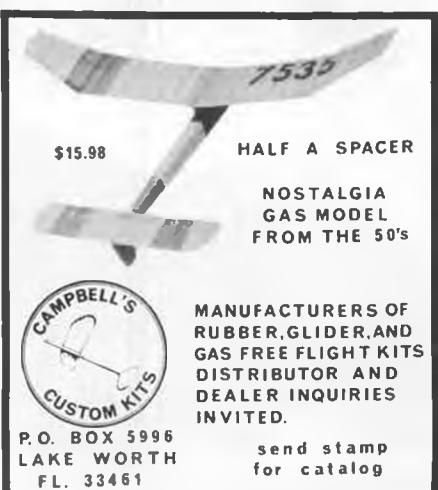
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Anyway, Lester is now in that happy home of thermals, where max flights are for the asking. We're gonna miss you, old friend!

POSTSCRIPT

Just received another letter from Walter Lawrence, informing us that Bruce's wife and son have instructed Walt to dispose of his models. He also mentioned he will go through all the old photos and forward these to this columnist. As Tony the Tiger sez, "Gr-r-eat!"

REMEMBER WHEN?

Another Bruce Lester goodie again taken at the 1938 (39) Nationals. This

time identification of Photo No. 14 eludes this writer. Perhaps one of our readers out there remembers this Berryloid Event entry for the best finish. It is over 43 years ago, but maybe one of you sharp-eyed oldsters will remember.

THE WRAP-UP

As the new Secretary-Treasurer of S.A.M. (no longer President), this newly elected officer is after all SAM members new and old, to put up their ten bucks. Actually, for the price, this is a terrific bargain, with excellent issues of "SAM Speaks" edited by Jim Adams, a good modeler in his own right.

All SAM memberships should be sent to the Society of Antique Modelers, 4269 Sayoko Circle, San Jose, CA 95136. Remember fellows, regardless of what you think of the rules, the present officials, etc., this is the only game in town for old timers. We need your support. So join the fun today! •

R/C Auto Continued from page 47

racing, and the reputation for quality that the Kraft name stands for.

RUNNING IT . . .

My primary interest in RC cars is the mean 'n nasty 1/8 beasts, but I get a kick out of the 1/12 cars as well. And, hey, a new car is a new car. The RC12i was out in the cul-de-sac just as soon as the batteries were charged. And I didn't like

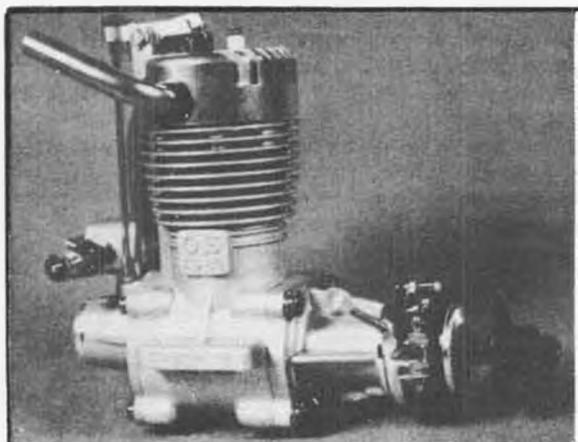
it much. No real stability at all. The "suspension effect," at least in the rear, was having an effect (sorry, I did that on purpose, too) in smoothing out the bumps, the front seemed to mostly go along for the ride and the whole package was . . . What would be a good word . . . how about skitterish? Back in the shop, slipped a proven body on the car, installed a wing and fiddled with the damper adjustment. Back on the pavement the car was still very much a handful.

I hung the car on the wall and decided to call Associated. Before I finally did, however, in the mail came new steering blocks. Seems a pin in the mold was out of position when the first series of blocks were run. With new parts in place, the car started to come together better, especially when the steering throw was cut way down . . . And I didn't have much in the first place.

Since then I have played a lot with the car, spent some time seriously practicing with it, and raced it a number of times. And have decided that while many of you will probably like the car, I still prefer my older (but completely tricked-out) RC12Es. There are a couple of reasons for this. First, it's rare for our local club races to have super traction and the RC12i has traded some stability down the straights and a little push in the turns for a quicker, tighter-turning car at the medium to high-traction tracks. The other is that while in 1/8 scale I only rarely drive smack into something, in 1/12 racing I seem to hit my share of stuff. And when you run an RC12i into something just right (or even just wrong!) the pan will take a tweak and hold that tweak for a lap or two, meanwhile making the car harder to drive and so more prone to being slammed into tweak-inducing crashes. It seems that this tweaking happens in the front end, at least that is where the car looks to be most vulnerable, as the rear end, even though pivoting, is attached as one unit, instead of to separate parts of the pan, as is the front end.

Actually, to some this tweaking will only be a minor problem, and in any case it may be that a graphite pan will cure it completely. Another cure for racers operating on less than high-traction surfaces would be to order an optional set of steering blocks with more offset, this will slow the steering down some and will be the next thing I try with this car myself.

I suppose that before closing this article, it should be mentioned that as car racing gets more competitive, the cars will be getting more and more specialized, always (it seems) toward the trick setup that works best at the big races and with the best racers. This is what we have with the RC12i. Where the RC12E was great in its early years, it is merely contemporary today, but the RC12E worked super for everybody. And it still works great for what I personally want in a 1/12 scale race car; I simply do not like these twelfthers that flit this way and that. The RC12i actually



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doesn't flit around that way, but the point is that it is more specialized than the RC12E, as well as featuring a much more logical radio layout, and it turns a lot better, something the RC12E has a problem with, especially on a high-traction track.

So, You get to take it from there when deciding if the new RC12i is for you. If you like quick-turning cars (and the majority of today's 1/12 racers do), a car that can smooth most of those bumps and that will make use of your huge assortment of Associated wheels and tires, here is a car for you to seriously consider. If you think it will be too quick for you and/or your track, remember that set of optional steering blocks I mentioned.

In any case, Associated was the first with a 1/12 car that really handled and now offers the RC12i for today's RC racer, the first car to have front and rear suspension, uh, suspension effect front and rear, a feature that we will definitely be seeing on other brands of cars, in one form or another.

R/C Boats . . . Continued from page 50

Joe Monohan, using a Prather 29, took second place and actually used a modified engine.

Besides being the race sponsor and doing the organization, Norm Teague also managed to win half the events. Along with the .21 Modified, Norm took .21 Deep Vee honors on Saturday and added .21 Stock Class on Sunday. One doesn't have to spend much time around Norm to figure out why he manages to bring home the trophies. Every one of his race boats is impeccably prepared. Norm is also a pretty fair competitor and knows how to get around those buoys in smart fashion. When good running boats are coupled with heads-up driving, you have yourself a winning combination.

The .21 Stock Tunnel event drew the most entries, with thirty-two. I was pleased with my second place finish. The boat I used is a down-sized version of my Dumas Hotshot 45. The main reason for my placing second was good steady running during all four heats. There weren't a whole lot of laps separating second, third, and fourth places in the .21 Stock Class.

I was most interested in seeing how my Dumas Hotshot 45 would perform in the .45 Tunnel Class. I had heard that the fellows in the L.A. area really had their Prather tunnels moving. What I'd heard was true. There are some super-quick .45 tunnel boats running in District 19. Unfortunately, I never really had the opportunity to compare my boat against some of the better tunnels in the race. Out of four heats, I only managed to complete one for the full five minutes. In that particular heat, only Roger Wiechman and I were running after the first two minutes, and he was also racing a Hotshot 45. He eventually ended up second overall and Ellie Tom drove

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Both motors are built in the same castings but the 25 has a bit more bore and stroke and has one more fin on the crankcase.



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another Hotshot 45 to a fourth place finish. Diane Semler, John Cochrane, and George Campbell drove Prather Tunnels to first, third, and fifth place finishes.

Having the opportunity to participate in one of the District 19 Outboard Championship races was a rewarding experience. It was great to see all my boating friends from Southern California again and to meet new model boaters. Being able to win a couple of trophies was a real bonus. I want to thank Jack and Rosie Garcia for hosting Paul and me during our brief visit. Jack provided me with all the necessary support equipment, as all I brought were my boats and radios. The whole trip proved to be a most enlightening and worthwhile endeavor.

RACE RESULTS — NAMBA DISTRICT 19 TEAGUE OUTBOARD REGATTA LEGG LAKE — AUGUST 21 & 22

Laps

A STOCK TUNNEL (.21 c.i.)

1. N. Teague	50½
2. J. Dunlap	44½
3. M. Boundy	43½
4. J. Hazelwood	43
5. D. Wiechman	39½

A MODIFIED TUNNEL

1. N. Teague	47½
2. J. Monohan	45½
3. P. Dunlap	41½
4. J. Dunlap	37½
5. B. Jones	35½

B STOCK TUNNEL (.45 c.i.)

1. D. Semler	56½
2. R. Wiechman	53½
3. J. Cochrane	51
4. E. Tom	49
5. G. Campbell	48½

A DEEP VEE

1. N. Teague	48½
2. J. Brodbeck	44½
3. J. Roman	43
4. C. Galbraith	41½
5. B. Jones	36

A HYDROPLANE

1. R. Hazelwood	59½
2. J. Garcia	56½
3. J. Monohan	42
4. N. Teague	36
5. M. Grimm	30½

B DEEP VEE

1. J. Cochrane	48½
2. R. Gonzales	36½

Total Laps After 4 Five-Minute Enduros

LEE CRAFT R/C BOATS HAS WESTCOAST DISTRIBUTOR

One of the folks I met at the Championship Outboard Series was Jim Johnson, the distributor on the west coast for Lee Craft R/C boats. Lee Craft tunnel boats are available in both .21 and .45 versions. I had heard some very favorable reports about the boats, and this was my first opportunity to actually see the boats. The hulls are of fiberglass and I'd rate the workmanship as excellent. More information about the boats can be obtained by contacting Jim. His address is: J&J Model Marine, 7511 Mark

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Circle, La Palma, CA 90623. The telephone number is (714) 739-8533. The address of Lee Craft is: Rt. 11, Box 375E, Cullman, Alabama. Sorry, I didn't get a zip or phone number. I was told that David Lee used one of his .45 tunnels with a modified 7.5 K&B Outboard to win the .45 Hydroplane Class at the 1982 I.M.P.B.A. Internationals. That is quite an accomplishment.

ANOTHER OPINION

Back in my October column, I spouted off about having two skill levels for competition at national model boat races. I asked for comments, and Russ Fairfield (NAMBA 642 and IMPBA 2242) of Birmingham, Alabama, sent along the

Formula 1 entry is really two people. The pilot physically cannot race the airplane alone.

"Also, the AMA 'Builder of the Model' (BOM) rule applies to nearly all events ... not so with model boating. Any boater can buy the speed for racing. For about \$600, you can have a custom Crapshooter built with a John Ackerman engine rework, radio, hardware, and engine installed ... ready to paint and run. A Sightler, complete, test run, and guaranteed can be had for about the same price. I know similar situations exist on the west coast. This has nothing to do with skill level ... only bucks. Do we want a dollar separation of model boat racing? Quality equipment is expensive. Setup and driving ability are all that's left. The above illustrations only show that building and setup (trim) can also be purchased. Speed alone is not a good separation of skills, because it can be purchased."

"How about the guys who do not enter lots of district races? Our Birmingham bunch is an example. Outside of our own annual race, most had not been to a major race this year prior to the I.M.P.B.A. Internats at Orlando. We took first in outboard, second in Deep Vee, and brought home 25 trophies in all with only six guys. Do they get restricted to the 'Standard' class because of insufficient district racing points?"

"How about the sponsoring club? Do you require them to buy additional trophies for the new events? I believe the quality of prizes will be diluted by a speed separation. It would also be necessary to stage more heats for the same number of entries."

"One of the attractive things about boats is the lack of a 'professional' classification. The car and aircraft events do not share this, as their top skill level is a very professional category. It consists mostly of people who make all or part of their livelihood from the hobby. Check any entry list of a national event and you will see what I mean."

"On any given day and heat, any boat can come out on top. Let's not lose this ability. The high point of several years of racing for me was a heat win by half a lap over Martin Davis, Roger Moran, and Bill LeFeber (IMPBA's fastest guys) with an old style "Gator" hydro in my first ever hydro race. That was an incentive to race that I would never have for a long time with your system of separation. Others have shared this experience ... let's not eliminate it with a 'professional' class separation system."

"Most of all, don't forget that this is still a hobby even though our need to win races and vent our unrealized competitive desires makes this easy to forget at times. Let's not make the enjoyment of fast boats any more difficult or frustrating than it already is."

"Anyway, I have rambled on enough. Can you tell that I am not in favor of your idea? (I sorta had that feeling. J.D.) I don't plan to be in Alabama forever and will race NAMBA sanctioned events again. Therefore, I have an interest in

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following comments.

"Had to throw in my 20 cents worth on the skill level separation of model boat race competition."

"Any comparison to either car or aircraft competition is a poor one. The levels of car racing are two . . . Amateur and Factory. When was the last time someone NOT a part of the "factory team" won any national event? If not on "THE" team, nearly all high finishers have an access to "goodies" not yet available to the general public."

"Look at the R/C aircraft events. Pattern is a structured set of high skill level maneuvers. There are obvious skill levels. As an example, a beginner cannot be expected to do a rolling-eight, knife edge, or rolling circle. So the skill level is based on the ability to perform a prescribed series of maneuvers, and performance is judged against an ideal concept of each pattern maneuver. Any comparison to boat racing is not valid."

"The only aircraft racing I know of with a skill level separation is Formula 1, at the national level. And that is for safety only. The pilot is dependent on a caller as he stands in the middle of the course, and depends on someone else to tell him where the pylons are relative to his airplane. Again, a unique skill and coordination not required in boat racing. We can drive the entire course without an assistant. Granted, he is a valuable asset, but the practiced 'team' effort of Formula 1 is not required. A

the rules."

I wish to thank Russ for taking the time to send me his thoughts.

A SLIM TWIN

Al Berry, who has written a number of model boating product reviews, sent along a photo and some information on one of his latest projects. The boat is a new, low-profile, midship twin powered outrigger hydroplane. As can be seen in the photo, the twin Picco 80's sit quite far back. The boat weighs 15 pounds, fueled and ready to run. It is 48 inches long, has a width of 24, and is only 2 inches thick. Octura 1667's provide a super ride, according to Al. I bet "Big Al's" pride and joy really terrorizes the turtles down there in Chickasha, Oklahoma. Anyone interested in finding out more about this boat can contact Al at Rt. 5, Box 45-A, Chickasha, OK 73018.

COMMENTS, CONTRIBUTIONS, OR WHATEVER ALWAYS WELCOME

Jerry Dunlap, 119 Crestwood Dr. S.W., Tacoma, WA 98498.

Electronics . . . Continued from page 51

and Orange bands, will, with this coding have Brown, Red, Black, and Red ones.

Obviously, with one more band being added, a little more precision is possible in marking some values of resistors, and maybe this is the intent, as the three bands do have limitations. For example, the precision resistors, of less than 5% tolerance now being manufactured in this country do not use the code at all, but have the actual resistance inked right on the body. This makes for some very small printing on the side of a quarter-watt resistor! We won't question the why's and what for's, just keep this in mind the next time you pop the cover off that new Japanese transmitter.

Ni-CD LOAD RESISTORS

One of my calls this month had to do with Ni-Cd battery testing, which we won't go into at length, that being already well plowed ground. But the point did come up about how to calculate the value of the resistor being used to load a cell or battery during testing, and we will cover that.

Backing up just a bit, most of the makers of the slow (C/10) charge rate batteries recommend that loading during testing be done at approximately half capacity. In this respect, most of the timed battery dischargers drop the batteries at 300 mils. Just why that value was chosen I am not sure, but it is close enough to half capacity of the most common battery, the 500 mil type, to be considered a safe value.

We load a battery and test its voltage in an effort to discover a defective cell. This can be done in two ways; either putting the load resistor across the entire battery, and testing the voltage of each cell individually, or by putting the load across each individual cell, at the same time checking its voltage. Each method requires a different size resistor. I personally prefer to load the entire battery. It saves some time, and keeps

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the discharge even on all the good cells.

To arrive at the desired resistance, we resort to the Ohms Law formula for unknown resistance when the voltage and current are known: $R = E/I$, where E is the voltage (1.2 for a single cell), and I is the current in amps (.250 in the case of a 500 milliamp capacity cell). Our calculator comes up with a value of 4.8 ohms; an easier to obtain unit of 5 ohms would be acceptable.

Resistors are also rated for wattage; the amount of energy that they are able to dissipate in the form of heat. To determine the desired wattage, we use another form of Ohm's Law. This formula gives us wattage, when the voltage and current are known, $P = E \times I$. In the above example, the 1.2 volts times the .250 amp gives us a wattage requirement of .3. In this case, a half watt unit will do the job, though a one watt will not get quite as hot and be better.

To calculate the proper resistor values for load testing four or eight-cell packs, just crank in the proper figures. For example, a four-cell pack, at 4.8 volts, being tested under a .250 amp load, will need a 19.2 ohm resistor. Again, use the nearest available value; 20 would do well in this case. The wattage in this case calculates as $4.8 \times .250$, or 1.2 watts . . . use at least a two.

These small value resistors, in the wattage required are not uncommon in the electronics industry, though like many other bits and pieces, are some-

times difficult to obtain in small quantities. You may have to resort to parallel or series connections to arrive at the desired values. Resistors add when connected in series, i.e., in a straight string. They divide when two like values are connected in parallel, or across each other. For example, two 100 ohm resistors in series would act in the circuit like a 200 ohm resistor, while a parallel connection would introduce only 50 ohms into the circuit. The individual wattage rating, as determined by the physical size, does not change regardless of the type of connection used.

The formula for resistors in series and parallel does go on to include more than two resistors, which in series is always the total of the individual amounts. For more than two resistors in parallel, or for those of unequal values, the calculations get slightly more difficult, but we won't go into them here as they are not really pertinent, we can arrive close enough to the desired values by using only two resistors.

As stated above, these examples are based on half capacity of a slow charge battery. Those cells that can accept higher charging rates can also accept higher discharge rates, and if desired, can be loaded even more for testing, say to full capacity. To calculate the required resistance, simply dial in the proper numbers. Don't forget that the formula is based on amps, and that we usually refer to the capacity of our batteries in milliamps, 1000 of the latter being 1 of


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the former.

To use the load resistor, simply connect it across the cell or battery being tested, and read the voltage across them both. Most cells that will not accept a charge will still exhibit full voltage under no-load conditions, but will drop out within a half a minute under at least half capacity load.

Whatever your conclusions, there is another good formula to remember: The cost of a new battery is always less than the cost of a new plane!

DIODES AND PARTS SUBSTITUTIONS

Had a couple of queries about the 1N87 diode as used in the RF measuring circuit mentioned in our October column. Seems that it is not all that

readily available, which, upon second thought, is not too surprising, as it is definitely an oldie, but certainly still a goodie.

Let's talk a bit about diodes in general, shall we? You old timers who remember winding a couple of hundred turns of very fine wire around a toilet paper cardboard roll, connecting that to a pair of headsets and to a crystal detector, on which you probed around with something called a cat's whisker looking for Jack Armstrong, the All American Boy, were playing with a diode . . . before the word was even invented! A diode is a sort of electronic one-way valve, permitting the passage of electrons in only one direction. This quality makes it useful for many applications, and they are used in large quantities, being present in just about anything you might pick up that contains even the most basic electronic circuitry. They often go under different names, when designed and used for certain applications. For example, the output of your car's alternator, being alternating current, is first fed to a diode, or diodes, now called a rectifier, before being used to charge the battery and run all those DC accessories with which our cars come equipped. The diodes being used here are solely to convert AC to DC, and the entire group of such diodes manufactured for that purpose are referred to as rectifiers, and are rated for specific currents and voltages. One or more of these, in a smaller physical and electronic size, is also present in your

R/C system charger.

Most of the small glass diodes, usually the size of a quarter watt resistor, are normally called signal diodes, or simply, diodes. In this class are those designated 1N4148 and 1N4446, found in much of our domestic R/C equipment, doing various chores. The diode family is large, and gets very specialized, and many branches of it are referred to by specific names to identify certain specific qualities. One example is the Zener diode (pronounced Zay-nor), which is a voltage regulating device, which is rated and used to maintain a fluctuating voltage at a single predetermined value. You won't find these in your old PCS, Orbit, or Sampey (huh?), they are a later development, and are now common in current equipment.

Another well known member of the diode family is the Light Emitting Diode, or LED, as it has come to be known, which in addition to keeping the one way valve feature, also has a unique one, that of emitting visible light when the proper voltage is applied. Being a diode, it too can be used as a rectifier, though at relatively small values, and is most often used simply as an indicator.

All of these diodes, from the simplest to the most complex, have in common the rock and cat's whisker of your first crystal set, only that now the hunting for the proper live spot is no longer necessary, it has been located for you, and the whole thing is encapsulated into the familiar package. The electronic features of the diode are determined by just what type of materials are used internally, the most common being germanium, and silicon. Both types exhibit some similarities, but also have some differences which makes one more desirable than the other for certain applications.

One of these applications is the rectification of an RF signal, which is alternating current at a high rate, into direct current, in this case required to drive a meter which we are using as a relative strength indicator. For this purpose, the germanium diode is best. My choice of the 1N87 was made for purely practical reasons. I know from past experience that it will work; I know that it is germanium, there being no indication in the generic nomenclature (1N87, 1N4148, 1N4446, etc.) to the type, and, I happened to have some in my parts stock. Any germanium will do, such as the 1N90, or Radio Shack's 1N34A, part number 272-1123.

Local parts availability always being a problem, especially when you are interested in buying only one piece, it is well to remember that exact replacement of electronic parts is not always absolutely necessary. Generally speaking, one with similar, or larger ratings will work. For example, electronically, a 1/4-watt resistor can always be replaced by a 1/2-watt unit of the same resistance, space permitting. As a matter of fact, there are a number of component manufacturers who make a business of supplying replacement type solid state components, listing a relatively small

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number of them to replace an infinitely larger number of others. They periodically publish manuals which will not only give you the recommended replacement, but also offer much valuable information on the subject of general replacements.

These manuals are simple to use . . . you look up the number of the original part, and read the recommended replacement right next to it. Best of all, the replacements are generally available off the rack, and priced acceptably. Amongst the companies who provide this service, you will find General Electric, Mallory, Sprague, Sylvania, Workman, and others. In case you should be interested in some of these manuals, and cannot locate them locally, the following addresses will be useful.

Tube Products Department, General Electric Co., Owensboro, KY 42301. Ask for its "Replacement Semiconductor Guide."

Mallory Distributor Products Co., Box 1284, Indianapolis, IN 46206. Semiconductor Products Guide.

Sylvania; (1-800) 225-8326; ask for the nearest distributor who can supply you with a Sylvania ECG Semiconductor Replacement Guide.

Workman Electronic Products, P.O. Box 3828, FL 33578. Semiconductor Catalog and Cross Reference.

Now, when I started talking about replacements, I stated that "generally speaking," components can be replaced with others having similar specs. Obviously, an exact replacement is always best, and should always be used in the more critical oscillator and RF amplifier circuits, both in transmitters as well as in receivers, and in stages where certain gains must be maintained, such as in receiver IF amplifiers. Just don't be scared to experiment . . . after all, that is what modeling is all about, isn't it? •

Electric Continued from page 53

or nose up would lose it for him. You have to fly elevator all the time. Other than that, the plane is quite satisfactory in the air.

The landing gear, the nose gear in particular, was a constant problem, the mount is not strong enough, and the nose gear flattened on every landing (this is on grass). Since I was flying from grass, I had to hand launch anyway, so I took off the landing gear, this reduced the weight to 32 ounces, and eliminated the hassle of straightening the landing gear every time.

The battery pack gets quite warm by the end of the second flight. Cox recommends two packs so you can alternate and keep flying, plus allow the pack to cool. The pack is wrapped up in a heavy plastic jacket, I would strip it off to allow better cooling. The motor is well ventilated and never got hot.

Since I prefer longer flights than 3-1/2 minutes, I also tried a 1200 (sub C) mah Sanyo pack. This was installed in the fuselage, right where the original pack

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was, but just under the wing. Some foam has to be removed to get it to fit, but the pocket for the original pack still works all right for the original pack.

The flight times immediately went up to seven to eight minutes, which I consider much more satisfactory, with no changes in flight characteristics. The weight went to 37 ounces, with no landing gear, but the climb and altitude were not affected, so the extra weight is not a problem. Cox does sell the 1200 mah pack and its charger, but for its cars, so no numbers for these are included in the instructions.

The usual flight trim for this and the original pack, with the 1/8 inch shim under the wing, is about 1/4 down trim under power, 1/4 up trim in glide, with some right trim with power, some left trim in glide.

So, for the conclusions, I would say that for someone who has had previous R/C experience, that the Fibrini would be a satisfactory introduction to electric flight. The short flight times are a drawback, so a 1200 mah pack would be a good idea. I would not recommend the plane to an absolute beginner, because it flies fairly fast, has very quick response, and is not very stable in pitch. The power unit is excellent, and for better performance, could be used in an Astro Sport or an Olympic 650. So far, of the electric ready-to-fly planes I have tried, the Fibrini comes out better than most, though not as good as my top two choices.

A couple of columns back, I talked about John Szary's fuse installation, which has saved well over \$100 worth of motors for me. Just to back up how simple this installation is, I'm running a few photos here to show how. No soldering is necessary, just cut a line, strip off a 1/4 inch of insulation, clamp on the female spade lugs with pliers, and wrap them with tape. Plug in the fuse

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And now for a change of pace . . . some U-control. The Top Flite Baby Flight Streak is an ideal introduction to electric U-control, because it has a large wing which can hold the batteries inside it, and it has excellent flight characteristics. The photos show how a box is made in the wing to accommodate the batteries . . . I use the R/C pack with the Astro 020 and a 5-1/2x3 or 6x3 prop. The bottom of the battery box is sheeted, and the top is just a sheet of thin plastic, cut from a plastic jug. The battery pack is dropped into the box, then the sheet is "folded" in on top of that. Arubber band around the chord of the wing holds everything in place.

You can use either Dacron or steel (.008") line to control the plane, the steel lines gives a little better control. The takeoff should be from pavement, and you do need to "swing" the plane on takeoff and around for the first circle to build up speed. If you don't, the plane will hang on the nose and stall out. Typical flights are about three to four minutes. You can do mild wingovers, but loops are a bit too much, they tend



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Hannan Continued from page 54

Our thanks to Richard Miller for sharing these observations with us.

MODEL SCALE FOR SCALE MODELS?

Gerald E. Myers, of Redway, California, notes that a tiny hand-held scale, suitable for weighing small models, is offered at low cost in many stationery

R/C flying field, both will have transmitters with the same frequency.

10. Model engines usually stop under the following circumstances:

a. Just before take-off, after you have carried your model to the end of the runway.

b. Just after take-off, when the craft is too low to make a safe turn, but too far away to make a safe landing before it hits the field fence.

c. When flying at low altitude, inverted.

d. During a low turn over a corn-field.

11. The lifetime of a scale model is inversely proportional to the time spent building it.

Our thanks to Georges Chaulet for helping with the translations.

Georges' comments published earlier, regarding the non-scaleness of Hughes flying boat models which have flown more than once, elicited this reaction from John Elliot, chief pilot of the Meyers brothers' R/C model: "I have thought about it; maybe he's right; maybe the Meyers' Spruce Goose is 'more better' 'cause it has flown more? Maybe the real one ain't so real 'cause it has flown less? At any rate, a cute thought (I think). . . ."

PREDICTIONS

Ernie Wrisley, of Santee, California, sent in this little extract from the 1917 Jane's All the World's Aircraft: "HELI-COPTER. Any proposed flying machine in which the lifting force is intended to lift it vertically from the ground. (An object in which experiments have as yet failed, and by which it seems unlikely that any useful purpose will be served if they ever succeed.)"

SURE HE DOES

From a letter by Dave Gibson: "Saw my first ultralight plane recently. What a sight! It flew around the outside of a county fair we were attending. Reactions of the people were interesting. A woman asked her husband what it was. He said it was just a kite. 'Are you sure?', she asked. 'Oh ya,' he said. 'I know all about them. You just can't see the string.'

"A clown, who was making balloon toys for the kids, was quite disturbed by the ultralight. 'What is that; what is that?' he repeated. 'What powers that thing?' A little boy in the crowd responded: 'He pedals it.'"

THE SOLUTION

Frank Scott, describing his son's most recent model: "It will, in all likelihood be too heavy for indoor and too light for outdoor. If so, we'll just have to fly it indoors with the windows open!"

FICTITIOUS SCALE MODELS?

The Cleveland Free Flight Society publishes one of the finest newsletters we've seen. Coordinated by Russ Brown, with help from volunteer editors, such as Michael Zand and Dick Bennett, it is always a treat to see. Their April/June 1981 issue (somewhat belatedly published in January, 1982), offered a most interesting concept. How about building models of well-known aircraft that

never really existed?

Examples presented (including "proof-of-scale!") were Kerry Keen's *Black Bullet*, Bill Barnes' *Lancer*, Shorty Hassfurter's *Snorter*, and Crash Carringer's *Hale Hellion*... all taken from the exciting pages of such fondly-remembered magazines as *Flying Aces and Air Trails*.

Meanwhile, back in San Diego, John Olivera has already test-flown his model of Batman's aircraft, having developed it from old comic books!

TRASH NEWS

These days one might be inclined to think that all news is trash, especially that presented on television, but in this instance *Trash News* is the title of a small 12-page newsletter aimed at the lighter side of plastic model building. Featured are such items as "detailing Outhouse Dioramas", converting a plastic model submarine to a tie-rack, and miscellaneous departments including fake advertisements, unfortunately probably inspired by real ones: "The Rip-Off Shop" . . . "Back Order Hobbies" (just a hole-in-the-wall store with a Xerox machine and a lot of nerve).

Edited by Jack Gurner, the publication apparently will appear intermittently at unspecified subscription rates. We received our copy by sending two unused 20-cent stamps and a pre-addressed envelope to: THE YELLOW JOURNAL PRESS, 4202 Vann Ave., Memphis, TN 38111. Who knows, perhaps you may receive an issue too.

HOW TRUE

Building a full-size homebuilt aircraft has a lot in common with building a model. Witness this extract from Bob Walters' article in *Sport Aviation* entitled *Finishing Composite Aircraft*: "I believe that each builder has only a certain amount of sanding effort that he is able to expend on a project. There is simply a psychological limit to how long a person can stand sanding, after which time he will apply paint and go flying."

R/C World . . . Continued from page 15

here. It is now difficult to continue under the original concept of KISS (keep it simple, stupid!) with respect to static judging Sport (and Giant) Scale models. Six to ten years ago, the Stand-Off or Sport Scale rules were more than adequate for the task at hand. As the quality of the models has increased, fair judging under the very basic Sport Scale rules has come to the point of having to nit-pick or 'split hairs.' For flight judging, we use half points to differentiate between a 6 or 7 for a medium quality maneuver (or mechanical option), or for an almost perfect 9 to a 10 performance.

Last year at the regionals, half-point assessments in static judging were used with confidence, but were not employed in the Western Regionals or the Masters this year, to give a new judging form a fair chance. This year's static judges (and quite a few contestants) feel that the half-point idea is quite valid.

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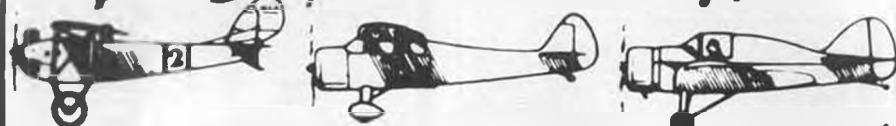
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interface with FAI, and a proven majority of active American sport scale modelers (and a few world-wide modelers, too) are tired of 11 pound limits.

Another item implemented at the Masters was to have each pilot hold his entry vertically, in a nose-down or nose-up attitude (pilot's choice) for the "outline" judge to view the top-view planform (sure is amazing what one can "see" this way as compared to the usual placement of the model upon the ground or a low table). Models were placed on 30-inch high tables for the balance of static judging.

Sport Scale judging provided for, in the beginning, "workmanship," and the question was asked, "Why have it, who can see poor sanding or seams?" But it has been with us and we have learned from it. With the increase in quality of Sport Scale, workmanship points can be a deciding factor. Another thought being considered (proposal change on the way to the AMA), based on experience, and one which can work even if only one judge performs all static duties, (or as is happening in most contests, using three judges, one for each cate-

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gory), is to allow the "Craftsmanship" judge to closely examine the model, rather than from X number of feet away. If one judge is handling all the static scores, he simply judges Accuracy of Outline, then Finish, Color, and Markings, then takes a walk into the circle to examine the model for Craftsmanship. Guys, we need it. The class of models being built, judged, and flown in Sport (and Giant) Scale is a far reach away and above the stand-off models of a decade ago.

What we are seeing is an attitude shift due to the simple fact that Sport Scale has, for all practical purposes, replaced AMA Precision Scale in the competition marketplace. "Precision" offers no

incentive to join its ranks anymore. A few will take exception to this, but they certainly don't show up at the contests. Miniature aircraft that look right and fly, approximating the full scale counterpart, is still what it's all about.

★ ★ ★

Oh yes, about the "Tennessee Waltz" ... The version referred to last month was the one that R.A. "Bob" Hoover has done so many times in his airshow routines, while flying the P-51 or the Aero Commander Shrike. Bob would come in over the runway threshold and put either main gear on the runway, then rock the bird over with a cross-controlled application of rudder and aileron and put the opposite wheel on the ground, while lifting the first side back into the air. This was repeated several times before Bob ran out of runway! (Have you ever wondered how well Mr. Hoover would do if he ever took up R/C?)

C/L Continued from page 60

regular monthly schedule by late 1982, with a minimum of 8 pages and a maximum dependent on subscribers support and contributions. Picture quality is excellent. Ads are planned to be limited to materials of interest to control line and smaller suppliers. Computer-filed

suppliers lists, membership lists and the like will be available. Full-size plans will be available of most models published. Copies of technical reports, etc., are planned for future availability, as are selected, hard-to-get specialty supplies and the like.

Frankly, it is an experiment to see if control line is really dead the way some people say. I don't think so. Write in and support the Coalition concept if you refuse to believe control line is gone.

Subscription is \$10.00 per year, or a single sample will be sent upon receipt of 37 cents in stamps. Send requests to Laird Jackson, 2322 Wilson Ave., Bristol, PA 19007.

★ ★ ★

What you just read, or more accurately your response to it, may quite possibly, be the most important CL-related action that you will take in the 80's. You see, there are those who are saying that CL modeling is dying. Sure, you're involved enough that you don't see much, if any evidence to back up such a statement, but quite a number of the movers and shakers in this hobby look at R/C modeling and see Good Things. They look at FF, and while they don't see the same Good Things, they do see a group of highly involved and organized people who take their side of the hobby very seriously.

Actually, I suppose the movers and shakers must do a lot of wondering about the FF guys out pursuing an activity that was supposed to have died long ago, what with the really super (and relatively cheap) radio systems available today, lost flying sites, and so on. But they damn sure don't say that FF is dead, or even the least bit sick, do they?! Why, even K&B, a large manufacturer of model engines selling tons of RC motors, takes pains to produce specialized engines that have very little use for anything other than powering a honkin' FF model.

Look at it realistically, FF should have gone away years and years ago. Why it didn't is an interesting story in itself. But all we need be concerned with right now is that Doc Jackson is trying to put together an organization of CL folk that, to me at least, closely resembles the National Free Flight Society. What it will end up being is in question right now, and this space should be used to note that the NFFS is not perfect and that there is room for improvement. But the NFFS does so many good things that any imperfections can be ignored, and through the NFFS, all FF fliers speak to the AMA in a unified manner. No splinter groups to muck things up, a FF guy belongs to the one organization, whether he flies Rubber Speed, HLG, or FAI Power.

We can have the same thing in CL. Wait a minute ... We can have something even better, after all, we are CL modelers, the best type of modeler in the world, right? And, most fortunately, we have Doc, who is willing to spend the

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time and money to get the NCLC off and running. For right now, all he is asking is that you show your support by joining, giving him the chance to make NCLC go. Only costs \$10.00 to join, that is less than a third of the AMA membership dues, about equal to a roll of plastic covering, even a card of plugs costs around 10 bucks now.

My check is already in the mail, how about you?

NO TAKERS...

You people either don't believe most of the stuff I write or are very perceptive... Or just don't care! Several months ago I took considerable column space building up to the idea of racing the RC guys cross-country... "us" wind-flying CL models, "them" stuck with pokey old foofers RC models piloted by strangely outfitted folk sticking out of vans and pickup trucks.

Never did I seriously think about flying a CL model cross-country; the idea was to get everybody all hot on the scheme and then turn the cart over. The

whole thing was actually in defense of the RC guys, at least to a certain extent. Somebody had the nutty idea of flying RC cross-country, passed it off as promotion of modeling, got a bunch of other people enthused about the idea and BAM, we had a semi-serious cross-country race on. It got so out-of-hand that the AMA actually sanctioned the event. And when you can get our super-conservative AMA to do something like that... Well, I still can't believe it went as far as it did.

Anyway, we in CL laughed our heads off at the whole idea, an appropriate reaction, by the way. But I thought it would be great to do the same thing within the CL ranks. You know, get the interest up, apply for a sanction, the whole bit. And then when some action had to be taken, I was going to stop and point out that the same circumstances resulted in the RC guys actually doing their thing across this land of ours.

But no takers! I prefer to believe that you fliers reading this are most percep-

tive, not wanting to face up to the other two possibilities...

Still, it really would be possible to wind-fly a CL model cross-country. An El Camino, equipped with a 427 Rat motor, CB set, radar detectors front and rear, two seats in the bed, a little work in developing a suitable model...

OIL THAT MOTOR FOR STORAGE...

Last month's column went through getting everything ready for winter storage. One item that I want to add is that George Aldrich says he prefers Rislone top-end lube to be used as an after-run and engine storage oil. Never used the stuff myself, but when George speaks...

TODAY'S CL KITS...

A few of us went sport flying the other day, not on impulse as is usually the case, but on the invitation of a group of RC fliers (honest!) who were taking a break from the RC stuff to re-discover the pleasures of CL flying (as well as dipping into the nostalgia bucket, no doubt). I took Combat planes, as I find them a

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terrific vehicle for sport flying; they showed up with models built from kits. Man, I had forgotten how dated the available CL kits really are. To call them trash would be a mistake, as that implies that all kits are junk, but how many easily available kits are there out in hobby shop land that reflect the state of the art in CL models? Several Sig kits are ok, even though of very conventional construction, I like Top Flite's redone Nobler, Sterling also has an updated kit that is decent, the "new" Ringmaster . . . and my list has come to an end. OK, there are some very sophisticated CL kits around, first to come to mind are the Mono Boom series from Hoffelt. But even though Mike makes these kits available to shops, they don't enjoy wide distribution. So they really can't be counted, as you could walk into quite a number of hobby shops before seeing a Hoffelt kit hanging on the wall.

No, I'm talking about the "old standard" CL kits, the ones you can find in almost any hobby shop. Paw through the pile, what do you find? About what you found twenty years ago when pawing through a similar pile, right?

I'm not sure any of this is leading up to a statement of any kind, just an observation, I suppose. Oh, back to the sport flying. I was at first taken back at the level of sophistication of the kits, but will have to admit that those old designs, are

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today, about as much fun, at least in a sport flying atmosphere, as they were back then. A Flite Streak still flops into those itty-bitty loops when fed 80° worth of up-elevator . . . Look at how tight that sucker turns! Uh, huh, look at how slow it's going, too. A Fox .35 Stunt is still a killer engine to those who have never seen a new Fox Combat Special howl its way around the circle. Thin sheet-metal tanks, designed to be easy to manufacture, still do one thing well . . . They are easy to manufacture. Too bad they don't give very good engine runs. A 70 mph model is still a heck of a thrill when one has only a few flights of experience, I was actually asked to clock this camel of a model that couldn't have been hitting more than 60, even with a lot of arm in it. Didn't even wind the stop watch, just went through all of the signals and an exaggerated punching of the button and told the guy he was pushing 80. Made him happy, what the heck.

Actually flying upside down successfully still comes as a real thrill, I'm not putting down anybody who hasn't mastered that bit of mind-reversal yet. It's just that after so many years of contest flying where inverted is treated the same as upright, one tends to think that everybody can fly upside down . . . Or at least fly a model that is. Maybe "thrill" is the wrong word, I watched grown men, accomplished RC fliers, go nuts after a

few laps of inverted flight. It was great. After all, even wcn can't do it, according to the rumor. (*Wanna bet? wcn*)

Bits of new things tended to mess up the proceedings somewhat. There ought to be a law against electric starters at the CL sites. An easy starting motor like a Fox 35 Stunt, mounted on a tradition-backed model like a Ringmaster certainly should not have its nose twisted by a hand-held 12-volt motor. The Valley Girl would have thought it all very gross . . . And I did, too.

Not one single cut finger did I see and you simply cannot fly CL well at all until you can perform all the maneuvers using a freshly mangled hand.

But there is one thing that has not changed at all, at least not since I started flying CL, and that is the impact made by a really nasty Combat model. Not the ground-related impact, but rather the kind that shows in the faces of those who have a 60 mph model they think is flying at close to 80 when they see a 120 plus mph Combat model not only do the magic number in level flight but perform those incredibly tight, fast loops as well.

Also an excellent way to keep others from wanting to fly your models. I could have showed up with a Slow Combat model or even my sole remaining Stunt model, and several would have wanted to fly it. But would they fly the AMA Combat model? No way, only a couple

of them would even launch the thing for me. Can't say as I blame them, either.
NCLC...

Say, before you forget it, yes, you there, falling off to sleep, flip back a few pages, scribble Doc Jackson's address on an envelope, drop a \$10.00 check in it and mail that thing off tonight. Ok, tomorrow will be soon enough. But do it... •

Ida Grove Continued from page 13

thunder storm and buckets of rain. By the time it left the area, most everyone . . . exhibitors, fliers, and spectators, had pretty well given up. Those who stuck around had lots of barbecued beef sandwiches to eat!

THE FOOD

"When in Rome. . . ." The primary diet in farm country is meat and potatoes, and we had the best while in Ida Grove. The delicious, smokey aroma coming from the barbecue pits next to the concession stand whetted everyone's appetite. The steaks at the restaurant next to the motel (we were lucky and had a room at the one in Ida Grove) were fresh, tasty, and tender.

The early breakfasts outside the hangar, across the road from the festival site . . . well, I haven't had powered eggs since I left the Navy in 1946, and until now, I hadn't realized how much I didn't miss them! I'm sure the caterers had a problem keeping food warm in a tent on a cold, windy morning, and we had equal difficulty keeping warm in the long line waiting outside. We couldn't find anyone who went back the next morning. Maudie's Diner, in Ida Grove, was the spot for breakfast, and we confirmed that on Monday morning.

THE WEATHER

"The weather's never been as cold this time of year!" If we heard that statement once, we must have heard it a hundred times, from embarrassed Iowans. Dick Phillips caught good-natured hell from numerous modelers . . . being accused of bringing cold weather with him from Canada.

Thursday evening was warm and clear, but during the night, a cold front moved in and seemed to bog down right on Ida Grove. Temperatures dropped into the mid-40s before sun-up, and it remained windy and cold most of Friday and Saturday. Byron Originals and Sig jackets were sold out in no time! This pair of Californians didn't bring any cold weather clothing. Brrrr!

And then mid-morning of Sunday, the final blow . . . a slam-bang thunderstorm with drenching rain, which put an end to all aerial activities. It sure paid off to have a three-day affair. At least two days of reasonable weather were enjoyed by everyone.

THE EXHIBITORS

Two rows of exhibitor booths, back-to-back, were set up in a long tent. Unfortunately, because of the cold wind, the sides had to be closed, leaving

only a couple of very drafty openings for spectators to come through. With the ends closed so you had to go outside to get around to the exhibitors facing the other way, many spectators missed seeing all of the exhibits until it was announced and explained over the P.A. system.

It was frustrating to be there as an exhibitor, because we missed much of the activity going on outside, which was what the fun-fly was all about. Next time, we would set up a self-sustaining booth and just check on it from time to time. Of course, other exhibitors were not there in the dual capacity of exhibitor and magazine reporter.

THE SPECTATORS

Many of the 15,000 or more who came to see the show did so because of the full-scale aircraft attraction. It was a great idea for attracting throngs of spectators who might not have otherwise come, just to see "remote control toy airplanes" alone, though we're sure they went away with more understanding and respect for the hobby and those involved in it.

Purely from an exhibitor's point of view, the percentage of people coming by the booths who were real model nuts was lower than what is experienced at an all-out trade show. However, that's to be expected, and the opportunity to see new faces and answer the many questions, should not be passed over lightly.

THE WARBIRDS AND CLASSICS

Not a whole lot of them, but what a selection was present! A razorback P-47, owned and flown by Ray Stutsman, and Grand Championship trophy winner at Oshkosh. It had been found in a junk-yard, where a tree had grown up through the fuselage. A Douglas "Skyraider," purchased in Africa, from the French government, flown by Jack Spanich, Elkhart, Indiana. How about a Grumman TBM Avenger (the "M's" were built by General Motors), bought 20 years ago in like-new condition, and stored ever since? Originally to be used for water-bombing, the FAA ruled against single-engined aircraft for this purpose. Back to this one later. There was a beautiful cream and red Waco cabin biplane. The FAA-built "Spirit of St. Louis" replica was there complete with wicker seat, accompanied by a mint conditioned Stinson Junior. Tom Bohn demonstrated his Rutan designed Vari-Ease. And of course, there was Duane Cole's Taylorcraft, Joe Schumacher's Christen Eagle, and Hazel Sig's clipped-wing J-3 Cub.

About that Avenger. What a torment for me. There was a Marine Air Group on my carrier in 1945, with Hellcats, Corsairs, Curtiss Helldivers, and Avengers. Those big "turkeys" always fascinated me. What a huge airplane for only one engine.

The torment? The pilot, a guy named Thien, brought it in on Saturday, and I was in the exhibitor tent at the time and didn't know it. I was told that he buzzed the field and rolled it going out! I saw it

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that evening, parked by the hangar, wings folded. Later on, while talking with Bruce Godbersen, he told me about getting a piggyback ride in the P-47 that day, and asked if I would like a ride in a warbird on Sunday. Of course, I opted for the TBM, and it was all set . . . and then the rain. I got word the next day, after the storm, while it was still raining, that the warbirds had to get out and head for home between storms, or not get out at all.

Early Sunday afternoon, sitting in the tent, I heard the familiar sound of that big radial, dashed around to the end of the tent, and with rain water (and a few tears) running down my face, stood and watched as that big bird thundered down the runway, lifted off, swept up those long, bent landing gear legs, and



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disappeared into the low, wet, overcast. Oh well, 37 years and still waiting...

THE MODELS AND FLIERS

It seemed to be another trick of fate, but I missed seeing the controversial "Monster" models, the B-29 and Aero Commander, in action . . . until Randy brought me the VHS tape the other day. But aside from these, and a huge, quarter-scale Stinson Tri-Motor model "U" that did not fly at Ida Grove (it actually had too light a wing loading at 99 pounds to be considered flyable in the blustery wind conditions), of all the over 400 aircraft flown and/or displayed, only these, as far as we know, were over the 40-pound weight limit specified in AMA's rules for Giant Scale.

The photos pretty well tell you what was there. I didn't have time, during my forays to the pit areas and flight line, to search out and get names and equipment info on all of the ships photographed. No one aircraft really dominated the scene, though there seemed to be quite a few Byron P-51's. Scale or near-scale aircraft far outnumbered sport models, and most were non-military.

I was happy to note quite a few scratch-built aircraft. And if Giant Scale does anything, it certainly separates the model builders from the ARF kit assemblers. There's more at stake, many more building hours, much more dollar value, and much more concern about safety than is normally seen at a model flying field. As complete and well manufactured as giant scale kits seem to be, there is still a lot of building, planning, installing, fitting, finishing, and aerodynamic trimming required to get them in the air. And that goes for Byron kits, too, even as complete and "preformed" as they are, it takes a model builder to get them to the point of flying, and that's good for everyone concerned. The carelessness and indifferent attitude that goes with the "bought it yesterday, fly it today" types, is very harmful to our hobby.

That brings us to the fliers. Again I must say that the quality of flying witnessed at Ida Grove was close to the highest I've ever seen at any large gathering. With the exception of a few "hot dogs" who

made their aircraft go through highly unrealistic gyrations, with the idea that they might impress someone (not me, that's for sure), the flying was of well controlled and realistic quality.

THE FACTORY

We took advantage of the cessation of flying on Sunday afternoon to have a private tour of the Byron Originals factory, at the edge of town, right across the street from Midwest Industries, the parent company.

I had suspected that everything in the factory would be kinda neat and organized, but I was still amazed by the absolute "clean room" appearance as we walked from one area to another. You could eat off the floors! And this wasn't just cleaned up especially for the expected visitors during the fun-fly weekend. The facility is kept this way throughout every day of the work week. In fact, I remarked that one room we walked into looked like a giant meat locker, with row after row of fiberglass "carcasses" hanging from overhead racks!

I was particularly happy to see the molds for the Staggerwing Beech very near to completion. This one is a real beauty, and the prototype, according to leading scale model pilot, Dean Copeland, is a smooth, stable flier with surprising aerobatic capability.

The final touch of class at the Byron Originals factory, is actually the first thing you see as you enter through the front door. You find yourself in a plush-carpeted lobby, with completed Byron Originals models individually suspended in arched recesses. Each model is illuminated by hidden spotlights, and a control cable comes down so you can see and operate the retracting gear systems. In a large double-arched, recessed area to the right are more spotlighted models, drive units, and cut-aways, set on carpeted raised platforms, all behind a formal wrought-iron railing. It is classy, it is impressive, and it sets the tone for everything else you observe as you go through the building.

THE CONCLUSION

I don't recall ever attending a larger, single-interest modeling extravaganza than this one in Ida Grove. The Toledo Trade Show is just that, a tradeshow, and there's no flying. The AMA Nationals includes many categories of model aircraft, and no one category could touch the statistics of IMAA/Ida Grove. Registered pilots: over 380. Registered models: more than 400. Other statistics include: 43 manufacturer exhibits, 4000 spectators on Friday, and 10,000 on Saturday. There's no telling how many more would have appeared on Sunday. A large number began to show up after the storm went through, but unfortunately, exhibitors and fliers had begun their preparations to leave.

The format of the IMAA Fun-Fly Festival turned out to be based on the correct formula . . . lots of advanced publicity . . . full-scale added attractions . . . outstanding facilities . . . no form of organized competition . . . and most of

all, the hottest new activity in modeling, large-scale R/C aircraft.

It has been a year of many major R/C scale modeling events. The World Champs in Reno, the Nationals in Lincoln, the Scale Championships in Fountain Valley, and still to come, the QSA Fly-In in October. With the tight economy, it becomes a matter of choosing which one event to attend. It appears that the IMAA/Ida Grove Fun-Fly got the most votes for 1982.

NEXT YEAR?

The latest word, from Bruce Godbersen, is "Yes." The date, just approved by the IMAA, is August 19, 20, and 21. The Navy's "Blue Angels" have been contacted, though confirmation must wait until later. But the Christen Eagles stunt team is almost a sure thing, having already been verbally confirmed, with a signed contract in the making.

An additional flying field is being considered, with certain frequencies limited to each one, to avoid interference complications. This could allow an increase in the flying opportunities.

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

though we're not sure the spectators and modelers would go for the divided centers of interest.

Whatever the final arrangement for 1983, it is now a fact that there will be an IMAA/Ida Grove Fun-Fly Festival, and the 1982 affair turned out to be one hell of an act to follow!

Indoor Continued from page 63

the air. The flying speed is very slow and boy, does it draw the attention. Don't be surprised if the applause breaks out as your Albatross Peanut touches down. You're gonna love it!

Begin the construction with the wing. It's the hardest part. Cut the sliced ribs from light 1/32 sheet balsa. An aluminum rib template of .010 sheet is ideal. Yes, there are quite a few ribs between them. The leading edge of the wing is 1/20 sq. balsa. The trailing edge is the same size wood. My model had thread for the trailing edge, but it is too hard to cover with plastic over thread. I believe the added strength of wood in this area is essential on such a long, thin wing. Attach the completed wing to a template (see sketch) and cover the bottom surface. Cut the wing away from the template, turn it upside down, and repeat the covering on the topside. After both halves are covered, join together. Covering the wings, while attached to a template, will keep the delicate structure from "drooping."

The canard (stab) is easy to construct, once you've finished the wing. There are only 11 ribs and 10 false ribs in the stab. It is necessary to thicken the center rib near the front to form a wider area to attach the canard mounting posts to the motor stick. Small control tabs of 1/64 sheet balsa are added at the outer tips.

The motor stick is made from thin, light balsa. The heavier the entire model is, the larger diameter the motor tube must be. The form for the motor stick on my model was 3/16 aluminum tubing (a discarded TV rabbit ears). One edge of a sheet of bond paper is scotch-taped lengthwise along the aluminum form. The wood blank is soaked in warm water and rolled around the form and inside the paper. The paper is sealed to the roll with tape. The wood and form are then placed in a 300° oven for 30 minutes. Carefully remove the wood from the roll and seal the seam with model cement.

The three vertical posts in the cabin are cemented to the motor stick and the rest of the cabin is constructed around these verticals. The Brian Allen sheet wood pilot and bicycle assembly is cemented in the cabin before the bow ribs (horizontals) are put in place. The wood in the cabin is stained with Dr. Martin's Water Color Dye before assembly. The bottom and front of the cabin were white foam in the real plane. White Japanese tissue was used for these areas. The cabin is then covered with clear plastic.

Small hollow plugs are then made for

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each end of the motor stick. The one at the front has a small wire (.015 dia.) hook through it to hold the rubber. The plug at the rear holds the wire prop shaft. Small aluminum face plates are cemented on each side of the wood plugs. A .015 hole in the one at the prop end allows the prop shaft to spin freely.

The prop blades are cut from light 1/32 sheet balsa. The hub is 1/8 sq. hard balsa. The kingpost is 1/16 sq. balsa sanded to a round and tapered to 1/64 round at the tip. This post is inserted through the top of the wing near the leading edge and cemented to the wing and the top of the motor stick.

Use the bracing jig for stringing the flying wires to the wing. After attaching the wing to the jig at two points near the center, also glue it to the leading and trailing edge near the tips. Black fisherman's fly-tying thread is strung snugly (but not tightly) from each wing point to the kingpost. When complete, the wing is cut away from the jig.

NOTE: The entire structure is lightly sprayed with black Dr. Martin's dye to simulate the look of graphite tape (used for strength and lightness in the real plane). The adhesive used to attach the covering to the model was Spray Mount artist's glue from the art supply store. The wing and stab frameworks were sprayed lightly on both sides before covering with the see-through plastic. The covering can be lifted and repositioned with this method of adhesion.

Some care should be used in choosing a suitable place to store the Albatross. My model was inside a cardboard model box in my garage. The heat in the garage caused the bracing thread to shrink, thereby warping the wings somewhat. Avoid a HOT storage area for your model.

This model is a winner. Don't build it unless you like winning contests. Maybe you just fancy building a beautiful Peanut of a very historic aircraft.

When someone asked Brian Allen what he had to do with the Gossamer Albatross project he smiled and said, "I was the pilot and the powerplant!"

MODIFYING THE HONEY BEE KIT

One of the many modeling imports to come to us from Japan is an indoor kit called the Honey Bee. This little model has a stick fuselage and is a good novice's introduction to indoor duration models. The flying surfaces are covered with super thin plastic that comes with brightly decorated color schemes. Many of these models are showing up at our local flying sessions. They are ideal for the beginning indoor builder. The construction is simple and the prop assembly is uncomplicated. The blades are thin card stock and several sets of blades are included.

Recently, son Chris and I were looking for models to build for an upcoming record trials. We checked the list of existing records in the AMA magazine, then decided that ROG stick would be a

good event for Chris to try. Since a Honey Bee kit was among our stack of unbuilt kits, Chris opted to build it. He took one of my old "past-its-prime" ROG models and studied it to get the dimensions for ROG. By simply adding landing gear to the Honey Bee, it qualified for ROG. A single strut of 1/20 sq. balsa 2-3/4 inches long was cemented to the motor stick, just behind the front wing post. The wing should be moved forward about 1/8 inch to compensate for the weight of the landing gear. A 1-1/2 inch length of the same wood was cemented across the bottom of the vertical strut. This axle will support the wheels. One 3/8 length of .015 wire was glued to each end of the axle piece. Two 3/4 inch wheels were traced and cut from 1/64 sheet balsa. A 1/8 diameter disc of thin balsa was cemented in the center of each wheel. The axle wire was then punched through the center of each wheel. A small drop of glue at the tip of each axle wire serves as a retainer.

The model Chris built set a new junior Catagory I record of one minute, with no modifications. By sanding the motor stick to a lighter weight, the time could possibly be increased to two-plus minutes. It's a great fun model for a novice indoor flyer. Maybe I'll build one myself and see what kind of time I can get with it. Are you game to try one? If you really want to go all out, build it with lighter wood, a tube fuselage and a built-up prop. Cover the model with

Micro-Lite or microfilm. No telling the times you could get with it then.

WHAT DO YOU GIVE AN INDOOR MODELER?

Christmas will be here before we know it. So what do you give an indoor model builder for the big day? Or for his or her birthday, or whatever?

Here's a list for the modeler who may not have quite everything. How about:

A skein of Pirelli rubber at about \$16.00 per skein.

A Jim Jones Rubber Stripper, about \$12.00.

A new indoor 16 to 1 winder, about \$7.00 to \$10.00.

An Uber Skiver Hobby Knife set, about \$15.00.

A new book called, "Building and Flying Indoor Model Airplanes", \$12.00 from Indoor Model Supply, Box C, Garberville, CA 95440.

Assorted wood, kits, stripped rubber, microfilm, wire, etc. from either Micro-X Products, P.O. Box 1063, Lorain, OH 44055, or Indoor Model Supply, Box C, Garberville, CA 95440.

A new beam scale for weighing model parts and rubber from Ray Harlan, 15 Happy Hollow Road, Wayland, MA 01778.

A reading must is Bill Hannan's Peanut Power book. Available from Historical Aviation Album, P.O. Box 33, Temple City, CA 91780. It's \$8.95 post paid.

Indoor Wood Stripper from Jim Jones, 36631 Ledgestone Dr., Mt. Clemens, MI

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Peanut Model Plans, three sets (15 plans per set) about \$5.00 from Walt Mooney, 2912 Cabrillo Mesa Drive, San Diego, CA 92123.

Kits, plans and accessories from Peck Polymers, P.O. Box 2498, La Mesa, CA 92041.

Last but not least, a subscription to the best model magazine there is anywhere. Model Builder, 621 West Nineteenth Street, Costa Mesa, CA 92627. \$25.00 for 1 year or \$47.00 for 2 years.

A final note. Flying indoor at the United States Free Flight Championships at Taft, California, in May was a big kick for me. However, I hope advance planning in the future can eliminate the time conflicts we fell victim to at this meet. Peanut scale and Easy B are flown at the same time in two different buildings. I, for one, wanted to fly both events, but could not. Peanut Scale judging was happening at the same time that Pennyplane was being flown in another building. By beginning the events earlier in the day, this overlapping could be avoided.

Regardless, both Chris and I enjoyed Taft, and encourage every indoor modeler in the area to come and fly there next year.

Write comments and questions to Ken Johnson, 16052 Tulsa St., Granada Hills, CA 91344. Please send me photos for the column. Clear black and white prints will be greatly appreciated. •

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SPECIFICATIONS:

Wingspan 38 in.
Wing Area 674 sq. in.
Length 41½ in.
 (without spinner)

Engine Size40 or .35-45
Flying Wt. 72-88 oz.
Radio Equip. 4-channel
Kit No. RC-30



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Acoms 2-Channel System With 2 servos, battery box, transmitter, receiver, switch harness, frequency flag, mounting screws and grommets.

Featuring:

Transmitter Modulation System: A M • Pulse Time Neutral Position: 1.4 • Pulse Time Minimum Position: 1.0 • Pulse Time Maximum Position: 1.8 • Operating Voltage: 6 volts • Typical Current Consumption: 150 millamps • Dimensions: 6.3" x 1.97" x 5.2" • Weight: 11.1 Oz • Frame Time: 18 milliseconds • D'arsonval metering of battery voltage • Integrated circuit encoder for precise control • Quick, precise single axis self-centering controls • FCC type Accepted • For economy, it uses only 6 cells instead of 8 • On-off switch with anti-bump ridges • Neck strap attachment • Handle grip provided • Crystal controlled oscillator circuit • Interchangeable finger grips provided

Receiver FCC certified • Operating voltage: 4.8 volts • Operating frequency band: 72 MHz • Intermediate Frequency: 455 kilohertz; • Selectivity: ± 5 kilohertz 6 dB down • Sensitivity: 5 microvolts • Typical current consumption: 10 millamps or less • Dimensions: 1.5" x 2.3" x .83" • Weight: 1.55 oz. • Antenna Length: 39 $\frac{1}{2}$ " • C-MOS integrated circuit decoder • Receiver Type: Superheterodyne, double tuned shielded front end • Crystal controlled oscillator circuit

Servos 2 provided, operate in standard direction • Idle Current Consumption: 10mA or less at 6 volts • Size: 1.6" x 1.7" x .8" • Weight: 1.6 oz. • Three different style output discs supplied for each servo • Amplifier powered by dual inline integrated circuit and two external motor drivers • Rotary output torque: 41.6 in-oz. • Splined output gear shaft for easily trimmed output • Heavy duty, 3-piece servo case to resist crash damage • Powerful 17mm motor

System Features One year limited warranty • Servo hardware provided • Frequency flag provided • Battery case and switch wired together for simplicity of hookup and maintenance • Detachable transmitter antenna for easy storage • Small size receiver fits in most electric and gas R/C vehicles • Only 10 Alkaline cells needed for operation rather than 12 as in most other units



Sugg. Retail \$214.95
FALL SALE PRICE **\$139.72**

Acoms 4-Channel System with 4 servos, nickel cadmium battery pack, dual output charger, transmitter, receiver, switch harness with charging jack, servo trays, frequency flag. Featuring:

Transmitter RF input: 700 milliwatts • Modulation System: AM • Pulse Time Neutral Position: 1.4 milliseconds • Pulse Time Minimum Position: 1 millisecond • Pulse Time Maximum Position: 1.8 milliseconds • Operating Voltage: 9.6V to 12V • Typical Current Consumption: 150 millamps • Dimensions: 7.1" x 2.3" x 6.02" • Weight: 1.4 lbs • Frame Time: 18 milliseconds • Large easy-to-read battery meter (D'arsonval meter to monitor battery condition) • Integrated circuit encoder for precision reliability and low current drain • Transmitter frequency: 72 megahertz band • 34 click stop trim levers for precise control • Positive throttle ratchet • FCC Type Accepted • Diode protection on charging circuit • Easy to grasp knob switch • Neck strap attachment • Handle grip provided • Crystal controlled oscillator circuit • Knurled metal finger grips for positive grasp • 8 nickel cadmium rechargeable batteries supplied

Receiver FCC Certified • Operating Voltage: 4.8 to 6 volts • Operating Frequency: 72 megahertz • Intermediate frequency: 455 kilohertz • Selectivity: ± 4 kilohertz 6 DB down • Sensitivity: 5 microvolts • Typical Current Consumption: 10 millamps or less • Dimensions: 1.6" x 2.4" x .8" • Weight: 1.55 oz. • Antenna Length: 39 $\frac{1}{2}$ " • C-MOS integrated circuit decoder • Receiver Type: Superheterodyne, double tuned shielded front end • Crystal controlled oscillator circuit

Servos Four servos provided • Three operate in standard direction, one servo operates in reverse direction • Idle Current Consumption: 10 millamps at 6 volts • Size: 1.6" x 1.7" x .8" • Weight: 1.6 oz. • Three different style output discs supplied for each servo • Amplifier powered by dual inline integrated circuit and two external motor drivers • Rotary Output Torque: 41.6 inch-ounces • Splined output gear shaft for easily trimmed output • Heavy duty 3-piece servo case to resist crash damage • Powerful 17mm motor

System Features One year limited warranty • Servo trays supplied • Frequency flag is provided • 500 milliamp hour nicads supplied for receiver and servos • Dual output charger with light emitting diodes to indicate receiver battery and transmitter battery charging • Receiver and transmitter batteries can be charged simultaneously or independently • Switch harnesses with charging jack for easy charging

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