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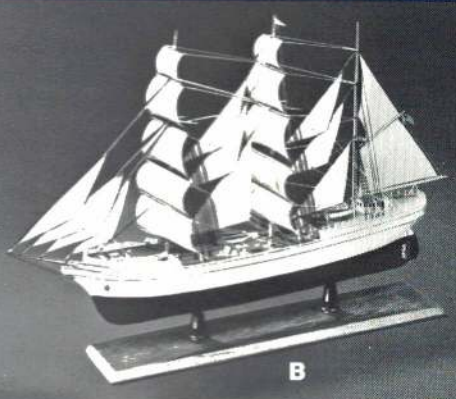

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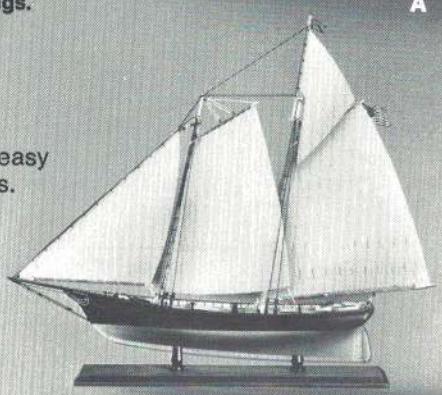

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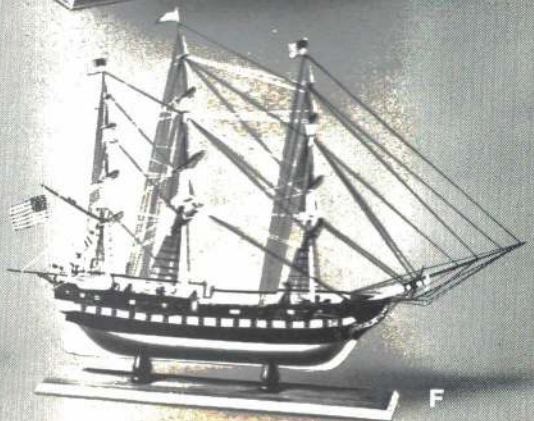

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See your Dealer. If kits are not available at dealer, you may order direct from the factory, adding $1.00 for postage and handling. Outside U.S.A. add $2.00.

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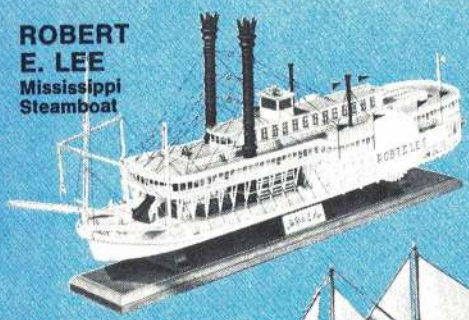

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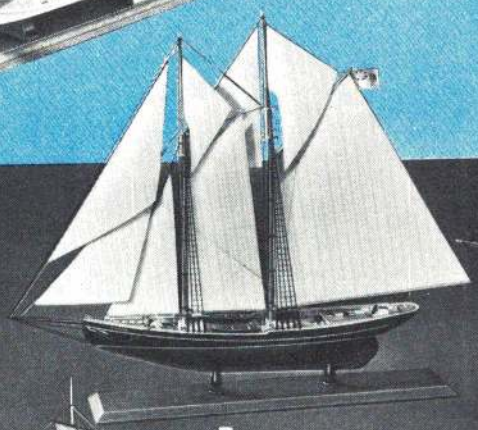

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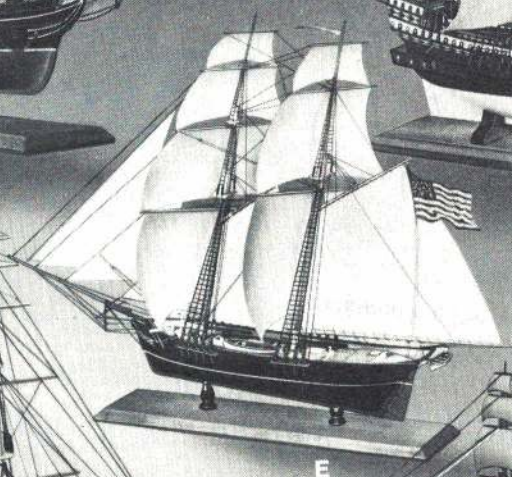

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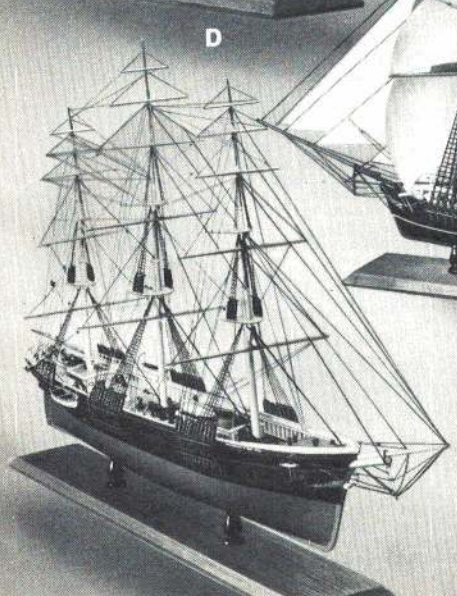

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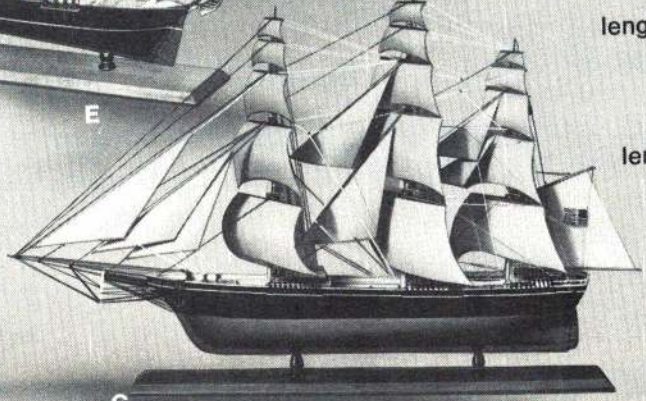

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SCIENTIFIC MODELS INC
340GH Snyder Avenue
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AMERICAN aircraft modeler

VOLUME 77, NUMBER 6 DECEMBER 1973

COVER PHOTO

Color photos of the Pitts Special were furnished by Phil Kraft. Read about the resurgence of the biplane as a sport flyer and competitor on page 25.

POTOMAC AVIATION PUBLICATIONS, INC.
733 FIFTEENTH STREET, N.W.
WASHINGTON, D.C. 20005

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Published monthly by **Potomac Aviation Publications, Inc.**, 733 Fifteenth Street, N.W., Washington, D.C. 20005. Edward C. Sweeney, Jr., President; Walter L. Hulstedt, Treasurer; Harvey E. Cantrell, Business Manager and Secretary.

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Adv. No. 68

GUEST EDITORIAL

Uplift-PR at work

JOSEPH R. WRIGHT
Circulation and Promotion Director
Potomac Aviation Publications, Inc.

When Ed Sweeney first mentioned UPLIFT to me, the obvious pictures started popping into my head. I thought we might have landed an advertisement for Maidenform, or something. I was even so uncouth as to suggest that we use the idea as a logo for the section. After Ed dumped a bucket of ice water on me, which he keeps for just such purposes, I regained a semblance of sanity and took a good look at what he meant.

UPLIFT means action and reaction. The action is all of us involved in a hobby that immediately stops people in their tracks. Non-modelers will stand for an hour in utter amazement as a modeler puts his plane through its paces. This non-modeler is just beginning to realize what our hobby means. This reaction can be used as a tool to acquaint more people with modeler. It is good PR.

Earlier this year we started the UPLIFT section to highlight a club's efforts to promote modeling. We've had a story on modeling for the American Cancer Society. The Orange County RC Club raised money for the charity and received newspaper coverage of the event.

Another article was about a club's static display at a shopping center. In addition to the static display, there was a workshop where spectators could see how models are built. A story that will be published in a later issue is about a club that put on a show for two or three schools. State Park officials were at the show and liked what they saw. What started as a show ended up with the club receiving a free flying site on state land that is a permanent site.

If you are beginning to see the picture, that's good. Each club that ran a show or a charity drive, benefited by having non-modelers getting a better understanding of modeling, publicity, and maybe some new members.

We are very interested in UPLIFT. PR must be a part of our hobby. We (all modelers) have a hobby that almost everyone could get interested in. Make your meets and contests count. Schedule one or more of them for the public and run it for a cause. Your club will receive much free publicity from local radio and newspapers.

If your club is thinking of doing something, or has already done something, drop me a letter describing the activity. Send it to me in care of the magazine. Let's get out and promote ourselves.

Here are the specifications for an UPLIFT article.

PHOTOGRAPHS—We require at least ten black-and-white photos, preferably 8 x 10; however, 5 x 7 shots are acceptable. We will select six of these. Please send your negatives, too; we will return them after publications if desired. Please furnish captions for each picture furnished.

MANUSCRIPT—The text must be typed, double-spaced. Author's name and address on the first page, name and number only on succeeding pages. Length of manuscript should be no more than 500 words, preferably 400. We reserve the right to edit your text.

Be as clear and concise as possible. Consolidate information and organize material to flow smoothly. Avoid parenthetical asides and vague "for the glory of the sport" comments. Vary sentence structure to keep the article moving.

Names of people and products must be spelled accurately. In case of an unusual spelling, indicate that it is correct. Beware of excessive punctuation—underlining, all capitals, or "very" are seldom necessary.

Quotation marks are not needed for names of models, products, groups, standard events, common technical terms and slang expressions. Use only when needed for clarity.

American Aircraft Modeler is referred to as **AAM**. Magazines and books should be underlined, titles of articles in quotation marks, newsletters are not marked specially.

ADDRESSES: Abbreviate when possible, but write out names of states

(Continued on page 112)

An uncharted flight through the tricky price maze.

If you're about to shell out money for R/C equipment, be careful. The least expensive path can be costly in the long run. And a high price doesn't always mean high quality. The competition is treacherous, and some manufacturers fly by night.

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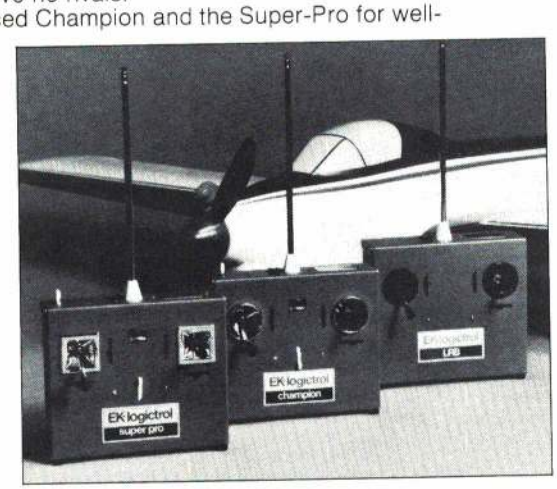

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Modeler Mail

It's Not Whether You Win or Lose. . .

It gets to be an old story after a while—a broken record so to speak. Al Rabe this and Al Rabe that. Can you just picture Al Rabe at a contest that is combined with Jr., Senior and Open? The kid with the $5.95 kit he worked so hard all year to get doesn't have a chance. All the Al Rabes, Hungerforths, Les McDonalds who have complete shop equipment, large sums of money to invest, and rooms full of trophies will get another which means nothing.

Slow Rat, Slow Combat, and Carrier events are proof that what I'm saying is true. Scale and Stunt are dying. Why? 1969 Scale was modified. It helped the rules but the rules are not fair because now you have Semi-Scale planes entering and carriers entering Scale events. Scale should be kits and you should have to use everything that comes with the kit. Retracts, 25 points. That's pointless. Find a kid that could afford that!

Let the Al Rabes fly with their class. I'm not one to put anyone down. I've been flying for over 25 years and followed control-line contests all that time. I've had wins and losses. And many times I was glad to lose. This last time I was glad to lose. You should have seen the person that won. Was he happy! Just a kid—18—a nobody—but it was a good feeling. The wind was high and he was the only one who didn't wreck.

I only fly with kids because I enjoy working with them. But with the high cost of things today, I think something should be done to improve the Control-Line Sport contest.

Enclosed is a picture of my plane, a kit, and it flies inverted, loops, figure eights, and lands well. No big thing, but it was made on the dining room table. No machine, no fancy shops, spare time only. Everything standard.

David E. Mark, Sr.
Titusville, Florida

Bind your old issues

I would like to know if you sell hardbound editions of AAM magazine covering one year and having complete reproductions of each magazine, including the covers, old ads, articles, and plans that could be ordered through you.

If you don't have anything like this I am sure other modelers would really enjoy something like this, as they can throw or give away those old magazines to make room for the books and be happier doing it.

Malcolm Strachan III
Butler, Penn. 16001

We don't issue hardbound books per se, but you are welcome to buy a hard cover binder which fits one year's worth of AAM *magazines neatly inside it. You can get one from* AAM *postpaid for $3.95.*

—Editor

F9F Panther plans

I would very much like to build the F9F Panther Jet. However, I understand that the manufacturer has gone out of business. I wonder if any of AAM's readers might have one in his possession.

Joe Gauthier, 1930 Todd La.,
Windsor, Ontario, Canada

Ban NATS Bunions

Your magazine article on the NATS was a splendid bit of journalism, and being an old modeler with a boy in the AMA, we decided to make the trip. We found after a parking fee of $1 and a gate fee of $2 (myself and wife paid; young son and AMA son had free admission), that we could not get within a mile of the flying site without an AMA pass. So, as our boy had his license, we purchased another $6 worth of passes, then found we would have to walk to the flight line. That was too much for us to do, so I asked and got a refund of $6 and headed home 400 miles away.

Why couldn't the magazine print the charge and publicize the fact that AMA spectators were not welcome on the field? Or why didn't they at least publicize the "no car" rule? Before we left I found out that a great many of the cars at the lines were *not* contestants' cars.

Let's get this thing printed before the next NATS takes place. Things like this don't help model aviation at all.

Howard Gaskill
Box 456
Mitchellville, Iowa

I, too, attended the 1973 AMA NATS. In so many ways I was just as disgusted with what I found as you were. Believe me, the planning of the NATS had been very difficult for the Academy and what was planned at the time of my article on the Nationals (many, many months ago), changed almost daily up until the time of the event itself.

Among other things the people managing the gate were supposed to have given passes for automobiles to those people who paid for an AMA license and/or mechanics badge, but for some reason did not. That is possibly the situation which prevented you from driving out to the field.

As this was the first Nationals to be run totally by the AMA without any outside help on a private location, I think the Academy did very well. I am certain, however, that next year there will be some very careful thinking about proper handling of spectators so that the spectators may enjoy the NATS close up.

—Editor

Reed Rig Combo

Help! Being rather nostalgically inclined, I have temporarily set aside my Heath GPA-405 in favor of a new (?) Min-X Powermite 101 No. 32265 Superjet Multi Receiver reed rig combo. I bought the thing from a private party sans servo connector blocks and instructions on how to wire the bundle of wires coming from the receiver to the appropriate servos. I would appreciate help from any reader having such info and/or wiring diagrams/instructions that would help. When I get it installed, I'm going to send you a pic of my Fox 78-powered Barnstormer 72 with this reed rig in it.

Ronald Sindir
1206 Coollage Avenue 34
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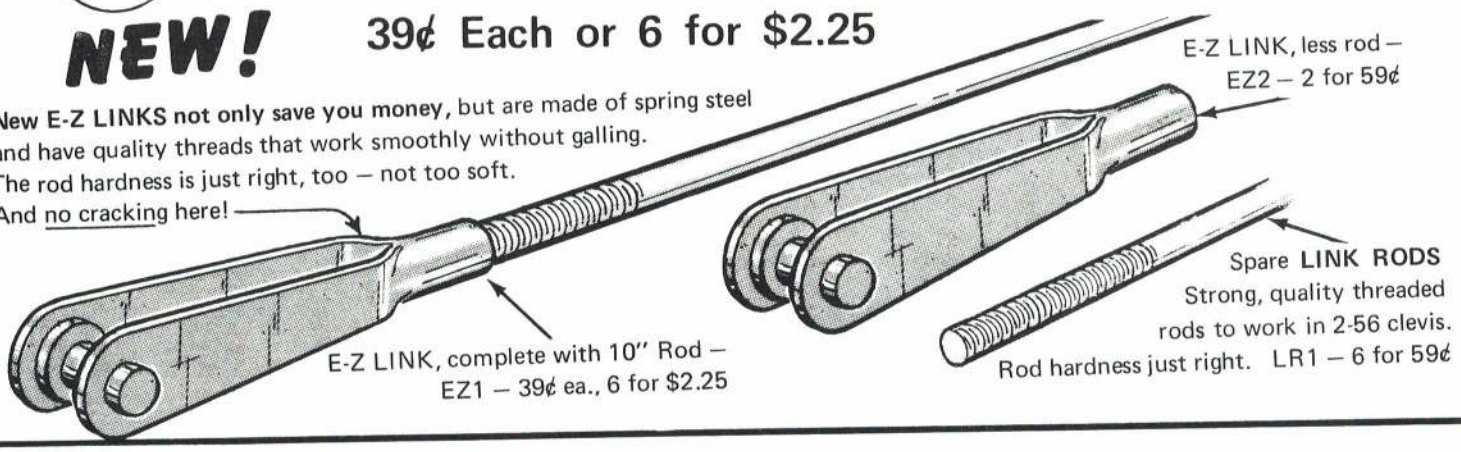

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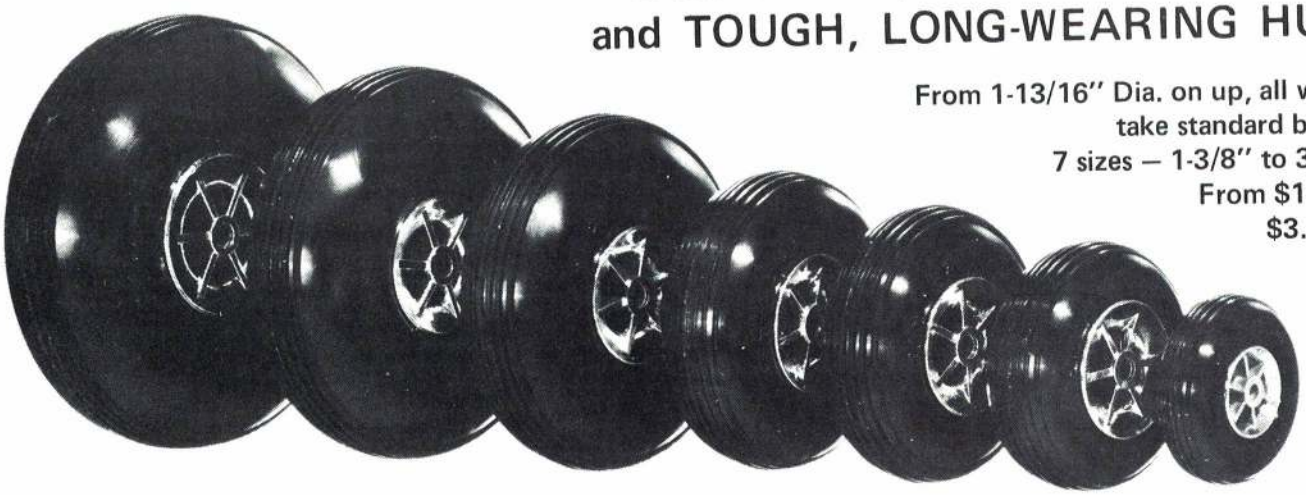

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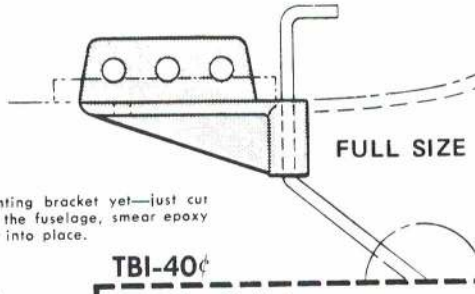

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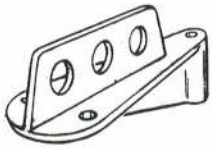

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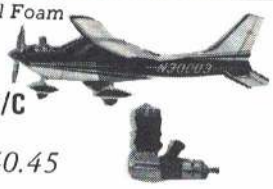

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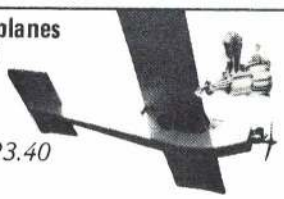

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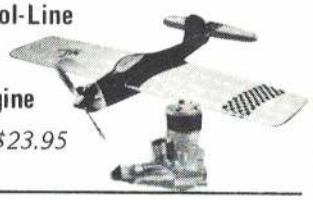

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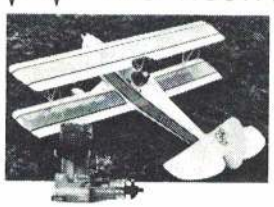

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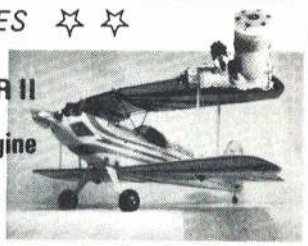

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Since we couldn't fit the fully assembled plane into a box you must glue the two wing halves together, and glue the tail to the fuselage. But, this only adds up to about 23 MINUTES WORK, and then you charge the airborne nickle cadmium batteries, gas 'er up, and GO FLY IT!!!

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until Dec. 31, 1973
Blue Max Mk. II $159.99
6 CHANNEL *List price $265.00*
Digital Proportional SEMI KIT...

with 4 FULLY ASSEMBLED SERVOS

Outfit includes semi-kits for transmitter, receiver-decoder, charger, and 4 assembled servos. Complete n-cads, factory warranty on all factory assembled P/C boards. 72-75 mhz. frequencies only.

Our new 1973 radio is for the RCer who wants the very best, even if it costs him less.

RC MODELER MAGAZINE SAYS . . . (December 1972 issue)

"Our (Hobby Lobby 5) has performed flawlessly under all conditions and its performance has equalled or exceeded systems selling for twice the price. . . . If you want an extremely precise system that will offer you years of reliable service, then we seriously recommend the Hobby Lobby 5 to your consideration."

- Unsurpassed Reliability
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- Extra servos cost only $12.00 each.
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- PRICE: About HALF of what you'd expect to pay for a top quality 5 channel system.

- Improved Airborne Battery pack with ONE-CELL-OUT flight capability
- Only 11½ oz. airborne weight

Please call or write for free brochure.

Series III

HOBBY LOBBY 5 Digital Proportional $209

YEAR-END SALE! SAVE $10.00
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Series III **$199.00**

Here's Hobby Lobby's New 3 Channel Radio. *Add up what its features are worth,* then see if you believe the price!

- ★ ULTRA-LIGHT airborne WEIGHT: 6.5 ounces with 2 servos, and 225 mah. batteries; 8.8 ounces with 2 servos, and pencell batteries
- Excellent SERVO RESOLUTION and CENTERING for CONTEST work
- ★ I. C. Servo Amplifiers with ONE-CELL-OUT flight capability
- ★ Smallest SERVOS made
- ★ A COMPLETE, ready-to-operate outfit: 3 channel Transmitter, 3 channel Receiver, 2 Servos, Airborne battery holder & switch
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The Hobby Lobby 3 is a ready-to-operate 3 Channel Digital Proportional outfit, consisting of a 3 Channel Transmitter, a 3 Channel Receiver, 2 Servos and airborne battery holder and switch.

The Hobby Lobby 3 is manufactured for Hobby Lobby by the same company that makes the unusually reliable Hobby Lobby 5 proportional system. Many items are common to both systems: the servos...HL 3 uses the same servos as the HL 5 Series III 5th Channel servos; and the optional airborne nickle-cadmium battery packs are interchangeable between both systems.

With its optional 225 mah. nickle cadmium airborne battery pack, the Hobby Lobby 3 is one of the true ultra lightweight systems.

The precision of the control stick-to-servo, the 3 ½ pound servo thrust, the out-of-sight range, and the proven reliability record of the circuits used in the system combine to make the HOBBY LOBBY 3 the finest 3 channel system available regardless of price.

HOBBY LOBBY 3 3 Channel Digital Proportional $89.00 (27 mhz, 2 servos) **$99** (72 mhz, 2 servos)

27 mhz. HOBBY LOBBY 3 available November 1, 1973.
72-75 mhz. HOBBY LOBBY 3 available January 1, 1974.

NEW! **Dremel Variable Speed No. 381**

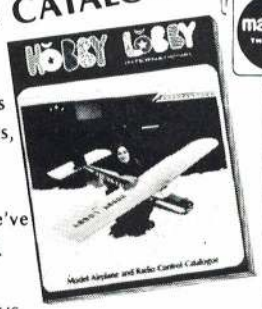
MOTO-TOOL KIT

The extreme high speed of a standard Dremel Moto-Tool is both its best and its WORST feature. High speed is great until the Moto-Tool eats right through some carefully shaped part. High speed drilling with a standard Moto-Tool can result in the drill bit actually VAPORIZING.

Anyway, here's Dremel's fanciest Moto-Tool—Model 381. It has a built-in SPEED CONTROL to give you complete control of any grinding, drilling, sawing, or carving job. Speed is variable from 5,000 to 25,000 RPM. Model 381 has ball bearings for long life and precisely centered rotation of the chuck.

The list price of the Model 381 Moto-Tool kit (complete with case, grinders, cutters, sanders, mandrels, etc.) is $59.95, but we have a special introductory offering on it. Call or write for price.

NEW! Volume II HOBBY LOBBY ILLUSTRATED CATALOG $2.00



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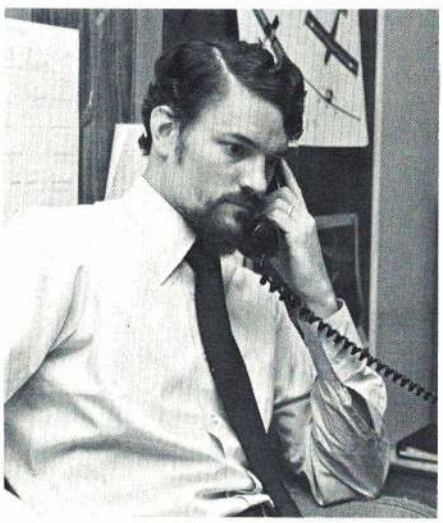
MODEL WORLD

Those People At Potomac. / by Frank Pierce

RIGHT: Doug Boynton, on the phone with an advertiser. Doug wears two hats: Ad Sales Manager for Potomac, and Publisher of Model Dealer. BELOW: Ed Sweeney, pivotal force around which most things at Potomac revolve. BELOW RIGHT: Harvey Cantrell is Business Manager and all-around administrative specialist.



It's pretty easy, I suppose, to get a rather impersonal image of an organization when it is a corporation with a nationwide influence in its field. The very name "corporation" to me gins up a mental image of a sprawling industrial giant with lots of people working at a very impersonal level. Somewhere at the top of a pyramid of organizational charts, well-protected from mortal view, is a man called the President or the EDITOR, called by his given name only by a handful of the elected elite, down to, let's say, the second vice-presidental level.

This may be the case with a lot of large organizations. . .I don't really know. But I do know the people at Potomac Aviation Publications. I've worked with them since the first day they opened up shop in Washington way back in 1966. And so I have to remind myself that in fact it is indeed Potomac Aviation Publications, *Inc.* . .actually, it doesn't look corporate.

Maybe it's because the average age of the staff is too young for that sort of facade. There are a few old-timers who are a part of the scene. Bill Winter has been in the aviation publications business since the days when a gas-powered model was a real show-stopping novelty, but for the most part, Potomac Aviation is a pretty young bunch. I have even heard Edward C. Sweeney, Jr. referred to as "young Edward" by some of his cohorts, such is his image.

Maybe part of the informality results from the close confines of the offices at 733 15th St., NW in Washington. In downtown Washington, nobody has enough room; when you take a staff of 16 people plus a few visitors and cram them into a single suite of offices, addressograph and all, the results are bound to bring on a certain informality, a type of "forget-the-intercom-and-holler" type of attitude. It also breeds a collateral-duty type of mentality—who ever is nearest to the phone usually answers it. When I call Editor Ed Sweeney, someone usually tells me he's on another line—a fact, not a dodge.

In the midst of a clutter of overstuffed file cabinets, overstuffed cryptically marked manila folders and an assortment of airplanes ("He sent it in for photographs and I liked it and bought it from him"), Ed Sweeney is the focal point of dozens of daily conversations. In fact, an amazingly large portion of each day's business is conducted over the telephone. Ed buys, sells, proposes, and disposes over the phone. His letters may not be literary gems but his phone conversations are pure masterpieces, carried on with singlemindedness, interspersed with shouted questions, instructions and asides to anyone in the room. After all, it is the general concensus of everyone that nothing happens without Ed's OK and sometimes the phone is the most direct route. Sit by his desk for 30 minutes and you get the picture.

If you call in cold, wondering if AAM would possibly be interested in your text and Fujichrome slides of your

(Continued on page 95)

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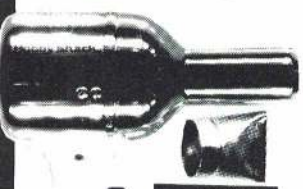

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The REAL THING and nothing but the Real Thing! + Cox .049

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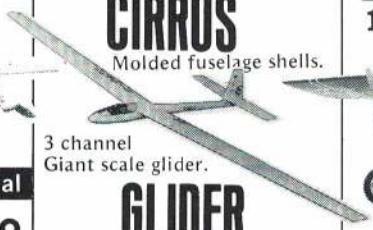

Molded fuselage shells.

3 channel Giant scale glider.

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Veron FOKKER DVIII & Taipan 15 RC

46"span formed cowl, vintage wheels, decals, die cut balsa.

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SIX CHANNEL TWO STICK

Complete system;
6 channel transmitter,
6 channel receiver,
4 servos, nicads, charger
and switch harness.
27 or 72 MHZ choice.

Why would you pay more for a 4 or 5 channel system? **$209.00**

Complete 90 day warranty. Service at World Engines or right here at Hobby Shack.

Christmas Radio SALE

World Engines new BLUE MAX MKIV 6 channel SEMI KIT, featuring fold-up handle which acts as a Tx stand also. New improved circuitry and latest electronics techniques. 4 new styled S-9 small servos, nicads, and charger. PC boards are prechecked before leaving the factory. The boards come to you assembled, leaving you with only the inner wiring to do.

WORLD ENGINES BLUE MAX
6 Channel 2 Stick SEMI-KIT $165.00

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TWO SERVOS / 27 MHZ

Cessna Cardinal

Medallion .09

27 MHZ.

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54" span "stand-off scale" mid size sport thriller and McCoy's 40 R/C power plant!

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63"span ARF 630sq."area.

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56" span / 558 sq. " Area for .15-.19-.35 Displacement 1 to 4 channel systems. Die cut ribs and symmettru wing construction.

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46" span / 414 Sq." .19-.23 Disp. 4 Channels.

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410 sq." wing for beginners in 2, 3, or 4 channel radios! .09 to .19 engine displacem.

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injection molded all foam plane, for 2-4 channel flying. Taipan .15R/C for exciting sport flying fun!

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For having fun or starting out in R/C for the least amount of money, you just can't do better than our CIRRUS SPORT III. It features the smallest servos made, which means a lightweight system and easy radio installations. Complete system; 3 channel mini light trans. (dry), w/ a single stick, w/trim and a 3rd channel lever. 3 ch. receiver, 2 servos, 4 cell (dry) battery pack/switch.

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Cirrus SPORT III on 27 mhz

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71¾" span, slope tow, hand and powe launch glider.

+ the Cirrus SPORT III with 2 mini servo on 27 mhz. You can add the 3rd servo at a later date.

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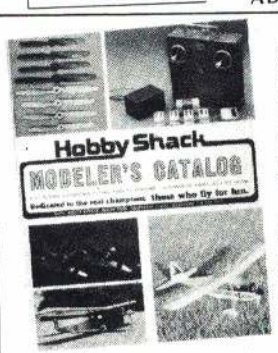
ADD $10.00 for 72 mhz system.



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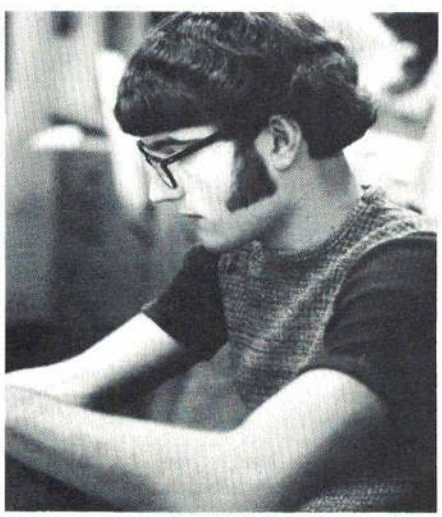
Uplift

A FAMILY AFFAIR: These kids get high with model airplanes. / by Larry Kruse

ABOVE: Mark and Bruce hold just two of the many trophies they've won. RIGHT: Bruce collected eight trophies. . .just from the '72 NATS! BELOW: Bruce gets a little assistance fitting a new timer. Family participation is stressed. BELOW RIGHT: Mark is working on a scale project for this year. His main interest is free flight.



Photos by Jerry Blythe

Editor's Note: This is the type of activity we are happy to see. At this year's NATS we saw a husband and wife combination competing against each other. Don't be selfish, share the hobby with your whole family.

Anyone who is involved in model building recognizes that it is a perfect father and son hobby. Regardless of the age or skill of either the boy or his dad, the formula remains the same—a father plus a son plus a plane equals pleasure. Building and flying for kicks and companionship allows each member of the duo to share in a mutual creative satisfaction. If we add just a dash of the spirit of competition flying to the mixture, the brew becomes heady. Stirred liberally with teamwork and camaraderie, the mixture can be a catalyst with almost amazing effects.

A case in point is the modeling Mathews family of Greensburg, Kansas. Bruce and Mark along with their father, D.B. Mathews, have entered competition flying in a big way with equally impressive results. In the past eight years they've won over 200 trophies and awards in AMA sanctioned contests and have held three national records. At the 72 NATS in Glenview, Bruce, who is 12, walked away with eight trophies in a total of nine events entered, missing the Junior National Championship by only 11 points. Mark, also a seasoned modeler at 17, has numerous meet grand champion trophies to his credit, dating back to his first grand championship at the ripe old age of nine.

Flying mostly free flight aircraft that range from FAI power to exacting scale, the family logs nearly 9000 mi. per year on the midwest contest circuit in such cities as Tulsa, Kansas City, Abilene and Wichita, always capping off the season with a trek to the Nationals, wherever it happens to be held.

"In looking back at how we got started," Dr. Mathews reflects, "I got back into modeling after my tour of duty with the Air Force. When Mark got old enough, modeling was something a father and son could do together. The simplicity of free flight appealed to us and we began to enter contests as a lark. When he was about five Bruce got into the act with his first ship, a Midwest Sniffer, and we've been a team ever since."

Contests have become a type of vacation for the Mathews family. "As small town people, the boys don't have a lot of contact with a cosmopolitan setting," comments Dr. Mathews. "Since most contests are near larger urban communities, the boys can get the flavor of a more metropolitan life than the one they live. Also, contests allow them to meet the type of friendly, outgoing people my wife and I would like them to know as friends."

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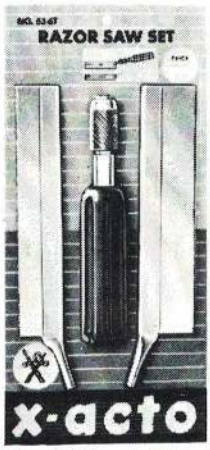

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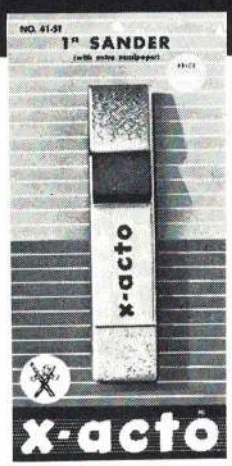

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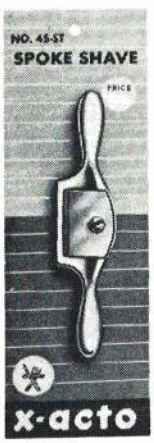

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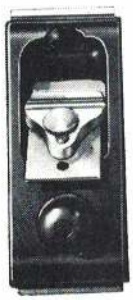

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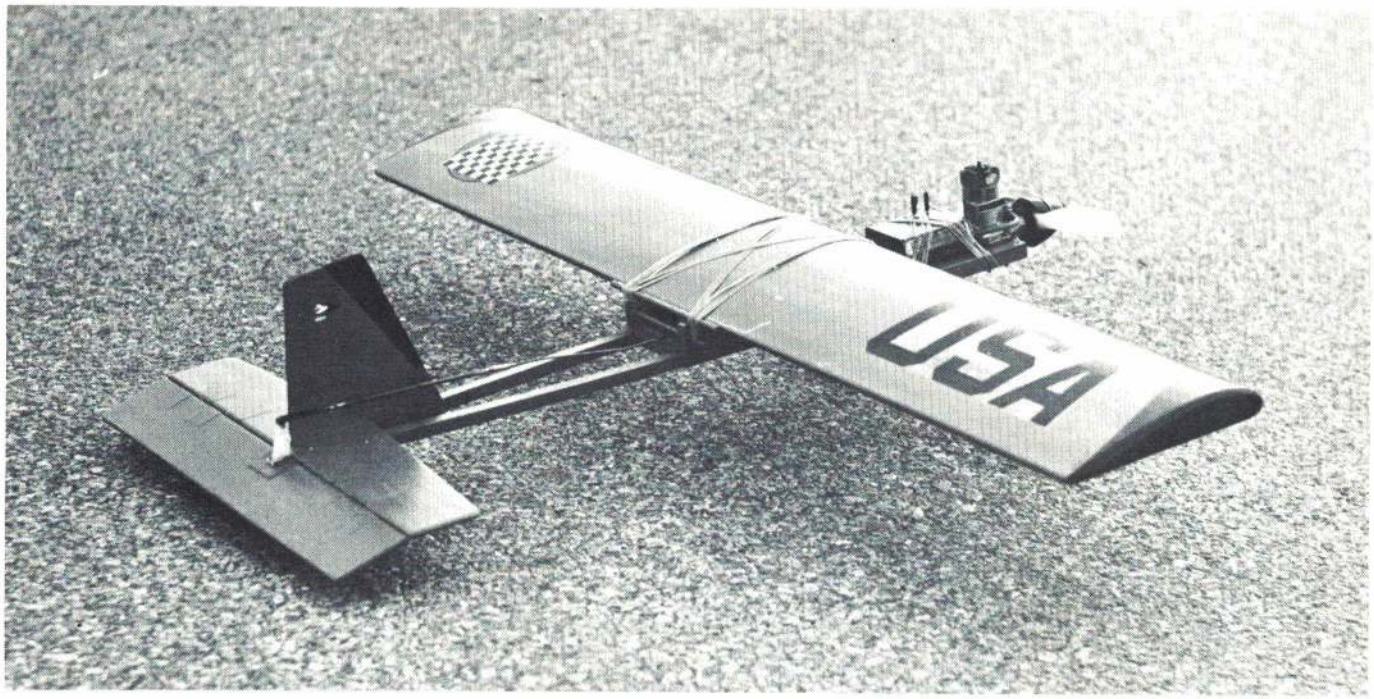


FOR THE TENDERFOOT

T-19

Durable grass-field 19-powered basic CL trainer is fine for breezy days, too. It even converts to a biplane for stunting. / by Dave Kingman

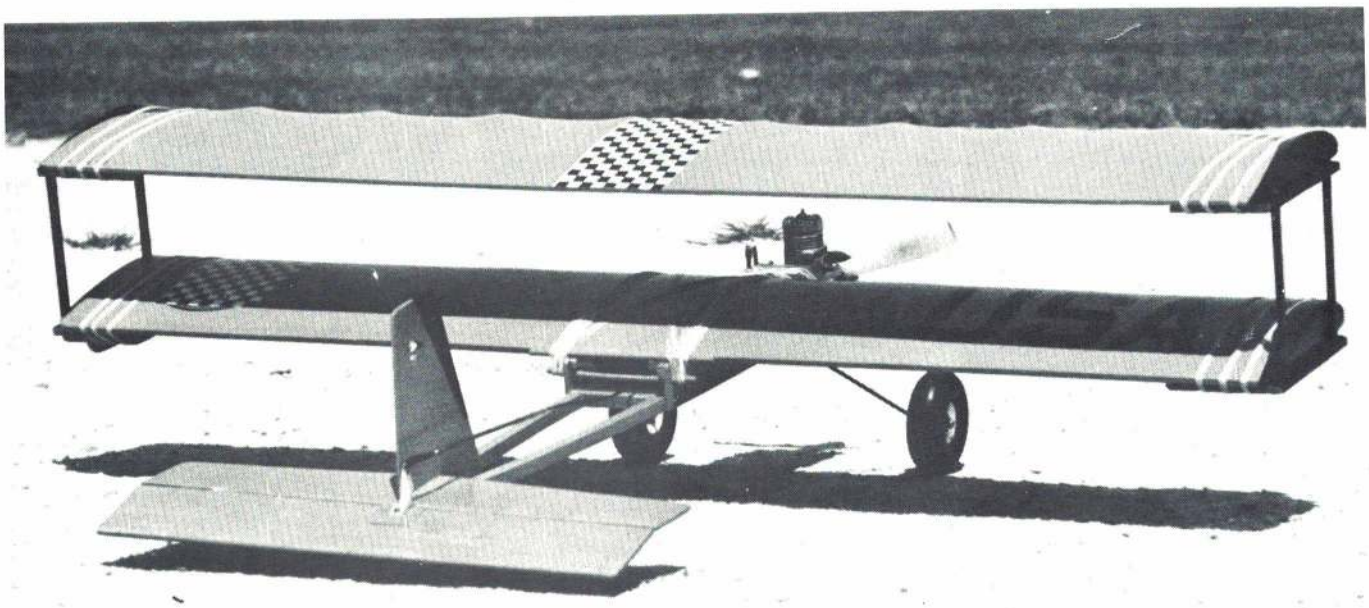
Not long ago my wife and children decided to join me in the hobby of flying control line model airplanes. Good news! Besides the promise of sharing my favorite pastime with my favorite people, I had a reason to design a new model. We would need an easy-to-fly basic trainer which would survive most training mishaps with no damage and be easy to repair in the event of a real earth shaker.

We are pleased with the T-19, our answer to the trainer problem. Sometimes it is flown with an extra wing banded on a jury-rigged set of biplane struts; it doesn't fly any better that way, but the basic design must be fairly docile to permit such doings and still function. A set of floats is next on the program.

Built as a wheeled one-winger, the way the plans are drawn, T-19 offers several advantages over the common ½A lightweight trainers. It pulls harder on the control lines, which gives the student flier confidence. Knowing the model will stay out on the lines, particularly on windy days, can only be a bonus. We don't suggest training with any design on a windy day, but we know that models of this size and power tend to live longer in windy weather flying than do smaller ones with less power. T-19 is large enough to be fully controllable during the glide and will flare for pretty landings. We like the way the big wheels allow takeoffs and no flip landings on grass fields that are safest for training flights.

Material specifications such as wood thickness and wire diameter are detailed on the plans. Everything needed should be stocked at local hobby shops. If you can't get what you need locally, Sig Manufacturing Co., Inc. of Montezuma, Iowa, can supply it.

Start with the ladder-type motor mount assembly. Hold the parts

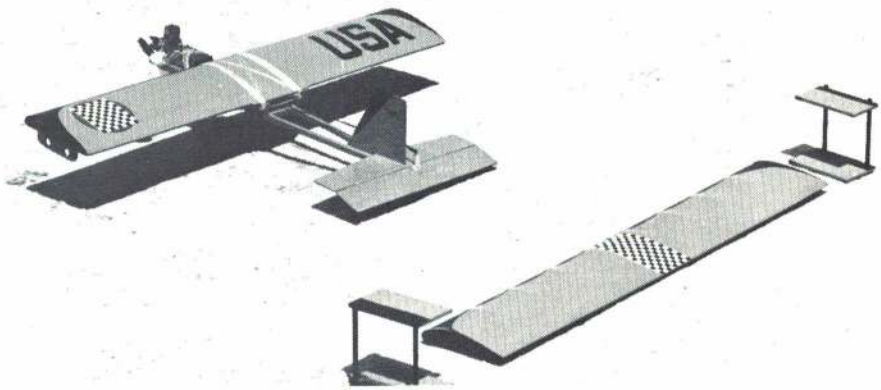


together with a vise or clamps while this important structure is being built. Add the fuselage sides. Glue them together at the rear and secure the rear brace in the same operation. Suggestion: The rear brace and all other plywood pieces of the fuselage can be held in place on the fuselage crutch with tiny (approx. 3/8" long) wood screws as the glue dries. Leaving the screws in place will make a strong fuselage.

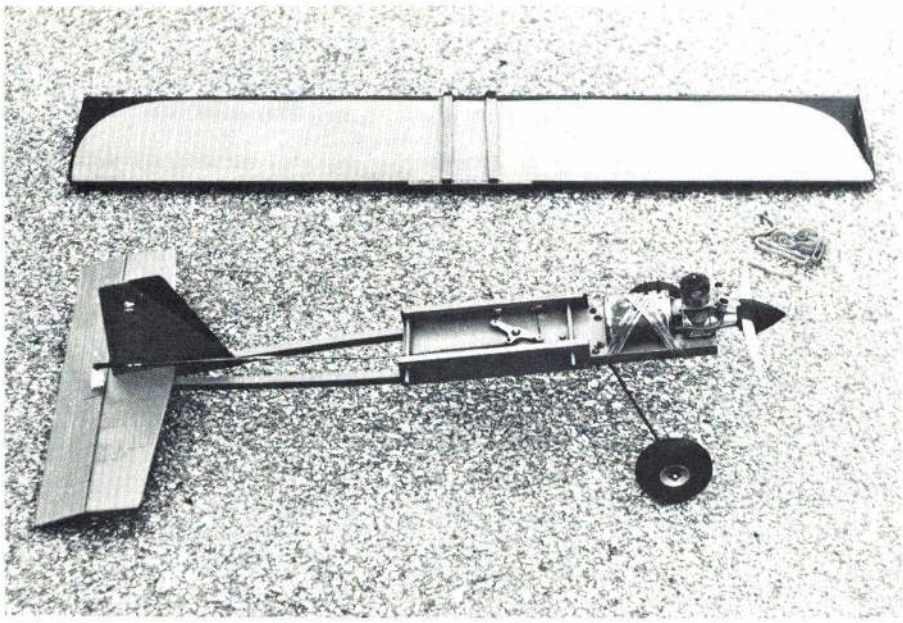
Now glue on the deck. Make a right and a left wing mount, each with a wing rest strip at the top. Drill 3/16" holes for the wing, tie-down dowels in both mounts, and make elongated holes for the leadout wires in the left mount. Attach the wing mounts and the tail skid to complete the basic fuselage.

The elevator and stabilizer can be made and hinged together now. Cloth hinges are shown on the plan, but any of the modern mechanical hinges available would be fine to use. Note the thin plywood plate shown under the elevator control horn. This insures against the horn pulling loose in flight. It's worth having if soft balsa is used for the elevator. When cutting the one-piece rudder, note that the front half drops so it can be glued to the inside surface of the left fuselage side. Mount the tail components to the fuselage, leaving the elevator horn to be mounted later.

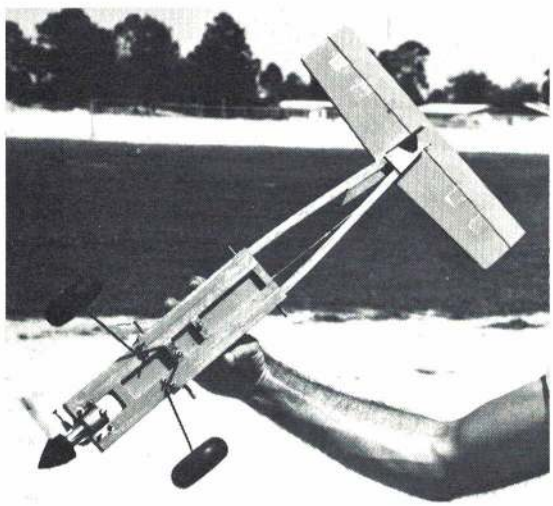
Wing leading edge, trailing edge and sheet balsa covering are full 36-in. length pieces. Using six-in. wide sheets for covering is easier than gluing together two three-in. sheets for each wing surface. Unless a precarved trailing edge of the proper cross section can be found, a standard rectangular cross section strip will have to be shaped as shown on the plans. This should be no problem at all; a razor plane or sanding block is all that you need in the way of tools.



Opposite page: It is certainly a basic plane. The lifting section sheeted wing is attached with rubber bands so that in a crash it pops off undamaged. Top: Bipe configuration is fun but tricky to fly in high winds. Once you have mastered control-line flying, add a wing and go stunting. Above: To make a biplane, here's all you add. Rubber bands attach the top wing, too.



Above: Wing removed, control system is fully exposed for servicing or adjusting. Big wheels allow easy grass field operation. Right: Undersides reveal more of the "keep it simple" philosophy of the design. Below: Author's daughters enjoy an afternoon of flying with dad and are also learning to fly Control Line.



The use of a dowel for a leading edge is unusual, but it is appropriate for a trainer of this size. Assemble the lower wing covering, ribs, leading and trailing edges on a flat working area. Secure not less than one oz. of weight by the outer right wing rib. This weight is to compensate for the weight of the control lines hanging from the left wing. It should overcompensate on the T-19—a drooping right wing is one more feature that will keep the model trying to pull away from the center of the flying circle.

With the glue dry and the wing warp free, slot the covering at the left tip and attach the control line guide. Cover the upper surface of the wing. Glue on the wing tips, then spend a few minutes with some sandpaper wrapped around a balsa block or a scrap piece of light plywood. A respectable looking wing should result with little effort.

Nicks or cracks can be filled with a putty such as Aero Gloss brand Plastic Balsa, then sanded again with fine grade sandpaper.

Now is the time to cover the entire wing with Silkspan, if desired. Silkspan over the sheet balsa and wrapped around the exposed leading edge dowel is an instant crack sealer and grain filler. It will also add strength to the wing. The Silkspan is applied to the top and bottom surfaces in separate sections. Wet the Silkspan and stretch it over the area being covered, attaching it to the leading and trailing edges and wing tips with clear dope. It will shrink tighter as the water evaporates. Glue on the wing alignment strips, checking to assure they fit snugly between the wing rest strips on the fuselage wing mounts. Attach the dowel reinforcement at the center of the trailing edge, and cut some wing

Plans on page 22
Text continued on page 78

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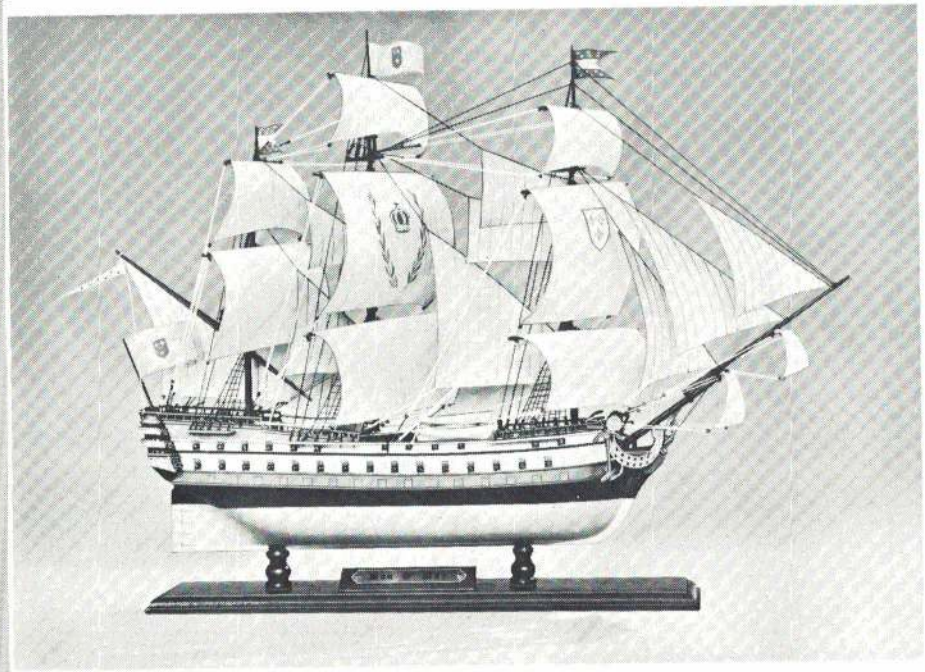

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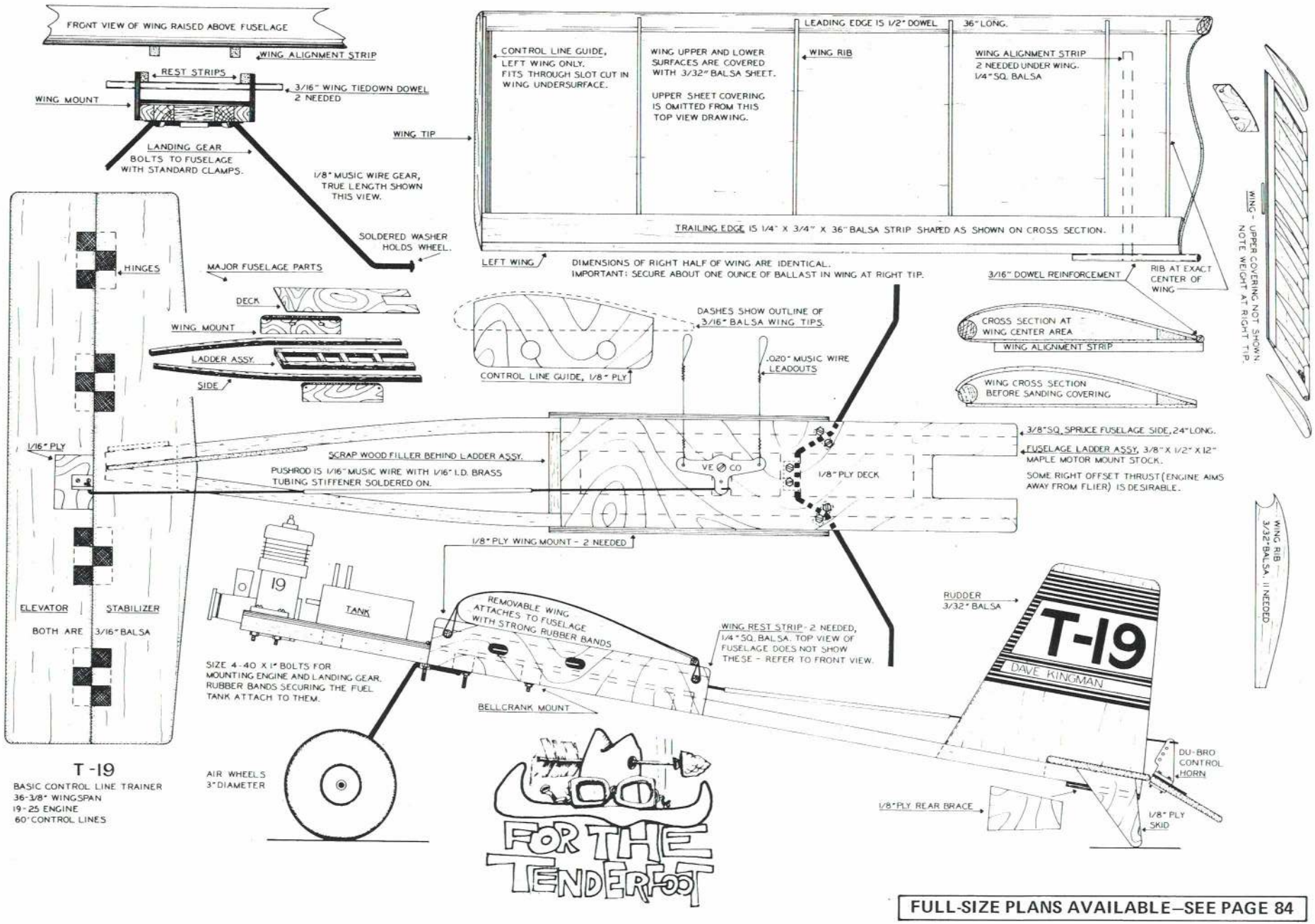

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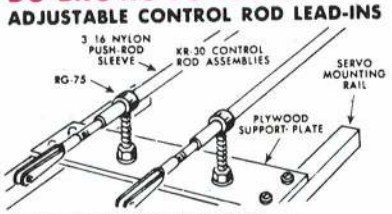

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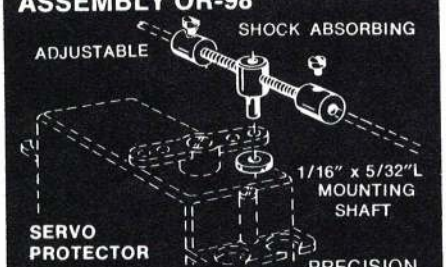

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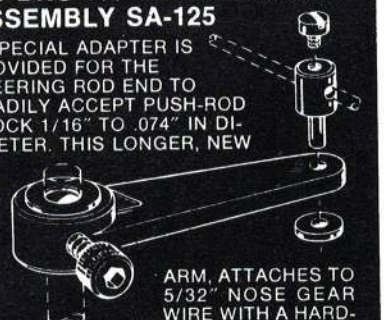

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BILL HANNAN ON FF

Flightmasters' Indoor Flying Scale Contest: On July 8, the Flightmasters sponsored another Indoor Flying Scale Contest in the Marine blimp hangar near Santa Ana, California. (Wait Mooney was serving as a judge at a Control Line contest and was unable to attend!) About 50 models were present; 35 were official entries. Classes included AMA Rubber Scale, Peanut Scale and CO-2. Additionally, there were separate Monoplane and Multiplane divisions in the Rubber Power event.

First in CO-2 was captured by former Flightmaster prexy, Kingsley Kau, flying a 1912 Blackburn Monoplane. This model was originally constructed for rubber power, and later converted to accept the Brown Junior powerplant. Second went to Bill Krecek, with his Westland Widgeon, which also had previously been flown with rubber power. Bill Stroman's highly detailed 1909 Antoinette placed in third spot, while your author squeaked into fourth position with a 1910 Nieuport monoplane.

Clarence Mather flying an extremely lightweight Russian Stormovik was awarded first place in the AMA Rubber-Powered class, Monoplane division, and Bill Warner's brand-new Swiss Comte finished in second position. Third went to Jim Wright who turned in some fine performances with his FW Stosser.

In the Multiplane class, Kingsley Kau demonstrated the reliability of his vintage Sopwith Tabloid which has been flown in active competition since 1964. He took home the first place prize.

Publisher Ed Coleman, who traveled all the way from Canada to attend this meet, garnered second place honors with his Bucker Jungmeister.

Jill Peck upheld both feminist and Junior honors by taking a solid first place with her Miles M. 18 constructed from a Peck Polymers kit.

Peanut Scale had the greatest support, with 15 entries. Many more planes, while not entered in Peanut Scale, added variety to the scene. Colonel Bob Randolph took an easy first place with his Cougar, followed by Clarence Mather flying a Jodel constructed from Walt Mooney plans. Third spot went to Fudo Takagi with his Miles M. 18, another Mooney designed aircraft.

Among the more unusual models noticed, were a Spratt flying boat by Jim Adams, a Flying Flea by Daniel Walton, a DH-2 by George Barrows, and an electric-powered Aeronca low wing by Lloyd Brickner. With this sort of variety, it is easy to understand why Indoor Flying Scale continues to attract such large numbers of entrants and spectators.

CLAUDE McCULLOUGH ON RC

Homemade II: Dave Gjessing read about homemade decals using blank decal paper in the June column and decided to try some experiments to see if special paper was really necessary. His solution is simple—ordinary heavy notebook paper coated with mucilage. Brush the mucilage on fairly thick and allow it to dry. Cut a mask slightly larger than the shape of the decal you will make and spray on a coat of clear enamel. Paint the required art work on the clear enamel. The mask could be skipped and the decal cut out with scissors before using, leaving a narrow border of clear around it. He apparently didn't put a coat of clear on top of the insignia but it probably would be a good addition. Soak the decal in water long enough to soften the glue and slide on to the model.

Ink Kink: There are types of drawing inks available at drafting supply stores that are specially made for drawing on mylar and other plastic films. One of these is Pelikan T or TN. It goes on a doped surface readily, unlike other india inks which act like they had been put on an oiled surface. A ruling pen or special drafting pen such as a rapidograph can be used to apply all types of panels and lines to a scale model. Pin stripes can be done with French curves and a ruler. With a Wrico pen and lettering guides, small stenciled markings can be reproduced.

Tape a straight edge to the model to slide the guide along while lettering. The ink will even replace dope for some larger markings. For my Shinn 2150 it was necessary to keep down the number of coats of dope to prevent covering the rivets and seams too much and ruining their effect. So the outlines of the large black registration numbers on the side were drawn on with a rule, pen and Pelican T and then filled in with a brush dipped in the ink. These ink markings must be overcoated with clear dope because they are not fuelproof or waterproof. Two coats of sprayed clear dope is sufficient to make them permanent.

Jack Hammond and Fokker triplane built from VK kit. He added fine details from information obtained from the Smithsonian Institute.

Corner Caper: Because of its realistic appearance and fuel resistant qualities, butyrate type dope has been one the most popular finishing materials for modelers since they first discovered it in army surplus stocks after WWII. It has one irritating characteristic, however. When sprayed into a corner, such as a finfuselage juncture or a small radius fillet, it is likely to pull away the dope film from the surface during drying, leaving an unsightly blister. This is because the last coat has softened and loosened previous layers and the shrinking tendency of the outside pulls up the base before it rehardens. So one way to avoid the problem is simply not to ever get the top wet enough to melt the base. Spray on a number of very light dusting coats instead of a few heavy wet coats. Allow full drying and cure time between coats. (It's tedious!) If it is a very sharp corner, mask off one side and completely finish just one side, then remask and do the other.

BILL BOSS ON CL

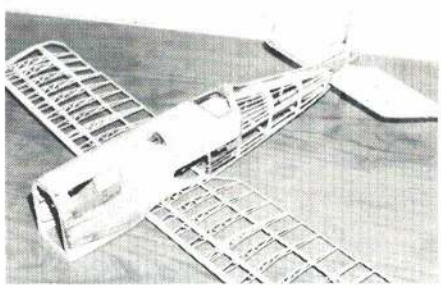
Spinner Troubles?: Williams Bros. issued a report concerning a problem with their Twist Lock Spinners. Modelers, especially those using electric starters, have been experiencing an unlocking of the spinners. It was discovered that the unlocking is caused by the use of the electric starters rather than a fault in the spinners.

Williams Bros. states, "In all cases to date we have found that the engine was started with wide open throttle. This allows the engine to exceed the speed of the starter, and the drag unlocks the spinner and it comes off. We had assumed that all experienced modelers would know that an engine start more quickly on low throttle and with less wear. We have been using these spinners for the past eighteen months, with and without starters, and have never lost the front cap from normal operation."

Another problem which may contribute to the unlocking of the spinner was pointed out in the Williams Bros. report: The prop slots are not being trimmed to completely clear prop blades when required, causing the spinner to warp out of shape.

To sum up, trim prop slots to clear prop blades when required, start engines with minimum throttle setting, or, if engine is started on high throttle, remove electric starter as soon as engine fires.

The weathered look adds the final touch to John Glab's P-51-D Senior winner in CL Scale at the 1970 NATS. Dark streaks on wings and fuselage behind exhaust stacks (result of machine gun firing) add realism to the model. Ken Moore's S.E. 5a built 3/4"-1' scale features exact scale construction throughout. Model will have working cockpit controls, and is to be powered with a TD 049.



Weathering: Want an easy way to get that realistic look around exhaust stacks, gun ports, and over certain areas of the wings and tail surfaces? Well, Jerry Farr suggests using red and black soft artists pencils which sell for a few cents each instead of comparatively expensive airbrush equipment.

Start by applying lines or streaks around the gun ports or exhaust with the black pencil. Be sure the streaks are applied in the place and directions following the airflow (over the wing and fuselage) that is created when the plane is in flight. Rub out the streaks with your finger (dry) to fan out and feather the edges until the desired effect is achieved. If you don't succeed the first time, the pencil markings are easily removed for another try. After the black has been applied to your satisfaction, you might want to add just a touch of red, especially at the exhaust

(Continued on page 76)

Pitts Special

THE FEEL OF WIND IN YOUR HAIR AND GREASE ON YOUR FACE. / by Don Berliner

Today, out in the wide open spaces of Wyoming, there's an airplane factory where they build nothing but open-cockpit biplanes! The last biplane of the two-seat, open variety produced in the U.S. was the Stearman PT-17 trainer, built for the Army Air Corps during WWII. Then a whirlwind of progress swept these jolly airplanes into history, and low-wing, all-metal, closed-cockpit, retractable landing gear types took their place.

It wasn't a case of change simply for the sake of change, however. If young Aviation Cadets were to learn to fly superfast jets quickly, the training program had to be brief or they'd never get finished. The Stearmans were sold as surplus and the newer Cadets never experienced wind in their hair and oil on

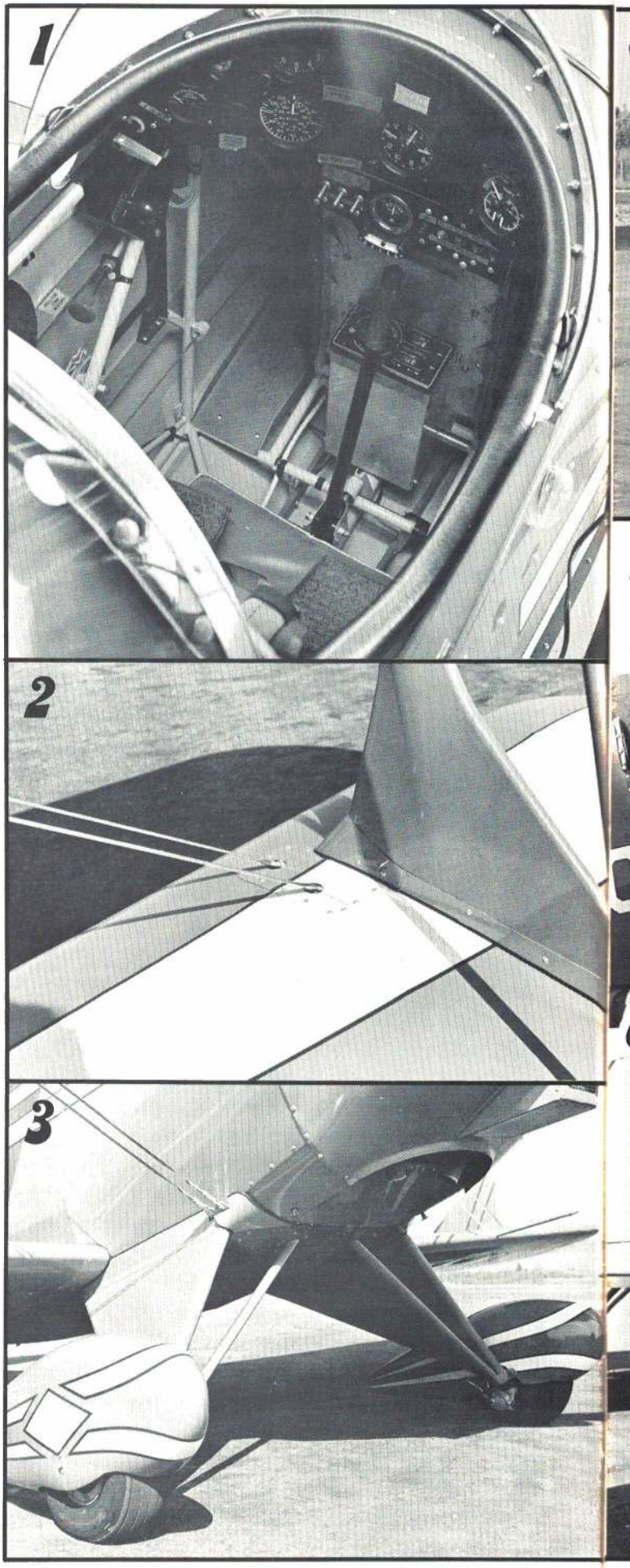
their faces. There was no point in showing them how much fun flying could be—they were being trained to fly airborne computers and it was all business.

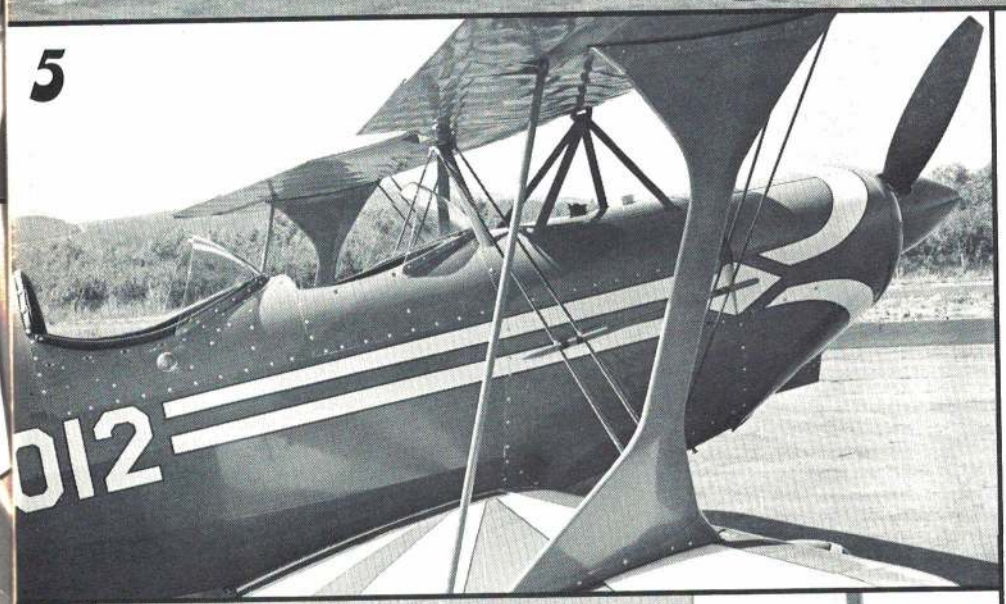
Those who wished to fly without canopies, but with two wings, had to be content with old airplanes. It wasn't such a bad idea though. There were many fine old birds around: Wacos, Meyers, Fleets, Great Lakes, Travelairs. The heyday of the biplane was obviously past; those old-timers would probably remain paramount in the development of the breed. The frontiers had moved on. People wanted speed, comfort and smooth flying.

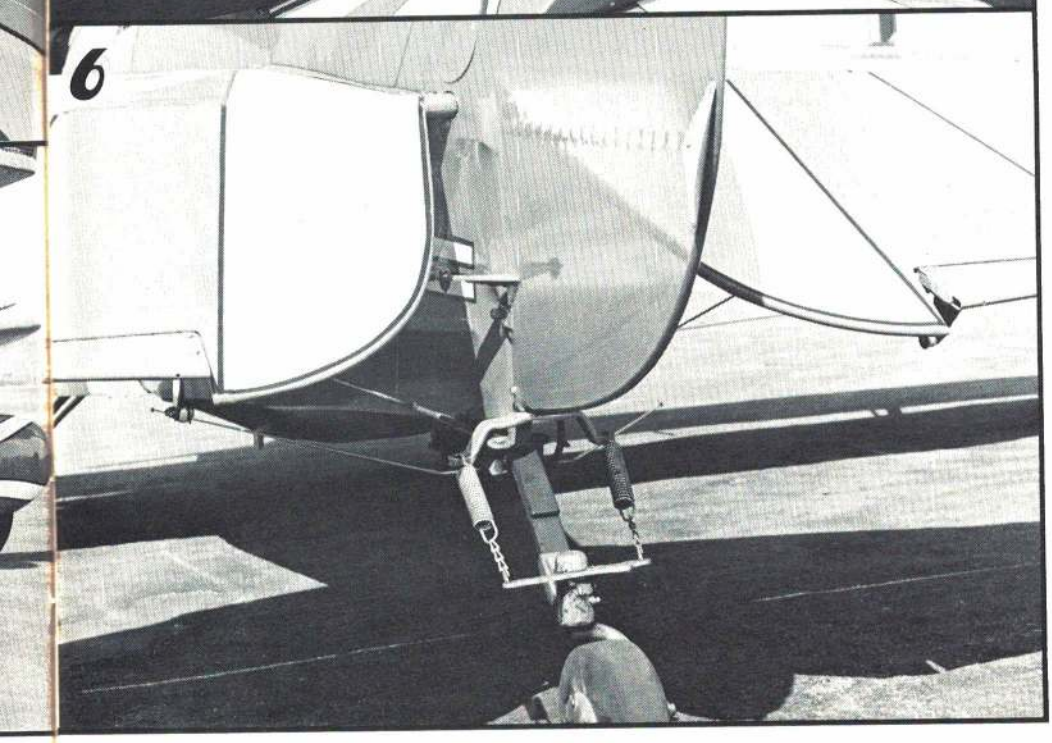
Well, not quite everyone. As the 1950s dawned and a monstrous war became a bad memory, a few people began to think about flying for fun, in addition to flying for business and defense. As these few grew in number, the homebuilt airplane movement began and the happy biplane was reborn. The late Frank Smith built his "Miniplane," Ralph Mong his "Mong Sport," and Lou Stolp his "Starduster." And in an early issue of EAA's *Experimenter* magazine, a reader asked if anyone knew how he might contact a man named Pitts who had built a tiny two-winger.

Gradually, fliers remembered—or learned for the first time—that open-cockpit biplanes were more fun to fly than the newer styles of lightplane. They sent for plans and began to build their own airplanes because that was the only way to acquire a new sport plane. The factories were busy making side-by-side cabin planes with (ugh!) tricycle landing gears. They weren't interested in the old way. As they saw it, aviation had grown up during WWII, and anything smacking of the old way had to be the wrong way.

Factories must be concerned with factors like supply and demand if they are to stay in business. Individuals do not. If you want a biplane for yourself,







1 The clean and simple cockpit and controls make this a great plane for the sport flier. But look out! It has also been flown in world competitions.

2 Workmanship is of prime importance to Curtis Pitts. He produces only two Specials a month to keep the fun and craftsmanship on a high level.

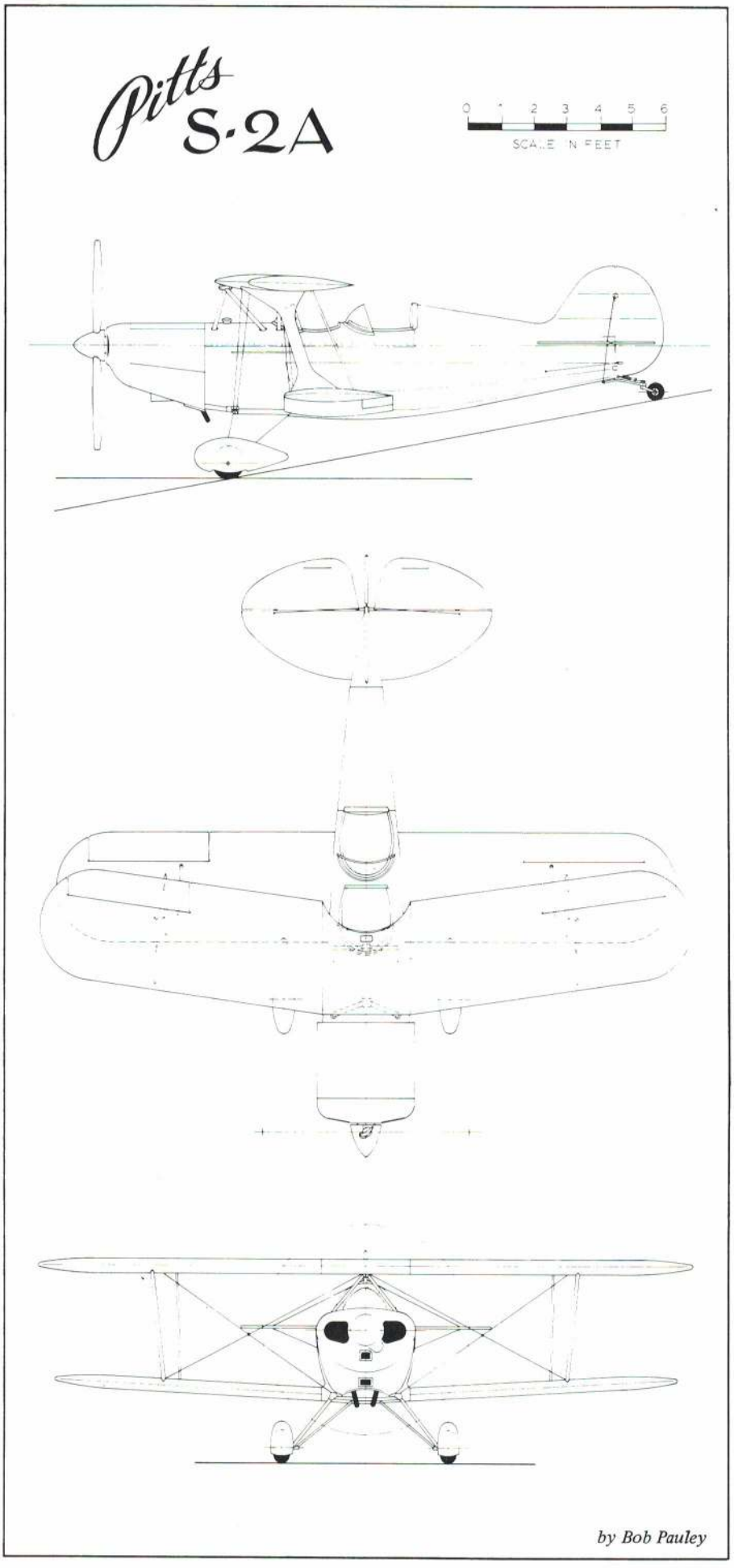
3 Tricycle landing gear! Note how the exhaust is vented from the bottom of the cowling.

4 Even from the rear, the Pitts Special is distinctive. It has been a crowd pleaser wherever it appears.

5 Smacking of the old Tub-seater trainer, the Pitts Special is a step back into the days when flying was all fun.

6 This rear view shows the control lines and strength of the tail-wheel. This is just about the greatest plane for the amateur aviator.

Photos courtesy of Kraft Systems



by Bob Pauley

you simply build it. That's how it is with a hobby.

That was also the case with a slim Southerner named Curtis Pitts. He built a little biplane in the mid-1940s to prove that anyone could build an airshow machine that was better than most of the lumbering craft he had seen. The first Pitts Special was powered by a mere 55 hp Lycoming engine, but otherwise bore an amazing resemblance to its grandchildren turned out by amateurs all over the world almost 30 years later. It was a fine little airplane to fly, but in 1945 Curtiss was short of money and sold it to the first man who came along with cash.

The new owner wrecked it two weeks later. Soon afterwards, Curtis built his second Special, this time upping the power to a fuel-injected 85 hp Continental engine. His long-time cohort, Phil Quigley, flew it in airshows for almost two years before it was sold to young Betty Skelton. She named it "Little Stinker" and flew it to fame.

Two more Pitts Specials were built in the late 1940s: One for Caro Bayley, and a larger, much more powerful Pitts called "Samson" for airshow pilot Ben Huntley. The 1950s was a slow period for airshows and aerobatics, even though homebuilts had been legalized and were increasing in number. Pitts spent most of his time running a crop dusting business in Florida, rebuilding Stearmans, and thinking about building better little airplanes. A few Pitts Specials were built during this time by men who hounded Curtis for drawings, sketches and advice, and other soon-to-become-famous homebuilt designs were produced in the same manner.

It wasn't until the great Bob Herendeen flew his Pitts N66Y in the 1966 World Aerobatics Championships in Moscow that the world took notice of this truly outstanding airplane. The homebuilders flocked to Pitts's door, and he had no choice but to draw up plans and sell hundreds of sets to builders on every continent! The flood of Pitts Specials was now in the making.

Not long afterwards, work began on what was to become America's first production two-seat biplane in several decades, and the finest aerobatics trainer of all time. In 1966, Curtis sold his crop dusting business (by this time located in Homestead, Florida), to devote all his time to his very special airplanes.

The first result was the "Big Stinker" (N22Q) completed just in time to fly to Rockford, Illinois for the annual EAA bash. To an airport full of Pitts's friends, the new, bigger airplane with its symmetrical airfoils and four ailerons was an exciting new homebuilt, but probably not much more.

To Curtis Pitts, however, the new model was a major step forward. His long-range goal was FAA certification of a full aerobatic craft for production. Five years later, after overcoming countless obstacles (not the least of which was a communication problem between an easygoing airplane maker and the FAA brass in Washington), the certificate was granted. In summer 1971, the

(Continued on page 90)

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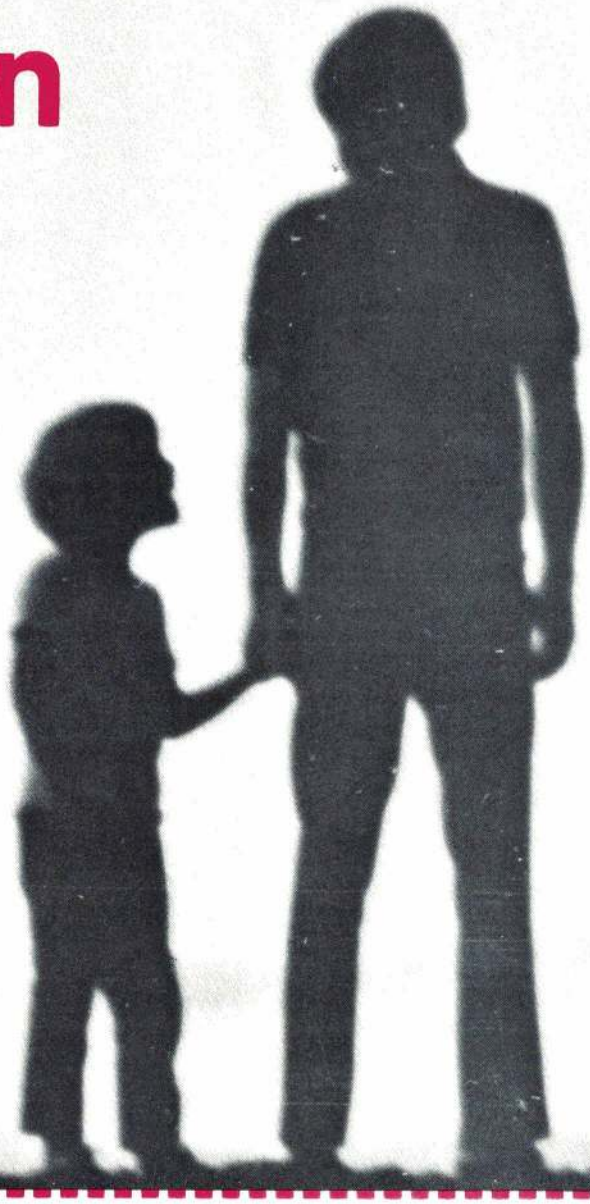

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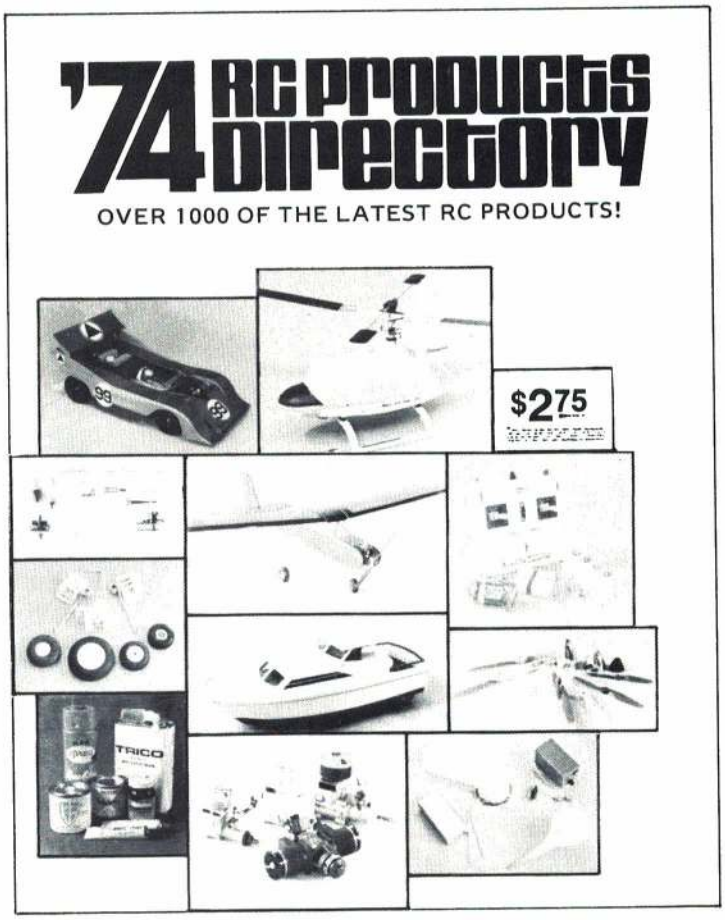

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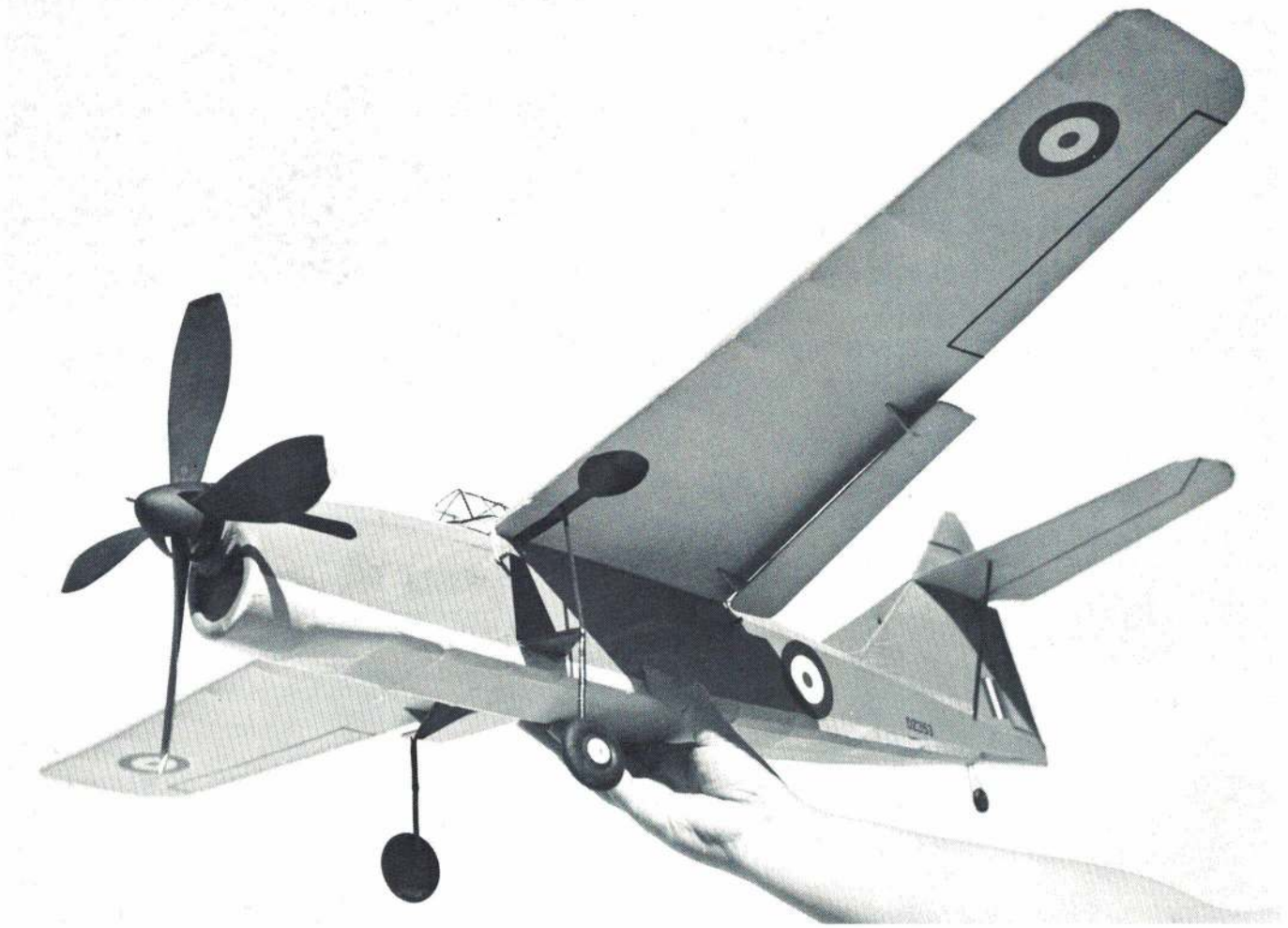


AN ALMOST TO SCALE RUBBER-POWERED MODEL.
by J. W. Headley

The Fairey Barracuda was designed originally to replace the Albacore and Swordfish biplanes. Strangely enough, it was the first monoplane torpedo bomber to be used by the Royal Navy. The Swordfish and Albacore didn't seem to want to be replaced, however, so the Barracuda actually saw little wartime service as a torpedo bomber. Modified gradually during the war, the final version was the T.R. MKV, produced in 1945, which is the subject of our model. This version had the distinctive square wing tips and large dorsal fin.

Our rubber-powered version of this aircraft deviates from true scale in tailplane size (we added a little more area), dihedral and propellor. Although an ungainly looking aircraft on the ground, especially with its wings folded, in the air it looks quite good. We had originally planned a retracting undercarriage for the model, but it became a little too complex, and a little too gimmicky, so the idea was dropped. If you want more of a duration type model, just leave off the U/C altogether.

Construction of the model follows the usual rubber model lines, and should present no problems for the experienced builder.

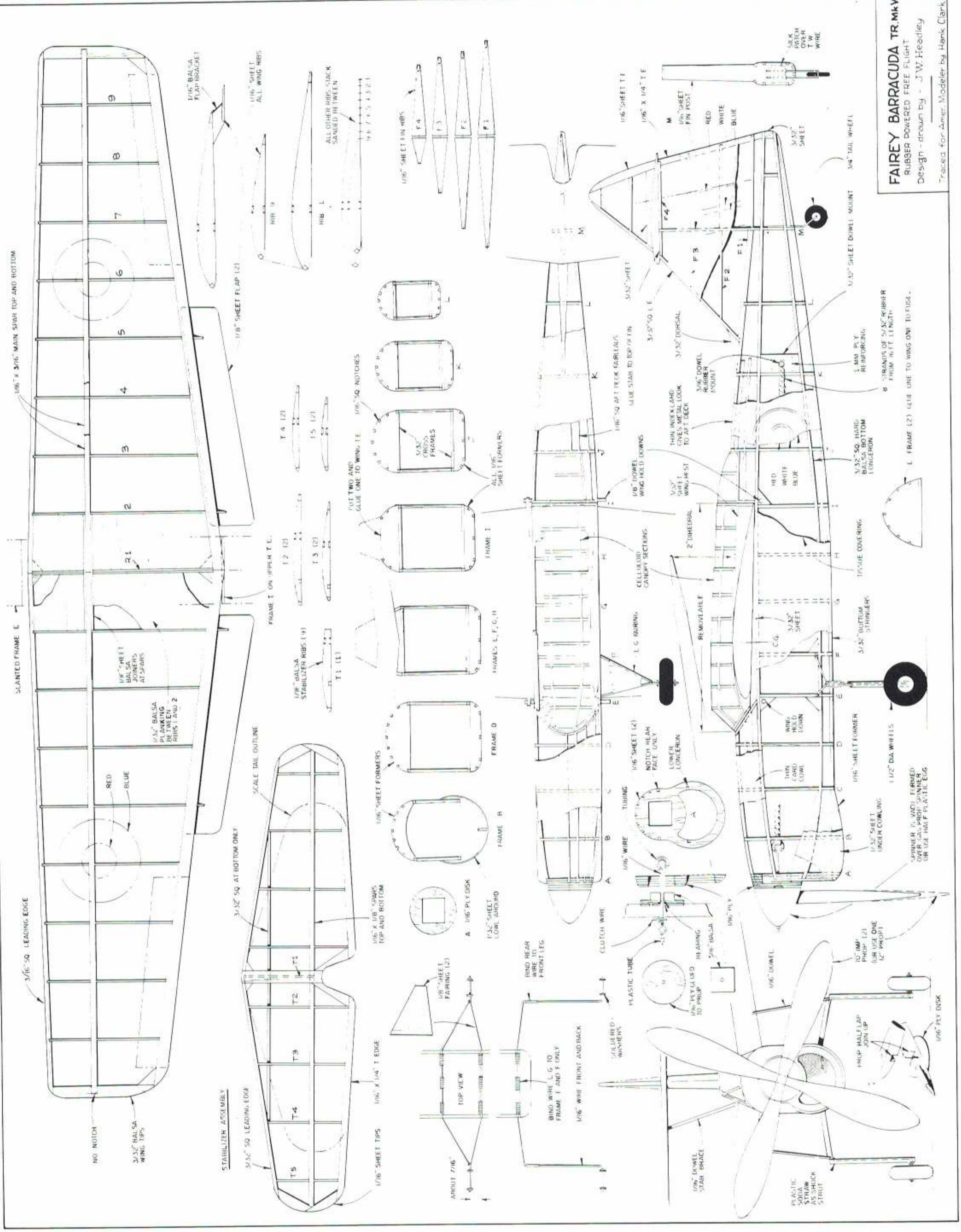
Construction

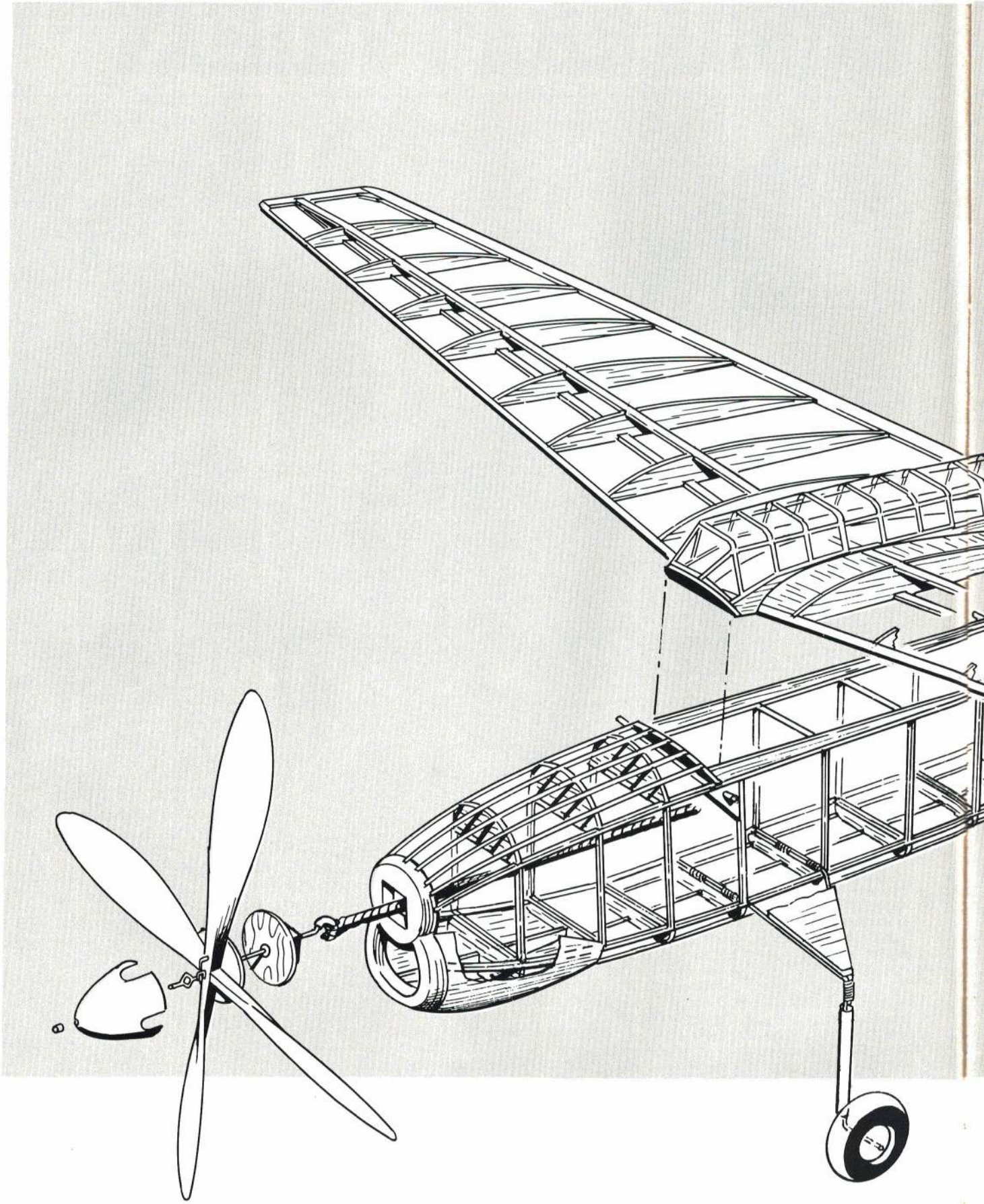
Wings and Tail: Being by making templates for the root and tip ribs and sufficient blanks for the intermediate ribs. Clamp these together and sand the blank ribs to the correct profiles. While still in the block, cut out the slots for the spars and the leading edge.

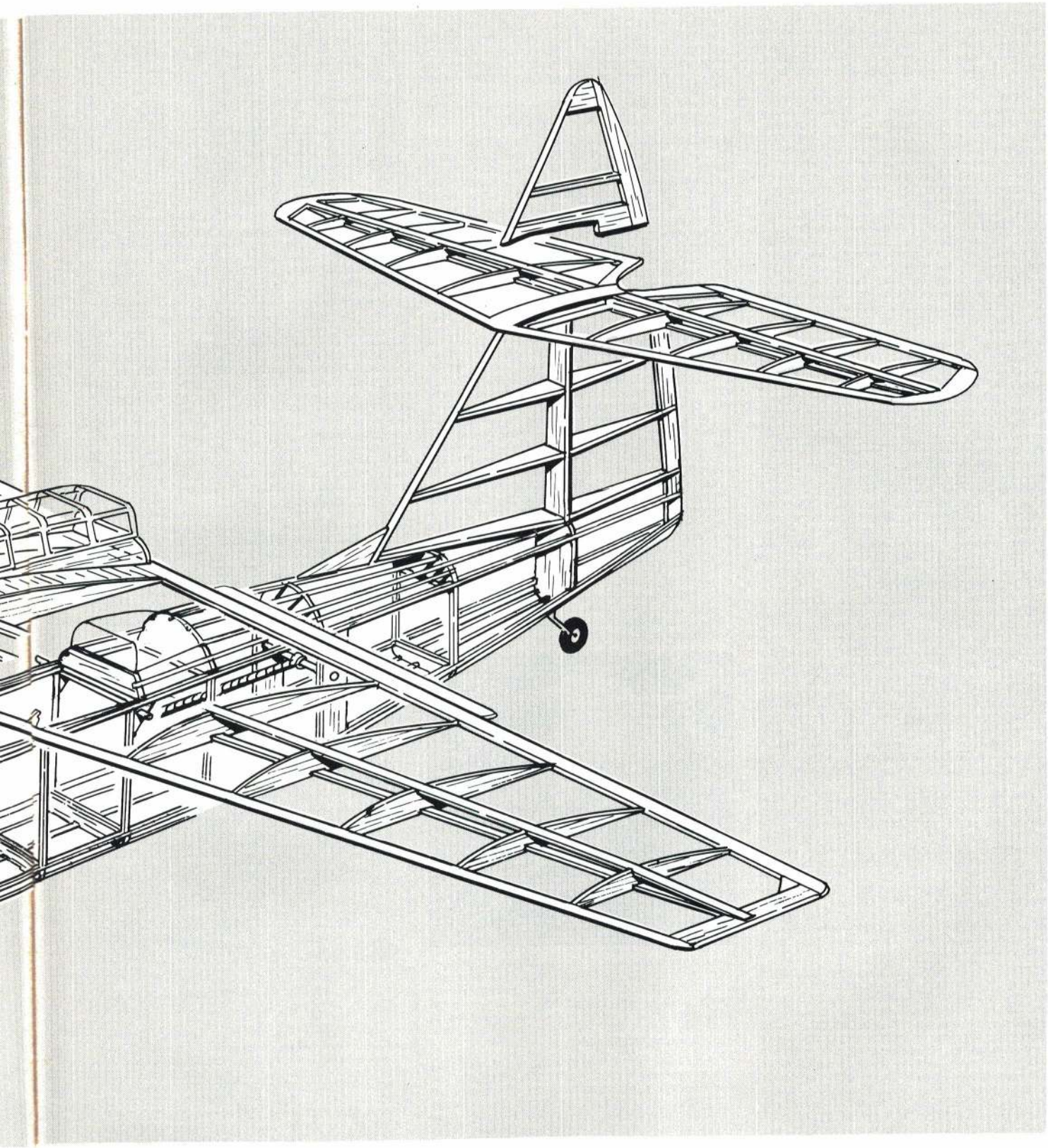
This operation is done twice, once for each set of ribs. The second block should be the opposite shape so that the bevels on the ribs are correctly aligned. After breaking open the blocks, lightly sand each rib individually to remove any sharp edges.

The wing spars can now be laid down together with the trailing edge. The complete wing is initially made in one piece, the spars are then cut at the centerline to give the correct dihedral. For this reason the center rib is not glued in place until after the dihedral braces have been added. So after all the ribs have been cemented down add the upper spar and leading edge, cut and add the dihedral braces, add the center ribs and the center section sheeting.

FULL-SIZE PLANS AVAILABLE—SEE PAGE 84







The wing can now be covered with jap tissue. Water-shrink and give one coat of clear dope.

The fill-in structure around the cabin area is constructed after the fuselage and wings have been completed. With the wings in place on the body, trim the slant frame and the upper frame to the correct height, and attach. Fit and cement in place the 1/16" sheet pieces that support the canopy. Two pieces of 1/16" square are now cemented on top of the wing as reinforcing pieces for the inside of the canopy.

The wing can now be painted in the appropriate colors. At this stage the flaps are constructed from stiff 1/16" sheet, painted and glued to the wing. The canopy can now be attached.

The tailplane construction is similar to the basic wing assembly except that the ribs can be cut out from the patterns shown on the plan. Next the upper fin structure is made and cemented to the tailplane after covering with Jap tissue.

Fuselage: The basic fuselage is built in the "classic" rubber model style. Select four, similar, hard longerons and make the basic fuselage box from these. While this box is being built, cut out the various frames and prepare these for the stringers. When the fuselage box is satisfactory, bind and cement into place

(Continued on page 89)

CARL MARONEY ON RC

What's In The Future: As a diehard soaring enthusiast who has been active in the soaring movement since it started in 1968, I believe it is time to review our growth and consider our future.

Within the past five years several organizations have been formed to advance soaring representation and activities. The League of Silent Flight (LSF), organized by West Coast modelers in California, has undertaken to develop a worldwide organization which will recognize individual proficiency and accomplishments through a defined program of standard performance criteria for RC sailplanes. The LSF is managed by an executive board consisting of a President (currently Le Gray), Vice-President, Secretary, Treasurer and National Chairman, selected and elected from the LSF membership. The LSF has no membership dues or fees, holds no general meetings, assigns no responsibilities and imposes no obligation for membership. There is no regular publication for communication to its members.

The East Coast Soaring Society (ECSS) is a society of independent fliers and mainly East Coast RC clubs who are interested in RC sailplanes. The governing body consists of nine ECSS members with three new directors elected yearly. Membership has grown beyond the East Coast. This expansion is due to the organization's publication, *Sailplane*. (Effective communication is the most important tool to attain success of any organization.) Through the publication, members are kept up-to-date on soaring activities from around the globe, and technical articles on thermals, winches, aerodynamics, towing methods, construction articles on winches and experimental designs. Current news on AMA and FAI proposals, rulings and meetings, and many other items of interest to the soaring enthusiast are also reported.

In addition, ECSS operates a soaring program to coordinate a season schedule with interested clubs or soaring groups who host thermal soaring meets using standard rules and operating procedures for competition flying. A member's proficiency is determined through a percentage point system. At the close of the soaring year the member with the highest score receives champion recognition.

The sole existence and growth of both LSF and ECSS has been through the voluntary efforts of interested modelers. Many members of one organization belong to the others simply because each has something to offer.

The Silent Order of Aeromodeling Club (SOAR), based in Chicago, Illinois, is much smaller than LSF or ECSS; however, it is extremely strong in leadership. SOAR members have worked diligently for three years to give soaring national recognition by hosting an unofficial NATS.

The Mid-America Soaring Society was founded last year in the Omaha, Nebraska area to organize and run a soaring program similar to ECSS. Dozens of other smaller soaring groups throughout the country hold local soaring meets frequently.

Effective January 1 of this year a Soaring Advisory Committee was established by the Academy giving each AMA district one representative to function with other committee members to review soaring matters for the RC Contest Board and submit unified proposals for consideration. This advisory committee is suffering to date because there is no committee leader to coordinate the efforts and establish a defined charter with the AMA. Three proposals on RC Soaring Rules are currently being reviewed by the RC Contest Board.

Insufficient time and poor (SAC) organization has placed the rules action in a very precarious position. The most important rules action pending at this point in time is to change the current AMA rules from provisional to official status. Preliminary votes cast by District RC Contest Board Chairmen indicate a tentative acceptance. Acceptance is very important at this time, regardless of the many differences in soaring views. Without this change, soaring will never acquire a NATS status. We have too many activities throughout the country all going in different directions and each struggling with its own problems, consequently, progress is sure to be slow.

What is really needed is one National RC Soaring organization with chapters consisting of either soaring groups or soaring members in an existing RC Club, a publication to provide the communication link and a consolidated effort of manpower. We, like the National economy, are suffering from an energy crisis and it is imperative that we take definite steps to change.

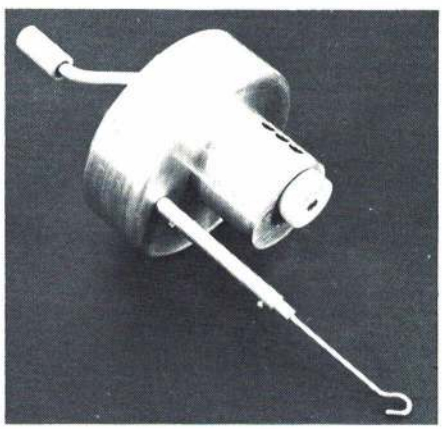
BOB MEUSER ON FF SPORT

Spotters' Manual Continued: The Condor 800 is rarely seen outside Southern California since it is available from only one source: Hobby Fair, 7212 Vassar Ave., Canoga Park, Calif. 91303. (Kit, $13.95 plus $1.50 postage. Plans, $5.50 plus 50 cents postage. California residents add sales tax.) Designed by Don McNamee in 1964, it has been flown by Toshi Matsuda, Bob DeShields, Lee Hunt and Scottie Harte. It took first place in Class B Open at the last California NATS in 1967, and has enjoyed a good track record at major Southern California meets over the years, flying in Classes B and C, and more recently in Class D with a K&B 41 Stroker.

The Satellite 1000 is now available in kit form from Bill Hunter, 9486 Sandusky Ave., Arleta, Calif. 91331. ($24.00, plus $2.00 postage and handling. California residents add sales tax.) The kit contains 130 pre-cut parts, but does not contain standard-size stripwood.

A kit of the ½A Satellite is soon to be released. We do not show a drawing, as one has already appeared in this column—April 1972 **AAM**—and a construction article appeared in the May 1972 issue. Plans of the 1000 are available from **AAM** Plans Services. (Plan No. 0521, $8.50.) The Satellite was awarded a 1973 Model Of The Year Award from the National Free Flight Society, and its list of major wins and records continues to mount. At this writing the various Satellites hold nine national AMA records!

Wilder Than Ever: We showed Bob Wilder's wild Wakefield winder and his equally wild torque meter earlier (September 1972 **AAM**). Now the Wilder Model Machine Works has produced a prototype indoor winder of the

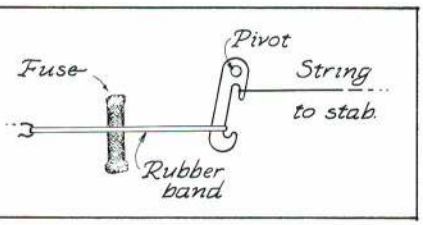


same high quality of workmanship and design. The ratio is 20, precision ball bearings are used throughout, and a turns counter is provided. The Wilder Works has no plans to go into production, but if it does, we predict that the price will be very high, and the winder worth every cent.

Tissue Grain: Which way should the grain of the tissue go? Horizontally or vertically on the fuselage sides? Spanwise or chordwise on the wing? According to *Satellite*, San Valeers FF Club newsletter, John Ferrer claims that the grain should be vertical on the fuselage sides for greatest stiffness. To prove the point, he exhibited fuselages covered both ways at a club meeting.

Every wing I have noticed has the tissue applied with the grain running spanwise. I have asked several modelers why they do it that way, and the answer invariably has been, "Because the tissue sags less between the ribs that way." I have always run the grain *chordwise* for the same reason. Tissue shrinks more across the grain than with the grain—I'm sure of that, because I have measured it. So apply the tissue with the grain running chordwise, and it shrinks spanwise. And, when you cover a wing, which way do you pull the tissue to minimize sag? *Spanwise!* Comments?

Stronger Fuse Dethermalizer: Also reported in the *Satellite* is the method used by Bill Hunter to ensure that the huge stabilizers of his Satellite 1000s stay put. The simple lever shown in the sketch multiplies the force of

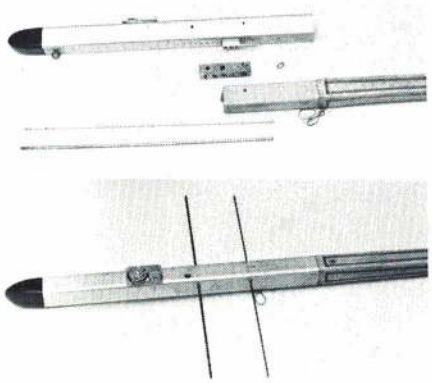


the DT rubber band by more than three. One could simply use a stronger rubber band instead, but if the fuse is squeezed too much, it often extinguishes without burning through the rubber.

Finishes: The idea of using dye for coloring dope has been passed around the country from newsletter to newsletter. Here are some recipes used by Steve Fauble of Macomb, Illinois, to impart a transparent MonoKote look to white tissue. Machinists' dye comes in red and blue. (It is the stuff they apply to a metal surface to make scribed lines stand out; Dye Chem is one brand.) Add about one oz. to a pint of clear dope, or use the dry type regular Rit dye. Add one package of dye to ½ pt. of clear dope, strain, and add two oz. of that solution to a pt. of clear dope. These work best when sprayed. If it is applied by brush, successive coats should be brushed on at right angles to each other.

I have used "universal tinting colors," available at paint stores, for coloring clear dope. Avoid "colors in oil"; the oil might affect the drying of the dope. A wide variety of colors are available. The result is a dull matte finish that doesn't draw attention to poor workmanship as much as a gloss finish. If a glossy finish is desired, cover it with a thin coat of gloss dope or other glossy clear finish.

Simple Nordic Glider Fuselage: Many Nordic fliers nowadays use round aluminum tubing for the front end of the fuselage and a tapered rolled balsa tube for the tailboom. Several have been shown in this column. Making one is often beyond the capability of anyone who is not a virtuoso of the metal-turning lathe.



Don Edson found that square tubing, available in many hardware stores, solves many of the problems. It matches up nicely with an easily built square tailboom. Wing wires are simply inserted through holes in the tube wall, and the wing root ribs fit neatly against the flat sides. Bottom is tapped for a range of tow-hook positions. Timer is simply inserted into a hole cut into the side.

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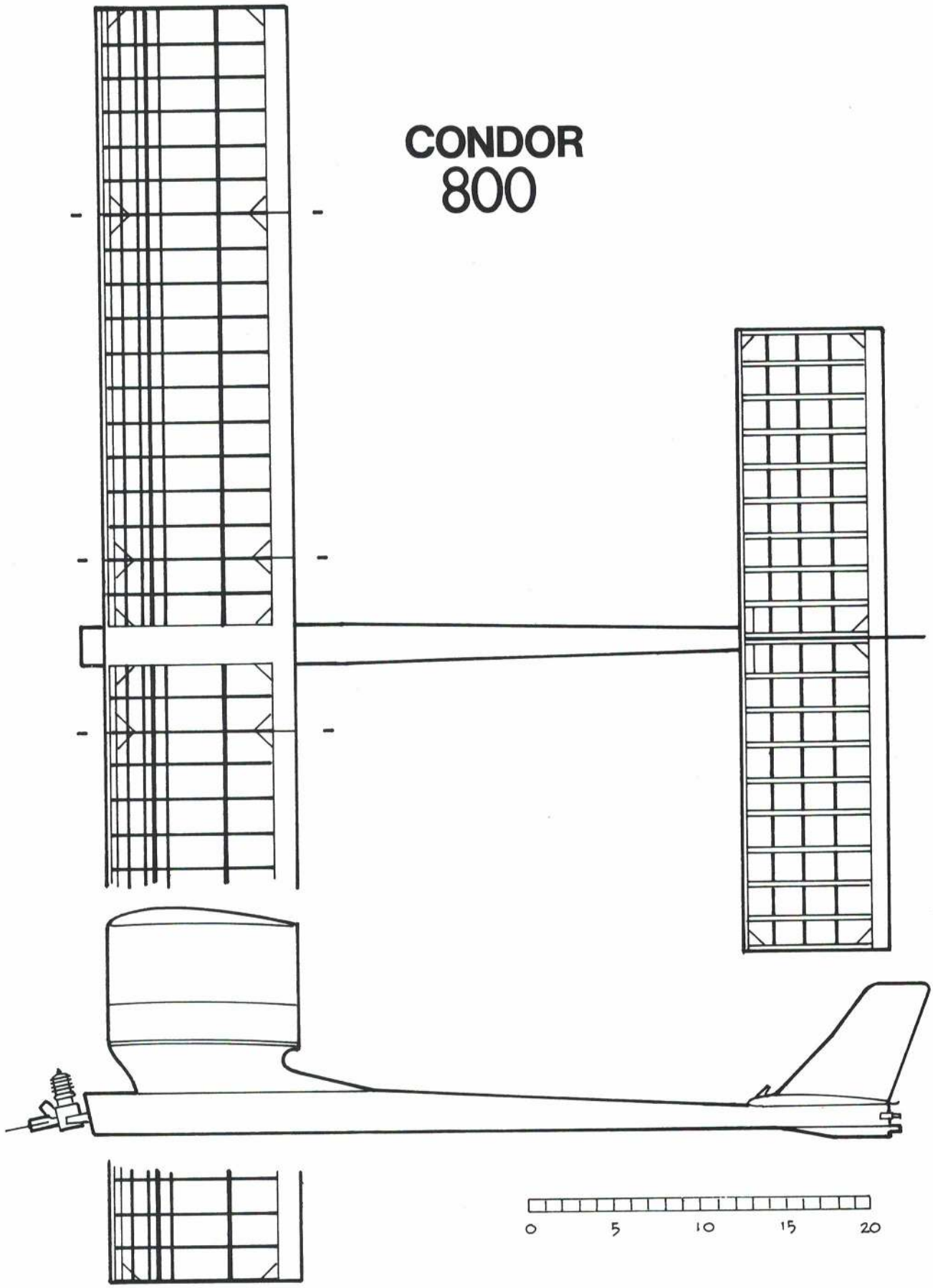

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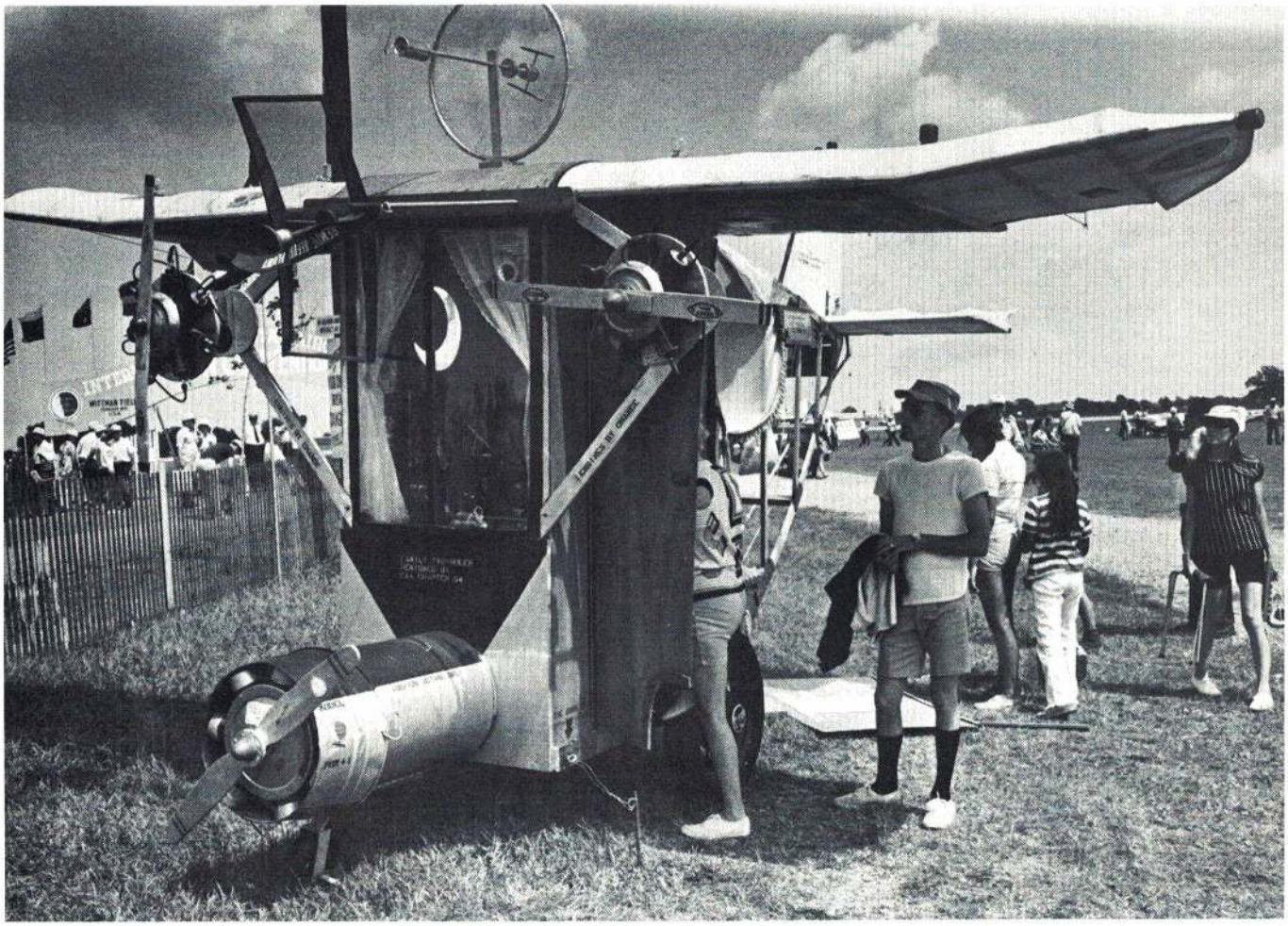


Chapter 64 two-seater outhouse did fly about four ft. at the NATS—in a thunderstorm. *(Photo courtesy of Oshkosh Daily Northwestern.)*

Maybe scale modelers should be banned from the EAA Fly-In at Oshkosh—for their own good!

The variety of interesting airplanes might be too much to cope with. Faced with almost 400 different homebuilts, plus examples of most of the vintage and classic lightplanes built in the U.S., the eager modeler could easily extend himself too far. In attempting to take detailed notes and measurements of everything, he could fall victim to his own enthusiasm and end up, spent and discarded, like an old Bede brochure.

The massive annual EAA event can pose more problems than it solves. The member who is trying to decide what kind of airplane to build, can leave for home farther from a decision than when he arrived. So, too, for the scale modeler. You say you've firmly decided on an open-cockpit biplane? Great! That narrows the choice down to *only* 18 different kinds of homebuilts and 15 kinds of vintage and classic open bipes at Oshkosh in '73. And while some of the rarer old Wacos offered a single example to study, measure and photograph, others such as the Pitts Special gave a choice of as many as 45 examples.

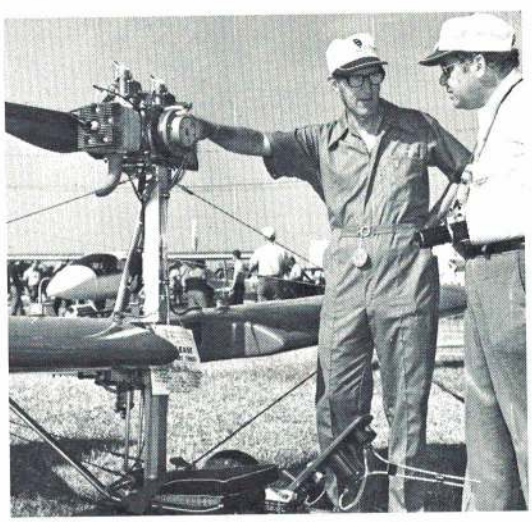
Something obviously must be done to simplify the situation; or we run the risk of overtaxing the enthusiast so that it all dissolves in a swirl of shapes and colors. In the name of sanity, let us offer a few airplanes to those who would build a scale model of something that was at Oshkosh in '73.

At the extreme high end of the speed and sophistication scale was the brand-new BJ-520. A sleek, powerful machine designed to cruise at high altitude on long cross-country flights, it added a new dimension to the homebuilt movement. Owner/builder Dr. B.F. Brokaw made it clear his airplane was not aimed at the average homebuilder, though plans and materials kits are being offered for sale.

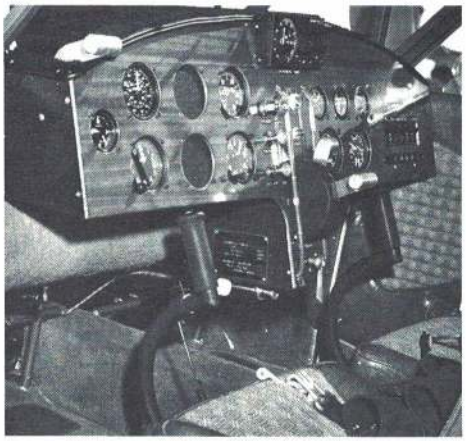
1973 EAA INTERNATIONAL CONVENTION:
A SCALE MODELER'S DREAM - OR NIGHTMARE.
by Don Berliner

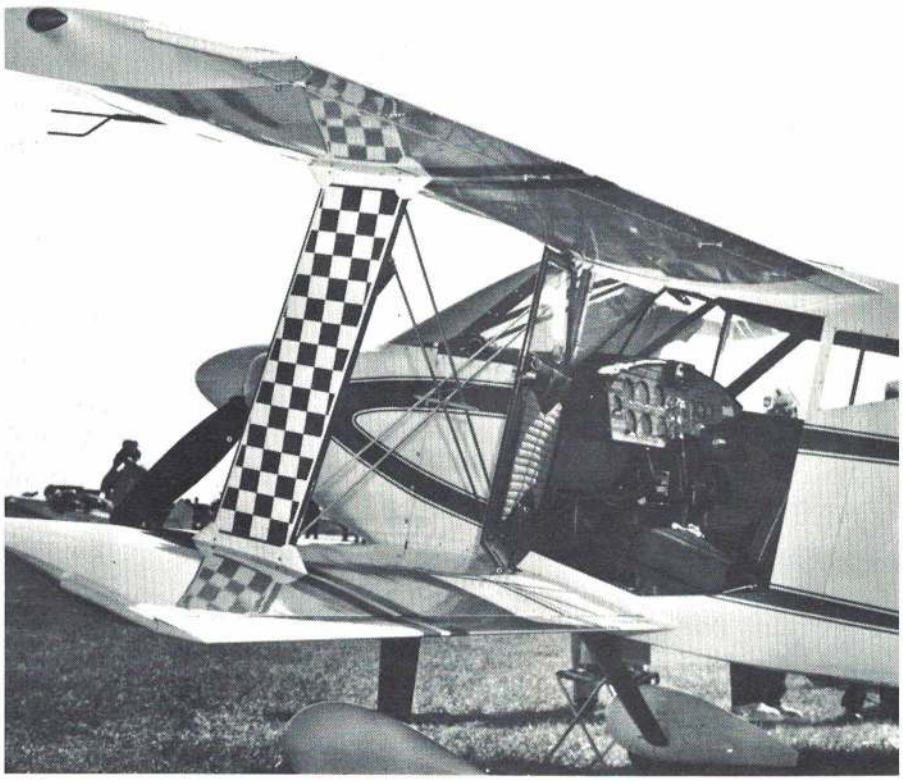
Above left: The BJ-520 is a powerful low-wing homebuilt. It is not for the average builder. Above right: Dr. Brokaw's BJ-520 is a two-seater. Because of its characteristics, it is not the best plane for the strictly amateur flier. Left: Dr. Brokaw's background as an ex-Navy pilot is evidenced by the highly detailed cockpit area. Far right: The PDQ-2 drew a crowd during the entire show.

Right: Wayne prepares to take off with an engine that will cruise at 70 mph. Below: Wayne Ison's PDQ-2 is a study in simplicity. You can even use a discarded engine for power. Below right: Wayne discusses the engine—a snowmobile engine—with the author.



Above: The Sorrell Hiperbipe, just one of Hobie Sorrell's creations. Right: All the comforts of home. Even a padded dash and carpeting on the floor. Below: The closed-canopy two-seater cruises at 155 mph. . .in comfort.





With retractable tricycle landing gear, a three-bladed prop, a supercharged 285 engine and an instrument panel loaded with the exotic gear needed to travel high and fast, the total cost of the BJ-520 approaches $30,000. Dr. Brokaw obviously wants performance, and so has been willing to sacrifice economy. As an ex-Navy pilot, he is used to the characteristics of planes with high wing loadings, so the BJ-520's 37 lb./sq./ft. doesn't bother him as much as it might a Cub pilot, used to just six lb.

Design of the dark blue speedster was begun in September 1966, construction began the following January. The first flight was made November 18, 1972. A major flaw in computing the CG was corrected by extending the engine mount almost 18 in., and from then on the airplane flew the way it was supposed to: Cruise worked out to 220 mph at 10,000 ft. and an amazing 300 mph at 20,000 ft. It can take off over a 50 ft. obstacle in a very reasonable 2500 ft.

Empty weight is 2020 lb., and gross is 2907 lb. Area of the 20 ft. 6 in. wings is a mere 78.3 sq. ft., For more information, contact Dr. B. F. Brokaw, Rt. 3, Box 58-B, Leesburg, Fla. 32748.

If the BJ-520 is too much, try going to the other end of the performance range with the PDQ-2. Designed along the lines of the open-work Breezy, it offers strictly-for-fun flying at just about the minimum imaginable cost—estimated at $350 with a used engine or $525 with a brand-new engine.

At first glance, Wayne Ison's little bird looks too small to be a serious attempt at an airplane. No more than half the size of a Breezy, it has even fewer of the comforts of home, being about as simple a flying machine as could be trusted to get one off the ground and then back down according to plan. Yet the quality of construction and the owner's serious attitude point to an airplane which could become

(Continued on page 85)

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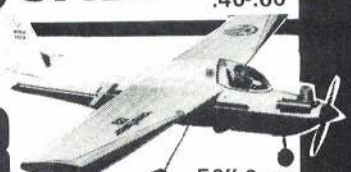

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TATONE		
Engine Testing Unit	$ 5.25	$ 4.99
AMA flying handle	$ 1.95	$ 1.67
Hinge-it cutting set	$ 2.95	$ 2.76
Glow Plug Starter	$ 8.25	$ 6.47

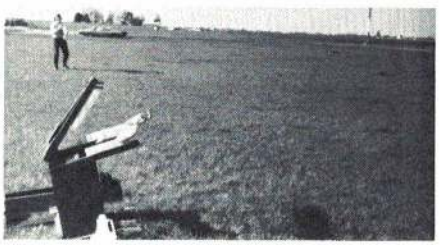
SPECIAL INTEREST

HOWARD RUSH ON COMBAT

Supertigre Shafts: The Supertigre G.21 35 has been the most popular Combat engine for several years. Its weakness is its crankshaft, and keeping these shafts together is a problem. I can't offer a sure cure, but here are some ideas. (1) Don't loosen the fit of the rear bearing in the crankcase. Heat the case in the oven to change bearings. If the rear bearing does become loose, hold it in place with Loctite or epoxy. (2) Don't hog out the hole in the shaft. If you must grind it inside, put the shaft on a lathe and grind the hole with a tool post grinder until the bore is smooth. (3) Balance the props. (4) Open the hole in the case where the shaft runs. Use rubbing compound on a small felt wheel with a Moto-Tool.

We are on the trail of a heat-treat process that will solve the problem for sure. In the meantime, good luck.

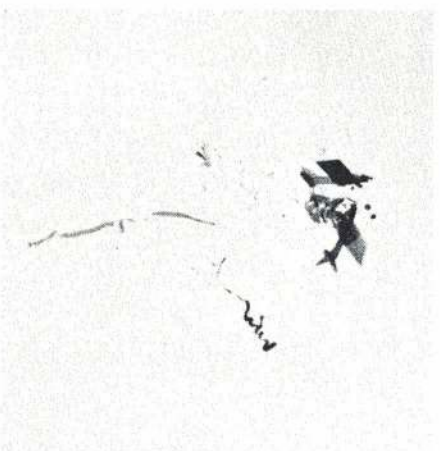
Steve's Machine: Steve Fauble lives out on the prairie in Illinois, miles from the nearest pit crew. So he made his own. His launcher holds the plane in foam rubber jaws and lets go



when Steve pulls the string from the center of the circle—or when he trips on the string on the way to the handle. This machine seems to be just the thing for those of us who are embarrassed to try a new plane in public.

On Rules and Lines: AMA rules specify that Combat lines—fast or slow—must be 60 ft. long, plus or minus six in. Ready-made lines are *never* within these specifications; typically, they are a foot or two longer. At a contest, two groups of people appear—those who cut their lines to legal length, and those who leave them long. The result is bad. The guy with the long lines is the only one who can score cuts—until the guy with short lines cuts him loose and sends his plane flying into somebody's face. Safety thongs aren't the only answer. Contestants must be conscientious enough to cut their lines to legal length and contest directors must enforce line length rules.

Two Flite Streaks compete for the same piece of air at the Northwestern Championships at Eugene, Oregon. No line-length difference here.



BOB STALICK ON FF GLIDERS, POWER, RUBBER, INDOOR

Modeling Is For Kids: Imagine over 80 modeling contestants all 18 years old or younger competing in one large contest. The winner receives a $1000 college scholarship and the two runners-up win $500 and $250. The events cover all facets of flight from Rockets to Indoor, but this year's winners at the Fourth Annual Boeing Management Association Model Aeronautics Scholarship Contest were all FFers.

This year's winner, Marty Thompson, who also won last year—*and* the year before—totalled up his three-year winnings to $4000. Rick Peyran placed second, and Rick Sironen, winner of the 1970 BMA meet, placed third. The outdoor FF events are known for their diversity: ½A Gas, Unlimited Rubber, (Marty Thompson set a new AMA Senior record in this event at this meet), Hand-Launch Glider, Cargo, FAI Towline Glider, and Helicopter. But probably the most unusual special event is Design Craftsmanship. Each contestant enters a model that he has flown, and it is judged on design innovation, execution, quality craftsmanship, finish and accuracy. This event was won by an A-2 glider. It should not be overlooked that there are RC events and UC events in this meet, but this is a Free Flight column, right?

Why does the BMA do this? Their purpose is to reward and encourage excellence in designing, building and flying model airplanes and rockets. That altruistic motive should be reason enough, and it is. The project is the brainchild of John Crosetto, Jr., an old-time modeler and AMA officer (and the man responsible for design and production of the foam wing "Super Glider").

Next year will bring the Fifth Annual BMA Scholarship Contest. You should enter if you are not yet 19 years old. Your chances of winning next year's meet will be greater, too. Why? Marty Thompson will be ineligible because of old age.

Marty Thompson, winner of the BMA $1000 scholarship at the 1973 contest, launches his last unlimited flight of the day for a new Senior class AMA record of 22 min. 11 sec.

All smiles! Marty Thomson (center) first place, Rick Peyran (right) second place, and Rick Sironen (left) at the BMA Scholarship Contest held in Kent, Washington, July 7 and 8.

Pen Bladders and Pressure Fuel Systems: A letter from Jimmy Livesay prompts a few words about pen bladder or pacifier fuel systems for Power Free Flight. As a long time user of these systems, I personally favor them. My normal hookup procedure is to run the pen bladder fuel line through the timer loop directly to the carburetor fuel pickup nipple. To shut off, pinch off the fuel line which leans the engine out for a clean stop.

(Continued on page 111)

JOHN BLUM ON CL CARRIER

Which Way Proof?: It seems like a technicality, but rules are rules—which is the way it should be. There are many Carrier enthusiasts who do not have access to proof of a carrier landing of their favorite project. Where do they go for such proof? Would more modelers build Carrier models if they could prove this aspect?

A while ago, this column offered to act as a clearing house for such things, but nothing happened. Perhaps the next step is a National Association of Carrier enthusiasts who could swap information, data, plans, etc. Quite an undertaking? Only at the start! How about some volunteers? In addition to info, authenticity and reference, the group could give guidance to rules and administration. Now, we'll see where the interest lies!

With The Event: We've talked of models and gadgets, three-views, sketches, etc., but what about the event?

Newsletters tend to indicate that Carrier is strong in various parts of the country: Throughout New Jersey and New York and in Florida interest is growing; correspondent Jerry Farr of Abilene indicates high interest there; the West Coast is a steady thing; the Chicago area up slightly; St. Louis is status quo.

In all discussions of how to increase interest, trophies are mentioned. "Offer more and bigger trophies." That is usually the solution offered. Yet, if local contests are any guide, trophies are not the whole answer to increasing either interest or sponsorship.

In the last ten years, when interest was extremely high, the advent of two classes seemed quite logical. Now, as the historical aspects are reviewed, perhaps the two-class organization of Scale Carrier has outlived its usefulness. As with any event in which there exist "records," all flights could be made against the existing AMA national record flight. All entries could be flown in one event—Navy Carrier—regardless of engine displacement and could be compared to the existing record. After all, this has been done by many groups in Speed for years.

Although this would add one more administration problem—keeping track of existing

(Continued on page 112)

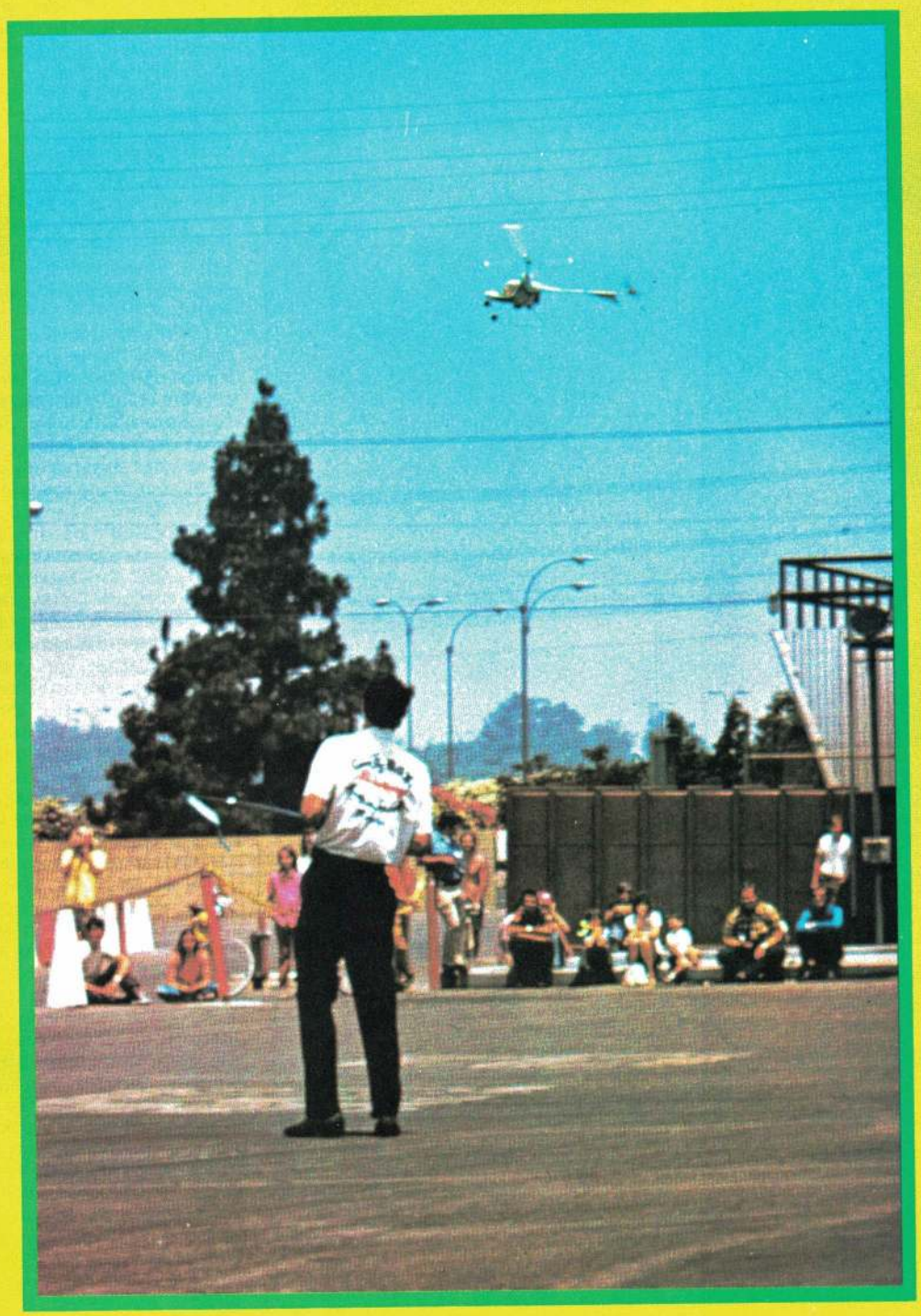
Profile F-8-U by Jerry Farr of Abilene, Texas.

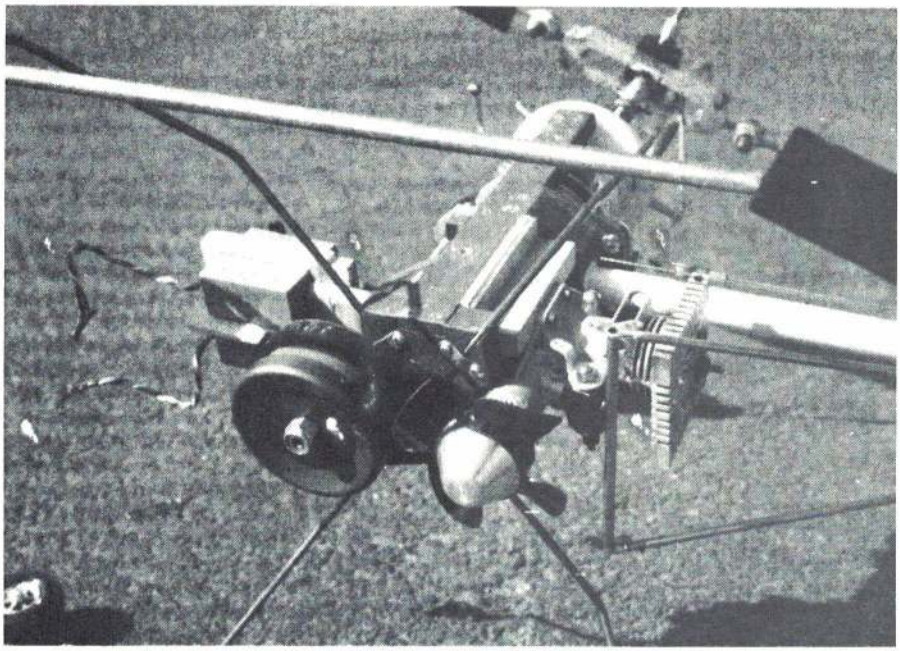
Merco 29-powered Mustang profile by Darrell Freeman of Abilene, Texas. Flaps. Note deck.

William Anderson (L) and Lee Oliver of the Abilene Naval Recruiting Station. The Carrier Display is on a trailer.

Superbird

Small 19-powered full-performance RC helicopter is simple conversion of the Du-Bro Whirlybird. It is fast, simple, realistic, and inexpensive. / by Ed Sweeney





Top: Carlin Tobin's conversion is a bit more ambitious. He made all the changes shown in this article and even fabricated his own Hughs 300 body for it. Note his use of a commercial four-bladed cooling fan and his big homemade engine heat sink. Above: Completely assembled Tobin's model will be a charmer. The little helicopter can handle the heavier body and needs lots of nose weight so the Hughs 300 shape is quite ideal. Right: Dave Grey of DuBro Products, creator of the original Whirlybird, admires the conversion. He found the new model quite easy to fly.

Superbird

Why not build a small copter? I had a noisy Du-Bro 505 and, without the motor on top, it looked sharp. I had mastered the 505 in calm weather and knew its limitations. I had numerous RC car motors, clutches and shafts in my workshop, so I played around with the 505 frame/body and came up with a shaft-drive system for the model, but would it work?

After many conversations with Dave Grey, John Burkham and Gene Rock, the mechanical parameters for a helicopter using only the power of a typical RC 19 engine were determined. Less than a month later, the prototype was ready to fly. In about a year it has flown over 200 hours and many, many changes have been made. My goal had been to build a 505 conversion as close to the original design as possible. It had to be practical, durable and repairable.

These objectives were finally achieved. The model, as simple and as inexpensive as a shaft-driven helicopter can be, requires only average model building skills. If you have a 505 and know how to fly it, here's a neat way to find out just how well helicopters can fly.

Without question, the Du-Bro 505 helicopter has been made and flown by more modelers than any model chopper to date. It is still the least expensive kit for a workable helicopter. The 505 is a great trainer machine, but it does act somewhat top-heavy. It is not a very realistic looking machine though, and its performance is limited. The model uses a 40 located atop the rotor shaft driving its own 10-6 prop one way and spinning itself and the main rotors the other. This method of powering the helicopter is known as torque reaction. It is ideal for learning to handle a helicopter in calm weather or indoors. Throttle changes give instant altitude control and no sudden swing of the tail. So, if you want to get into helicoptering, use the 505 in stock form. Once you have mastered it, try either the conversion helicopter presented here or buy one of the big expensive and scale kits.

Our little helicopter will perform just as well as most of the big models; being smaller gives it many advantages. The Superbird can cruise at 35 mph in forward flight, and it loves to fly in a wind. It is small and quiet—great for backyards that intimidate the larger model copters. It can be transported in small autos (like VWs) without removing rotors, costs very little additional money (if you have a 505 now), is extremely durable, uses only a 19 for power, and most of its components are readily available as stock items.

The conversion uses the 505's frame body mechanical systems and all fittings, to which a motor mount, clutch, shaft, more durable tail rotor system, and a new rotor head are added. Belts and pulleys are the transmission. A conversion will cost you about $30 and an engine.

This article makes two assumptions: First, that you already have a Du-Bro 505; second, that you have mastered flying the 505. The conversion machine is the smallest actively flying four-channel RC helicopter around today offering full performance and this is written as a conversion project.

The conversion is a shaft-driven, semi-rigid rotor helicopter. The engine drives a clutch via a belt and the clutch drives the main shaft through another belt. Overall gear reduction here is 12.3 to 1. The large white bevel gear from the 505 is attached directly to the aluminum pulley which was belt driven from the clutch shaft. This drives the 505's original small, white bevel gear. At the end of the tailboom, another set of bevel gears gives an additional 1 to 2 gear ratio increase for an overall main shaft-to-tail ratio of 1 to 8. When the main rotor rpm peaks at 1300, the tail rotor spins at 14,000. The loading is light, but at this speed balance is important—almost critical. Normal speeds are 1000 rpm and 8000 rpm.

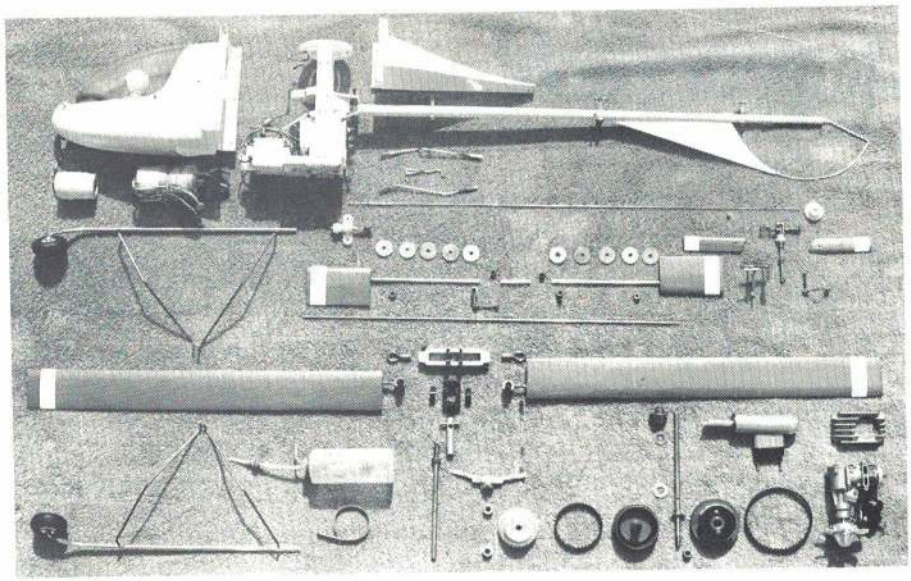
The skill level in building and flying fits three chopper types. From simple to complex, they are torque reaction (like the 505), shaft-drive throttle only for lift control (most kits), shaft-drive and collective pitch (Kavan and Graupner only, at present). If you are new to helicopters, work up the ladder of complex skills; don't try to learn at the top. If you take my advice, converting your 505 to shaft-drive is a perfect second stage. That's exactly what this Superbird is for.

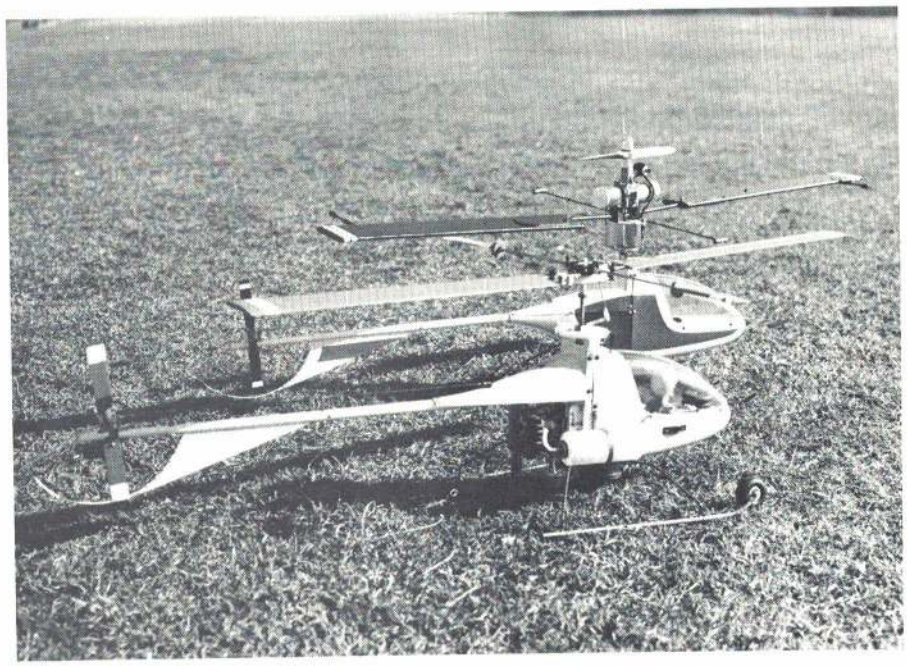
Construction

To begin converting your 505, completely disassemble the model down to the basic frame. You will reuse about half of the parts in the conversion. Obtain a K&B Veco 19BBRC (or similar) and order parts from Stock Drive. List of parts and appropriate addresses are in panel at lower right of this page. Find miscellaneous parts at local hobby shop.

Only two wood parts are shown on the plans. The major rotor head part may be bought at Sears. (The plans with this issue are full-size as printed.) These are the upper adjustable and lower (fixed) clutch shaft bearing blocks. The firewall and engine bearers are cut to fit the original frame which you already have. Firewall is 3/16" (or 1/8") plywood located at the backside of the frame uprights between the tailboom block and gear block. Engine bearers (1/2 x 1/4" cross section) simply glue to the firewall spaced to suit your engine. Seal the completed frame with surfacing resin or epoxy and cover with a very durable paint (K&B epoxy or Hobbypoxy).

Originally, the clutch gripped the shaft it was intended to drive. On our helicopters the clutch is drive-pin engaged. Notice the two slots in the plastic shaft/bearing which enabled the clamp to grip its shaft. After cutting the clamp off, extend the two slots 1/8" inside and below the metal clutch bushing. Also widen the slots to suit your drive pin. Trim the plastic shaft/bearing flush with the steel bushing. Such location prevents the pin from escaping. Natural-





Top: This layout of parts shows general relationship of each part. Note especially body nose section cutout for clutch and radio, receiver, servo and battery positions. Above: Posed together, an original 505 meets the converted model.

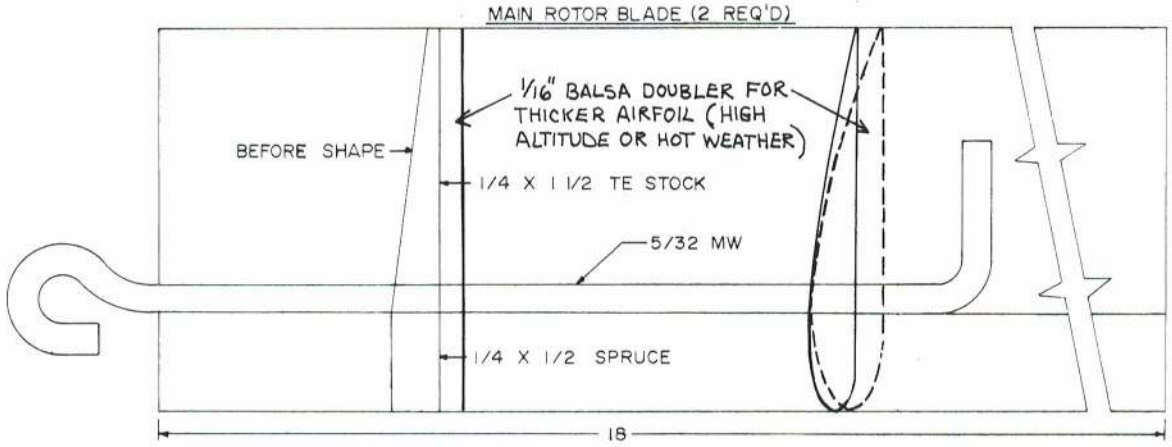
PARTS LIST

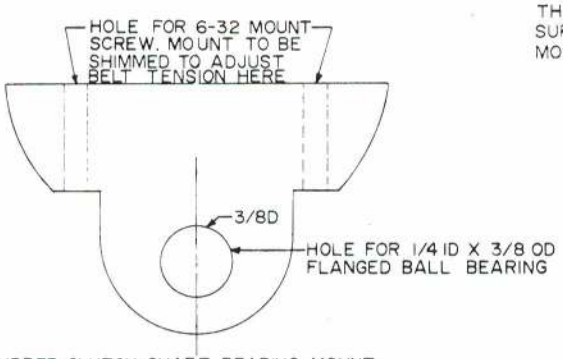
1	30 groove alum. 1/4" pulley 1/5th pitch 1/4" hole	6A3-30DF02508
1	10 groove alum. 1/4" pulley 1/5th pitch 1/4" hole	6A3-10NF03708
1	6½ x ¼" steel shaft	7X1-08065
1	7 x 1/5" P 1/4" wide belt	6R3-0350025
1	10" 1/5" P 1/4" wide belt	6R3-050025
Set	Plastic Bevel Gears	1M3-Y3216 & 32
2 ea.	1/4 ID 3/8 OD ball bearing flanged	7Y55-F3725
4 ea.	1/8 ID x 1/4 OD ball bearing flanged	7Y55-F2512
	All the above parts are available in one package No. HK105 for $16.39.	
2 ea.	Rocket City nose gear bearing	
3 ea.	I.B.M. large clevises	
1 ea.	Delta heat sink blank (black)	
1 ea.	Curtiss clutch assembly	
1 ea.	3½" Sears turnbuckle (3½" alum. part)	
	SDP Handbook of Commercial Drive Components (No. 71) is $1.49 ppd.	

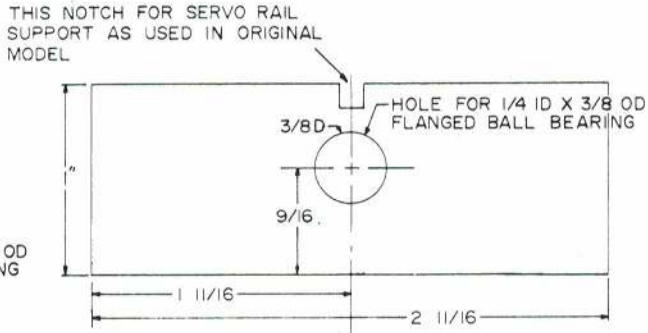
Curtiss-Dyna Products Corp.
Box 297
Westfield, Ind. 46074

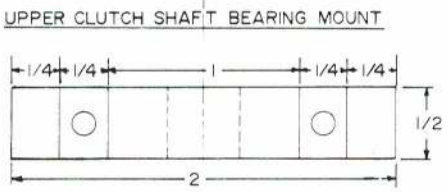
Delta Systems
P.O. Box 754
Bridgeton, Mo. 63044

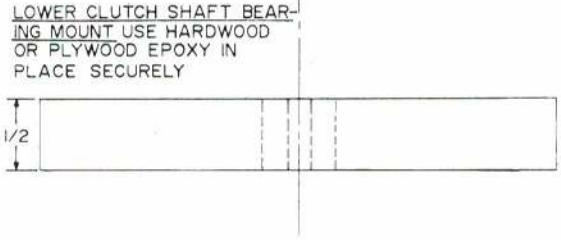
Stock Drive Products
55 South Denton Ave.
New Hyde Park, N.Y. 11040


MAIN ROTOR BLADE (2 REQ'D)
1/16" BALSA DOUBLER FOR THICKER AIRFOIL (HIGH ALTITUDE OR HOT WEATHER)
BEFORE SHAPE
1/4 X 1 1/2 TE STOCK
5/32 MW
1/4 X 1/2 SPRUCE
18

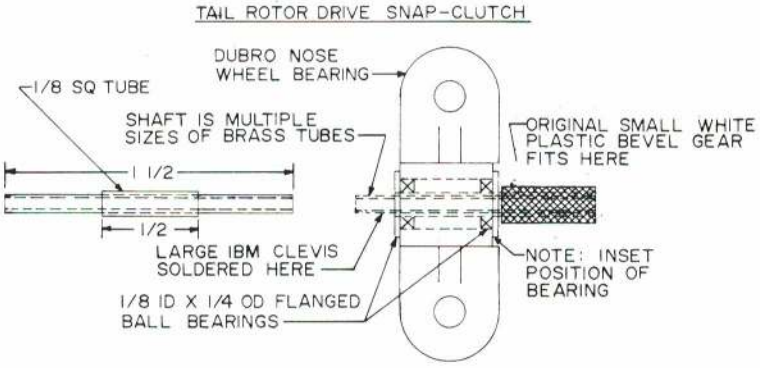

HOLE FOR 6-32 MOUNT SCREW. MOUNT TO BE SHIMMED TO ADJUST BELT TENSION HERE
3/8D
HOLE FOR 1/4 ID X 3/8 OD FLANGED BALL BEARING

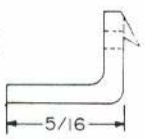

THIS NOTCH FOR SERVO RAIL SUPPORT AS USED IN ORIGINAL MODEL
HOLE FOR 1/4 ID X 3/8 OD FLANGED BALL BEARING
3/8D
9/16
1 11/16
2 11/16

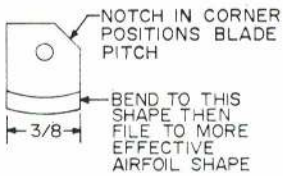

UPPER CLUTCH SHAFT BEARING MOUNT
1/4
1/4
1
1/4
1/4
1/2
2

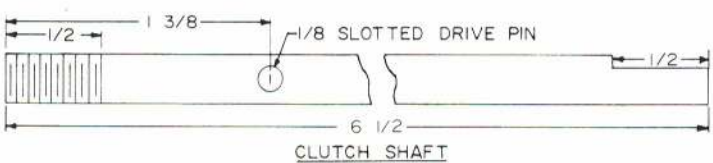

LOWER CLUTCH SHAFT BEARING MOUNT USE HARDWOOD OR PLYWOOD EPOXY IN PLACE SECURELY
1/2

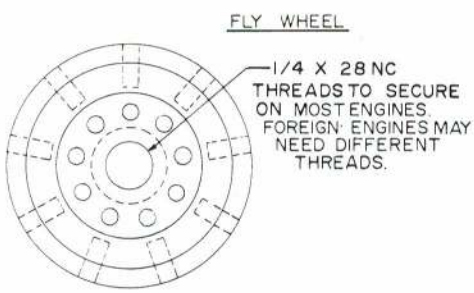

ALUMINUM FAN BLADES
9 REQUIRED

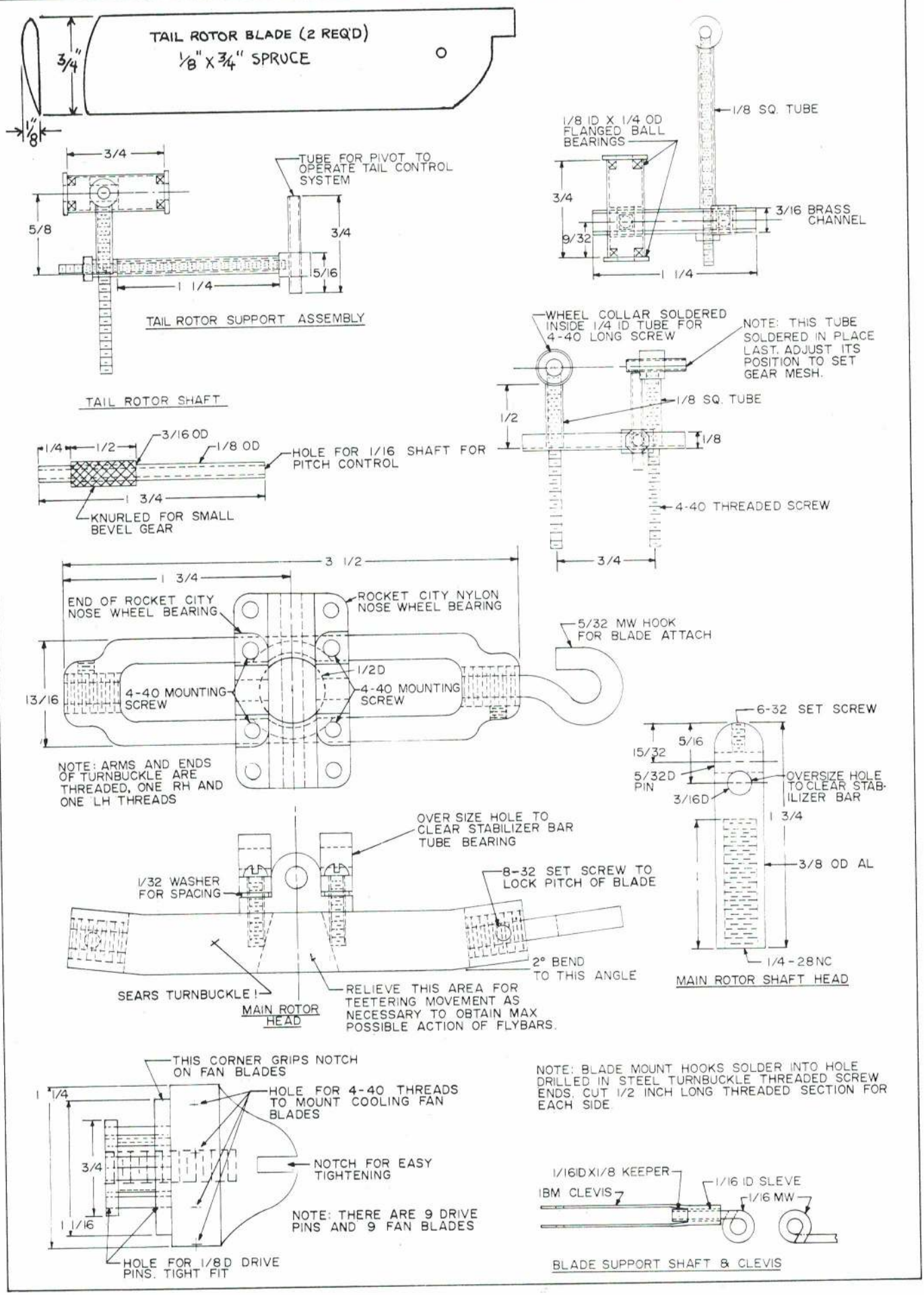

TAIL ROTOR DRIVE SNAP-CLUTCH
DUBRO NOSE WHEEL BEARING
1/8 SQ TUBE
SHAFT IS MULTIPLE SIZES OF BRASS TUBES
ORIGINAL SMALL WHITE PLASTIC BEVEL GEAR FITS HERE
1 1/2
1/2
LARGE IBM CLEVIS SOLDERED HERE
NOTE: INSET POSITION OF BEARING
1/8 ID X 1/4 OD FLANGED BALL BEARINGS


5/16


NOTCH IN CORNER POSITIONS BLADE PITCH
BEND TO THIS SHAPE THEN FILE TO MORE EFFECTIVE AIRFOIL SHAPE
3/8


1 3/8
1/2
1/8 SLOTTED DRIVE PIN
1/2
6 1/2
CLUTCH SHAFT


FLY WHEEL
1/4 X 28 NC THREADS TO SECURE ON MOST ENGINES. FOREIGN ENGINES MAY NEED DIFFERENT THREADS.


TAIL ROTOR BLADE (2 REQ'D)
1/8" X 3/4" SPRUCE
3/4"
1/8"
3/4
5/8
TUBE FOR PIVOT TO OPERATE TAIL CONTROL SYSTEM
3/4
5/16
1 1/4
TAIL ROTOR SUPPORT ASSEMBLY
1/8 ID X 1/4 OD FLANGED BALL BEARINGS
1/8 SQ. TUBE
3/4
3/16 BRASS CHANNEL
9/32
1 1/4
TAIL ROTOR SHAFT
1/4
1/2
3/16 OD
1/8 OD
HOLE FOR 1/16 SHAFT FOR PITCH CONTROL
1 3/4
KNURLED FOR SMALL BEVEL GEAR
WHEEL COLLAR SOLDERED INSIDE 1/4 ID TUBE FOR 4-40 LONG SCREW
NOTE: THIS TUBE SOLDERED IN PLACE LAST. ADJUST ITS POSITION TO SET GEAR MESH.
1/8 SQ. TUBE
1/2
1/8
4-40 THREADED SCREW
3/4
3 1/2
1 3/4
END OF ROCKET CITY NOSE WHEEL BEARING
ROCKET CITY NYLON NOSE WHEEL BEARING
5/32 MW HOOK FOR BLADE ATTACH
13/16
4-40 MOUNTING SCREW
1/2D
4-40 MOUNTING SCREW
NOTE: ARMS AND ENDS OF TURNBUCKLE ARE THREADED, ONE RH AND ONE LH THREADS
6-32 SET SCREW
5/16
15/32
5/32D PIN
3/16D
OVERSIZE HOLE TO CLEAR STABILIZER BAR
1 3/4
3/8 OD AL
1/4-28NC
MAIN ROTOR SHAFT HEAD
OVER SIZE HOLE TO CLEAR STABILIZER BAR TUBE BEARING
1/32 WASHER FOR SPACING
8-32 SET SCREW TO LOCK PITCH OF BLADE
2° BEND TO THIS ANGLE
SEARS TURNBUCKLE!
MAIN ROTOR HEAD
RELIEVE THIS AREA FOR TEETERING MOVEMENT AS NECESSARY TO OBTAIN MAX POSSIBLE ACTION OF FLYBARS.
THIS CORNER GRIPS NOTCH ON FAN BLADES
1 1/4
HOLE FOR 4-40 THREADS TO MOUNT COOLING FAN BLADES
3/4
NOTCH FOR EASY TIGHTENING
1 1/16
NOTE: THERE ARE 9 DRIVE PINS AND 9 FAN BLADES
HOLE FOR 1/8D DRIVE PINS. TIGHT FIT
NOTE: BLADE MOUNT HOOKS SOLDER INTO HOLE DRILLED IN STEEL TURNBUCKLE THREADED SCREW ENDS. CUT 1/2 INCH LONG THREADED SECTION FOR EACH SIDE.
1/16IDX1/8 KEEPER
1/16 ID SLEVE
IBM CLEVIS
1/16 MW
BLADE SUPPORT SHAFT & CLEVIS

ly the pin must not scrape the bushing either.

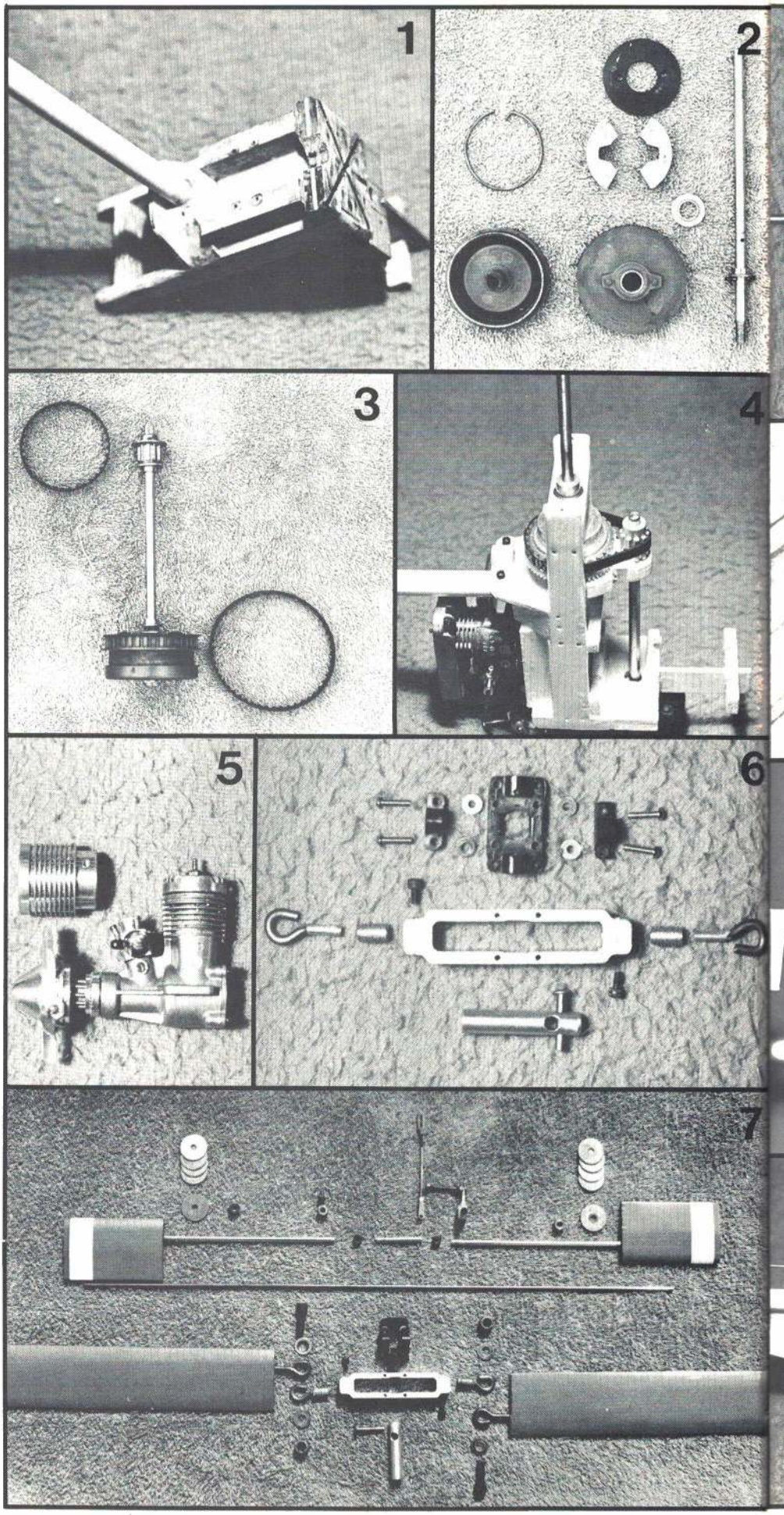
Prepare the clutch by surfacing the bell (instead of the shoes) with leather or cork lining. Recess the spring by grooving the shoes with your Dremel tool, then tighten the spring by removing about 3/4" of spring coils. This is a starting point; the spring must be adjusted later to suit your engine's idle speed.

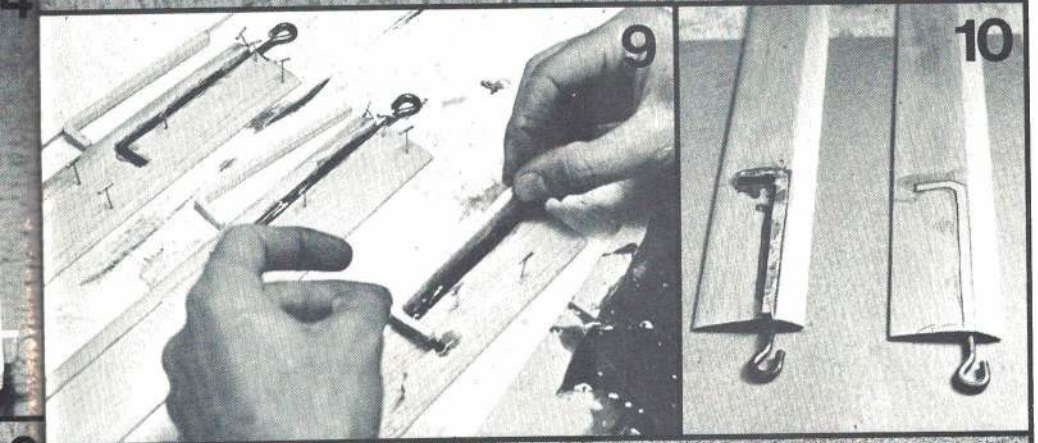
The 505's aluminum engine counterweight can be machined to make the new flywheel/fan assembly. Any machine shop will do this for a nominal fee. Also have them shape and drill the aluminum main shaft head piece. Do all the thread tapping yourself. You will use 4-40 and 1/4-28NC taps. Also make and attach the fan blades and the nine steel pulley drive pins.

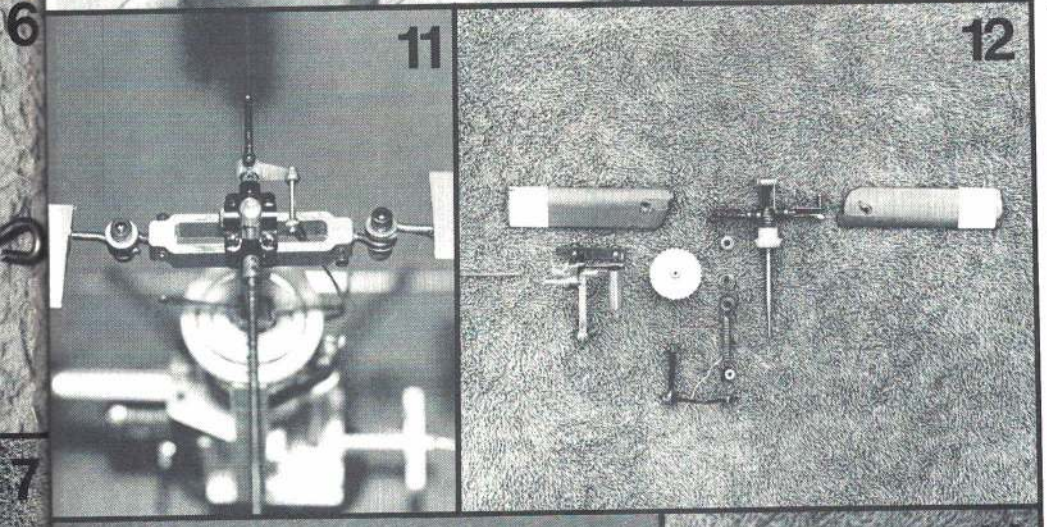
To prepare the 505's large white bevel gear, cut it flush on its backside, center it on the bare bottom of the 30 groove pulley, then attach it with two or three screws to lock the parts together. Prepare the clutch shaft with its flats, hole and threads. Now assemble entire power train as shown in the photos. The clutch must be just low enough to clear the landing gear mounting screws; locate the engine height on the frame accordingly. Engine is secured with long 4-40 bolts into blind nuts at the firewall. Upper pulleys are located according to the tail drive bevel gear mesh. Your original 505 bevel gear system can be used temporarily to adjust gear mesh properly. Upper pulley tension should permit only 1/32" movement on one side of the belt. Lower pulley can have 1/4" movement on one side. Shim the clutch shaft or engine to achieve these tensions. Mount the servos. They are positioned almost exactly where they were on the 505 but moved forward by the width of the lower clutch shaft bearing block. The cyclic controls are not spring loaded as on the 505; make them solid. Install all pushrod systems for throttle, cyclic and tail rotor controls.

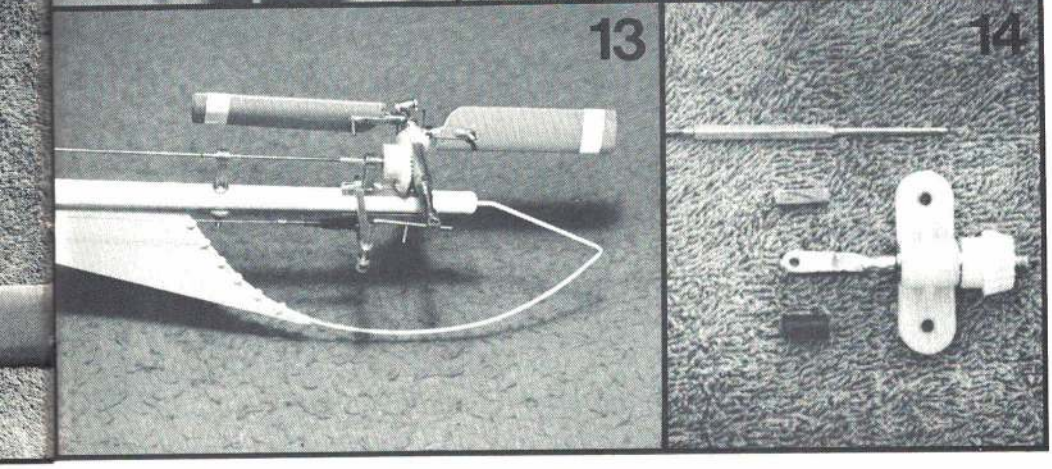
Using your old 505 body parts, reassemble the forward section containing the battery and receiver. Provide cutouts as necessary for the clutch. Only small sections of the lower rear body cover are used.

Now reinstall the landing gear and swashplate. Prepare the aluminum rotor head main piece—mine was an aluminum Sears and Roebuck turnbuckle. Bend the coning angle into the turnbuckle ends as diagramed, then tap holes for the modified Rocket City nose-wheel bearing parts. The drawings show how the Rocket City bearings are cut, drilled and modified. With the Dremel Moto-Tool, cut away the inside lower edge on the turnbuckle to allow adequate teetering of the assembly. But do it after preassembling the head. You want to maximize the teetering movement, but cut away as little of the turnbuckle as possible.









1 The modified frame showing firewall, engine bearers, lower clutch bearing mount with servo rails moved forward.

2 Preparation of the clutch including a heavy duty return spring. Note drive pin groove in center of clutch ball bearing.

3 Clutch shaft assembled with bearings, pulley and belts.

4 Entire power train installed on a finished and epoxy-painted frame. Upper clutch shaft bearing mount is secured by bolts and can be shimmed for optimum belt tension adjustment.

5 The Veco engine fitted with the flywheel/pulley/fan which can be made from the original model's engine counterweight.

6 Rotor head parts in "exploded" view. Sears turnbuckle is main piece. Rocket City bearings are the black plastic parts.

7 Complete rotor head system shown here. Number of washers on the flybar determines the control stability/sensitivity.

8 Underside view of assembled rotor head shows how the turnbuckle is cut away to maximize flybar tetering movement.

9 Building the rotor blades is easy. First, splice the spruce leading edge to the balsa trailing edge stock. Then plane and sand to airfoil shape. (Note two airfoils shows on plans to suit conditions. Take the shaped 5/32 mw arm and insert it into a cutout in the blade. Epoxy the wire in place and then epoxy the "L" shaped cutout over it.

10 After resanding, the blade is ready for Mono-Koting and matched set balancing. These are very durable blades.

11 Top view of rotor head with swash plate follower properly aligned and linked to the flybar. "Servo paddles" are pitched by the control. They aerodynamically move themselves up and down for cyclic control.

12 Tail rotor system is similar to original model's unit, but much stronger and ball-bearinged. Note brass center piece in the large gear.

13 Complete tail rotor installed on helicopter uses same spring-loaded control system as on original model. It works surprisingly well, but keep it lubricated. Gears handle quite a load. Keep checking the gear mesh and solder joints for safety's sake.

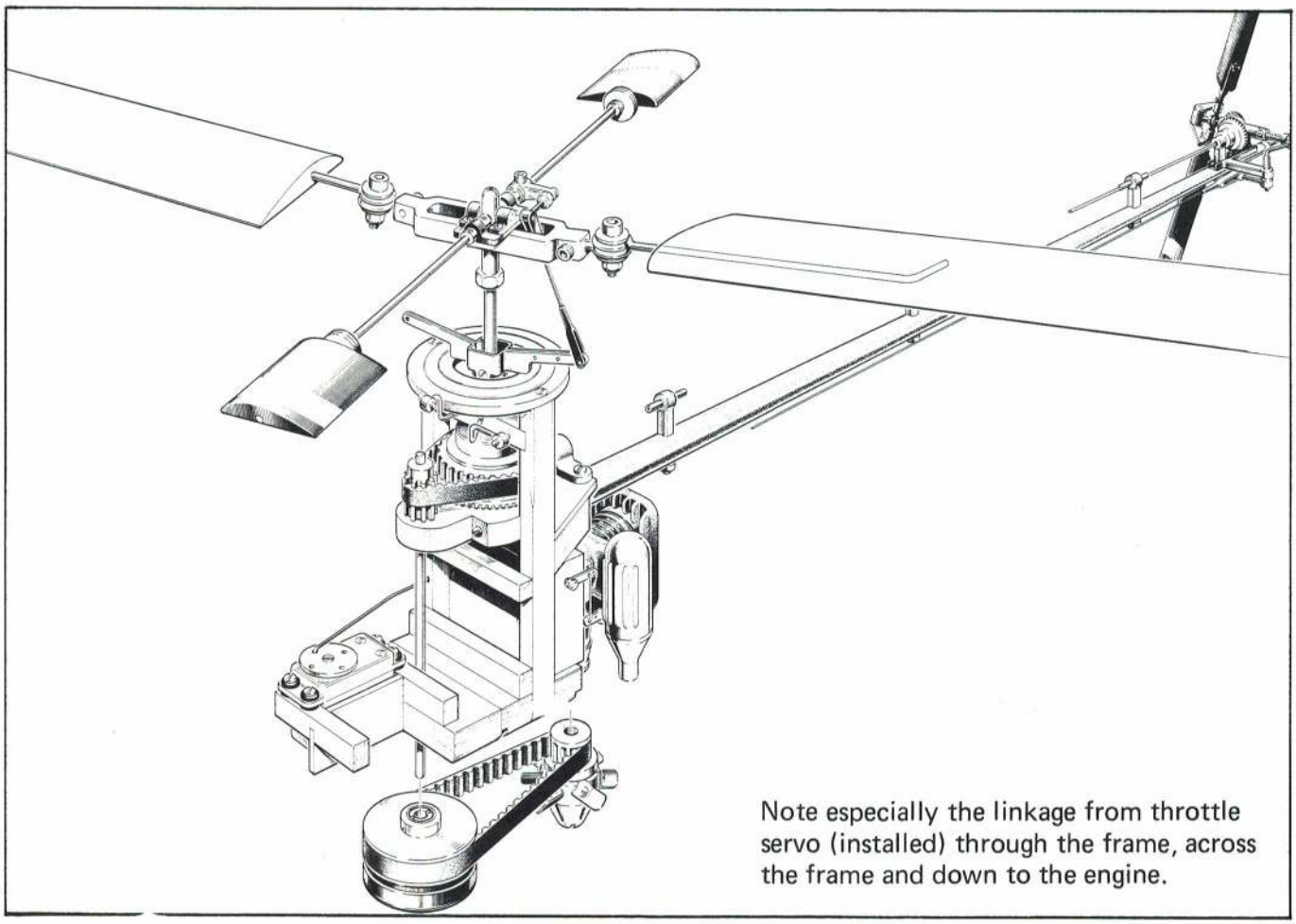
14 The snap clutch provides overload protection for the bevel gears and tail rotor blades. It also permits splining action of the tail drive shaft. Heavy wall Pylon Brand surgical tubing tensions the clevis against the larger square tube.

Above: Cutaway was seen in Fred Wolff's fantastic article in *Popular Mechanics* last year. We thank them for letting us reprint it here. Below: This cutaway is his adaptation of the original artwork showing conversion's mechanics.

Superbird

The turnbuckle bolts are RH and LH threaded respectively. Cut 1/2 in. from each and center drill each piece for 5/32 hole. This hole takes the 5/32 music wire blade mounting loop—make one for each side. Solder these wire loop parts securely in the threaded sections and cut to equal lengths. Now just screw these assemblies into the turnbuckle. The set screws will later lock the threads to hold the proper collective pitch setting.

Build your main and tail rotor blades as drawn and shown in the photos. Incidentally, I suggest that you cover the blades (including tail rotors) with trim MonoKote. The servo paddles (as Hiller calls them) in this model use the same lifting section airfoil and chord as the main blades but are only three in. long each. When the paddles are made, epoxy a five-in. length of 1/8" ID brass tubing in them. The flybar is to be 22 in. long of 1/8 mw. It is bearinged in a short length of brass tube inside the longer nose-wheel bearing. Wheel collars pinching the 5/32 OD brass tubes lock the paddle assemblies to the flybar. The flybar is weighted with brass or steel one in. dia. washers with 5/32 hole. The number of washers is varied to suit flying conditions and control reactions desired.



Note especially the linkage from throttle servo (installed) through the frame, across the frame and down to the engine.

New FUTABA PROPORTIONAL SERIES

FP-6DN

6-CHANNEL RADIO CONTROL

The FP-S5 is uniquely designed with Futaba Custom ICs and a 3-wire, gold-plated 3P mini-connector for compactness, light weight and powerful torque with low power consumption. A highly advanced servo.

FP-T6D 6-channel transmitter
complete with 8/450mAH nickel cadmium battery package.
Built in battery charger.

4/450mAH nickel cadmium battery package

FP-R6D
6-channel IC receiver
Weight: 1.96 ounces
Dimension: 2.71×1.57×0.75 inch.

FP-S5
Compact, 3-wire servo.
Power consumption: 7mA
Weight: 1.3 ounces
Dimension: 1.54×1.48×0.71 inch.

The Futaba Tx, Rx and Sx are all interchangeable due to consistent quality control plus design and production to rigid specifications. Use them as a set for maximum performance.

Transmitter (FP-T6D)
High maximum output assures complete 6-channel control. Throttle position can be varied (mode 1, mode 2). Smooth control with the ball-bearing equipped stick mechanism and the neck strap makes the transmitter the easiest ever to use.

Receiver (FP-R6D)
A light, compact and rugged unit including an 8-bit decoder and a 3-wire, gold-plated 3P mini-connector. Includes 2 low power ICs, 8 silicon transistors and 7 silicon diodes. The RF and OSC coils are housed in a shielded case making them strong against spurious signals.
A constant voltage circuit guarantees stable operation from 4V～6.6V (guaranteed from 0～150°F). A double-tuned pre-selector circuit is included.

Servo (FP-S5)
Futaba's original BA-607 and BA-606 monolithic ICs, 16mm mini-motor and 3-wire, gold-plated 3P mini-connector makes the unit compact, light weight and rugged and provides high output torque (2～2.5 kg/cm) and high resolution with low power consumption (7mA). A temperature-guaranteed constant voltage circuit gives complete control up to 4V without mutual interference from servos.
The BA-607 monolithic IC has 73 transistors, 13 diodes and 79 resistors —a total of 165 parts.
The BA-606 monolithic IC has 2 PNP and 2 NPN type high output (500 mA) transistors, 4 diodes and 4 resistors—a total of 12 parts.

Futaba's new Proportional 6-channel Radio Control (FP-6DN)
The set includes Transmitter, Receiver, 4 small rotary servos, nickel/cadmium batteries for Tx and Rx,charger, a servo tray, spare servo horn, switch harness, neck strap and frequency ribbon.

• Service Centers offer rapid, complete service with skilled factory trained technicians.

FP-6DN	6-CHANNEL 4 SERVOS	$299.95
FP-5DN	5-CHANNEL 4 SERVOS	$289.95
FP-4DN	4-CHANNEL 3 SERVOS	$244.95
FP-5	5-CHANNEL 4 SERVOS	$299.95
FP-3D	3-CHANNEL 2 SERVOS	$149.95
FP-2D	2-CHANNEL 2 SERVOS	$119.95

FUTABA

FUTABA INDUSTRIES, U.S.A.

630 WEST CAROB STREET, COMPTON, CALIFORNIA, U.S.A.

Above: The Superbird in flight with Dave Grey at the transmitter. He likes to fly so close in hovering that you can reach out and touch the helicopter. Below: Stylish body houses four-channel radio entirely inside. External fuel tank shows when to land without disaster.

A short Du-Bro nose-wheel steering arm links the flybar, via a pushrod, to the swashplate. The swashplate follower must be straightened and will be positioned parallel with the rotor blades, not parallel with the flybars as on the 505. A length of 4-40 bolt added to the arm, with one of those neat Du-Bro swivel links and its clevis, completes this assembly. Add two new holes in the swashplate follower to give 1/2 and 2/3 of original control. Link the pushrod to the inner hole. When all parts are assembled, you now have the model complete with body, frame, power system, radio system and rotor head. The threaded joint of the aluminum rotor head piece and the shaft must be extra strong—use a lock nut and "Loctite" compound. Be sure the piece is properly aligned on the shaft in relation to the swashplate follower. Next is the tail rotor drive shaft and system.

You will find the tail rotor system easy to make if you realize it is very similar to the 505 system, but much more durable. The square tubing locks things together with less dependence on solder joints. Some of the work is quite intricate, so be slow and plan your work.

Not shown in the drawings is a 1/16" wheel collar set into the large tail rotor drive bevel gear. Drill out the gear to snug-fit the collar. Drill all the way through the gear's hub into the collar's set screw area. One long set screw through both parts will lock them together. Also, drill and tap for another set screw in from the other side. The small bevel gear is secured on the knurled section of the tail rotor shaft.

The tail rotor blades are mounted via bolts in the large IBM clevises. Under impact the blades pivot in the clevis. This clevis has a short brass tube soldered inside it as its pivot bearing. The clevis is controlled exactly as on the 505, but a new wire control arm is made to suit the clevis's larger diameter.

There is one critical step. A tiny length of 1/16 ID brass tube retains each blade mount clevis on its axle. If you overheat the joint, you might solder everything together; not enough heat and the joint might fail causing a blade to fly off!

The snap clutch on the tail rotor drive shaft is a unique feature. Because the new model's shaft is turning faster and at a higher load, the brass-in-nylon bearings won't last and the gear mesh must be kept accurate, hence the ball bearings. The clutch has two purposes: First, it allows splining action when the tailboom flexes up and down. Second, it releases overloads which result from striking the tail rotors into the ground by accident. Adjust the clutch later using thick surgical tubing to clamp the clevis on the outer brass square tube. This adjustment must safely handle the maximum flight loads on the tail rotor. With this feature, I have never lost a bevel gear; without it, gears were constantly failing as a result of ground impact.

When final assembling the tail rotor system, make sure the drive shaft is

(Continued on page 79)

AMERICAN
aircraft modeler

733 15th Street, N. W., Washington, D. C. 20005

Dear Modeler:

Potomac Aviation Publications, Inc. is looking for a person to work with **American Aircraft Modeler**'s Editor/Publisher.

As Assistant Editor, your duties would include soliciting material, organizing manuscripts, handling correspondence and representing the magazine at various modeling events.

You must be a recent college graduate in journalism, or a related field.

You should know modeling in FF, CL, and RC, and perhaps have some publications experience.

The position is available now; relocation to Washington, D.C. would be necessary. Salary will be discussed in personal interview. Please send a resume; no phone call applications considered.

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WASHINGTON, D.C. 20005

Sincerely yours,

Edward C. Sweeney, Jr.
Editor and Publisher
American Aircraft Modeler

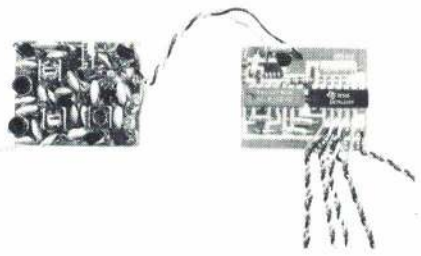
ECS/wpk

NEW! NEW!

1 TO 8 CHANNEL CAPABILITY!

ACE R/C digital commander KITS

* Compatible with any modern digital transmitter: 4, 5, 6, 7 or 8 channels. Must be on same RF frequency. Use it as an extra flite pak.
* Available on 26.995, 27.045, 27.095, 27.145, 27.195, 53.100, 53.200, 53.300, 53.400, 53.500.
* Receiver-Decoder in its case measures 1.45 x 1.72 x 1" deep. Weight is 1.4 ounces.
* May be used with positive pulse servos.
* You can begin with 1 or 2 channels if you want to start simple. Adding channels is easy; no conversion required--all you need are a servo and connector for each channel.
* Performance counts! Hundreds of letters from satisfied flyers attest to the fact that the Digital Commander is up there with the best! Kits CAN be assembled with little experience--following directions is a MUST, however!



digital commander (1-8)

RECEIVER-DECODER KIT

Up to 8 Channel Capability!

Here is the Ace Digital Commander (1-8) Channel Receiver-Decoder Combo. This is the ultimate of the 2 channel system developed by Fred Marks, which received a great reception and met with fantastic success in the field.

Voltage regulator has been added to replace original filtering of power supply--this results in outstanding improvement of performance.

With the new decoder you have your option of going with 2, 3, 4, 5, 6, 7 or 8 servos--whatever your transmitter provides.

The Ace Digital Commander Receiver-Decoder Combo will work with any of the present day transmitters available, provided they are on the same RF frequency. It will not work with the Jerobee, ACL Digilog, or Digitrio.

The unit is just as simple and easy and straight forward to wire as the 2 channel. The secret is using IC chips.

May be used with the Ace Digital Commander servos or any positive pulse servo. Provisions for three or four wire output from the decoder.

Unit in its vacuum formed case measures 1.45 x 1.72 x 1" deep. Weight of the receiver decoder is 1.4 ounces.

Kit includes ABS formed case. No connectors are furnished. Step by step instructions.

No. 12G18—Digital Commander (1-8) Channel Receiver-Decoder Kit $34.95

* **Available on the following frequencies: 26.995, 27.045, 27.095, 27.145, 27.195 53.100, 53.200, 53.300, 53.400, 53.500**

digital commander SERVO KIT

Housed in the D & R Bantam DS3P mechanics, uses WE 3141 IC for ease in assembly. Kit contains motor, pot, wiper and all components required, with step-by-step manual.

Weight for the DS3P servo is 37 grams: 1.3 ounces. With the DS2P servo, 44 grams: 1.55 oz.

No. 14G20—Digital Commander Servo Kit $21.95

No. 14G20L—As above, except with D & R DS2P Linear Mechanics (Less connectors) 22.95

digital commander (1-8) FLITE PAK KITS

Offered in Two Versions

We are offering the Digital Commander 8 channel Receiver-Decoder Kit with servos and the new Deans Block Connectors for both convenience and economy.

Available in two versions--8 channel Receiver Decoder with 2 servos; and with 4 servos.

If you want only two channels, our 2 channel Flite Pak (12G30) is your most economical approach. But if you want the capability of going 3, 4, 5 or more channels later, use the Digital Commander 8 combo. No modifications or conversions are needed! The only extras you will need are servos/connectors for as many channels you want to add.

With the Flite Pak Combos you get Deans 3 pin three connector block, with mating 3 pin plugs, battery connector, on-off switch and guard, and hardware. With the 4 servo combo you also get extra 3 pin plug, and a 3 pin connector set for aileron. (Less batteries)

Flite Paks compatible with most existing transmitters.

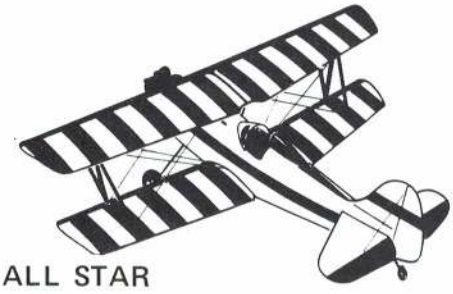
No. 12G18-2—Digital Commander (1-8) Receiver-Decoder with 2 Bantam servos-connectors $74.95

No. 12G18-4—Digital Commander (1-8) Receiver-Decoder with 4 Bantam servos-connectors $114.95

No. 12G18-2L—As above, but with D & R Linear servos $76.95

No. 12G18-4L—As above, but with D & R Linear servos $116.95

Please specify frequency



ALL STAR

BIPLANE KIT BY ROMAN BUKOLT

Uses two sets of Ace Foam Wings for ease of building. For use with .09 to .15 power and 2 or 3 channel digital. Do NOT overpower! Beautiful Experimental Aircraft Association type plane.

131200—All Star Deluxe Biplane Kit $21.95

COMING!

digital commander ASSEMBLED UNITS

Our Digital Commander kits have been extremely popular. However, there have been numbers of requests to have them factory assembled. In fact, the response has been so great that we are going into it.

First we will produce the Digital Commander servos. Being small, they are intricate to solder, and do require precision. When they are built right, they are among the finest servos available today.

We will offer the assembled units in two versions--the submini D & R Bantam and the D & R Linear.

Factory assembled, tested and cycled, they will be offered as three wire units less connector. They are positive pulse units and will be compatible with any system of this type.

No. 14G20C—Digital Commander assembled Bantam servo $29.95

No. 14G20LC—Digital Commander assembled Linear servo $30.95

We will be happy to supply your Flite Pak Kit with assembled servos--just add the price differential of $8.00 per servo.

Watch for the announcement of the factory assembled 1-8 channel Digital Commander Receiver-Decoders. Soon!

NEW 4.8 VOLT BATTERY PACKS

Using the new Gould National-Burgess 450 SCL battery, which is sintered and vented, and probably one of the highest performance type batteries available to the R/C modeler today, Ace now is proud to introduce 2 battery pack configurations using four of these cells for 4.8 volts for digital systems.

These are center tapped for use with older systems, although most current systems use only two leads.

Available in either a Square Pack or a Flat Pack, depending on your installation.

The Square Pack measures 1 15/32" square by 1 15/64" tall. Weight is 76 grams or 2 11/16 ounces.

The Flat Pack measures 2 27/32" long, is 25/32" wide, and is 1 15/64" tall. Weight is 78 grams or 2 3/4 ounces.

Housed in vacuum formed case for crash resistance, and also easy disassembly for service if required.

No. 38K56S—4.8-450 SCL Square Pack $12.50

No. 38K56F—4.8-450 SCL Flat Pack 12.50

Builds either P51B, Hurricane Mk IIc or ME109E. Designed by Roman Bukolt. Kit contains precision band sawed and machine sanded parts. Portions of the wood are blank to let you make the variations required for model of your choice. Kit uses Ace Foam wings for easy construction.

Each War Bird has a span of 42", and an area of 225 square inches. For docile performance use a Cox Babe Bee or Golden Bee and Pulse Commander Rudder Only. Or use a Tee Dee .049 with a 2 channel digital for commanding characteristics.

No. 13L110—Ace War Bird Kit $17.95

OUR 21st YEAR

ACE R/C INC.
HIGGINSVILLE, MO. 64037

pulse commander
Price Reduction!

Sales for the Pulse Commander have continued high, and since we are also buying additional components for the Digital Commander, we are getting volume price breaks. We have also become more efficient in our line assembly. As a result we've come up with savings--and we're passing them on directly to you!

The Pulse Commander has the same high quality that thousands of R/C modelers have come to respect, with topnotch excellence of performance. Features the Drain Brain for less receiver-actuator drain; more transmitter power output; four sizes of powerful magnetic actuators to choose from.

Join the thousands who fly the Pulse Commander "Just for Fun"!

THE SIMPLE SYSTEM--

--From 2.5 oz.

--WITH Nicads and Charger

RUDDER-ONLY PULSE IS:

* LIGHTEST WEIGHT--2.5 oz. for Baby.

* LOWEST COST--WITH airborne nicad batteries and charger--begin at $59.95!

* SIMPLEST--only one moving part, easily serviced and maintained; noise free.

* VERSATILE--Arrange to suit your particular installation. You can go up or down in size without obsoleting receiver or transmitter. Simple changes of battery pack and actuator allow change.

* FULLY PROPORTIONAL

* INTERCHANGEABLE--Plug-in wiring allows quick switching of receiver from plane to plane.

* INEXPENSIVE--Initial cost of system, airplane, and engine is low; one transmitter and receiver can be used for many different styles and sizes of planes.

* SIMPLE--Easy installation; actuator has one moving part. Minimum maintenance.

* GREAT for Beginners--FUN for Experts.

TOTAL Flite Pak Weights--

Unit	Weight	Recommended
Baby	2.5 oz.	Pee Wee .020 Up to 48" gliders
Baby Twin	2.7 oz.	Tee Dee .010-.020 Up to 72" gliders
Standard	3.7 oz.	.049 to .10
Stomper	4.1 oz.	Tee Dee .049-.23

IMPORTANT: You can save an additional weight on the Standard and Stomper packs by using the Ace 225 ma Stack Pak (38K37) instead of the 500 ma buttons which are supplied. This will come up to weights of 3 ounces for the Standard and 3.4 ounces for the Stomper. This Stack Pak will give you one hour plus flying time between charges. Specify on your order

pulse commander R-O Systems

Completely wired, tested and guaranteed with airborne battery pack and charger, but less transmitter battery.

10G15—Baby System	$59.95
10G15T—Baby Twin System	62.95
10G16—Standard System	61.95
10G17—Stomper System	64.95

26.995, 27.045, 27.095, 27.145, 27.195

Please Specify Frequency

SELECTION OF PLANES FOR R-O PULSE

There are many good plane kits on the market for the Pulse Commander. In addition to the Ace Foam Wing Dick's Dream, Ace High and Skampy, there are the House of Balsa Nomad, Micro Models Replica Old Timers--Super Buccaneer, Mercury and Miss America, Sterling's Cirrus and other kits in their line, Dumas Mod Pod, also kits by Goldberg, Midwest, Top Flite and others. Kustom Kits will soon be having their RCM Javalero.

Many builders are designing their own small ships using the Ace Mini Foam Wings.

ACE WHIZARD KIT

An Owen Kampen design means a super something! Features in January 1974 R/C Modeler.

This has to be seen in the air to be believed. Beside the very pleasing lines that it has as a model, its performance is outstanding.

Has been successfully used as a 2 or 3 channel plane with rudder and elevator; or rudder, elevator and motor. Also may be used as a pulse rudder only for single channel.

Recommended for .049 engines. Weight empty is 14-16 ounces. For lighter installations, Cox .049 recommended. For 2 or 3 channels T.D. .049-.051 will be all the power required.

Will perform virtually every maneuver in the book!

Modelers who have test flown this are enthused about it and are using it in addition or in place of their larger ships. Truly designed for the sport flyer, although it is also ideal for the beginner and the novice.

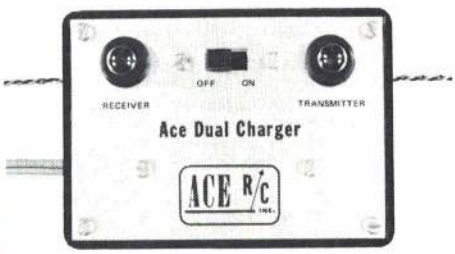
Contains complete sections of the foam wing required to achieve the 40 3/4" span--240 sq. in. wing and special trailing edge stock.

Kit contains hardware, bent landing gear, and precision band sawed and machine sanded balsa wood and other wood parts.

Top Ace quality.

No. 13L105—Ace Whizard Kit $17.95

(Available December 1973)



ACE DUAL CHARGER

Here is our Ace Dual Charger which is capable of charging your 450-500 mil receiver and transmitter pack either separately or simultaneously. The two diodes used in our charger are your assurance that you will get the correct charge rate going to your 450-500 mil cells, whichever way they are charged.

Has two pilot lights which indicate charger is operating correctly. Housed in bakelite case, with aluminum front panel. Utilizes heavy duty high quality transformer to isolate it from the 100 volt AC line.

Requires a charge of 12 to 16 hours to restore your batteries to their full peak.

Not furnished with connectors for your battery pack, since there are so many different type of connectors in use.

No. 34K17—Dual Charger Kit	$9.95
No. 34K18—Dual Charger Assembled	$11.95

TRY YOUR DEALER FIRST—if he does not have it, order direct using coupon for fast and courteous service.

Canadian Commander Customers

All Canadian customers for the Commander series of Pulse or Digital Units should contact H & W Enterprises at Box 972, Regina, Sask., Canada S4P 3B2.

R-O PULSE HANDBOOK
WITH
UPDATED CATALOG
Only $1.00
Refundable First Order

Handbook has expanded data on How Pulse Works, Installation, How to Fly, and much more. Most complete information on Pulse Rudder Only available anywhere.

New catalog is completely updated. Includes many items from major manufacturers.

Price is $1.00 via THIRD CLASS BULK MAIL. If you wish faster delivery, add 50¢ for turn around FIRST CLASS service.

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NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

Master Charge or
BankAmericard No.

Add $1.00 shipping-handling for direct mailorders except catalog

STUNT

AL RABE ON CL

More NATS News: It was an awfully windy NATS. Every day the gusts would increase to 8-10 mph by 10 A.M., 10-12 mph by noon, and 12-20 mph through the afternoon. After 6 P.M. the wind velocity would begin to fall, reaching 8-10 mph about 6:30 (thirty min. before we had to clear the runway). All the top Stunt fliers sat around watching the flags whip and told each other how they wouldn't fly their airplanes in that kind of wind. Everyone was going to save his airplanes for St. Louis FAI Finals. When the time came, everyone flew, of course. Wind or no wind, you don't travel clear across the country just to watch.

Never having flown much in wind that strong, I wondered how various types of airplanes would handle these adverse conditions. I had a sneaking suspicion that skinny "Stunt Machine" type airplanes with minimal side area would fly much better in strong wind than big side area planes like my Sea Fury.

I was pleasantly surprised. While I won't say that side area is unimportant, the best wind flyers were characterized by strong engines with lots of torque. Don't confuse strong engines with excessive speed. If you had the necessary torque to get up on top in a vertical eight, then you could usually make it with fast *or slow* engine settings. For example, Bob Gieseke, flying a Jehlik Fox 35-powered Nobler was able to fly beautiful, accurate vertical eights in a 15-20 mph wind with his engine set in a dead four-cycle. I think my ST 60-powered Sea Fury and the ST 46-powered fifth, sixth, seventh and eighth place airplanes had the advantage. Oversized, overweight, or underpowered airplanes with restricted venturi engines had to be flown with great skill just to keep them out on the end of the wires. After finals, there was much talk of switching to larger engines, particularly ST 46s for next year.

It looked like it was going to be a first round NATS. The winds were excessive every afternoon and the judges showed no signs of "ballooning" scores due to fatigue. Each afternoon the wind ruined the Patterns and the scores went down. We all wanted to draw an early position in the first round of finals to take advantage of light winds and consistent, even judging. Gene Schaffer drew first flight. Les McDonald and I found ourselves scheduled to fly at the end of the first round after 11:00. We would probably have to fly in a fairly strong wind. To everyone's surprise, however, the wind didn't come up! It stayed at 5-8 mph all day with occasional gusts to 12 mph.

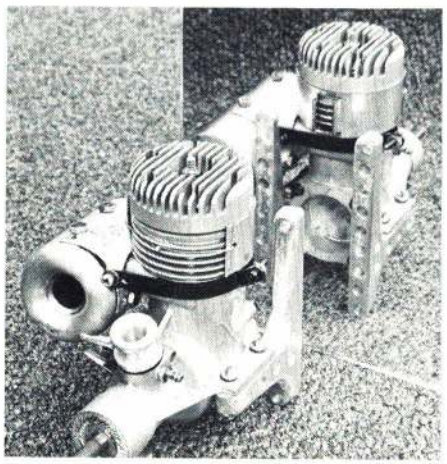
As it turned out, early first round flights didn't score particularly well. Gene was one of the few who was able to make a substantial improvement in the second round and he wound up second. As long as finals flying order is determined by draw, luck and circumstances will always be a factor in winning.

Most of the Stunt fliers agreed that using an active airport for the NATS was a pain. We had only one runway for model use and that one only between 7:30 A.M. and 7 P.M. At night the NATS runway was open to jet traffic. This arrangement precluded practice flying early or late to avoid winds and we usually wound up fighting the mid-day winds in one of three practice circles with six or seven other Stunt fliers.

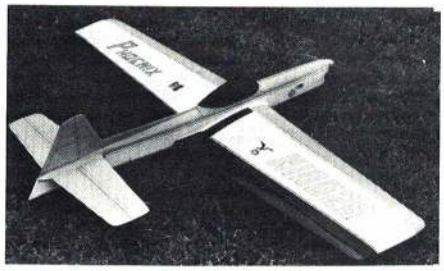
Some of the fliers found that they could get away with using K-Mart's parking lot from first light to 7:30 A.M. for a little light wind

(Continued on page 92)

Two pictures in the space of one. Use of a mirror graphically details the installation of a cylinder head baffle. Made from a tin can—held on with a twisted wire. Cost $.00001.



ABOVE: Tom Dixon's Stephen's Akro, 52-in. span, 53 oz. wt., OS 40. Tom is particularly proud of this Akro as it flies circles around his Phoenix. Tom plans a new Akro for next year. BELOW: Dixon's OS 35-powered Phoenix, 55-in. span, foam wing, 52 oz. wt.



DON LOWE ON RC

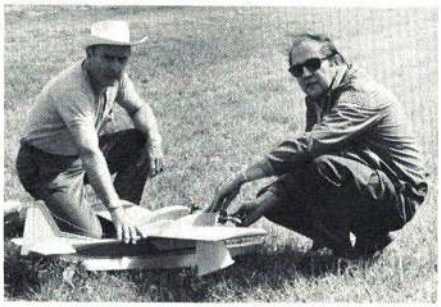
Quickie Building Method: I received a nice letter from my old friend Dick MaGuire of Lancaster, California. Dick flies with the Antelope Valley Tailwinds and has been modeling about as long as I have. (Longer, Dick?) He's still very much in the game and sent along an excellent idea for making fuselages to all you scratch builders, or kit builders for that matter.

Dick uses a cardboard tube, like those you find with piano wire, to provide a fuselage keel or building base. He slides fuselage formers cut from ¼" sheet balsa over the tube and positions them properly at their required fuselage station. He then sheets over the formers with balsa, plywood, block or whatever to form the fuselage skin. When completed he removes the tube, makes necessary cutouts in formers for equipment, etc., adds the firewall and that's it.

During construction, stick a broomstick in the tube and clamp it in a vise. This allows rotation of the assembly for easy work. Dick says that he has scratch built four ships using this method and won't do it any way.

Worth Repeating: When working with servo motors *do not* use a soldering gun such as the popular weller type. The magnetic field it generates will demagnetize the motor and ruin it. The symptom may be a slow-running servo. Use only resistance type soldering irons for this purpose. My friend Bill Welker warned me about this a long time ago, but I am surprised how few fliers know about the danger.

Bob Amy (left) and Don Foster of GeeBee Line crank up ship as part of demonstration held during Kentucky Mint Julep Meet. Event was well attended and many enjoyed the Hydro demonstrations held during break periods.



Contests and Such: The typical Pattern, Pylon or Scale contest is sponsored and run by a local club. It is promoted by that club strictly out of the local initiative of a few members and for fun. Usually no one makes a profit and some end up on the minus side of the ledger. The typical contest may attract 40 or 50 entries and provide inexpensive trophies and some merchandise. The prizes and cost of operation come out of the club's hide, entry fees and contributions from the hobby industry. Rarely do you see major private sponsorship.

The contest schedule is simply a collection of applications initiated by these local clubs, without national promotion or sponsorship other than a listing in the AMA competition mailing. Often people outside the hobby have asked about our own contest—is it a sectional, regional or national meet—or what? I reply lamely, "No, we don't have that kind of thing in this hobby except for one national meet that is open to all."

Many of us feel that we should have some system of sectional, regional and national championships controlled and directed by our national organization. It would create a more manageable Nationals, help our public image and promote interest in significant sponsorship by industry and others. I also believe that this would promote a greater challenge for achievement among the competitors and stimulate growth and development. It is even possible to envision a professional circuit like those currently enjoyed by major and monied sports. What do you think?

More Contests: The fellows in Chardin, Ohio made a rather unique addition to their annual Pattern contest this year. It was a judging school in which both judges and competitors were instructed on Pattern flying techniques and judging criteria. I was an instructor along with Dave Brown of World Engines. Unfortunately, due to poor weather the session was shortened but I think that the idea was very good. The bad weather continued throughout the weekend and the field became soft and sloppy. In fact this was the only contest I ever attended where the takeoff wasn't judged! Some were hand-launching Pattern ships and Dave Brown did yeoman service in shoving them off the ground. My retracts had a hard time with the mud and a major clean up was in order after each flight! But we had fun—right?

Wright Brothers Memorial Annual: The 11th Annual Contest was held at the Wright-Patterson Air Force Base, Dayton, Ohio in June and attracted about 75 contestants, competing in all classes of Pattern, Stand-Off Scale, Limbo and a Helicopter event. Every Pattern contestant got six rounds of flying in one and a half days, using four flight lines and a short pattern. A short pattern is becoming

Jim Gord of Indianapolis in serious mood at the first annual Mint Julep Meet held at Rough River Dam State Resort Park, Kentucky. Note reflection in metallic surface of Jim's Quarter Midget racer.

Winners in NATS Open Finals: (left to right) Gene Schaffer (2nd place), Al Rabe (1st place) and Les McDonald (3rd place).

the norm these days with every contest putting together something different. A number of guys are suggesting a *standard* short pattern set up by the AMA. How about it, contest board?

Due to fine local advertising in the newspapers, radio (thanks to Dick Norman) and television, an estimated overflow crowd of 5000 people was present on Sunday to view the action. Retail value of prizes and trophies awarded was over $2500 obtained from donations by the hobby industry, entry fees and raffles. This contest normally attracts around 100 contestants. (This year Pylon events were eliminated.) I think this contest annually represents one of the finest around and it's due to the hard dedicated work by many people heading the various committees.

The Helicopter event was one of the few on record at this time with a small entry but gathering much public interest. Dave Keats from Michigan won this pioneering event. He also (would you believe?) flew a chopper in the Limbo event—but didn't win it—something about concern about his rotor blades.... Incidentally, Dave is one of the most proficient chopper pilots in this country and has a very interesting driven rotor system modification of the Du-Bro "Whirlybird."

Feedback: You may recall a previous column I did on "Mini Airshows" and the lack of fair treatment handed out to modelers who participate in airshows and such. It has always appeared to me that we have received second class treatment. I simply believe that we have as much to offer in terms of showmanship and should receive equal treatment.

Well, anyhow, I received a letter and brochure from Gabriel Gendrow of the "Club Avion Radio Controle" of Quebec, Canada. Their club participates in the annual airshow put on by St. Maurice Aero Club which attracts fliers from many parts of the world, including Japan and Russia. The program brochure includes a half-page spread on the RC club. The schedule also shows their two half-hour demonstrations. This indicates that model aviation is a significant crowd pleaser. Gabriel says that they have been in the airshow three years and that the hobby is growing due in part to the fine exposure received in shows such as the "Air SMAC International."

Central Jersey RC Eastern States Championships: Leon Shulman forwards information on the annual one-day Pattern and Scale contest held at Lakehurst Naval Air Station, Lakehurst, New Jersey. Central Jersey Radio Control Club annually sponsors this meet and they usually attract over 100 contestants. And this is a one day meet! (Held on October 7 this year.) One of the very unusual features of the meet is that trophies are given down to 15th place in each event and prizes are awarded to *every contestant*! This year they will have a Loop-and-Spin event for the usual A and B fliers and a Short Pattern for the Class C, novice and expert. Of course they will use the "Shulman System" for running the pattern event. This system is a streamlined method for pushing the fliers through in minimum time and was featured sometime ago in several magazines.

A few months ago we initiated a treatise on flying the pattern. The intent is to help the beginner and intermediate fliers improve their flying and scoring, and thus eventually progress to the Expert category. We offered some suggestions on general procedure, some do's and don'ts and then launched into a discussion of individual maneuvers. We will continue this after a time out for some observations of a "first look" at pattern flying by John Miller of the Elgin Aero Modellers Club way down Florida way. We are quoting John's comments found in the September issue of the *Elgin Aero Modellers Newsletter* edited by my old friend Ron Van Putte. After participating in his first contest John had this to say:

> (1) "*Never* fly an airplane that you have never flown before or have had very few flights on. One such gent did this and his plane was a "bear" to handle because it wasn't properly trimmed out.
> (2) Don't leave *anything* to chance. I had to replace one rod end of my elevator pushrod the night before we left. This gave me peace of mind concerning the air worthiness of my machine.
> (3) Replace the glow plug and be sure to have a good starting battery. One flier lost a flight due to a bad battery. The new glow plug is cheap insurance.
> (4) Be sure your needle valve is properly set before taxiing out. I had two minutes to start and tune my engine prior to my official flight. Ron misadjusted his needle valve on his first flight and had a difficult time with the engine running rich. This was prominent throughout the contest. (Ron, need some help?)
> (5) Dress properly. I wore my usual old dungarees and this could have had a negative effect (psychologically) on the judges. The 'jump suit' seems to be the thing to wear. With a jump suit, you fake out the judge by appearing to know what you are doing. Also, liberal use of deodorant and standing downwind of the judges helps out.
> (6) Be sure your nose-wheel steers your plane in a straight line on takeoff. Obvious? Some of the takeoffs I saw were pretty poor, including damaging the aircraft due to steering problems.
> (7) Concentrate on calming your nerves. Without a doubt this is the hardest part of flying in a contest. This demands a great deal of concentration. But, shaking hands and knees could become hazardous to the health of your aircraft (not to mention the safety of spectators and participants). Remember, *keep your cool, baby!*
>
> These few hints should help those who aspire to compete in contests. I enjoyed myself and intend to compete in more contests, but the next time I intend to bring home some 'hardward.' "

The Saga of Joe Flier, Boy Expert: And now friends we turn from the commercial to more serious things. Last time if you recall, we left Joe Flier hanging by his thumbs (on the transmitter) having completed the second maneuver of Class C, Pattern, Touch and Go Landing. He has retracted the gear (remember he aspires to be an expert and *every* expert has

(Continued on page 93)

SIG BALSA SWEEPS T

80% OF FIRST PLACE WINNERS

SIG BALSA WAS USED BY THE
ALL INDIVIDUAL NATIONAL CHAMP

In top competition, where quality counts, year after year SIG BALSA WOOD is used by more fliers than all other brands combined. The wide range of sizes and grades of wood available make SIG the Choice of Champions!

SIG®

HERE IS THE BALSA THE CHAMPIONS USED !

STICKS - 36" Lengths

1/16 x 1/16	.04
1/16 x 1/8	.05
1/16 x 3/16	.06
1/16 x 1/4	.07
1/16 x 3/8	.09
1/16 x 1/2	.11
1/16 x 3/4	.14
1/16 x 1	.18
3/32 x 3/32	.06
3/32 x 3/16	.08
3/32 x 1/4	.09
3/32 x 3/8	.10
3/32 x 1/2	.13
3/32 x 3/4	.18
3/32 x 1	.20
1/8 x 1/8	.07
1/8 x 3/16	.08
1/8 x 1/4	.09
1/8 x 3/8	.13
1/8 x 1/2	.16
1/8 x 3/4	.20
1/8 x 1	.22
3/16 x 3/16	.10
3/16 x 1/4	.12
3/16 x 3/8	.14
3/16 x 1/2	.20
3/16 x 3/4	.23
3/16 x 1	.28
1/4 x 1/4	.16
1/4 x 3/8	.19
1/4 x 1/2	.21
1/4 x 3/4	.28
1/4 x 1	.35
5/16 x 5/16	.19
5/16 x 3/8	.25
5/16 x 1/2	.30
5/16 x 5/8	.36
5/16 x 1	.42
3/8 x 3/8	.22
3/8 x 1/2	.29
3/8 x 3/4	.38
3/8 x 1	.48
1/2 x 1/2	.33
1/2 x 3/4	.44
1/2 x 1	.55
5/8 x 5/8	.39
5/8 x 1	.61
3/4 x 3/4	.53
3/4 x 1	.68

48" Lengths

1/8 x 1/8	.09
1/8 x 1/4	.12
1/8 x 1/2	.20
3/16 x 3/16	.13
3/16 x 1/2	.28
3/16 x 3/4	.32
1/4 x 1/4	.22
1/4 x 1/2	.30
1/4 x 3/4	.39
5/16 x 5/16	.25
3/8 x 3/8	.30
3/8 x 1/2	.38
3/8 x 3/4	.51
1/2 x 1/2	.44
1/2 x 3/4	.59

SHEETS - 36" Lengths

1/32 x 2	.26
1/16 x 2	.28
3/32 x 2	.34
1/8 x 2	.39
3/16 x 2	.46
1/4 x 2	.60
3/8 x 2	.69
1/32 x 3	.37
1/20 x 3	.39
1/16 x 3	.39
3/32 x 3	.49
1/8 x 3	.55
5/32 x 3	.61
3/16 x 3	.66
1/4 x 3	.87
5/16 x 3	.95
3/8 x 3	1.04
1/32 x 4	.55
1/16 x 4	.55
3/32 x 4	.61
1/8 x 4	.77
3/16 x 4	.88
1/4 x 4	.98
3/8 x 4	1.30
1/32 x 6	1.08
1/16 x 6	1.08
3/32 x 6	1.24
1/8 x 6	1.29
3/16 x 6	1.50
1/4 x 6	2.00
3/8 x 6	2.30
1/32 x 8	1.38
1/16 x 8	1.38
3/32 x 8	1.48
1/8 x 8	1.80
3/16 x 8	2.05
1/4 x 8	2.25
3/8 x 8	2.85

48" AAA Sheets

1/32 x 3	.55
1/16 x 3	.55
3/32 x 3	.65
1/8 x 3	.73
3/16 x 3	.87
1/4 x 3	1.19
3/8 x 3	1.49
1/16 x 4	.75
3/32 x 4	.83
1/8 x 4	.94
3/16 x 4	1.05
1/4 x 4	1.32
3/8 x 4	1.60
1/16 x 6	1.44
3/32 x 6	1.60
1/8 x 6	1.72
3/16 x 6	2.00
1/4 x 6	2.70
3/8 x 6	3.05

BLOCKS - 3" Lengths

1 x 1	.08
1 x 2	.14
2 x 2	.20
1 x 3	.20
2 x 3	.27
3 x 3	.44

BLOCKS - 6" Lengths

1 x 1	.14
1/2 x 2	.18
3/4 x 2	.22
1 x 2	.27
1½ x 2	.33
2 x 2	.37
1/2 x 3	.24
3/4 x 3	.34
1 x 3	.39
1½ x 3	.46
2 x 3	.51
3 x 3	.85
1/2 x 4	.36
3/4 x 4	.43
1 x 4	.49
1½ x 4	.63
2 x 4	.74
3 x 4	1.09
1/2 x 6	.55
3/4 x 6	.68
1 x 6	.80
1½ x 6	.96
2 x 6	1.05
3 x 6	1.75

BLOCKS - 12" Lengths

1 x 1	.27
1/2 x 2	.34
3/4 x 2	.42
1 x 2	.51
1½ x 2	.61
2 x 2	.72
1/2 x 3	.46
3/4 x 3	.65
1 x 3	.71
1½ x 3	.88
2 x 3	1.08
3 x 3	1.63
1/2 x 4	.72
3/4 x 4	.82
1 x 4	.96
1½ x 4	1.19
2 x 4	1.45
3 x 4	2.17
1/2 x 6	1.05
3/4 x 6	1.35
1 x 6	1.45
1½ x 6	1.94
2 x 6	2.26
3 x 6	3.35
1/2 x 8	1.45
3/4 x 8	1.70
1 x 8	1.90
1½ x 8	2.45
2 x 8	3.00
3 x 8	4.45

BLOCKS - 18" Lengths

1 x 1	.39
1 x 2	.77
2 x 2	1.08
1 x 3	1.10
2 x 3	1.65
3 x 3	2.42
1 x 4	1.38
2 x 4	2.20
3 x 4	3.30
1 x 6	2.25
2 x 6	3.40
3 x 6	4.90
1 x 8	2.80
2 x 8	4.50
3 x 8	6.70

BLOCKS -24" Lengths

1 x 1	.53
1 x 2	1.02
2 x 2	1.45
1 x 3	1.45
2 x 3	2.16
3 x 3	3.28
1 x 4	1.93
2 x 4	2.92
3 x 4	4.35
1 x 6	2.95
2 x 6	4.40
3 x 6	6.60
1 x 8	3.90
2 x 8	5.90
3 x 8	8.80

ROUNDED EDGE AILERON & ELEVATOR STOCK

1/4 x 1	.48
3/8 x 1	.54
1/4 x 2	.65
3/8 x 2	.75

ODDS & ENDS PKG. BALSA WOOD
Packages ..... .69

36" ROUNDED EDGE PLANKING

5/32 x 1/4	.09

PLANKS - 36" Lengths

1 x 1	.72
1/2 x 2	1.04
3/4 x 2	1.29
1 x 2	1.53
1½ x 2	1.82
2 x 2	2.12
1/2 x 3	1.27
3/4 x 3	1.71
1 x 3	2.10
1½ x 3	2.64
2 x 3	3.10
3 x 3	4.75
1/2 x 4	2.10
3/4 x 4	2.35
1 x 4	2.60
1½ x 4	3.45
2 x 4	4.25
3 x 4	6.25
1/2 x 6	2.85
3/4 x 6	3.45
1 x 6	4.25
1½ x 6	5.35
2 x 6	6.25
3 x 6	9.50
1/2 x 8	4.25
3/4 x 8	4.75
1 x 8	5.25
1½ x 8	7.00
2 x 8	8.60
3 x 8	12.50

36" BALSA TRIANGULAR CUT

1/4 x 1/4	.20
3/8 x 3/8	.25
1/2 x 1/2	.30
3/4 x 3/4	.40
1 x 1	.55

AIRFOIL SHAPED SHEETS

3/16 x 3 x 36	.74
1/4 x 3 x 36	.93
1/4 x 4 x 36	1.05

TAPER CUT SHEETS 36"

1/16" Tapered Edge	
1/4 x 3 x 36	.90
1/4 x 4 x 36	1.05

BAGS OF BALSA
Bags of Balsa ..... .98

CONTEST BALSA
Very Light
4-6 Lb. Stock

1/32 x 3	.44
1/16 x 3	.44
3/32 x 3	.54
1/8 x 3	.61
3/16 x 3	.72
1/4 x 3	.93
3/8 x 3	1.10

C-GRAIN AAA
8-12 Lbs.

1/32 x 2	.32
1/16 x 2	.35
3/32 x 2	.41
1/8 x2	.45
3/16x 2	.52
1/4 x 2	.65
3/8 x 2	.75
1/32 x 3	.43
1/16 x 3	.43
3/32 x 3	.54
1/8 x 3	.60
3/16 x 3	.72
1/4 x 3	.92
3/8 x 3	1.09

VH - VERY HARD

1/16 x 3	.44
3/32 x 3	.54
1/8 x 3	.60
3/16 x 3	.71
1/4 x 3	.92
3/8 x 3	1.09

LEADING EDGE
36" Lengths

3/8 x 1/2	.33
1/2 x 1/2	.39
3/4 x 3/4	.60
1 x 1	.85

36" TAPERED TRAILING EDGE

1/8 x 1/2	.21
3/16 x 3/4	.24
1/4 x 1	.32
5/16 x 1¼	.38
3/8 x 1½	.44

36" WING SKINS

1/16 x 12	2.25
3/32 x 12	2.55

CL-12 BUSTE

1ST CL SCALE RACING OPEN - Ulous
4TH CL SCALE RACING JR. - Cass Cal
4TH CL SCALE RACING OPEN - Linda

FF-16 AB

1ST FF B GAS SR. - J

FF-7 WITCH DOCT

5TH FF 1/2A JR. - Barry Pailet, Glen H

RC-23 ZLIN

5TH CL SCALE OPEN
Mike Gretz, Montezuma, Ia.

FF-8

5TH FFSC

THE NATIONALS AGAIN

S AT OSHKOSH WERE SIG USERS

E GRAND NATIONAL CHAMPION, PIONS AND CATEGORY CHAMPIONS

GRAND NATIONAL CHAMPION - Bucky Servaites of Kettering, Ohio
OPEN NATIONAL CHAMPION - Bucky Servaites
INDOOR FREE FLIGHT CATEGORY CHAMPION - Bucky Servaites
JUNIOR NATIONAL CHAMPION - Bruce Pailet of Brookville, Glen Head, N.Y.
SENIOR NATIONAL CHAMPION - Brian Pardue of Greensboro, N.C.
RADIO CONTROL CATEGORY CHAMPION - Bob G. Smith, Reseda, California
SCALE CATEGORY CHAMPION - Frederick (Tom) Stark of Florissant, Mo.
OUTDOOR FF CATEGORY CHAMPION: Robert Watson of Morton Grove, Ill.
CONTROL LINE CATEGORY CHAMPION - Terry Herron of Wichita, Kan.

STER

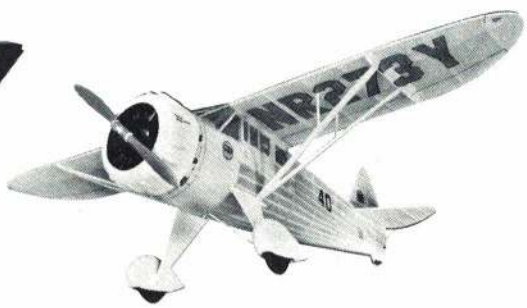
- Ulous Harris, Bethany, Okla.
ass Caldwell, Sleepy Eye, Minn.
- Linda Wheeler, Mesquite, Texas

A B C SCRAMBLER

S SR. - Joseph Mekinga, Barberton, Ohio

FF-10 WITCH DOCTOR 800

2ND FF B GAS JR. - Steve Calhoun, Rolling Hills, Calif.
3RD FF C GAS JR. - Steve Calhoun
2ND FF C GAS SR. - Lee Lieber, Moorestown, N.J.



FF-23 MR. MULLIGAN

1ST INDOOR SCALE JR. - Rebecca Stark, Florissant, Mo.
2ND FF SCALE RUBBER - JR. - SR. - Rebecca Stark

OCTOR-X

t, Glen Head, N.Y.

CL-16 AKROBAT

3RD CL STUNT JR.
Kenneth Stevens, Lexington, Ky.

F-8 PIPER SUPER CRUISER

TH FF SCALE GAS OPEN - Mathew Gewain, Midwest City, Okla.

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The Modeler's Wishbook"

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JOHN SMITH ON CL

Control Line Contest Boards: After looking over the preliminary vote of the CLCB on recent rules proposals, I had an idea. Why not a separate CLCB for each CL category? In other words, why not give each specialized event (Speed, Rat and TR, Stunt, Combat, etc.) its own rules making committee?

I think the proposal/comment sheet sent out by Bill Pardue bears out this idea. The percentage of returns we got back, along with comments and ideas from Speed fliers, was much higher than the CLCB has ever received from the questionnaire published in Competition Newsletter. Of course more people would be involved, but what is wrong with having the people who fly the event make the rules? (They probably know more about the event than someone who doesn't compete!) Possibly we could use the same districts now used for the District VPs.

A general chairman for each district and up to three or four committeemen for each district wouldn't be too far out of line. The general chairmen could coordinate all info from their district and send it to a central point for final writeup. For the final vote, instead of a few voting for many, everybody who flies in the event could have a voice. Granted it would take some work to set it up, but why not give it a try? After all, the Scale committee works for the scale flier; special interest groups work in the RC field. We should have the same advantage.

Automatic Speed Timers: While camping out at a local meet last year, we were visited by the local police who regularly patrol our camp area during meets. The patrolman was an old model flier (who isn't?), and one thing led to another. His car was equipped with Vascar. This is a speed timing device that tells the speed of cars while moving in the same or opposite direction of the cruiser. It's not automatic; it is run by a series of toggle switches activated by the patrolman. When the unit was activated the speed was shown directly in mph in a small window of the unit. This is a 12 volt unit so it could be made portable. These units may be available from local law enforcement groups, possibly as a worn-out unit, that could be made operable for our use. These would be ideal for a contest such as the NATS.

New Handles: I have heard through the grapevine that a couple of fellows are arranging to have some new Mono-line type twister handles made up for sale. Also one fellow is working on a low-cost geared handle for single wire. While both of these are still in the preproduction stages, availability seems a sure thing around the first of the year. I'll keep you posted.

Props and Things: While I was running in a new engine the other night, I checked my run in prop and saw that the blade was developing a goodly fracture. While never flown and never abused, the blade was still breaking up. While a blade leaving in the air will not cause any "people damage," one on the test stand could be a real problem.

Later, while going through a couple of boxes of new props that the hobby shop had ordered for me, I found four out of one dozen that were unsuitable for running of any kind. Why can't prop makers run quality control on props so these "baddies" don't leave the plant? The same goes for glow plugs. I remember a couple of years ago Roselle and Frye went through a dozen new plugs before they found *one* that wasn't bad. (Seal leakage.) If one manufacturer could come up with a good seal—one that you could depend on—he could corner the glow plug market overnight. Who'll be first in line with such a plug?

BOB STOCKWELL ON RC

Post-NATS Math: In the aftermath of the NATS, the '72 K&B Schnuerle continued to dominate—at least in Southern California. At the Pop White Memorial Races sponsored by the San Gabriel Valley RC League, Bob Smith won with a best time of 1:22.4 and Larry Leonard turned a fantastic 1:27.5 for eleven laps. I don't think I've ever seen a Pylon racer move as fast as that one. Everyone sensed a new record under 1:20 in the making until Larry got the cut. But Larry blew two engines during the contest and ended up with only 24 of 32 points, and fifth place.

Larry proved that his speed was no fluke, however. At the very next contest he carried home all the marbles. Sponsored by the RC Bees of Orange County, this contest was, like the Pop White Memorial, held at Whittier Narrows Recreation Area because Mile Square is now closed to all RC flying. It produced a new RC Pylon speed record—Kent Nogy posted a 1:21.9 flying a new Stafford Ricky Rat with a '73 K&B. Kent's '73 engines seem to go as well as the '72 engines or better. It looked as though he would win that contest, since he was the only one who beat Leonard. But in the next to last round he folded a wing coming around the near pylons.

One of the most remarkable facts about the Pop White event was that Terry Prather beat both Smith and Nogy with his old Supertigre G-40. At the RC Bees event, he tried out an X-40 which was extremely fast for as long as it kept running. However, the exhaust pipe was apparently too small, creating too much back pressure and overheating after four or five laps. Even with the plug gone, Prather was fast enough to end up first in most heats, and fourth for the contest. The X-40 obviously has enormous potential if enough engines and parts can be made available to permit some playing around with them—and of course if enough of them are manufactured to make them legal under the 1000 engine rule that is expected to be enforced next season.

The Pop White event also produced a puzzling situation. One of the features of this event is a perpetual trophy for the fastest time. Kent Nogy turned a 1:20.9, but did not appear to be going nearly that fast. Furthermore, his next-best time was 1:27.4, and he had several in the spread from 1:29 to 1:36. It was, therefore, pretty obvious that either he had not turned the time that was announced, or it was a nine-lap time (most likely possibility). Yet, the starter and his helpers on the line felt sure there had been no mistake. CD Jerry Silverman had a nasty little problem on his hands.

In my opinion, what he did was exactly correct: He did not count the time that Nogy had posted because he was convinced that it was a nine-lap time. Altogether, Silverman and his colleagues did a superb job of running the contest, and I thought that the decision to give the merchandise prizes (some $400 worth) to the workers rather than to the fliers was a neat innovation.

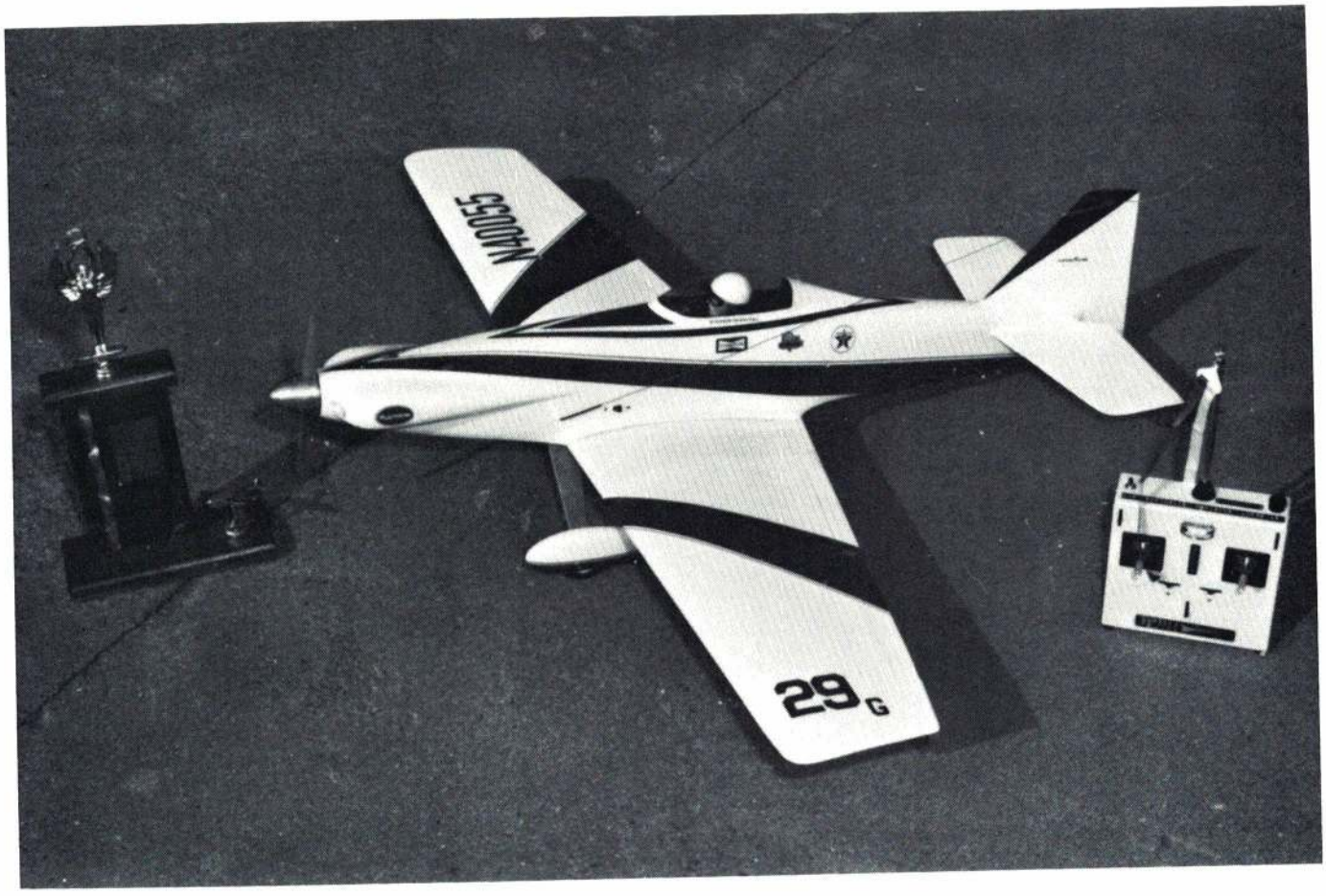
In Southern California this season, there have already been five contests. Smith has won one, Leonard has won two, Nogy one, and Whit Stockwell one. But Smith has placed high in all of them and he leads the standings. It looks like a race right down to the wire this season with no single competitor totally dominating the way Smith did last year, or Prather the year before. Prather, Stockwell and Leonard are all close enough to catch Smith or Nogy, especially with Smith having changed frequency so that he can race against Nogy which he couldn't do up through the Nationals.

The RC Bees produced a new champion in the Standard Class, Bobby Johannes. He is a youngster who got his start in Quarter Midget Racing, and he is sure to be tough for the experts to handle in the future. The Pop White event also produced a new champion in the Standard Class, but unfortunately he won't normally be racing in this part of the country: Marciel Davila from Mexico City put on a fantastic performance, with Jeff Bertken calling for him.

A Final Note: A few months ago, in reporting about the Bakersfield/M.A.N. races, and the

Happiness is a good, fast pit stop. FAI T.R. Catch by Jim Joy of the Joy-Albritton team.

Mary Derrough with husband Basil's FAI bird. They are leaders in the small but growing Canadian pylon group.



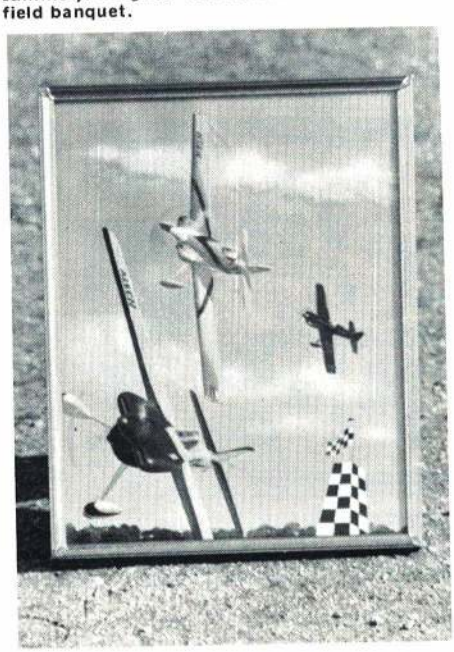
ABOVE: Beautiful Minnow built by Jim Bertoglio (Medicine Lodge, Kansas). Jim is one of top competitors in the Southwest. K&B Schnuerle engine, Pro-Line gear.

Valley Fliers' Race at Mile Square last spring, I noted that there had been a substantial number of crashes, including several mid-air collisions. I suggested that one of the mid-airs was "inexcusable" because the overtaking airplane had a two-lap lead and should have been able to pass safely. It is part of the responsibility of the pilot and in particular of his caller to know, whenever it is possible and reasonable, where another plane is in the race. It is also both possible and reasonable when there are only two planes with one much faster than the other. However, I have been severely criticized for this remark on the grounds that I did not have all the facts. I was not aware that (1) the slower airplane was flying an exceptionally erratic course, so that all the faster one could do was stay in its regular course; and that (2) there had been a cut during the race, and the caller was, at the time of the mid-air, turned the other way checking to see whether it had been picked up on the cards, so he could not warn the pilot. Now, I certainly don't deny that there are unavoidable mid-air collisions: In any tight race, they are a constant probability and it is miraculous, in my opinion, that they are not much more frequent. If the two circumstances listed above are sufficiently extenuating, then I was wrong to describe the collision as inexcusable, and I owe Larry Leonard this apology.

That particular column, however, brought some related criticism which I do not accept. I noted quite a number of crashes, including one by Jeff Bertken which came too close to killing one or more people—indeed, the most frightening crash I have ever witnessed, squarely into the midst of the pilot area between the starting line and the pylons. The criticism goes like this: We all think this is a great sport, and we don't want to see it atrophy. So when bad things happen, you shouldn't mention them—just publicize the fun aspects of flying. We all know that bad things occasionally happen, but don't make a big deal of them.

The fact is, however, the speeds have made it much harder to avoid these things. I've been saying this for two years, and have made a lot of people angry because of it. But now I believe that the extra two or three seconds per lap that would go with speeds in the 1:50 to 2:00 min. heats would allow the pilots a little more room for error than they now have. Speed for its own sake is meaningless. It is only relative to a set of rules that are meaningful in competition. There is just no longer any good reason why some firm step in the direction of controlled speed should not be taken—smaller venturis, only one blade of the prop sanded for balance. I see no reason why the change has to be any more radical than that, but I see increasingly good reason for at least that much change.

Painting for the outside cover of the new NMPRA Pylon Racing Book (published last summer). Original was raffled off at Bakersfield banquet.



Clarence Neufield with Thunder Chicken, all-balsa design by Glen Spickler.

FRED MARKS ON RC

Questions and Answers: From Richard Franchi—"I have a Blue Max Mk II System and I would like to know if Royal, Heathkit, or Cannon receiver and servos can be interchanged with my Blue Max system. If by chance most similar systems work with the Blue Max, I would appreciate knowing which will not work with it."

Richard, all digital systems have the following parameters that must match: (a) The transmitter and receiver must be on the same RF frequency and the receiver must be carefully tuned to the transmitter. (b) Servo control pulse width must be approximately 1.5 milliseconds at neutral plus and minus 0.5 milliseconds for full control. (All systems we have tested fall within this range within reasonable tolerances, including the three mentioned.)

It will be necessary to adjust the servos for proper center when mating up the second airborne pack. One should not tamper with the transmitter time bases. This whole thing is the reason we designed the AAM Commander 1-8 digital airborne system presented recently in **AAM** and now kitted by ACE RC. Quite a number of people desire to mate a second airborne unit for control of gliders, cars, boats, a second airplane, etc., without the need to pull their "first line" set from one model to fly another.

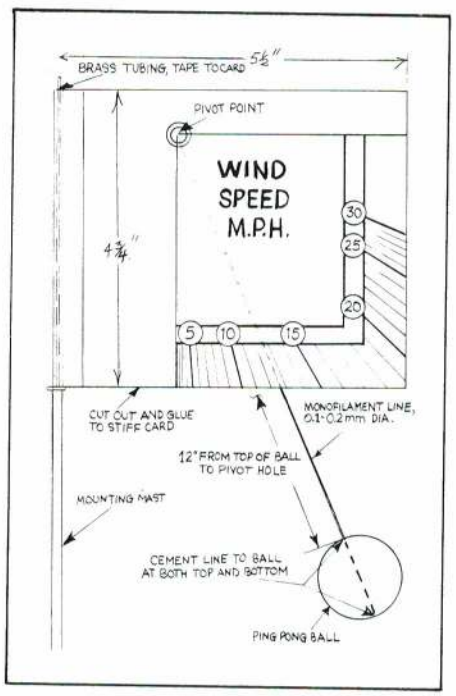
While we are on this subject, it should be pointed out that it is possible to mix servos, battery packs, and receivers but this requires quite a bit more knowledge of what one is doing. The wiring may differ. Some servos use a negative going pulse, others use a positive going pulse, and some servos simply may not be compatible with each other in terms of crosstalk, (i.e., electrical noise).

From the *Northrop Aircraft Modeler*, J.W. Headley presented the following.

"An anemometer looks so professional when arriving at the gliding site to spend the first ten minutes diagnosing the weather with the aid of a highly polished gadget full of mysterious dials and rotating things on top."

In a recent copy of *Scientific American* I ran across an anemometer that was as irresistible as it was simple. This device, called a pendulum anemometer, if carefully reproduced can be used as is, i.e., it requires no additional calibration, and should give wind speed readings to within 10% of the actual values.

"The sketch given here shows my own version of this device. To make you own, cut out the scale and glue to a piece of stiff card. Drill a small hole at the pivot point for the monofilament. Cement the ping pong ball to the monofilament, and then to the scale, so that the top of the ball is exactly twelve inches from the pivot point.



"One possible mounting scheme is shown in the sketch. Tape a length of tubing onto the edge of the scale, and then slip this onto an old antenna, which can then be fixed to your model box, or some other support system. To read correctly, the top of the scale should be horizontal, so don't use too flexible a support." (Be sure to blow sketch up to proper dimensions as shown before attempting to reproduce.)

A Report From Downrange: Ray Edester writes from the Grand Bahama Islands regarding his experiments with decoder similar to **AAM** Commander 1-8: "I read with considerable interest your article on the eight-channel update of your **AAM** Commander airborne system in the June issue. One shortcoming was spotted which I was confident would be corrected in a following issue, but having just read the July issue, I see no changes and feel a compulsion to tell you of my experiences with a decoder of this type.

"Almost two years ago I started development of a decoder for use with the Heath GDA-57-2 receiver. I chose the DM86L70 shift register simply because it was the first SR with more than two stages I found at a price I couldn't turn down. This was some time before eight-channels became the order of the new systems. So I lucked out in the respect that this combination was up to date for use with the new transmitters.

"On the first effort, I ignored the reset or clear input to the SR in order to keep size and parts count low. This resulted in a certain amount of grief due to the fact that when the airborne power was applied, with the transmitter off, the SR stages would come up in a random fashion of set and reset. Some servos, notably Heathkit GDA-19 series, have a direct coupled input and, should they see a high level from the decoder in its static condition, would run to their extreme travel and chew on their gears until the transmitter was turned on.

"I was using discrete components for shaping the shift register inputs at that time; upon seeing your first article in the April 1972 issue of **AAM**, however, I switched to the 74L04 hex inverter for shaping and added the reset input to the shift register. Note that the reset is applied from the last inverter in the series string so that a negative pulse is generated any time power is applied due to the hysteresis in the earlier inverters causing a changing level to come 'rattling' through. Also, the saving in space due to the use of a hex inverter allowed the addition of an active filter, a la Heathkit.

"The receiver decoder draws 10 ma and is housed in the Heathkit GDA-57-2 receiver case simply by exchanging the decoder boards and rewiring. This is an easy way to update the basic three-channel receiver for up to eight channels."

Ray sent along the schematic, component layout, and printed circuit layout for his decoder which we present here. With regard to the need for the "clear" pulse, please review the pc layout for the 1-8 decoder presented in the June issue. You will note that there is an unused land from pine nine of the SN74L164. Our earlier version had a jumper from that land to the land between pins six and nine of the SN74L04. However, our own tests indicated that, in the absence of any incoming pulse train, all outputs on the shift register (74L164) stayed solidly down. Since there seemed to be no need for that jumper (I hate jumpers!), we dispensed with it. Our point is, if any builder runs into the problem Ray describes, just add the jumper.

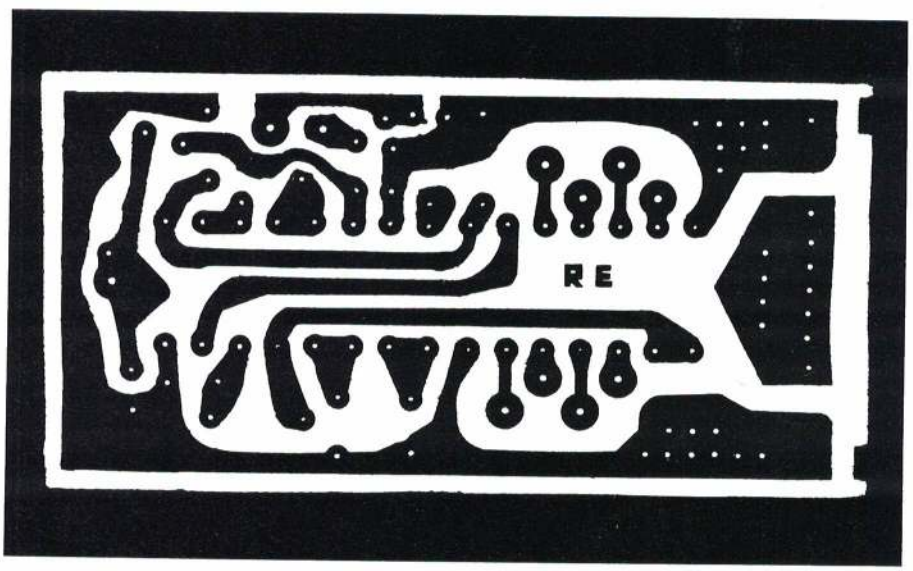
Ray also states that he had problems getting a wide sample of shift registers to work down to the stipulated 3.6 volts. He doesn't say if this is the National DM 8570 shift register nor does he note the source of the IC. Our tests included a sample of 30 or more ICs, both National DM 8570s (also labeled SN 74L164) and the TI was a good margin. We hasten to add that these are from the TI and National distributors; if you use the low-cost houses advertising in electronic magazines, watch out! You won't know for sure what you are getting. We close with one philosophical statement: I tolja and tolja—shut off the receiver first on any system! for he was a well-known educator in aviation, an historian, and model craftsman.

Fun At The NATS: I'd like to close with a unique report on the Nationals meet at Oshkosh, i.e., that of a non-competing modeler-spectator. My family and I made a stop at Oshkosh on Saturday, August 11, as part of our vacation trip. I am not a competition flier so our participation was strictly from the spectator's vantage. We arrived at the airport to find free parking for AMA members, then picked our way to the AMA activity center where "mechanics" badges were obtained at $2 each. Before leaving that area at the entrance to the flying area, a stop was made by the hobby shop in operation during the NATS. We then made a pass through the work hangar which reminded us of many photos of the work area at previous NATS.

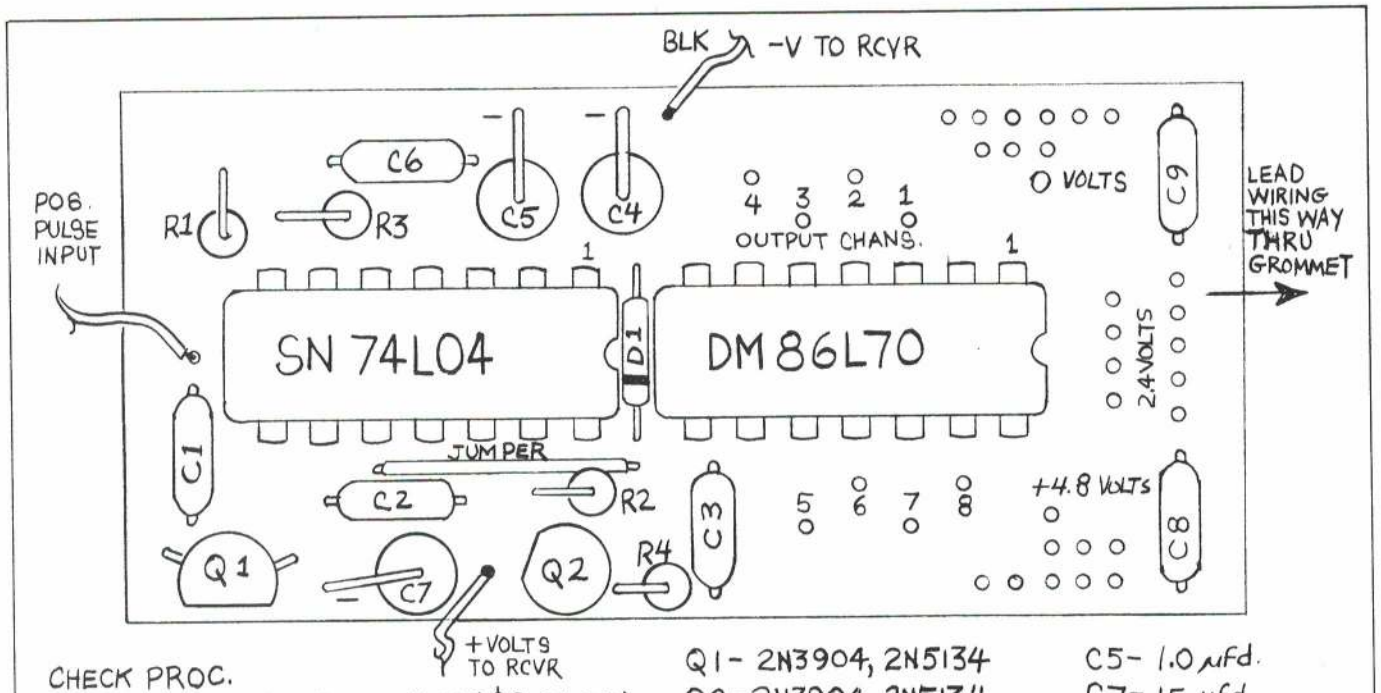
Next was a visit to the area where the L.M. Cox Co. was providing continuous entertainment for kids in the form of a number of flight circles where the youngsters (up to 90 years old!) were offered the opportunity to fly control-line models and to build and fly small rubber models constructed of polystyrene foam and plastic.

Just in front of the hangar was a Northrup T-38 Talon jet trainer that the visitor could look over completely until his attention was drawn to frequent flight demonstrations by teams of RC and control line fliers behind the snow fence. Beyond this area at the runway, the finals of C Expert Pattern were underway. We climbed in the car to drive over to the contest area since we were now permitted out there with our "mechanics" badges. Inasmuch as C Pattern, RC Scale, and several control

(Continued on page 95)



Reduce length of land to 2.25 inches (width of land is 1 inch).

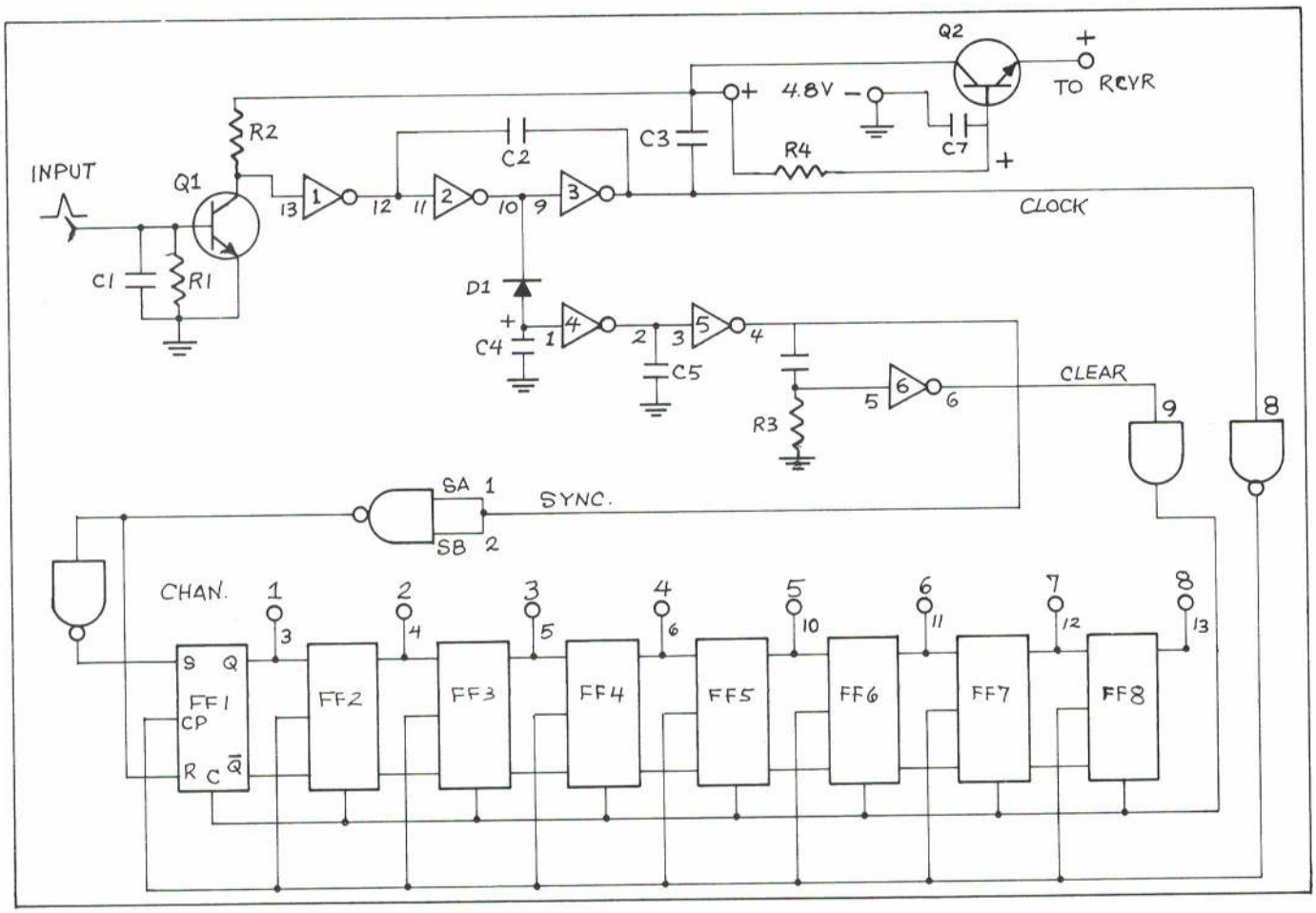


CHECK PROC.
SYNC 'SCOPE WITH DATA (PINS 1 & 2 OF S.R.)
ASCERTAIN THAT:

1. DATA IS HIGH BEFORE CLOCK PULSES BEGIN.
2. WITH ALL TRANSMITTER CONTROLS AT MAX. PULSE WIDTH POS. NO OUTPUT IS SEEN AT PIN 2, INV4, DURING CLOCKS.

Q1 - 2N3904, 2N5134
Q2 - 2N3904, 2N5134
R1 - 100K Ω
R2, R3 - 10K Ω
R4 - 1K Ω
C1 - .005 μfd.
C2, 3, 6, 8, 9 - .05 μfd.
C4 - .22 μfd. - .27 μfd.
C5 - 1.0 μfd.
C7 - 15 μfd.
D1 - IN4148, IN914

COMPONENT SIDE VIEW



Protect Your Hearing

by RAYMOND LEONE
M.A., Audiology

This sound level meter is used to approximate the degree of hazard to hearing from noise. Modelers should be aware of this danger and take appropriate precautions.

TABLE I

Hours of Exposure Per Day	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

Noise is defined as any undesirable sound. The sound of a screaming model engine may be music to the modeler's ear, but the damage it may do to his sense of hearing is definitely undesirable.

To understand noise and its deleterious effect on hearing, we must know how the level of sound is measured. The measuring device is called a *sound level meter*. It consists of a microphone which transforms the air pressure waves of sound into electrical current, an amplifier, weighting networks, and a meter which displays the measurement in the appropriate unit.

The unit of measure for sound level is the *decibel* (dB), named in honor of Alexander Graham Bell. It is a logarithmic unit which expresses the ratio between the pressure of the sound being measured and a standard reference pressure. The standard reference pressure is the least amount of sound pressure that the average human ear can just detect at 1000 Hertz, or .002 dyne per square centimeter. A *dyne* is a force which will move one gram at a velocity of one centimeter per second during each second.

The above definitions may be of little value to most readers, but it is important to remember that the decibel scale is logarithmic rather than linear. Therefore, every six dB increase on the meter represents a *doubling* of the sound level. It is convenient to use the decibel scale for measuring sound level due to the extreme range to which the human ear is responsive. If we used a linear scale, it would be equivalent to measuring distances of one in. to 16,000 mi. with the same ruler. In addition, the decibel scale is used because the human ear perceives changes in sound pressures in a similar relative manner rather than in an absolute way.

The letter "A" after a decibel reading (dBA) indicates that the sound was measured with the *A-weighting network* of the sound level meter. The A-weighting network filters out some of the low frequency (pitch) components of a sound. This network is commonly used now in measuring noise since it approximates the degree of hazard to hearing from noise.

The ear is a *transducer.* It changes sound energy into electrical energy or nerve impulses which are then sent to the brain. This change takes place at the receptor hair cells of the inner ear. Repeated exposure to high levels of noise will damage the hair cells. Since

(Continued on page 82)

Over 60 amazingly detailed aircraft! World War I and II fighters and bombers from many nations, commercial supersonic jets, choppers and historic prop-driven aircraft. All hand decorated, with moving parts and retractable wheels.

- Authentic scale and colors
- Moving parts and retractable wheels
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79¢
each

1. P-40 Flying Tiger
2. Messerschmitt ME-109
3. Russian MIG 21-C
4. F-104 Starfighter
5. French Mirage 4A
6. B17 Flying Fortress
7. British Spitfire
8. Japanese Zero-Zen
9. Boeing 707
10. F-105 Thunderchief
11. P-51 Mustang
12. P-38 Lightning
13. Huey Copter AH-1G
14. B-25 Mitchell
15. F-4U Corsair
16. Spirit of St. Louis
17. Fokker DR-1
18. Spad XIII
19. Corvair 880
20. Sopwith Camel
21. Albatros D-111
22. Boeing 727
23. Douglas DC-9
24. F-4K Phantom
25. Douglas DC-8
26. YF-12A Lockheed
27. Junker JU-88
28. British Lancaster
29. Nieuport 17
30. Fokker Eindecker
31. Stuka JU-87G-1
32. P-47D Thunderbolt
33. Fokker D-VII
34. SE-5A
35. Boeing 747
36. Boeing F4B-4
37. Kitty Hawk
38. Jolly Green Giant
39. B-24D Liberator
40. Douglas DC-10
41. Saab AJ37 Viggen
42. Curtiss P-6E Hawk
43. Ford Tri Motor
44. PBY-5A Catalina
45. C-119 Flying Box Car
49. Kawasaki Ki-61-2
54. Mitsubishi MU-2B
55. Kingfisher
60. 2 Shiki Flying Boat
61. Polikarpov
62. Grumman F4F Wildcat
63. Focke-Wulf 190
64. Morane-Saulnier
65. B-58 Hustler
66. Douglas Skyraider
67. Grumman F3F
68. Boeing B-29 Superfortress
69. Bell UH-IB Iroquois
70. Curtis Helldiver
71. De Havilland Mosquito
72. Douglas DC-3
74. Westland Lysander
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11. Grumman F-11 "Tiger"
12. Douglas DC-8 Jetliner
13. British DeHavilland "Comet"
14. Piper "Cherokee Arrow"
15. Piper "Navajo"
71. Boeing 747 "Jumbo"
72. B.A.C./Sud-Aviation "Concorde"
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AREA 770
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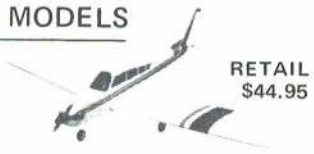

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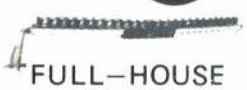

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Engine .60

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SEALECTOR SEALING IRON

Adjustable From 300°F To 550°F

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#86

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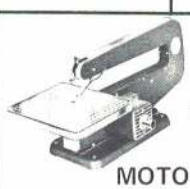

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RETAIL $19.95

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Mini-Olympic	19.95	17.00
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ASTRO-FLITE (AFI)		
ASW-17	$ 69.96	$ 53.00
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Hi-Pro Glider	$ 39.95	$ 29.00
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MIDWEST:		
Li'l "T"	$ 18.95	$ 13.50
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Dart	$ 55.00	$ 47.00
Dart II	64.50	55.00

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.19 BB TV	37.98	27.25
.29 IV TV	27.98	21.00
.29 BB TV	35.98	26.00
.35 III TV	29.50	22.25
.45 BB TV	51.50	37.00
.60 III BB TV	76.98	50.50
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.15 RC	$ 17.95	$ 12.75
.19 RC	21.95	15.50
.25 RC	21.95	15.50
.29 RC	26.95	18.50
.36 RC	26.95	18.50
.40 RC	29.00	19.75
.60 RC Eagle	59.95	39.75
.78 RC	74.95	49.50
K & B:		
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.25 RC	26.98	21.75
.30 RC	29.98	23.95
.30 RC Wankel	87.50	68.00
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VECO		
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.40 RC Blackhead	$ 81.50	$ 52.00
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JUST RELEASED FALL '73 CATALOG

FULLY ILLUSTRATED!

The Fall '73 catalog is twice as big as the Spring '73. Over 75 manufacturers of kits, radios, engines, and accessories at the lowest prices anywhere! Send 50¢ (mailed 3rd Class). For first class mailing, send 75¢. FREE WITH ANY SIZE ORDER

HEATHKIT GDA-1057-1
DUANE LUNDAHL

Basic system price starts at $139.95 for a three-channel set with two standard servos. The set includes NiCad batteries for both transmitter and airborne system and utilizes an external transformer isolated charger. The set as tested was in the four-channel configuration. Total system price in this version is approximately $220.

Transmitter: The transmitter is truly a unique configuration in the RC industry and though, for an experienced two stick flier, it takes some getting use to, a great deal of human engineering has gone into this configuration. The transmitter utilizes the newest Kraft stick assembly, both for the three-channel and four-channel "single stick" version.

Throttle control is by means of a flush mounted thumb knob located on the side of the transmitter. In the four-channel version, control of elevator and aileron are identical to a Mode II dual stick transmitter, while the rudder control is by means of a rotatable knob at the top of the stick.

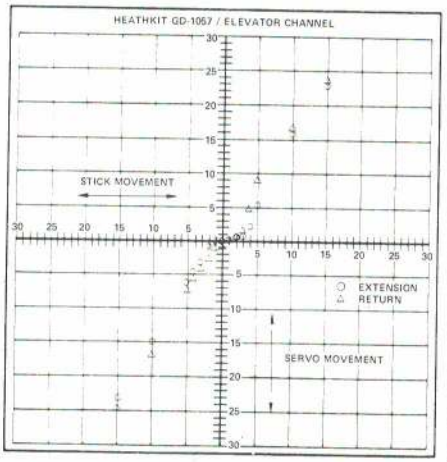
Internally, the transmitter circuitry is identical to the previous Heathkit GD 19 transmitter.

Receiver/Decoder: The receiver portion of the receiver/decoder is identical to previous Heathkit receivers. It utilizes an intermediate frequency of 453 KHz, together with crystal filters instead of IF cans. The double tuned front end coils are therefore the only adjustments required in tuning the receiver to the transmitter. The decoder section is unique to this particular radio. Rather than use SCSs as were used in the GD 19, or an integrated circuit as is used in the eight-channel radio, Heath has utilized pairs of NPN and PNP transistors as electronic switches for each channel.

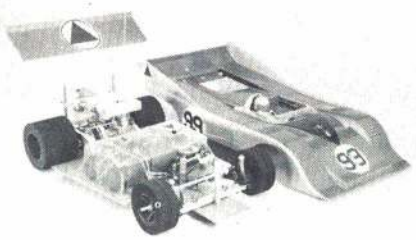
Servos: The servos supplied with this set were the Heathkit GDA-405-44 miniature servos. Heath is now using a Texas Instruments integrated circuit in their servo amplifier. The circuitry is of the bridge amplifier type, so that you now have only three leads to each servo. As a result, output torque of the servos are nearly doubled and servo resolution is improved.

Specifications: Temp Range—0-160°F. **Rec. Sensitivity**—5 micro volts or better*. **Airborne System Wt.**—(4 miniature servos) 13.4 oz. **Servo Torque**—24 in./oz.

*mfgs. spec.



DELTA DASH II SL
ED PENNEWILL



The Delta Dash II SL is the latest 1/8 scale RC race car from Delta Systems of Bridgeton, Mo. It is not too different from previous Delta cars in that the SL has a power pod which consists of twin clutch and engine supports. The SL pod has been redesigned and is much lighter than previous models. The chassis is a "pan" of aluminum sheeting over an aluminum stiffener extending from the power pod to forward of the front wheels. The stiffener also carries the front end assembly. The front end assembly is similar to previous Delta models except that the steering blocks are made of very tough plastic.

The car, complete with body, engine, and radio weighed five lb. 14 oz. The quality of the kit contents is excellent. It appears that Delta is maintaining its reputation for rugged durable race cars.

The engine used was my own new Veco 19, propeller broken-in, stock off-the-shelf (no modifications) with a high compression head. I chose a Porsche VDS body because of its better aerodynamic design. The body was mounted using the Delta body mounting kit. A Delta Phase III radio was installed. (An evaluation of the radio will appear in **AAM** as a separate AAM Test.) Also, a Delta Servo Saver was installed in the steering linkage. Total assembly time was about 15 hr.

The assembly manual furnished with the kit was followed closely. The manual is, in general, well written and easy to understand. However, a few problems were encountered. The engine used had the key type thrust washer, so the required length of the crankshaft had to be computed rather than simply cut to the length given for a crankshaft with a collet type thrust washer. Also, the manual does not call enough attention to the difference in ends of the clutch flyweights which resulted in the improper installation of the flyweights.

The flyweights are similar in appearance, but one end has a deep U cut and the other end is a shallow U. The deep end is the pivot end. If the flyweights are assembled incorrectly, they will not pivot freely and fully. Further, the manual states that 5° of toe-in should be set on each front wheel. Not having a model car front-end machine, toe-in is usually set by measuring the distance between the front and rear of the front tires after they are installed. Usually the toe-in is set so that difference is about a 1/16" to 1/8". This car, however, uses ¼" for proper running.

A template was furnished in the manual for locating and drilling the required radio equipment mounting holes. This is an excellent construction aid as the template can be taped to the chassis, the holes marked with a punch, and all the required holes drilled in one operation. All the car parts fit together without any modifications or alternations.

The SL is very easy to control and has excellent response to both steering and throttle. It cornered extremely well and tracked straight at high speeds.

More AAM TESTS on page 70

ROYAL APOLLO TWO-CHANNEL
FRED MARKS

The Test System: A two-channel digital set designed for use with boats and cars. Made in Japan for Royal Electronics.

Transmitter: Very small transmitter using discrete components. Control of steering using large spring-centered "wheel" knob on transmitter face. Steering trim is small knob below the wheel. Second channel is controlled from lever on right side using the forefinger of left hand. Electronically, frame rate is a bit higher than most sets, about 80 per second. Rate set by free-running multi followed by two half-shots for control of pulse width. Transmitter is powered by six pencells in a plastic holder. Base-loaded antenna used.

Receiver: All discrete components. Molded plastic case is sealed, can only be opened by carefully cutting the plastic. Uses the usual three IF transformer. Unusual feature is use of IF can type inductors for a double-tuned front end. Decoder uses two transistors per channel in the SCS configuration used several years ago in the U.S.

Servo: Rotary output servos driven by discrete component amplifiers that appear to be the same circuitry used in the Royal Classic set of about two years ago. Requires use of battery center tap. Unusual use of feedback potentiometer makes use of entire commercial pot. Use of pot and 20 mm motor determines servo size. Servo performance is shown in the figure below and proved to have about 3-4° deadband.

Receiver/Servo Power Supply: Uses four alkaline energizers in a plastic holder. Wiring harness and switch are part of power supply.

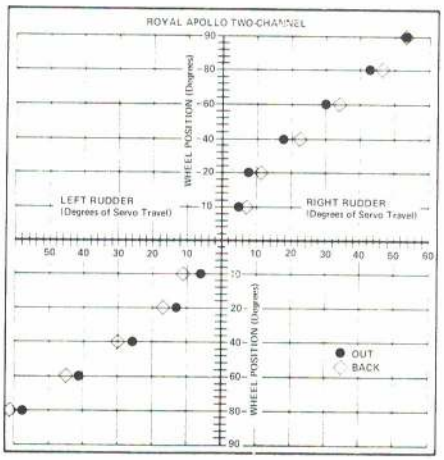
Overall Evaluation: Set designed for use in cars and boats where performance is not quite as critical as for airplanes. However, a skilled car driver will notice the broad deadband in the servos. The transmitter is small and comfortably held in one hand. Can't see the need or desirability of sealing the receiver case.

System Characteristics

Dimensions*: Transmitter: 6H x 3W x 2T. **Receiver:** 2¼L x 1-5/8W x 7/8H. **Servo****; 7/8W x 2-5/8L x 1¾H. **Battery Pack:** 2¼L x 1¼ x 1¼.

Servo Output: 1¼ lb. clockwise and 1¾ lb. counterclockwise at 4/10 in. radius for a torque of .5-.7 in./lb.

* Dimensions, in.
** Servo dimensions include mounting lugs in length, output wheel in height.



CARL GOLDBERG

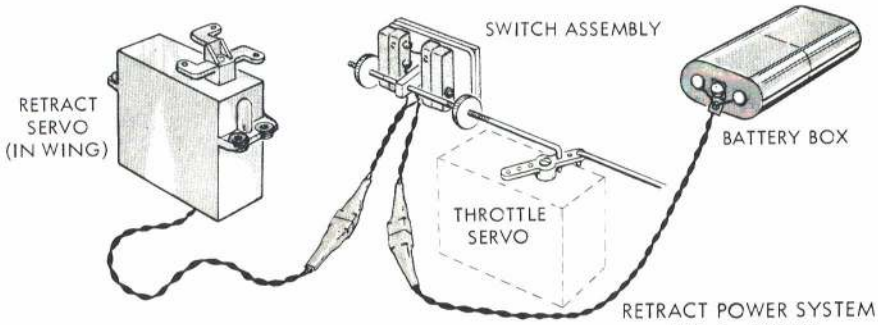
NEW! RETRACT POWER SYSTEM FOR 4-CHANNEL FLYERS!

POWERFUL NEW SERVO, SPECIAL SWITCHING SYSTEM AND 2-CELL BATTERY PACK— WIRED UP READY TO INSTALL. LIGHT! COMPACT!

At last! A way for 4-channel flyers to easily get into retracts! Our new Power System is ready to go - just add 2 penlite cells, mount the switch assembly on the side of the fuselage or on the throttle servo, connect the retracts and that's it! When throttle and trim levers are both moved all the way up or all the way down, the retracts will do the same!

Heart of the system is a small, powerful servo, geared down for heavy work, and with thick strong output gears. Transit time under load is about 3 seconds. Easily handles tri-gear retracts with power in reserve.

System comes wired up with plug connectors and needs only batteries. 2 nickel cads may be used, or penlite dry cells which are good for many hundreds of retract cycles when using a balanced system such as CG Retracts.



RETRACT POWER SYSTEM
RPS-1 $29.95

FLIGHT PROCEDURE 1. Take off using throttle stick fully advanced in normal manner. After take off, advance trim lever to limit, and gears will retract.

2. Leaving trim at maximum, perform flight maneuvers as usual, retarding and advancing main throttle stick as desired. Even with full retard, gears will remain retracted.

3. On preparing to land, first bring trim to full retard. When ready, retard throttle stick fully and hold for 3 seconds so gears will extend and lock. If necessary to add throttle to lengthen approach, gears will remain extended.

Complete system weight with batteries (not furnished) - 3 oz.

Packard Photography

Joe Bridi and his new Super Kaos; a beautiful paint job topped off with DJ Multi-Stripe.

KENT NOGY
DON DEWEY JOE BRIDI
LARRY LEONARD
BOB VIOLETT

DJ's MULTI-STRIPE

It's an instant hit! When the famous modelers named above tested DJ's Multi-Stripe and liked it, the word got around. Now modelers everywhere are finding DJ's Multi-Stripe fulfills its promises. It bonds permanently and sticks like paint. Very thin, with a special expensive adhesive, the final fuelproof bonding takes place in sunlight. There's no other tape like it! No more shrinking, lifting, and getting dirty. For the striping tape that solves these problems, ask your dealer for the one and only - DJ's Multi-Stripe. Exclusively marketed by Carl Goldberg Models.

4 SIZES
1/16" Wide, 36 Feet Long - $1.98
3/32" Wide, 36 Feet Long - 2.69
1/8" Wide, 36 Feet Long - 2.69
1/4" Wide, 36 Feet Long - 3.69

5 COLORS - RED, WHITE, BLACK, GOLD, DARK BLUE

P.S. For best service, see your dealer for items you want. If not available, write direct; add 50¢ per item ($1 outside U.S.). Minimum order $1.

ALL ITEMS AVAILABLE IN CANADA

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4735 W. Chicago Ave., Chicago, Ill. 60651
I am sending 25¢ for 8 pg. illustrated Catalog with Basic Explanation of R/C Equipment and Radio Control Definitions.

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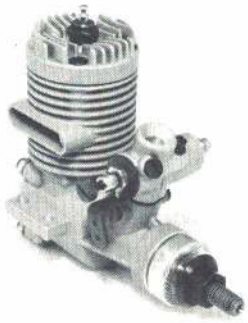
KOSMIC 23RC
DON JEHLIK



Break-in on the engine was rather long. The engine would stop suddenly (stick) and yet with no damage to piston and sleeve. After a couple of hours running alternate rich and lean needle settings, the test engine still wasn't completely free.

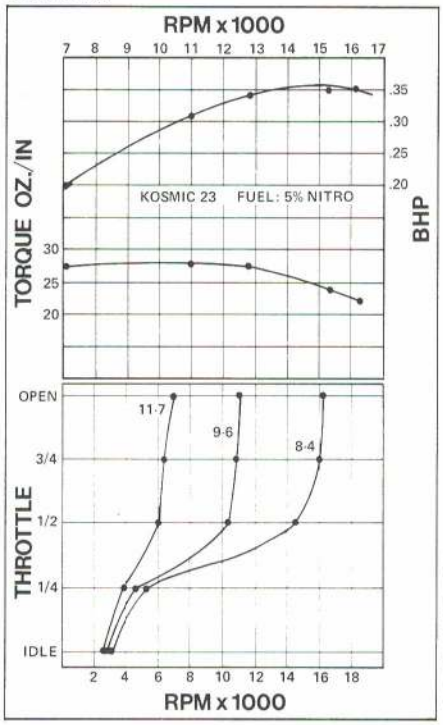
I took it apart and found the piston slightly large on the main portion. It's hard to describe, but pistons get rather barrel-shaped at the top. When viewed from the side, the top portion of the cylinder-shaped piston is tapered to about 1.5/1000 in. less in diameter than the lower portion. My problem was that the lower portion was slightly large and when the engine leaned out, there just wasn't enough room for everything to go up and down.

I lapped the piston in the sleeve with 1000 grit silican carbide in a soapy water solution. Didn't take much, about two min. and the lapping action became smooth and free. Then a thorough wash and reassembly. I've found 1000 grit establishes an almost perfect clearance between piston and sleeve on lapped piston engines from 15 to 35 size, except diesels.

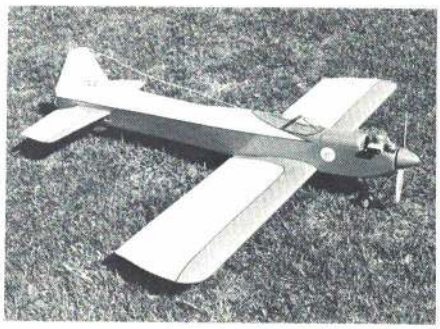
I ran the engine and found it operated perfectly at all needle and throttle settings. It's really difficult to manufacture a lapped piston engine with perfect piston-sleeve fit. I prefer one a little tight as in this case to one too loose.

The 23 is of conventional design with a single bypass and baffle type piston. Cylinder cooling fins extend well below the exhaust port—a sensible feature. The shaft is mounted on a single rear ball bearing with bronze bushing in front. The case casting makes provision for a front bearing that would be desireable if the engine were used in RC race cars.

The test engine blew a fair amount of fuel out the front of the shaft housing but the leakage didn't affect the throttle settings. Hot starts were really good, one for two flips every time.



STERLING LANCER SL-62
JIM WALKER



The Lancer SL-62 kit proved to be easy to construct and a welcome contrast to an earlier Sterling kit that contained a seemingly inexhaustible number of small parts. The die-cut components were sharp and clean and required little effort to separate. The design was generally standard for a built-up balsa and plywood model and could be constructed readily by a modeler with some previous experience.

The wing is equipped with strip ailerons and I like the new linkage arrangement that does not require bellcranks and long connecting wires. The linkage, which attaches at the end of the aileron and terminates inside the body, is a real time-saver. Wing construction was fast and alignment was true. The wing tips of the airplane have an angular appearance that I did not like. It was easy, however, to modify the tips to a more conventional curved shape. The fuselage is built from one-piece balsa sides and goes together quickly. Tail components are of sheet balsa and contribute to the general ease of construction.

The cavity for installation of radio equipment is large and easily accessible. As a result, the builder has a good deal of flexibility in locating components to achieve good balance and a neat arrangement. There is ample space for shock mounting.

I covered the Lancer with MonoKote and found all curves and compound surfaces to be compatible with a smooth finish. I experimented with water colors in selecting a color scheme for the Lancer before arriving at a two-tone approach for the fuselage. I feel that the approach selected, shown in the photograph, de-emphasized the broad lines aft of the cockpit and improved the general appearance. Black striping tape at the junction of colors gave a nice accent to the color scheme.

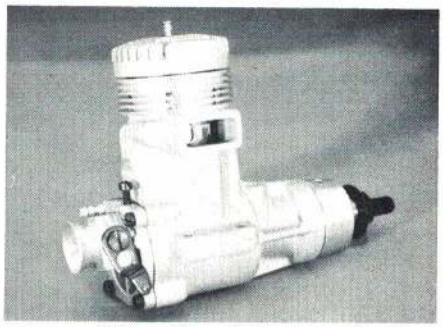
The Lancer was the first 60-powered model that my 13-year-old son and I have flown. The model was balanced according to instructions and the first flight revealed no serious problems. Slight adjustments on the servo trim controls were adequate for easily controlled and steady flight. We had no problems in making the transition from smaller aircraft though the Lancer's higher speed and sink rate on landing do require a faster response. Landings are easy and the Lancer is well-behaved in taxiing. We found that rolls, inside and outside loops and Immelmans were easy though we must still improve our technique. The Lancer is responsive and smooth in these maneuvers and we look forward to trying more difficult maneuvers. Our plane would not fly knife-edge satisfactorily, but this may be the fault of our rather tired engine. The Lancer has given us confidence enough to enter some Pattern contests soon.

I would recommend the SL-62 to inexperienced modelers as an easy model to build and fly. The kit is well-planned and materials are high quality. The construction approach results in a well-aligned aircraft and balance is easy to achieve without ballast. It has demonstrated that it has capability as a Pattern trainer.

The Lancer SL-62 is a product of Sterling Models, Inc., Belfield Ave. & Wister St., Philadelphia, Pa. 19144.

Specifications: **Engine**—60. **Airfoil**—symmetrical. **Wingspan**—62 in. **Wing area**—700 sq. in. **Flying weight**—6½ lb. **Price**—$39.95.

K&B 40 S SCHNEURLE
DON JEHLIK



I assumed the engine would be run on FAI 80-20 fuel for FAI Pylon. It could also be run on a 40 Nitro-40 Alky-20 oil blend to get consistent performance and long plug life. I selected a 65% Nitro-13 Alky-3 propylene oxide-20 K&B oil brew.

After a break-in of 5-8 oz. tanks of the alky fuel, three tanks of 40% brew and three of the 65% brew, I ran the following props with results shown below.

FUEL	9-6 SUPER M	8-6 SUPER M (from 9-6)	7-6 SUPER M (from 9-6)
80-20	17,200 rpm	19,200 rpm	20,400 rpm
40-40-20	18,400 rpm	20,600 rpm	22,375 rpm
65-13-3-20	19,300 rpm	21,200 rpm	23,100 rpm

The original glow plug lasted throughout the test until I used the 65% Nitro fuel. Then a plug burned out on each run.

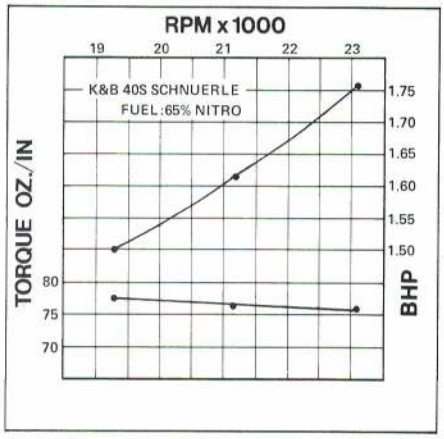
The almost flat torque curve of this engine (76 to 77.5 in./oz.) over the rpm range of 19,300 to 23,100 is notable. Many Pylon fliers are aware of the value of high or sustained torque over a large rpm range. With such consistent torque, the engine horsepower really increases with the rpm. But here's where the flier can encounter problems. The test engine still did not reach peak horsepower at 23,000 plus rpm. A Jr. C Speed flier could probably achieve 23,000 rpm on an eight-in. pitch prop and fly (my calculation) about 162 mph. Can Rat, Carrier or Pylon fliers do the same? I don't know if the peak HP of this engine can be reached in flight in all of the competitive events.

The special features are the heavy one-piece crankcase, HP-style rectangular exhaust stack, unusual exhaust port shape in the sleeve, and the aluminum Supertigre style rotor disc that runs on a steel pin and chrome-plate faced backplate.

I encountered some problems with the RC fuel cut-off carburetor. The needle valve did not adjust the engine evenly when turned. Solved the problem by substituting the Rat Race venturi.

K&B put a sticker on the outside of the box that says to "read enclosed introduction sheet before purchasing engine." The introduction sheet explains that K&B cannot fully guarantee the engine because of the Nitro and oils percentages that may be used in fuels. They do stand behind their workmanship guarantee. I believe that's fair.

The test engine met all the quality standards and completed the test in perfect condition.



R/C MULTI CHANNEL

THE CONTENDER—The first all-balsa R/C model you can build in just 8 hrs. Wing Span: 54" Eng.: .29 to .60. Kit RC-15 $39.95

KWIK-FLI III . . . World and twice Nats. winner. Designed by Phil Kraft. Span: 60" Eng.: 45 to 61 Kit RC-12 includes jig for true straight wing. $52.50

R/C NOBLER. Radio version of the winningest stunt model of all time. Wing Span 51" Eng.: .35 to .45. Kit RC-14 $32.95

R/C SCALE AND STANDOFF SCALE

S.E.5.a Never before has a R/C scale model been designed with such attention to the most insignificant detail. Wing Span: 52" Eng.: .45 to .60 Kit RC-13 $52.50

MUSTANG P-51 . . . A standoff scale model that only a ruler can tell from a true scale plane. Wing Span: 60" Eng.: .40 to .60. Kit RC-16 $49.95

WARHAWK P-40 . . . Now—in answer to your many requests. Span: 60" Eng.: .40 to .60. Kit RC-17 $52.50

R/C COMPACTS

HEADMASTER . . . America's best R/C trainer, for up to 3 channels. Span: 48" Eng.: .09-.35 Kit RC-11 $19.95

TOP DAWG . . . Single or multi-channel for sport or pylon racing. Span: 39.5" Eng.: .049-.15 Kit RC-10 $16.95

SCHOOLMASTER . . . Single or multi channel with rudder, elevator and engine control. Span: 39" Eng.: .049-.090 Kit RC-8 $10.95

SCHOOLGIRL . . . Span 32" Eng.: .020-.049 Kit RC-9 $9.95

SCHOOLBOY . . . Span: 29" Eng.: .010-.020 Kit RC-3 $6.50

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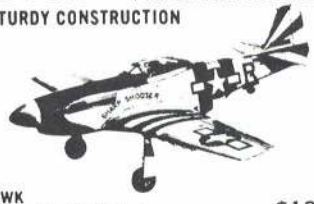
for those who insist on the

VERY BEST!

CONTROL LINE SCALE MODELS

SUPER FORM PREFORMED FUSELAGE SHELLS FOR FAST STURDY CONSTRUCTION



P-40 WARHAWK Span: 28" Eng.: .15-.29 Kit S-1 $13.95

P-47 THUNDERBOLT . . . Span: 27" Eng.: .15-.29 Kit S-2 $13.95

P-51D MUSTANG . . . Span: 37" Eng.: .29-.35 Kit S-3 $19.95

SEMI SCALE STUNTERS

HAWKER HURRICANE . . . Span: 42" Eng.: .19-.35 Kit S-51 $9.95

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ZERO . . . Span: 18" Kit S-20

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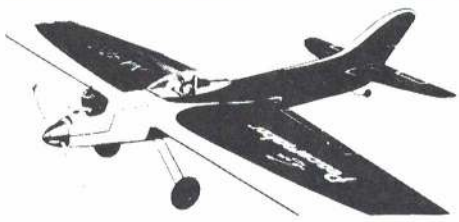
NATIONAL AYSC PLACE WINNER

JUNIOR NOBLER . . . For expert or novice. Span: 40" Eng.: .15-.25 Kit N6 $10.95



PEACEMAKER . . . Superform for fast construction, exceptionally durable. Span: 46" Eng.: .15-.29 Kit N-7 $12.50

FAMOUS FLITE STREAK FAMILY

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FLITE STREAK . . . Combat or stunt flying at terrific speeds. Span: 42" Eng.: .15-.35 Kit N-2 $8.95

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BABY FLITE STREAK . . . Span: 24½" Eng.: .049-.099 Kit N-4 $3.95

COMBAT STREAK . . . Span: 42" Eng.: .19-.35 Kit N-5 $8.95

STREAK TRAINER . . . Span 33" Eng.: .15-.19 Kit N-10 $9.95

CONTROL LINE COMBAT MODELS

COMBAT CATS . . . Two complete models in one box. Span: 39½" Eng.: .19-.35 Kit N-8 $9.95 (2 models)

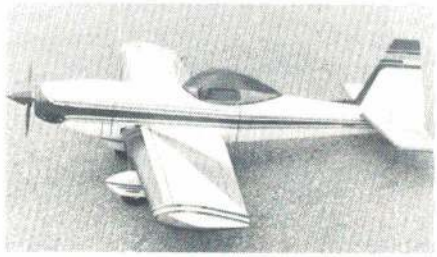
COMBAT KITTENS . . . Span: 22¼" Eng.: .049 Kit N-9 $6.50 2-models)

TOP FLITE MODELS, INC. 2635 S. WABASH CHICAGO, ILL. 60616

TELL THEM YOU SAW IT IN—

NEW PRODUCTS CHECKLIST

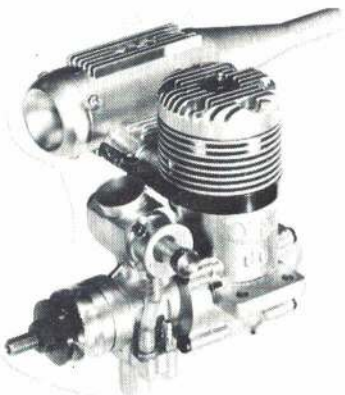
ERIC W. MEYERS



Hobby Shack/*Spinks Acromaster.* A medium-sized Stand-Off Scale stunter has a 54-in. wingspan and is for 21 to 40 engines. Fast building kit has foam cores and built-up balsa fuselage with molded canopy and wheel pants. Ship is perfect for your first RC "low winger" and will also perform the full AMA pattern. Retail price is $29.99. Hobby Shack, 6475 Knott Ave., Buena Park, Calif. 90620.

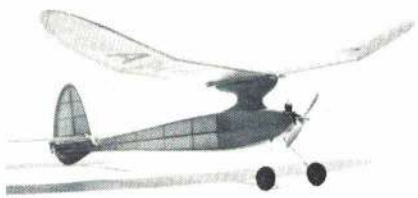
Astro Flight/*ASW 15.* Semi-scale kit is ideal for competition but gentle enough for beginners. 100-in. span model has 636 sq. in. area and is for two-channel radio. A plastic fuselage is used to simplify construction and increase durability and strength. Wing is constructed of balsa and spruce. $44.95. Astro Flight, Inc., 13377 Beach Ave., Venice, Calif. 90291.

Kraft/Throttle Actuator. An item useful to any sport or competition RC modeler, this convenient actuator allows a modeler to operate his engine without turning on transmitter. Throttle linkage from the servo automatically disengages when the spring-loaded knob is pulled out, thus giving you full control over the engine. Constructed of nylon, this handy item sells for $2.49. Kraft Systems, Inc., 450 West California Ave., Vista, Calif. 92083.



MRC/YS-60. A new concept in 60-powered engines, this YS-60 has a diaphram pump located directly under the crankshaft which draws the fuel from the tank through a pressure system allowing the tank to be placed anywhere in the airplane. The engine employs a chromed aluminum sleeve and massive air intake to develop high power and long life for the pattern or sport enthusiast. Model Rectifier Corp., 2500 Woodbridge Ave., Edison, N.J. 08817.

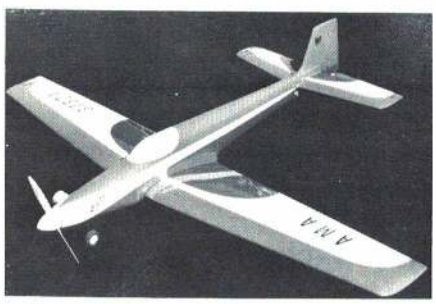
Perry/Fuel Filter. High quality filter has a polypropelene filter element which screens out the smallest particles to keep engine running smoothly. Attractive filter is easy to clean by reverse flushing and has a sealed element in aluminum housing to reduce leakage and corrosion. $.95. Perry Automotive, 581 North Twin Valley Oaks Rd., San Marcos, Calif. 92069.



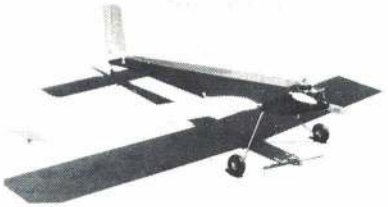
Cal-Aero/*Playboy Senior.* This Old-Timer styled airplane took first place at the 1973 Old-Timer NATS. The model has a 36-in. span for fast climb and a slow floating glide. Kit features sharp die-cutting, streamlined wheel, separate adjusting and flying sheets for field use. Kit sells for $7.95. Cal AeroModel, 7142 Bluesails Dr., Huntington Beach, Calif. 92647.

Sullivan Products/High-Torque Starter. A heavy duty, long-life 12 volt starter incorporates many innovative features such as "instant on" grip switch, hand guard, positive lock-in cone, and a surgical rubber insert for both spinner and propeller starting. All molded parts are of nylon material. A starting pulley for helicopters is available (not included). Starter has a two-year guarantee and sells for $27.95. Sullivan Products, Inc., 535 Davisville Rd., Willow Grove, Penn. 19090.

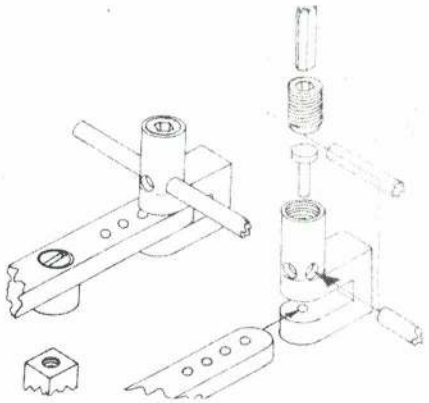
Cox/Black Widow. For a real edge in racing or combat U-control flying, this Black Widow engine produces about 2000 more rpm's than the Golden Bee stunt engine. The Black Widow features dual bypass porting and has the Golden Bee style long endurance tank. It comes complete with spinner and wrenches. Retail price is $9.00. L.M. Cox Manufacturing Co., Inc., 1505 East Warner Ave., Santa Ana, Calif. 92705.



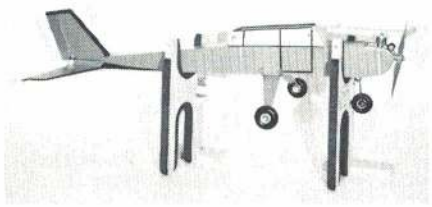
Better Built/*Super Cuda.* A proven contest winner in all classes, this RC pattern ship features a joined fiberglass fuselage and foam wing kit. Choose from either standard or deluxe kits—standard kit includes all balsa $69.95; deluxe kit has balsa covered wings with tips installed and sanded, $94.95. Wingspan is 64 in., area is 600 sq. in. and airplane is designed for side-mounted 60 engines. Better Built Airplane Products, P.O. Box 163, Camarillo, Calif. 93010.



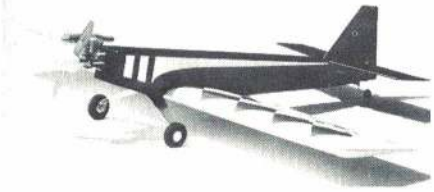
Hot Line/*Crickett.* Versatile sport/trainer airplane will fly in either a low wing or high wing version with a very simple five-minute changeover at the flying field. Airplane has a 48-in. span and is for 09 to 20 engines and two- or three-channel radios. Kit features plywood sides, simple easy construction and full-size plans. $16.95. Hot Line Models, Inc., P.O. Box 7757, Amarillo, Tex. 79109.



Orbit/Servo Arm Fitting. Modelers can look forward to a brand-new line of accessories from Orbit, one of which is this servo arm fitting for music wire pushrods called "Servo Links." Made of plated brass, nylon and steel, it is designed to really torque down on the set screw to secure wire pushrod. The nylon pin is locked to the servo arm by the pushrod and the steel set screw grips the pushrod. $1.49 for two. Orbit Electronics, 1641 Kaiser Ave., Santa Ana, Calif. 92705.

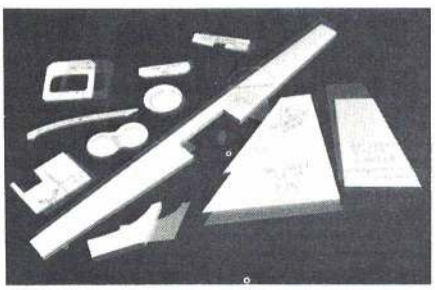


Creekmore/Model Caddy. This is designed to assist construction or installation of a model plane by holding the wing or fuselage in a cradle with special foam padding. It is extremely versatile as it can be attached to the edge of a workbench or table, or may also be used as a free-standing unit on top of bench, table or floor. Caddy comes with a tray to hold small parts and is completely assembled so it can be set up in seconds. Constructed of five ply birch hardwood, the caddy sells for $17.50. Creekmore Model Products, 2236 Lysander Ave., Semi Valley, Calif. 93065.



Wolff-Pak/Toad. A kit engineered with special emphasis on fast, accurate and simple construction, the *Toad* is designed for fun-flys, sport pylon and pylon trainer use. The fuselage and wing can be framed in one evening and all balsa and hardwood parts are machine-cut. The plane has a 50-in. span and weighs 3½ to 4¼ lb. and is for a 29 to 40 engine and four-channel radio. $36.95. Wolff-Pak, 1458 Husted Ave., San Jose, Calif. 95125.

TeleCraft/Flight Pacer. This is an automatic repeating interval timer which can be set for 2-10 min. ranges and receive an audible signal at the end of the interval. Great for warning the sport or competition flier when fuel is getting low. The device will also continue to sound whenever the transmitter is on—a great safety item. The item is in a kit which takes approximately two hours to construct and sells for $7.98 direct. Flight Pacer measures 1 x 1½" and sits easily on top of the transmitter. TeleCraft, Box 495, Kirtland, Wash. 98033.



See Temp/New Template Material. This new plastic has a no-glare surface for use in creating templates for part duplication from plans. The material assures a most accurate and easy way of making templates and is 15/1000 in. thick. Sheet measures 22 x 51½"—price per sheet is $3.95. See Temp, P.O. Box 576, Menomonee Falls, Wisc. 53051.

West Coast/*F4 Phantom.* Striking version of the *F4 Phantom* in fiberglass fuselage and foam wing construction. The ship has a 44-in. span, 500 sq. in. area and weighs approximately 6½ lb. with a 60 engine. An exciting Stand-Off Scale project, this kit is available in two versions. The deluxe kit includes fuselage, wing, wing sheeting, wheels, nose gear, tank and spinner plus a complete nylon accessory package for $94.95. A basic fuselage and wing kit sells for $59.95. West Coast R/C Products, 12084 Woodside Ave., Lakeside, Calif. 92040.

Sig/*Komander.* A unique design by Claude McCullough, this ship is a neat looking advance trainer for four-channel equipment and 35 to 50 engines. The ship has been designed to produce maximum stability yet retain maneuvering and aerobatic capability. Construction is simple and strong and a removable fuselage hatch allows easy access to tank and storage area. Kit has a balsa fuselage and foam core wing and includes balsa wing covering and hardware pack. 61-in. span—$29.95. Sig Manufacturing Co., 401 South Front St., Montezuma, Iowa 50171.

Maintenance/Plug Tester. A unique glow plug tester not only checks plugs but all associated wiring. When switch is put at test position, the tone tells you when you're ready to go. Especially good for hard-to-get-at engines. Device remains in circuit during start and uses all solid state circuitry. $14.95. Maintenance Engineering, 41 Norwood Terrace, Trumble, Conn. 06601.

SIXTY-FOURTH IN A SERIES

getting started in R/C

BATTERIES

JIM McNERNEY

The lifeblood of all RC systems is provided by batteries—unless you use a very long extension cord. However, batteries are just about the most unreliable component in the system.

Batteries rely on a chemical reaction to provide electric current. For rechargeable batteries the chemical reaction is reversible, but with carbon zinc, some alkaline cells, and mercury batteries, the reaction is essentially irreversible.

Let's define some of these terms: A *cell* is one unit with an anode, a plate and an electrolyte. A *battery* is a group of two or more cells. Depending on the chemical reaction, a cell will generate a specific voltage. No matter how big or how small, a cell will generate the same voltage using the same chemical reaction. The current available, however, is dependent upon the size of the cell, i.e., the area of the anode and plate. The larger the plate area, the more energy can be stored in the cell. Cells are rated by the amount of energy available.

Power is the product of voltage and current. *Energy* is the power available over a given time period. Since the voltage is the same for a given type of cell, ratings are frequently given in *ampere hours* (ampere being a measure of current).

A 475 milliampere hour cell will theoretically provide any combination of current and time whose product is 475 milliampere hours. But if you try to draw 475 milliamperes for one hour from such a cell, it will probably go belly up in about half an hour. If you draw 47 milliamperes for 10 hours it'll probably do fine. In other words, the amount of energy you take from a cell is dependent on the rate at which you take it out. The faster you take it out, the less total energy you get. (When is this guy going to get around to RC?)

In the typical RC system the cells are combined in series. An airborne battery has four cells. A transmitter pack may have six to ten cells in series. Initially it was typical for an airborne battery to be center tapped. That is, a wire was provided between the two sets of two cells. This provided steps of 2.4 to three volts from zero to 4.8 or six volts. The wire allowed voltage to flow in the plus and minus direction from a midpoint to drive the servos.

Recently, due to use of a gadget called a bridge amplifier, the need for the center tap has gradually diminished. Center-tapped systems have one fatal disadvantage: If one cell goes bad in the airborne battery, all the servos are driven to one extreme. The bridge amplifier systems, on the other hand, can normally operate at reduced range and speed even with a dead cell. This often enables one to retrieve a model after a cell failure.

Most modern transmitters have an output meter. The meter can indicate anything from a true radio frequency output to battery voltage. In general, it is indicative of battery charge condition. Always note what the meter reads when you turn the transmitter on after a full charge and what it reads after several flights. If the meter is significantly below this value, stop flying. Unfortunately, some systems are designed so that a cell can fail in the transmitter with very little change in the output meter reading.

In an earlier article, we discussed a method for testing the airborne battery. Always remember to measure the battery voltage under load. The load must be sufficient to cause a reasonable current drain. Remember, we said earlier that the voltage remains constant over a wide range of current drain. Thus, a battery can be nearly discharged and show full voltage under no-load conditions. However, a load can cause the voltage to drop to near zero.

For test loading, use a load which will draw rated current. That is, for a 475 milliampere hour battery, choose a resistive load that will cause a 475 milliampere current drain. For a 4.8 volt battery you would use a ten ohm resistor.

A word of caution. Be sure the resistor can handle the power. All the power discharged into the load is converted to heat. A ten ohm resistor across a 4.8 volt battery absorbs about 2.5 watts of energy. You should use a wire wound resistor of five to ten watts capacity. Even then be careful because the resistor will get hot. You need only keep the load connected long enough for the reading to stabilize; a few seconds is usually sufficient. If you leave the load connected for a prolonged period you may discharge the battery and stand a chance of reversing one or more cells.

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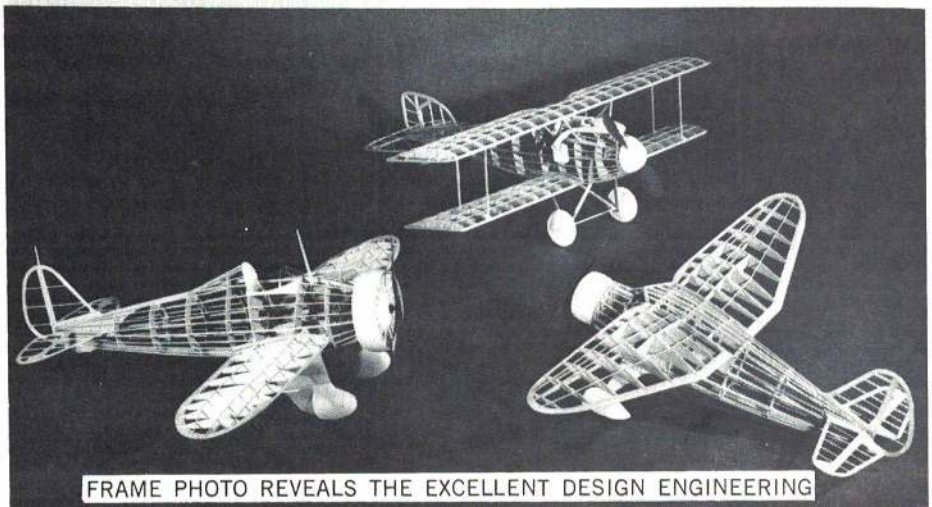

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BOSS

(Continued from page 24)

stack outlets. Once again, blend the red into the black for the desired effect. When weathered stains are completed, seal them with a light spray of clear flat dope.

For those trying the weathered look for the first time, the use of soft artist pencils for the final touches permits experimentation without the fear of ruining the final finish of the plane. When applying final touches with an airbrush and dope for the first time, the results can be disastrous.

OOPS!: Sorry about that—Captions on the photos of the Sopwith Camel and Nieuport 28 (with Swiss markings) were reversed in the September '73 issue. The Nieuport was built by Senior Howard Efron while the Sopwith Camel was the work of Gus Vogele.

Who Needs Scale Rulers?: In my last column I commented on the CL Sport Scale event proposed by the Scale Contest Board for 1974. I emphasized the need to keep the event on the simple side. This is especially true if we hope to attract Junior and Senior participation.

Another proposal that appeared in the Mid-May AMA Competition Newsletter is the provision for a Scale ruler to compare the model to the three-view drawings. The object of the proposal is to reduce judging problems and save time. While it's a great idea to help the judges with their chores, we are adding another burden to the Scale builder's chores.

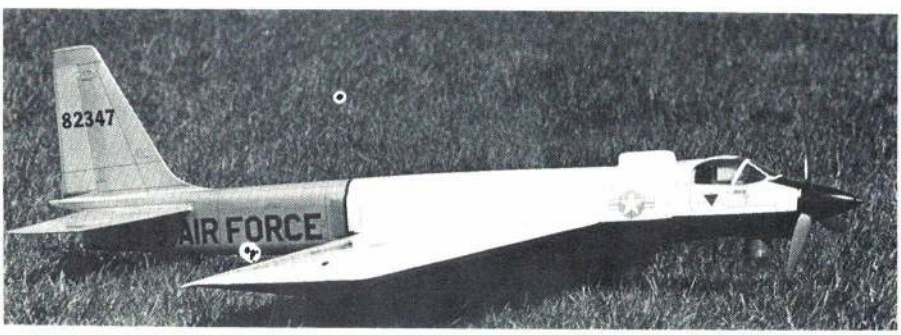
If passed this proposal will require all Scale model entrants to construct a ruler. What will the accuracy of the rulers be? Who will check them? The judges? Of what material should they be made, and how long should they be? How many contests are there that have so many models that not having a ruler provided by the contestant is a major problem? Is it the NATS only? If so, do we need a rule to satisfy a NATS Only situation? It seems that there would be just as many problems with a Scale ruler as without. And what will the Junior and young Seniors do? Have Dad make the ruler? And how cricket would this be with regard to the "Builder of the Model" rule.

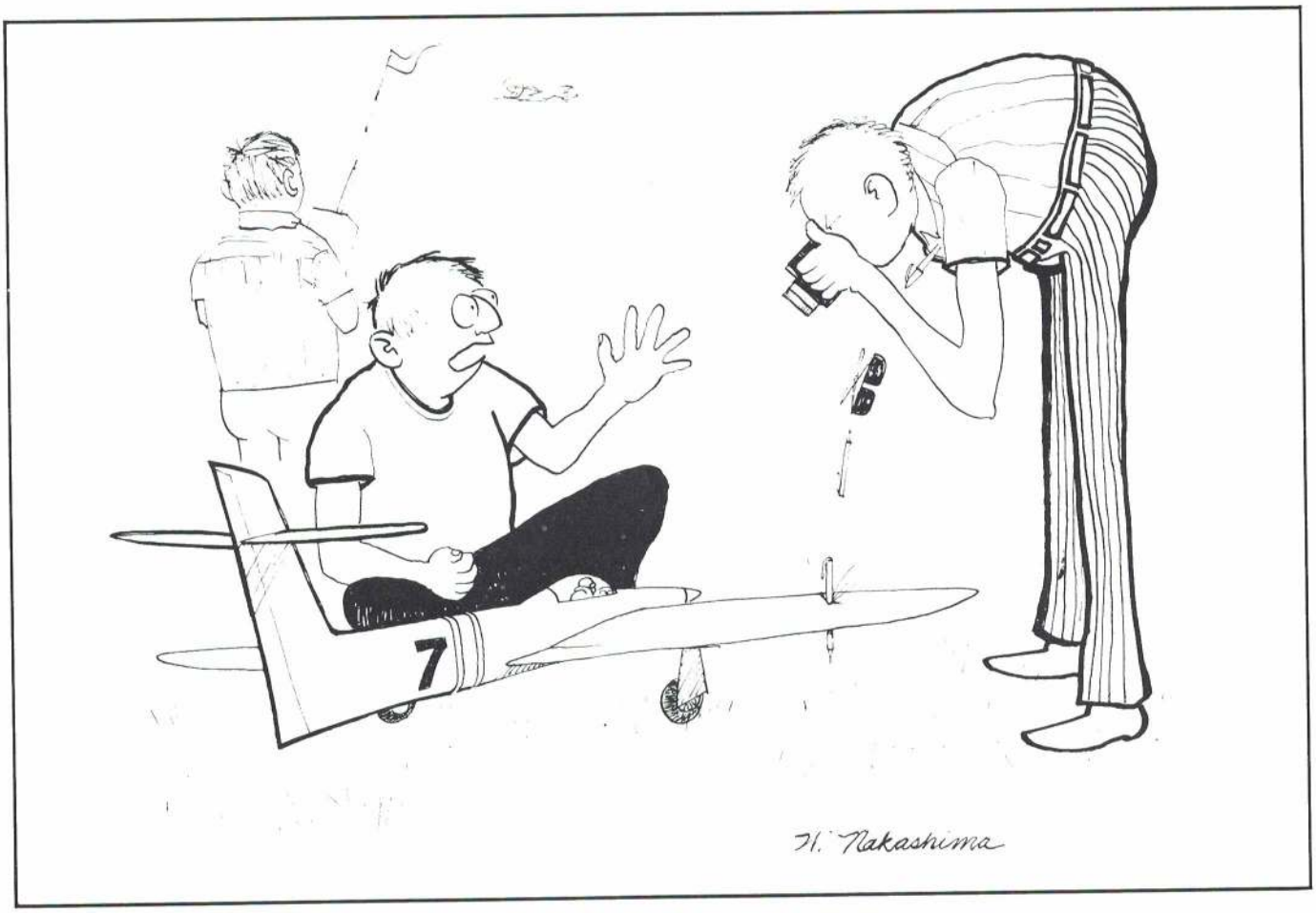
Why not provide the judges with a set of conversion tables (ft. to in.) for normal scale sizes, and let the existing rule stand which requires that the modeler who builds to an odd scale provide a means for directly comparing his model to the three-views? The tables could be set up in one ft. increments, one ft. to 100 ft., and in scales 1/4" to two in. in 1/4" graduations. Conversion tables of this kind would cover most scales to which modelers build. If part of a plane being judged had a prototype part that was over 100 ft., the judge would only have to do a little extra math for the conversion to inches under a particular scale.

While a set of conversion tables of this type may not get you down to the tenths of inches, they would point up any gross deviations when comparing one part of the model to another and the three-views. In addition, the tables would speed up the judging process by eliminating many of the calculations now done by the judges. If major deviations are found, a finer check can be made. The judges would have less trouble using undisputable conversion tables than wondering about the accuracy of homemade rulers.

A copy of the conversion table described above can be obtained by sending $1 and a letter-size, self-addressed, stamped envelope to Bill Boss c/o AAM. All proceeds will be turned over to the AMA Scale Team Fund.

A U-2 semi-scale stunt ship by Joe Adamusko has unique landing gear system. Power is an OS 35 with Grish 10-6 three-bladed prop.





T-19

(Continued from page 20)

mount tie-down dowels from the same material.

Wing, fuselage and tail parts are ready for doping. With or without Silkspan on the wing, the suggested minimum finish is three coats of clear dope followed by two coats of colored dope. Light sanding with fine paper between coats of clear dope will help the overall finish. More coats of clear and colored dope than the minimum specified are fine, since the dope skin is what keeps the fuel mess from soaking into the framework and ruining the model later on.

A big vise and a little patience will help when the landing gear is formed from music wire. Note that the true length of the landing gear legs is shown in the front view drawing. Angles of the portion that attaches to the fuselage are shown on the top view, and the forward rake of the legs can be seen on the side view. Mount the gear to the fuselage flights, the pushrod is best rigged to the bellcrank hole nearest the pivot bolt and to the fuselage provide attachment points for the rubber bands that will hold the fuel tank on. The balloon-type wheels can be fitted to the gear at any time. Soldering washers to the axle to secure the wheels is suggested as a cheap and strong method.

Mount the elevator horn and drill a hole for the bellcrank pivot bolt. The pushrod can be made now that the distance between bellcrank and horn is established. The 1/16" music wire specified for the pushrod will fit holes in bellcrank and horn, and will be easy to bend. Such thin wire might flex under load, so slip a section of 1/16" inside diameter brass tubing over the pushrod before both ends of the pushrod are bent. A spot of solder will hold the tubing in place at the center of the pushrod to reduce flexing. For first training flights the pushrod is best rigged to the bellcrank hole nearest the pivot bolt and to the elevator horn hole farthest away from the elevator. This rigging will compensate for over controlling tendencies most student fliers have at first. The pushrod can be repositioned later to provide faster control response as training progresses.

Attach leadout wires to the bellcrank and install the bellcrank and pushrod. It's important to correct any stiffness in the controls before the first trip to the flying field, and also to make sure the leadouts will hold when a firm, hard pull is applied to them. Check the final installation to see that the elevator and bellcrank are in the neutral position at the same time. The leadout wires should have their ends aligned at that time.

Installing the wing tie-down dowels, engine and fuel tank should complete this building project. Aim the engine slightly toward the right. This offset is another safe flying factor that will help

keep the model from trying to fly away from the control lines.

A Fox 19 or 25 is our choice of an engine that is perfect for both T-19 and stunt trainers that will follow. Mount the engine with bolts similar to the landing gear mounting bolts so that the fuel tank rubber bands can be run from the engine bolts, over the tank to the gear bolts. This rubber band secured tank won't be the most professional looking setup, but it certainly eases clean-up and maintenance.

All that remains is flying. The training method that works for us has the student and an experienced flier in the circle together. The student doesn't touch the control handle until the model is being flown straight and level by the instructor. At first they both hold the handle at the same time, the instructor demonstrating shallow climbs and dives. The first few times the instructor releases the handle to let the new flier have complete control, he won't let the handle get far from his hand; he will probably have to take charge of the handle fast more than once. A few flights will have the trainee ready for solo and probably hooked on flying control liners. If the T-19 is used for self instruction, we offer the following advice: (1) Make the first flights on a calm day. Wind gusts complicate flying any model. (2) Start the takeoff roll with what wind there is blowing from behind the model. (3) Move the control handle smoothly. Let your T-19 take off with neutral elevator, then make all control inputs without jerking the handle. (4) Don't fly the model overhead for several flights. High flying will cause the flier to lose sight of the horizon as he watches the model. Disorientation may result. T-19 will do pretty inside loops after round-and-round flying is mastered. Then train a friend to fly. We need all the fellow modelers we can get!

SUPERBIRD

(Continued from page 52)

straight all the way. Shim up or shorten any of the three supports to achieve this if necessary. Bevel gear mesh in front and in back are critical. Be sure that the teeth fully engage, that the shafts are at right angles to each other, and that there is no possible slop when under load. Note that a 1/16" collar is used on the tail drive shaft to locate the shaft at the rearmost bearing.

Now comes the balancing act. Balance your blades and paddles as individual sets removed from the model. Balance the blades by bolting them together at the loop in the music wire. Set this on a flat surface with the blades at 180 degrees. Lighten the heavy blade and/or heavy-up the light blade. While the blades are removed, balance the flybar system. When reassembled you will have a balanced system. Set main rotor pitch using the original 505 pitch gauge—the conversion's pitch is the

same. You will have to remove the middle brace from the gauge to use it. The rotor blades must turn in the *exact* same disc of rotation. Being a rigid-headed helicopter, an out of track blade can render the head system useless. Bend or shim the parts to achieve correct tracking.

Balance the tail rotor by removing the control input arm, but leave the spring and collar in place. Remove large rear bevel gear. If the tail rotor is out of balance, the assembly will turn on the ball bearings showing which side is heavy. With plastic tape, heavy up the light side. Reassemble.

Fore and aft balance of the helicopter is very important. It must balance 1/8" ahead of the main rotor shaft. I used over seven oz. of lead in the nose of my bird to balance it. Incidentally, to locate CG, turn the model on its side; don't guess the CG by hanging the model by the rotor head.

The controls should do the following: Forward stick tilts the swashplate down in front. Right stick lowers the right side of the swashplate.

Flying

Now it is time to fly. If you know the 505, you'll have no trouble. Don't bother with trainer gears. They are nice, but heavy. Absolutely don't use a tether.

Needless to say, your engine must be broken in before helicopter use. Set the idle as low as possible with drive belt removed. Use a needle setting at high speed that is a bit rich. Attach the belt. Always start at low throttle-high trim. Set the clutch spring tension so the rotors will fully disengage at engine high idle speed. Shorten the spring as necessary. Advancing the throttle must engage the clutch smoothly and positively. Usually about 1/2 hr. of running is needed to smooth the clutch.

The only screws that loosen with use are the main rotor drive pin retaining screw (the one in the top of the shaft) and the tail rotor assembly where it secures to the tailboom. Keep checking these frequently.

Now start the motor and hold the helicopter overhead, holding it under the back side of the swashplate. Run the engine up to 1/2 throttle to check for vibration. If there is any, inspect blade pitch, tracking and balance. If not, go to full throttle to set the needle for a two-cycle run. Hold it for a minute to be sure the engine won't sag as it heats up. The model should have a strong upward pull.

Check to see if the helicopter wants to swing R or L at the nose. Adjust tail rotor trims or stop and reset linkages. I can't tell you what pitch your tail rotors need; this test will guide you.

When making your first takeoff, concentrate on the tail. Get it trimmed when it is about one ft. up; don't try to trim it during takeoff. Also, being a rigid-rotor helicopter, the cyclic controls are useless until the model is airborne.

If the wind is calm, your 505 training will help you keep the new model in one spot. Hover at about two ft. for

most early practice. Don't make sudden throttle changes. If there is a wind, learn to hold forward trim to stay in one spot. Note that the power setting is less when hovering in a wind and the tail stays aft more steadily. (It acts like a rudder in forward flight.)

During this training period, use at least four washers on each end of the flybar. Set the control response for the maximum control. This conbination gives you the most stability and good control. Later, reduce control sensitivity to gain smoothness in hovering and at the same time reduce flybar weight as your skill increases. In calm weather this model can respond very fast without flybar washers, but in a gusty wind use all four on each side.

Still you are only hovering. Forward flight is easy and a real thrill. It is extremely easy to begin forward flight—just push forward stick and the model will accelerate and climb. But slowing to land—that is, coming out of forward flight into a hover—is quite difficult at first.

In forward flight the model behaves like a plane—aileron and elevator do the flying (cyclic controls). You can almost ignore the tail rotor control. *Warning:* Never go into forward flight if it takes more than 2/3 throttle to hover the model. You can cruise around in forward flight at your hovering throttle setting or higher. But if power is marginal, landings are abrupt.

As mentioned earlier, getting back to hovering is hard and can be disastrous unless it is done gradually. Here's the only safe way down that I know. Keep in steady forward flight until about six ft. altitude while reducing throttle enough to establish a slow rate of descent. The model must be moving forward, never stopping. With a helicopter, you need less power in forward flight—or to put it another way, you need lots more power in hovering. In this descent at a steady, slow forward flight the model will be nearly level. Keep the rate of descent steady with throttle—just like a plane. When you get to six ft. altitude and about 20 ft. from the intended landing spot, level off with a touch of aft stick. You should have slowed to under five mph.

Now things get tricky. You must add power as the model nears a hover, but not enough to completely arrest the slow rate of descent. As far as I am concerned, hovering is mostly done looking down on my model; forward flight is done higher up. So now the helicopter is descending below six ft.; forward motion (in a calm wind) stops and the chopper is hovering again.

Practice the above sequence only with plenty of fuel. Become very proficient in descending to a hover for landing. Why all the fuel? Well, if you feel unsure of the descent at any time, add power, push forward stick, and go back into forward flight like an airplane. It takes practice.

Once you have mastered takeoff, hovering, forward flight and landing, practice some aerobatics. Wingovers are especially fun and easy—do them as with a plane, but at a steady throttle

setting. Try a wingover with a full turn and a half for added spice. Two-bladed helicopters can't loop or roll—my attempts have ended in crashes.

I have also flown this little copter with a collective pitch rotor head, with which some modes of flight are easier, others more difficult. It has been flown with full gimbaled rotor head, but again there are advantages and disadvantages.

If you are trying to fly your model at a high altitude location or on very hot days when the density altitude gets above 4000 ft., or if your engine just won't put out enough power, make a change in the rotor and paddle airfoils. Thicken both of them by 1/16". Either make new blades and paddles or splice a sheet of balsa to the bottom side and reshape them. In any case, be sure to keep the rotor rpm up to 1000 at hover.

If there is enough interest in these little Superbirds, we will publish other rotor heads for you to try. At the time of this writing, about seven Superbirds are being built and flown by modelers. It is a well-developed and proven model. But, as improvements are developed by all of us, they also will be published. Should there be a problem, write me at AAM. I'm the editor. I'll try to answer questions as best I can.

If you need more information to build your model, note that a limited supply of expensive photo material on this model is available through our Plans Service. The photo set is $5.00 including first class postage—write to me directly for it.

PROTECT YOUR HEARING

(Continued from page 64)

they cannot be regenerated, the resultant loss of hearing sensitivity is permanent. Sounds must then be made louder for the individual to perceive them. In addition to the loss of sensitivity, distortion of sound usually occurs. If the distortion is severe enough, the individual will experience difficulty in distinguishing words which sound alike. Engaging in conversation and listening to a speech become arduous tasks. A hearing aid will provide only partial recovery. Since the hearing aid is basically an amplifier, it may improve the sensitivity of hearing, but usually it cannot completely compensate for the distortion.

In a recent study conducted by Dr. Fred Bess and Dr. Richard Powell at Central Michigan University, noise measurements were made of four unmuffled model airplane engines of various displacements. Measurements were taken with the microphone of the sound level meter placed approximately three ft. from the engine on the exhaust side. These measurements are representative of noise levels when the modeler is working close to the engine during the break-in procedure or bench testing with different propellers, fuels, carburetor settings, or performance modifica-

tions. Because sound decreases inversely in proportion to the distance, squared, from the source, the hazard is greatest near the engine. The results are shown below.

Displacement	Sound Level (dBA)
.19	110
.23	114
.35	106
.46	110

The higher the sound level and the longer an individual is exposed to the noise, the greater is the risk to hearing. Table I shows the maximum allowable noise exposure according to sound level as stated in the Department of Labor's Occupational Safety and Health Standards. These standards cover approximately 57 million workers.

Referring to the sound levels for the engines used in the Central Michigan University study, it can be seen that application of the data in Table I would limit exposure to the 23 engine to 15 min. per day. Hearing protection would be required for exposure beyond fifteen minutes. For engines which exceed 115 dBA hearing protection would be required at all times. Although the study did not include measurements for other popular sizes of engines, the data presented for the four engines tested are sufficient to demonstrate that modelers are exposed to sound levels within the range of hazard to hearing.

It is important to note that the exposure durations in Table I assume that the individual does not encounter more than one dangerous level of sound during the day. For multiple levels other calculations must be made to determine the permissible duration for each level.

In other words, if the modeler engages in several noise producing activities during the day, the exposure to each activity must be reduced proportionately to keep the total daily exposure within specified limits.

However, adhering to the exposure durations specified in the Occupational Safety and Health Standards will not prevent a hearing loss for all persons. Individuals vary greatly in susceptibility to hearing damage. Most authorities agree that whenever noise exceeds 90 dBA there is a risk for some individuals. But, to provide a feasible plan, current standards use 90 dBA as the basis for the exposure duration scale. Consequently, according to one source, the standards will protect only 85-90% of the population.

A more certain method of preventing hearing loss from noise is to wear hearing protectors. Hearing protectors can reduce the level of noise reaching the ear by as much as 48 dB depending on the frequency of the noise. The muff type gives more protection than the plug type in the middle and high fre-

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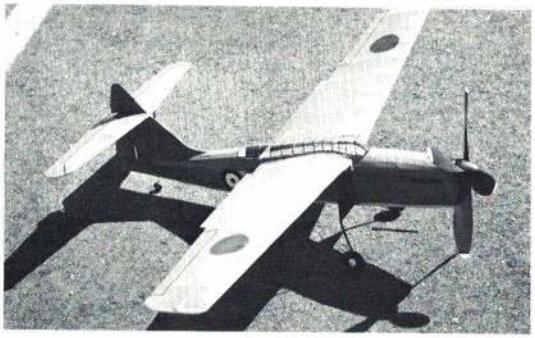

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No. 0734, Critter—Marblehead Class racing yacht by Victor Migliorina has an all built up construction. 50-in. length, hull is built inverted. Xerox copies of drawings accompanying article available for 50 cents each. List drawing by figure number and order through plans service manager. **$3.50**

No. 0631, Upper Crust—Very strong 1/2 A FF ship has a pre-stressed wing with full ribs in a geodetic-type construction. Has English-style fin located behind stab on a mostly triangular cross-section fuse. **$2.50**

No. 0632, Prairie Duster—Small, lightweight RC pattern ship uses built-up balsa wing with built-in ailerons and a plywood wrapped fuselage. For retracts and 60 engines. **$5.50**

No. 0531, Friend Ship I—Streamlined RC Pattern ship for 60s, retracts. Uses foam wing and fairly simple balsa fuse construction. **$4.75**

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No. 0536, Nord N.C. 853 S.—1940 French private plane in scale FF rubber form. Has twin rudders, 22-in. span. **$1.50**

No. 0431, Sirius—Foam and fiberglass RC scale beauty is a fine flying low wing, early Lockheed plane model by Bud Philips. **$5.50**

No. 0432, Skyhawk—Navy Profile Carrier model is mostly wing. A winner in competition and easy to build. Very rugged. **$3.25**

No. 0433, Thor—Terry Aldrich's easy flying two-channel job for rudder and throttle controls. Shoulder wing trigeared, well-detailed plan. **$5.00**

No. 0434, Bounty Hunter—Outstanding ½A Speed model is a frequent winner and Canadian record holder. **$1.25**

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No. 0331, Cajun Queen—Frequent winner in RC Pattern down South is Lou Penrod's graceful design. Takes 60's and retracts. **$3.75**

No. 0332, Macchi C. 202—Semi-scale profile stunter for 15 through 25 size engines, great for Slow Combat and practicing the pattern. Flaps. **$2.50**

No. 0333, Curtiss Robin—Rubber scale model for AMA events. Easy flying. Stick and tissue. Square shape builds easily. **$2.00**

No. 0231, Mustunt I—Primary profile fuselage, upright .35 engine, thick airfoil stunt trainer. By Al Rabe. **$2.25**

No. 0232, Mustunt II—Advanced stunt trainer, same aerodynamics as Mustunt I but fully shaped fuselage and upright .35 engine capable of winning any meet. **$2.75**

No. 0233, Mustunt III—Nats-level 35-powered non-scale competition CL stunter is exactly like Mustunt II but has many detail refinements and tapered wing. **$1.00.** You'll need 0232 for complete construction details, order separately.

No. 0234, Super Goose—Very unusual flying wing RC has swept forward wings for better flying, balance, and construction. Uses a 40, stunts real well for fun flying. **$3.75**

No. 0133, Mo-Bipe—Contest-winning Navy Carrier profile fuselage biplane. Thin wings go fast and slow. Takes a throttled 35. **$1.75**

No. 0132, Viper—Toledo Design and Finish winner, big State-of-the-Art Pattern ship by Dario Brisighella, Sr. for good 60s and retracts. **$2.00**

No. 0131, 720 Turn—Clarence Haught design Class B FF. Conventional design, high pylon wing, big plan. **$4.00**

No. 1224, Snoopy—Sport flyer and trainer for 09 thru 35. Can use Top Flite Headmaster wing. **$2.25**

No. 1223, Quicky 500—Glen Spickler's club pylon racer goes fast but is very quick-building, long-lasting, easy to fly and land. For TR type 40s. Great for grass-field sites. **$2.75**

No. 1222, David—An Al Nordic for competition with A2s is stronger, smaller, easier to make, and has lower wing loading. **$1.75**

No. 1221, Spitfire—Highly detailed, two sheet plans for 60-powered retract-geared CL scale model. A Nats winner and seventh in CL Scale World Champs. **$7.00**

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No. 0923, Vertigo—A CL vertical take-off-and-landing biplane. Uses throttled 19 for power. Really flies, lots of fun. **$2.75**

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No. 0921, Hot Pants—Jerry Nelson's large-bodied, realistic-looking, home-built type RC Pattern design. Smooth flyer uses all-moving stab. **$4.00**

No. 0825, S.S.P. RC Helicopter—Gene Rock's very successful large trainer helicopter needs only 40 to 45 size engine. Designed for home builder with minimum machined parts, gyro-stabilized tail rotor, all belt drive, 4 channel radios. **$6.00.** Also recommended is Plan No. 0826 with full-size drawings for all special machined parts. **$2.00**

AAM will present up-dates on the design during 1973 as experience of readers and designer shows need.

No. 0824, Ryan SC—Unusual 049 free flight scale model is low winger with excellent flight stability. Flies fast and handles wind easily. **$2.75**

No. 0823, Apteryx—New style mylar-over-foam wing on fast, tough, AMA Combat plane by Robert Mellen. Construction offers perfect airfoil and tapered wing. **$2.25**

No. 0822, Nemesis II—Howard Rush's winning AMA Combat ship. Ultra-light, balsa and silk, very quick. **$2.25**

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No. 0722, Wizrod 350—Ron St. Jean's combination of past FF power winners in a 350 sq. in. 049 screamer. **$1.75**

No. 0721, Douglas Devastator—Navy Carrier competitor for 40 or 60 of colorful shipboard fighter. A tough plane and a winner. **$3.00**

No. 0623, Chance Vought "Skimmer"—U.S. Navy experimental shipboard fighter is real flying saucer. For Profile Carrier events, by Frank Scott. **$4.50**

No. 0622, Denight Special—Well up-dated four-year-old Forum I racer by deBolt has many unique features for Speed. All balsa construction. Two-sheet plans. **$2.00**

No. 0621, So-Long—Miniaturized Old-Timer for 020 Power event and Sport flying. Easy to make. **$1.50**

No. 0523, Pegasus—A take-apart RC job designed for transportation in its own box. Full house with a 19, stunts well. **$2.50**

No. 0522, Lil' Rebel—Fast and very durable 15 Goodyear CL racer is a consistent winner. **$2.25**

No. 0521, Satellite 1000—Huge and highly-detailed plans for one of FF's most winning designs. For screaming 40s. **$8.50**

quencies which are predominant in model engine noise.

Some individuals may experience difficulty in obtaining a good seal with plugs if they do not have an audiologist or other qualified person to assist in the initial fitting. However, most individuals can fit themselves with muffs and obtain a good seal. An airtight seal is essential since even a small air leak will destroy the effectiveness of hearing protectors. This is why dry cotton is very poor for protection. Muffs also are easier to handle with greasy fingers, and there is less chance of contamination of the protector surfaces which contact the skin. For these reasons, the muffs are recommended for modelers except in a few cases where plugs are required such as when wearing a full coverage helmet or if thick eyeglass temples prevent muffs from sealing properly.

Prices of muffs vary depending on the amount of sound reduction afforded and the construction of the device. The range of prices for one well-known brand is $5.50 to $11.00. But, if the hearing protectors are purchased in a quantity of twelve or more the range is lowered to $5.00 for the least expensive model and $9.75 for the best model. Thus, clubs can take advantage of the quantity discount.

In conclusion, wear hearing protectors whenever noise is loud enough to cause difficulty communicating by speech, ringing in the ears, or a temporary reduction in hearing sensitivity. Repeated exposure without protection can lead to a permanent hearing loss. The few dollars you spend for hearing protectors can save you hundreds of dollars for the price of a hearing aid. And, whenever possible, operate your engine with a muffler.

OSHKOSH

(Continued from page 40)

popular, if the performance figures are close to accurate.

Powered by a 594 cc., two-cylinder, two-cycle Rockwell JLO snowmobile engine of 35 hp at 4500 rpm, it report-

edly cruises at 70 mph and will reach 80 mph at best, which is a shade better than a Breezy. Rate of climb is only 400 fpm, but with a landing speed of 45 mph, it could be a usable little craft. The 16½ ft. wing, with its 58 sq. ft. of area manages to do the job because the PDQ-2 weighs in at the ridiculously low figure of 210 lb., dry and empty, which must be close to the lowest in aviation history.

Construction of the machine is in line with a developing trend: The wings are built up from urethane foam, covered with polyester-impregnated dynell cloth—strong, light and simple, once you get the hang of it. Detailed three-views can be purchased for $3.00 from Wayne Ison, No. 7 Alpine Lane, Elkhart, Ind. 46514.

Somewhere in between the 300 mph BJ-520 and the toy-like PDQ-2 is the latest product of the fertile brain of Ladislao Pazmany. Father of excellent (but hard to build) PL-1 and PL-2, Paz has now come up with his PL-4A, which offers fine performance at low cost while being a lot easier to construct. The all-metal, T-tailed single-seater is powered by a 1600 cc. VW engine with a V-belt reduction drive.

With the steady drop in the supply of small airplane engines and the increase in price of those that can be found, there is an understandable swing toward car engines for homebuilt planes. The VW has long been popular in Europe and is finally coming into its own in the U.S. and Canada. Some standard designs will take VW engines with a minimum of modifications, but the surest way to performance is to design airplanes specifically for the power. weight and size of the aircraft-style German car engine. This, Pazmany has done.

His airplane, now well beyond the 75-hour test flight program required by the FAA, offers surprising room and comfort, along with economy (estimated cruise close to 100 mph for less than $2.00 per hour). The geared propeller makes the PL-4A unusually quiet, while allowing the VW to operate at optimum power, while the folding-wing feature (just five min.) makes it convenient to tow home and thus save the hanger rent.

The wing has a span of 26 ft. 8 in. and area of 89 sq. ft., giving a high-performance aspect ratio of 8:1, with an NACA 633418 airfoil. Length is 16 ft. 6½ in. Empty weight is 578 lb., rising to 850 lb. when fully loaded with 12 gallons of gas and 20 lb. of baggage. A full set of construction drawings is $60.00, but you should be able to get an information packet for a few dollars from Pazmany Aircraft Corp., Box 80051, San Diego, Calif. 92138.

All this is very well, but you really can't have sporting aviation without at least one biplane. Regardless of what their close friends say, all the little single-seat, open-cockpit machines are pretty similar, as are the newer two-seaters. What isn't at all like any of the others is a new streamlined, unstaggered machine called the Sorrell Hiperbipe. Not only is it different, but it is loaded

with enough important new features to have earned it the top award for new designs at Oshkosh '73.

While other two-wingers are designed mainly for puttering about in very nice weather, or for aerobatics at the expense of comfort, the Hiperbipe is a cabin two-seater that cruises at 155 mph on a 150 hp, four-cylinder Lycoming engine. It reportedly will top out at 170 mph and land at just 50 mph, while climbing at 1600 fpm.

The sleek machine from the Pacific Northwest is the latest in a long line of Hobie Sorrell products, the first of which to enter the spotlight having been a scaled-down Fokker Tri-plane. In the mid-1960s, Sorrell set out to develop a biplane which would offer more mph for the hp than those which were then popular. He began with a pair of single-seat, negative staggered craft powered by 18 hp, two-cylinder Cushman engines that would cruise at a respectable 70 mph. Next came Biggie Rat, with 125 hp, two seats, and the now familiar Sorrell trademark of a fuselage having non-tapered slab sides and an airfoil shape.

After an improved version of Biggie Rat, called the SNS-4, Sorrell and his sons, Mark and John, came through with their latest Hiperbipe, a result of continuing refinement of the original idea. Though generally referred to as a negative-stagger design, it isn't quite: The top wing is straight, while the bottom wing starts a bit forward of the top, but sweeps back to put the tips a little to the rear of those on the top wing. Still, the excellent visibility of the stagger-wing biplane is retained.

A lot of Wittman Tailwind can be found in the Hiperbipe, including the lifting fuselage. tapered-rod landing gear struts and the thin, plywood-covered wing. But it is strictly a Sorrell deisgn, since most of the high-performance homebuilts of today owe a debt to the amazing Mr. Wittman.

Wingspan of the Hiperbipe is 22 ft. 10 in., wing area about 100 sq. ft., length 20 ft. and height 5 ft. 9½ in. Empty weight is 1150 lb. and gross weight is 1800 lb. For further information, contact Sorrell Aviation, Rt. 1, Box 660, Tenine, Wash. 98589.

Some people build airplanes just to fly them; others build airplanes mainly to be building airplanes. The vast majority like both building and flying, or they'd be spending their time at golf or poker. One craft was at Oshkosh to demonstrate that there can be fun in building without any serious thoughts of flying—or serious thoughts about anything else, for that matter.

This was the Family Tuholer, a generally airplane-shaped thing, parked immodestly among the other homebuilts, as if it needed only a little luck in order to join its obviously more airworthy neighbors in the fly-by pattern. A mixture of tongue-in-cheek and johnout-back, this thoroughly static exhibit combined the fine old American tradition of simple sanitary facilities with the EAA enthusiasm for trying to build just about anything.

Lest anyone get too serious about the hobby of building small airplanes at home, one EAA Chapter designed (?) and built a nonflying, flying outhouse to poke some fun at its own hobby and at aviation in general. While the only time this thing could get off the ground would be following a large explosion, a scale model might be able to achieve flight with this questionable creation. Interested? Contact Ted Huwer, EAA Chapter 64, Rt. 1, Freeburg, Ill. 62243.

We could go on like this forever. Instead, we'll stop here and let you think about it. One thing to keep in mind: If homebuilts or models of them turn you on, there'll be even more of them at Oshkosh, Wisc., July 28-August 3, 1974.

FAIREY BARRACUDA

(Continued from page 35)

the U/C and the top set of frames, and add the stringers. Now cement all the lower frames into place and add the lower stringers. The various pieces of sheeting and the gussets can now be glued into place followed by the nose former and its associated sheeting.

As the lower fin and rudder are part of the fuselage they should now be made. Take care to align the top fin rib as this controls the tailplane incidence.

Sand all over very lightly and then cover with Jap tissue.

Undercarriage: Bend two pieces of wire as shown on the plans for the main U/C. Solder together as shown, then bind with cotton thread to the fuselage framework. The simulated legs are made from scraps of plastic tubing and painted black. After the fuselage is covered insert piece U, made from 1/8" sheet and glue into place. The main wheels are soldered into place after the model is finally painted.

The tail-wheel wire can now be made and installed. Don't forget to include the wheel before attaching the wire to frame. Use a small cloth patch soaked in glue to reinforce this joint.

Canopy: The cockpit cover is made in several pieces to simulate the various sliding panels. On our original the windshield and forward piece were made from a clear plastic toy bottle, which was exactly the right shape. The center pieces were made from strips of celluloid cemented together. The rear portion which is attached to the fuselage was made from an existing canopy. It is better to spray the wings in their final color before cementing down the canopy. The final color touches can then be made with a small brush. Canopy metal framing is made from 1/16" wide black chart tape.

Propellor: The propellor is a four bladed free-wheeling type made from commercially available blades. Buy two Imp Brand 10 in. dia. props from your local model shop and splice them together as shown on the plan. When this joint is dry (and leave it long enough to make sure it's really dry), trim the backs of the blades at the center slightly to allow the 1/16" ply prop disc to fit flush. This can now be glued into place. Again wait until this is quite dry before

drilling the holes for the propellor wire assembly.

The free wheel system shown is one that has been used successfully in many models, but requires careful assembly. Make the front half of the propellor shaft, and the clutch wire. Insert them in the propellor and make sure they engage and disengage cleanly. Note that the propellor shaft is used to steady the spinner when it is installed.

When the free wheel system is satisfactory, thread the bearings and the nose block onto the prop shaft and finish off the shaft by bending the hook for the rubber. Cover this hook with a small piece of fuel tubing to help protect the rubber motor.

The spinner is now added. This can either be made by vacuforming or by using half a plastic Easter egg as I did. These are excellent for lightweight spinners and cheap (or should I say "cheep"?). The spinner is secured by a very small piece of plastic tubing pushed onto the propellor shaft.

The assembly should now be balanced. Sand the heavy blades lightly until the propellor will stop in any position. Now spray the whole assembly black, and finish off the propellor tips in yellow.

If you don't want to go to the complications of the four-bladed propellor, a single 12 in. dia. Imp or similar propellor can be substituted. We found that 8 strands of 5/32" rubber were sufficient to give a realistic flight. To make up the motor obtain a 16 ft. length of 5/32" rubber, and make it into a pretensioned 8-strand motor. The pretensioning should be sufficient to hold the nose block in place, but permit the free wheeling propellor to work easily.

Color Schemes: The Barracuda saw service during and after WW II, so quite a few color schemes are suitable for our model. We chose a 1947 scheme, where the upper surfaces are extra dark sea gray, which also extends 3/4 of the way down the fuselage sides, and sky undersurfaces. (Sky is pale green.) Details such as U/C wells were simulated by pieces of black Scotchcal, aileron and tailplane outlines were chart tape.

Final Assembly and Flying

Although the tailplane is show to be cemented to the top of the fin, this should only be done temporarily at this stage until the correct trim has been established. As small variations will occur in building the model from the plans the correct alignment of the tailplane can only be determined experimentally.

First assemble the model including the motor and balance at the location shown on the plan, but if necessary add a small amount of weight at the nose or tail. When the CG is in its correct location try a few hand glides. If you are lucky the glide might be OK. If not, realign the tailplane and try again until a satisfactory glide is obtained. Some nice long soft grass helps while you are doing this bit. When the glide seems suitable try a few winds on the motor. A climbing turn to the right is required, so put in a little sidethrust if necessary.

Don't expect, or try for a contest type performance, remember that this is a scale model, and it should look like one in flight. Make the final trim changes by moving the CG around a small amount.

PITTS SPECIAL

(Continued from page 28)

first Pitts S-2 was delivered to airshow pilot Marion Cole at the Pitts factory in Afton, Wyoming. It had a 180 hp Lycoming engine, but all subsequent two-seaters have been model S-2A with a 200 hp Lycoming.

The production rate was set at two airplanes per month and remains at that level after two years. Not that there isn't a healthy demand. The waiting list for the S-2A remains at the one-year mark. But Curtis Pitts doesn't want his business to grow out of his personal control. He's an airplane builder, not an administrator. His airplanes are fun for their owners, and they're going to remain fun for him, too.

Of some 50 two-place Pitts delivered to date, the best known is owned and flown by Los Angeles aerobatics/airshow pilot Art Scholl. Famous for his performances in an extensively modified deHavilland Chipmunk, Art bought his S-2A for two reasons advanced instruction in his flight school, and unlimited competition. With many of his own modifications worked into it, this airplane (N13AS) carried Art to nineth place in the 1972 World Championships in the very first appearance of the S-2A in a major contest.

Since then, many others have been flown in contests with excellent results, though only Scholl can be rated among the top pilots who are using the type so far. Its increasing availability in aerobatics schools throughout the U.S. has already had a strong influence on the quality of instruction and competition since many of the school airplanes are also used in contests. With only 200 hp, its performance is not quite up to the level of the single-seat S-1S model. At least one is being built with a 260 hp Lycoming engine, however, and could prove to be a strong challenger for the "little" Pitts.

The presence of Scholl's S-2A at the World contest in France has already made an impact. A full 10% larger than the single-seat Pitts, the S-2A has a lot of appeal as an airshow airplane. Its size (which makes it easy to view), plus its availability, attracted the attention of Manx Kelly, leader of the five-plane Rothman's aerobatic team, which for years had been flying Belgian Stampe biplanes all over the British Isles. The team now has five S-2A Pitts painted in its distinctive two-tone blue color scheme. It is creating an interest in Rothman's cigarettes and modern aerobatics with a schedule of about 50 shows in 1973.

In mid-1973, a parallel assembly line was set up at Afton for the single-place Pitts S-1S, with the intention of turning out two of these per month, along with a pair of two-seaters. Still, for those who prefer to build their own, Pitts will

continue to sell plans for the latest version of his popular sport model S-1C, recently changed to four ailerons for improved maneuverability.

The Pitts airplane "line" is among the most interesting of the postwar era, but is it *important?* By the standards of the American aircraft industry, which turns out most of the world's airplanes, it's small potatoes. Just over 50 airplanes have been built by the Pitts Aviation Enterprises factory in Wyoming, plus 250 to 300 single-seaters by amateurs in basement and garage workshops. Compared with Cessna's total production which recently topped 100,000, it isn't very impressive.

In the lively world of sporting aviation, however, it's another matter entirely. The still-new Pitts S-2A is rapidly re-equipping most of the country's top aerobatics schools, and is widely recognized as the finest trainer of its type ever built. Its smaller, though older, S-1S version is easily the finest competition aerobatic machine in the world. And the S-1C sport version is quite possibly the most popular of all the homebuilt designs.

Together, they have made an impact on sport flying unmatched by another family of aircraft. The first one flew in 1945. Even today, however, the Pitts may not have reached its peak. A lifetime of 35 to 40 years does not seem out of the question. Surely that should qualify it as a landmark airplane.

For additional information, contact: Pitts Aviation Enterprises, Inc., Box 548, Homestead, Fla. 33030. Information packet on S-1C $3.00.

UPLIFT

(Continued from page 16)

Winning is not the whole store with the Mathews team, however. The personality development of the boys is an important by-product according to their father. "Modeling offers lessons in life for the boys. In a contest situation the boys set up deliberate goals and work to reach these goals. Most of the time they succeed, but sometimes they fail. Take Bruce's decision to try for Junior National Champion at the NATS. He set up a definite goal, knowing how difficult it would be to reach it, and he missed it by just 11 points. Of course he was disappointed, but the important thing is that he tried. The application of effort is the main thing. The results take care of themselves. It's the wanting to win, not the winning that's important."

Nothing symbolizes the Mathews family's relationship to modeling any more appropriately than the slogan emblazoned on the flight-box lashed to the top of the family stationwagon, *These Kids Get High with Model Airplanes.* "That message has caused a lot of comment in our drug-saturated culture," muses Dr. Mathews, "but it seems to sum up our feelings about model building. We've had fabulous fun—and some sorrowful times—but overall, the time spent together has been more than worthwhile.

RABE ON CL

(Continued from page 56)

practice. When I tried it, an aggressive trucker in a semi drove right through the circle.

We Stunt fliers think that in the future, as in the past, the NATS should be held on closed airports only, where all of the runways are available, all of the time, to allow last minute practicing, trimming and solving those engine run problems that seem to crop up at the NATS. This isn't to say that Stunt fliers need a whole airport for themselves. In fact, when a whole airport is available we can usually find ourselves a quiet corner away from everyone else to work and practice. We heard that the Air Force has offered Chanute AFB for next year but that the facilities are poorer than Oshkosh. If it's true, let's go. Practice is more important than motel accommodations.

We missed some of the regulars this year at Oshkosh. We heard that World Champion Bill Werwage had to work and that Jerry Phelps and Bob Lampione have quit. There were two welcome faces from the past, with airplanes out of mothballs and flying. Twice NATS winner Bob Gialdini, and Dave Hemstrought who published the PT-19 stunter in AAM in 1965. Both qualified for finals.

In case you missed Bob Giseke's name in the results, he was there and flying very well except that he ran out of fuel in the cloverleaf on both qualification flights causing him to miss finals. Jerry Pilgrim (seventh) and Bob Hunt (ninth) are new to the NATS and winding up in the top half of the finalists will mark them for special attention in the future. Bob Whitly (fourth), Bill Simons (fifth), and Bob Baron (sixth) are old timers and always a competitive threat. Lew McFarland and his Acromaster flew last in the second round and was closely watched by all. There have been many NATS won with the last flight and Lew is too good to be counted out. Unfortunately, he blew a couple of maneuvers and wound up tenth. A little engine trouble and a lot of pressure can really get to you.

Personally, I think that anyone making

Stunt finals at the NATS deserves recognition and congratulations.

LOWE ON RC

(Continued from page 57)

retracts, right?) and is heading upwind for an impressive turn around to zip into three gorgeous axial rolls. OK, pull up in your turn around so that you can split S and gain all the steam possible for your rolls. Head downwind parallel with the runway or takeoff direction, announce the three rolls, fly the required 50 ft. for entry straight and level and begin your rolls. Suggestion: Fly more than a 50-ft. entry and exit since this passes in less than a half sec. when you're moving at 100 mph and the judge may think it too short. I set up my ailerons so that full throw gives the desired roll rate. So I just concentrate on pumping the elevator up and down to keep the thing level and straight. I can't tell you when to apply elevator or how much since this is very responsive to how the ship is trimmed, how fast you're flying, etc. You must simply practice to synchronize the elevator so that the ship doesn't hump up and down or veer in one direction or another. Just remember that the elevator will act as a rudder to turn the flight path when the ship is on its side. Generally the elevator application is not a short burst of down when inverted and up when upright but smoothly flows over a large part of the axial rotation. Most aircraft roll more axially when rolled left, so if that's your taste, your job should be easier. I can roll both ways, but right is more natural; so, do it the way it is easiest for you. Be sure your maneuver is balanced; if so, you should be inverted in your second roll right in front of the judges. This is something you must practice since you must know the roll rate of the ship in order to know when to start the maneuver.

Another hint: Place the maneuver about 50 ft. high and 150 ft. out. Don't jam it in close or extremely low since it's hard to judge and every little twitch is observable. Complete the rolls by stopping absolutely level and fly your exit straight flight, following which (and not before) you call maneuver complete.

One more hint: Use your fastest and tightest servo on aileron since it gives a much more precise "feel" and requires very little if any apparent lead to stop a roll. It makes all maneuvers, and especially rolling maneuvers so much easier since you can roll to a point, neutralize and it will stop! Generally, servos on all axes shoud be *very fast*, but it's most important on the aileron. You will be pleasantly surprised at the change in aircraft "feel" when you go with zippy servos!

We're now headed downwind into a turn around to head back for the three inside loops which will be done into the wind. A note on your turnaround: Go out far enough so that you will have plenty of time to set up the next maneuver. Don't rush it. Make your turnaround smooth and don't wander all over the sky—make it look like you know what you're doing. You are not supposed to be judged for anything outside of "maneuver beginning now" and "maneuver complete," but the judges are human and impressionable. Besides it tones up your whole procedure and adds to your confidence and practice. OK, line up for your inside loops, call "beginning," complete straight flight and begin a smooth pull up directly in front of the judges. As with all maneuvers the loops must be centered.

Three loops sound easy but are among the most difficult maneuvers since they must be superimposed on each other and centered without losing track or using excessive obvious corrections. The loop size is a function of aircraft speed, but should be such that the aircraft does not slow excessively on top. If it does, torque will take over and make things more difficult.

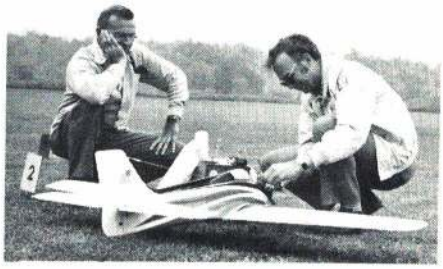
You should also learn to use rudder to correct for crosswind conditions so that you don't have to use much obvious aileron corrections. Remember, most contests are flown in cross winds; so, practice crosswind maneuvers with the wind from both directions and learn to use the rudder. Generally, you must slightly bank the ship into the wind and hold opposite rudder to keep it straight. You will

simply have to practice how much of each is required as a function of wind conditions and your own crafts peculiarities. The difficult thing about crosswind flying is that you must use three controls simultaneously. Remember we're in the loops and we're keeping them round and concentric while keeping in track, you'll have to play the elevator to keep the loop round and to play the headwind. Generally, you will loosen up the elevator as you ascend and pull it tighter on descent. Set the maneuver out far enough so that the maneuver top is not over 45° elevation per the book.

Dave Keats fires up his modified Whirlybird at the Wright Brothers Memorial Annual (Dayton, Ohio), Dave won the Helicopter event with a Du-Bro Hughes 300.

A common mistake is getting this maneuver and a lot of others too close! Set the bottom of the loops fairly low so that it's easy to judge the track altitude and to allow bringing the maneuver as close as possible without exceeding the 45° elevation requirement. Some fliers also play the throttle in the loop, that's OK since it permits a more constant speed maneuver. It requires a potent engine, how-

ABOVE: Three loops—starting now! Dave and Sally Brown flying and calling. Judges Jim Masters and Don Cable of Works Club at Wright Brothers Memorial Annual at Dayton. BELOW: Don Lowe and Floyd Lawrence at Chardon, Ohio. Mach I proves that Lowe is not prejudiced about Phoenixes. (Not much!)



ever, that accelerates well on the bottom of the loop. Try it both ways and use whatever technique gives the most consistent results. When you've finished three gorgeous loops, exit straight and call complete.

FRED MARKS ON RC

(Continued from page 62)

line activities were going on, we felt a bit like the mosquito who found himself in a nudist colony—we hardly knew where to begin! So we settled for RC Scale first, then caught the final few flights of C Pattern. And so it went with watching the Formula I Pylon Races, a stop by Control Line Scale, the Carrier contest, and finally the fun of watching our seven year old try to walk up the front of us when the first jet control line speed model he had ever seen lit off!

Saturday evening found my 13-year-old RC enthusiast and myself at the RC banquet for good food, fellowship, and the presentation of trophies. Although we had little contact with other than RC fliers, our impression was that everyone was quite content and happy with the "new" NATS. Speaking from the viewpoint of a one-day modeler-spectator, we must say it was marvelous, well run from the viewpoint of visitors, and an excellent show of modeling to the non-modeling public, as well as an apparent success for those fliers on the field who may not even have been fully aware of all the good public relations effort in progress. Our hats are off to John Worth and the crew who made this first of the "new" NATS possible.

THOSE PEOPLE AT POTOMAC

(Continued from page 12)

latest 60-powered effort to capture the FAI championship for inverted landings, you'll probably end up talking to Ed. And if you know your business, in ten minutes you'll be talking like old friends. Ed's enthusiasm for airplanes (or almost anything else you may care to mention) can add an element of dynamics to any operation. He is opinionated. I don't know if he is always right, but talk to Ed on anything to do with models, the modeling industry or the publications business and you'll get a strong, clear opinion. And from where he sits, this is usually the ex-officio viewpoint of AAM.

Ed believes in modeling, flying models, so strongly that he completely skipped the "and then I started building plastics" stage. If it flew, he flew it with gas power and vacuum-tubed reed receivers at a time when "digital" hardly even applied to computers. He enjoys flying but if you spend any time with Ed, you know that he really enjoys building. I don't mean just applying MonoKote, I mean the type of scratch-design or major modification that took the Nobler and made the *RC Nobler* out of it; the kind of workshop-based operation that involves lathes, silver solder and micrometers. Put Ed in a different environment, make him the son of someone other than FAA lawyer Edward Sweeney, Sr. and he would have made it as a machinist or design engineer.

Ed has other interests—the outdoors, his Saab and Datsun 240Z, his Dodge camper, his Siberian Husky "Blitz." But somehow the cars and camper are usually full of airplanes and spare RC gear and a local meet is an excellent reason to get the Sweeney household (Ed's wife Sandy, and two sons, Eric

and Sean) outdoors. If I have any strong mental image of Ed, it is of a very tall, neatly, but casually, dressed young man, staring intently at the sky over the top of an antenna. Except for deft finger movements, it's one of the few times I've ever seen him still.

Although Ed, by virtue of his position as both Editor and Publisher, extends his personality into all aspects of Potomac's operation, he tries to limit his influence to purely editorial matters, leaving advertising, business management, art and circulation to the specialists who are responsible for these fields as independent operatives.

For example, Ed leaves the real copy preparation to a true specialist, Anna Maria Nunez. After the first reading, Ed sends the month's manuscripts to Anna's desk. Anna turns them into finished reader-ready material by supplying the precision and exactitude to the editorial process which Ed, with all of his technical capabilities, couldn't match.

Anna is a striking, soft-spoken person, precise, but with a prevailing charm and dignity. Her office, just to one side of the main bay where Ed and Eric Meyers work, is just a bit neater than most.

Like many other successful and competent people I've met, Anna is in her present job because she is good at it and likes it, not because she was trained for it. . .four years at Georgetown University and a BS degree in Spanish still wasn't enough to offset the effects of a summer job as editorial assistant at the offices of Television Digest. Years ago, they called it "getting printer's ink in your blood." Today maybe they ought to call it "getting a computer typesetter on your foot," or something to update the analogy, but the result is the same. "I like the work" crops up frequently in any discussion.

Anna gets the raw manuscripts from Ed, reads them for general organization and content, corrects and rewrites in longhand if and when she must. ("I don't type. . .typing isn't one of my major qualifications.") She is probably the only person who reads every word in every issue of every magazine *twice;* once when it is prepared for typesetting, and again in blueline form (the proof copy of the pages from the printer). Maybe even three times on a particularly rough manuscript, the first time just to get it so somebody else can read it, and a later cut to get it so somebody would want to read it. She proofs, she schedules, she edits. I have always been impressed with Anna's general attention to detail and exactness. During the time I was Checklist Editor, I often called Anna late in the month, *too* late really, with a price change or something. If it was anywhere just this side of your local newsstand, Anna Maria Nunez could usually retrieve it and correct it—and would. If you want somebody who can spot a fragmentary sentence at 20 yards and looks great too, Anna is your person.

Potomac has been an expanding and growing organization ever since I first became associated with it. Every time I come back, there is a new staff function which wasn't there before. A few months ago Ed provided Anna with an editorial assistant, Jeanne Schinto, a charming and intellectually active young woman, recently graduated from George Washington University. Her appointment brings all of Potomac's functions "in house" as she now handles the Plans Service (formerly coordinated by Ed's wife Sandy), assists Anna with manuscript reading, editing and proofreading chores, and doubles on the computerized typesetter as needed. "*Everything* gets read thoroughly *in* house, including all of **Model Dealer**," says Ed

happily. Jeanne is an American history enthusiast and a Western history magazine has recently published her article on one of the most obscure facets of the American frontier. She is typical of much of the staff—into something all of the time.

Operating the in-house IBM computer typesetting equipment is Bill Kochanski. Originally from Bayonne, New Jersey, Bill came to Potomac over two years ago, and has about six years' experience in publishing. Bill worked for the R. R. Bowker Company in New York City as assistant manager for customer relations. Bill is also a motorcycle enthusiast, and has received many trophies for motorcycle events.

Neither Anna, Jeanne nor Bill fly airplanes, but many of the staff do. It would be hard not to. A lot of people become interested because they work at a place like this; others work at a place like this because they are interested. Such is the case with Eric Meyers. I haven't known Eric every long, but I have the feeling that he'd be misplaced in any other field, no disrespect intended. A century ago sea captains put to sea at eight and nine years old and by the time they were 20 they had their own command, proving that if you start early enough, youth isn't necessarily synonymous with inexperience. Eric, only 19, is new products editor and general technical theoretician out-opinionated only by Ed himself. His grasp of the hobby is broad and deep.

A Boynton-trained man, Eric has personal contacts throughout the industry and a formidable familiarity with hardware. He flies on Sundays, working out of his van, perfecting RC pattern techniques (the big thing at present), having evolved over the whole route—plastics, CL rocketry, RC boats, cars—a true universal-man approach to the hobby.

One has to be impressed with Eric Meyers. He brings a contemporary cool-

ness to what might almost be called an industry with incipient middle-aged spread. It is refreshing (and should be reassuring to those with a long-term growth interest in the industry) to see a tall, clean-cut hobbyist, with medium length hair and bell-bottoms among the fellers with the sport shirts, straw hats and 38-in. waistlines.

Eric brings an enthusiasm which I feel is engendered by a basic love of the hobby.

Professionalism runs strongly through the staff. From the hobby industry standpoint, it's probably difficult to find a group more thoroughly enmeshed and more professional than the Boyntons. Two things have happened during the brief time they have been with Potomac Aviation Publications: (1) they have brought an "in-house" knowledge of the industry and its manufacturers which is second to none and (2) with the absorption of **Model Dealer**, Potomac has become a true broad-based aviation publishing house.

Doug Boynton and nephew Dave Boynton came East from Chicago at the beginning of this year in a business venture which saw their expertise and the industry-oriented magazine **Model Dealer** merged firmly into Potomac. Doug wears at least two hats—in-house publisher of **Model Dealer** and **RC Products Directory** and Advertising Sales Manager for the entire firm—all of the magazines. The atmosphere in Doug's office is a little different, there is a bit less *joie de vivre*, and just a bit more of the buttoned-down image of the professional businessman/advertising executive. Somehow, everywhere else things get scotch-taped to the wall; Doug displays only a few frequently-used reference items on his darkpaneled walls. Dominating are personal certificates and awards and a needlepoint of a Schweizer glider, handmade by Ed Sweeney's mother. Doug's high-back leather chair adds just a bit more substance. And the phone calls to advertisers go on and on —queries, advice, confirmations, call-backs.

Doug and Dave are responsible for keeping advertisers happy. This means getting advertisers the space and display qualities they need, helping some of the beginners with the sort of copy which both informs and sells. "Information, real information in ad copy is a necessity in any "buff" magazine like AAM. People read the ads to find out what is going on in the model field, not like some other general interest magazines where product identification is everything." While Doug does the majority of the outside contacts, Dave handles the West Coast accounts, edits **Model Dealer** and puts together ad copy for AAM and companion JAM. They are naturals, third generation in the publishing field. They regard Doug's brother who has a PhD and is now successfully seated in Academia as something of a black sheep. Doug flies models too, professionally, in the sense that he's got to know the field from all aspects, and from talking to him, you would feel assured that he probably flies most competently.

Sandi Cymrot works as Potomac's Advertising Production Manager. Sandi was educated as a Fine Arts historian at George Washington University, but found her way into advertising instead. Talking to Sandi is an introduction into the complexities of advertising—those ads just don't mysteriously appear full-grown in **Model Dealer**, AAM, et. al. When you put an issue together, you must coordinate your editorial layout with the space committed to your advertiser's copy—an easy task *if* all of your ad copy is forwarded to you on time. So Sandi reminds clients to send in their copy, lays out ads for **Model Dealer**, coordinates space with AAM through the editorial and art departments and keeps the backbone of the publishing business on a business-like basis.

No magazine can run long unless it is based on firm business practices, regardless of how impressive its editorial content may be. The two tend to complement each other and when one goes up, the other follows. If you have ever been around a magazine, you know how deeply everyone feels about total ad pages, circulation, newsstand sales and the like. Almost everybody at Potomac can quote you circulation figures and this is good. It is probably one of the reasons that Potomac has grown from essentially a one-magazine house to a multi-publication organization based on a steadily-expanding foundation of books and periodicals.

Harvey Cantrell helps to provide Potomac with a sound, businesslike base. Harvey is business manager, possessor of an eternally sharpened pencil, chief negotiator, and purchasing agent, and is all business. . .he doesn't get too hung up on airplanes anymore. He's retired U.S. Army but young enough to have wanted another whole career when he left the Pentagon a few years back. Leaving Ed and Eric to go to the NATS and drum up articles from fellow fliers, Havey keeps touch with the reality of the dollars-and-cents world of cash-in versus cash-out. Having been with the military for years myself I picked Harvey as an ex-military type when I first met him—the clear, plastic-rimmed glasses, blue eyes, steel grey hair, but he isn't nearly as formal as one might think, given the traditional image of the accountant/business manager type. His approach to life is considerably less formal and more good-natured. He's a formidable chess player just beneath Master's status, a reader, a family man and a teller of interesting stories. When Potomac needs something negotiated, Harvey is the man, be it a printing contract, a major equipment acquisition or day-to-day office supplies.

Assisting Harvey and sometimes answering the telephone is a quiet soft-spoken young man from Pakistan, Abdul Sayeedi. Abdul has the actual ledger-keeping responsibilities. He came to the United States in 1966 and spent two years in the purchasing section of the Pakistani Embassy. Back home in Pakistan, Abdul earned a BS degree from Karachi University and, like

several others at Potomac, is still working toward another degree, this one in Business Administration. One of the more interesting aspects of this profile of the people at Potomac was to hear Abdul discuss the differences between the Asian and American concepts of a university. His English? A slight indistinguishable accent which is hard to place but ". . .the nice thing about here is if you can make yourself understood, nobody in Washington worries about another accent." His family, brothers and sisters are all equally well-educated and have all emigrated to the United States, and with the exception of an older sister, and have scattered themselves and their multitude of talents throughout the country.

Gretchen Cantrell Knowles, Harvey's daughter, is also tied into the business end of Potomac. Gretchen is a cheerful and spontaneous person and I suppose she needs to be, handling the complete subscription service for all magazines out of Potomac. (But for you AMA readers, yours are handled with your membership.) If you subscribe, your subscription plus all of your complaints go through Gretchen. She helps to carry out the various schemes, worries about the mailings and snafus of the U.S. Postal Service, keeps the addressing machine and those thousands of mailing labels in order each month, and recalls those Gremlin-induced problems like the time **Junior American Modeler** went out with nary a subscription blank anywhere in it.

Gretchen is assisted by Mark Winter (yes, that last name is a familiar one!), a quiet, intellectually-inclined young man who is majoring in psychology. Life as we all know is a long series of frustrations; his is keeping the Elliot addressing machine operating. Diligently keeping the plates with the quiet fortitude and self-effacing resolve which would do credit to almost any saint, Mark is one of the nicer people you could meet. He grew up in an atmosphere of the frustrations of model airplane building and probably developed a permanent aversion to anything mechanical. Mark has the literary bent which has marked his father, Bill Winter's, writing.

Bill Winter, I always thought, was one of the best professional writers I knew of. I always read Straight and Level first when he was writing it. Whether I knew or really was interested in what he had to say, I read it because I liked the way he said it. It is an almost-stream-of-consiousness style which can make a person appreciate the beauty of free flight or the power of an FAI pattern model. If you have a moment sometime, open up a copy of **Junior Modeler** or a back copy of AAM and read Bill Winter just for the sheer enjoyment of his style. Bill has a habit of dropping names, both current big guns and people from the early days of model aviation in an authoritative swirl

that can make a reader feel like a real insider. It is the style which comes from exceptional familiarity. In the early days of AAM, Bill was a sort of senior mentor to everyone on the magazine; he was Ed's teacher in the art of putting a monthly magazine together. Today he is the force behind **Junior Aircraft Modeler**, maintaining a set of offices down the street from the Potomac office. There he can be separated from the chore of publishing and can concentrate on editing and his work with the NAA.

Bill Winter's experience in aviation publications goes back further than it would be kind to mention. Suffice to say that when I was a little boy during World War II, I read *Air Trails*, the prototype ancestor of the present AAM and recorder of all sorts of aviation information and mis-information, Bill was firmly on the masthead. And he was no newcomer to aviation writing even then.

Bill Winter is a thinker. He is really dedicated to the ideal of model aviation as a means and an end of a happy and productive youth for any American. He's a big man, and when he lights a pipe and settles back into a chair and talks about the aims and objectives of **Junior Modeler**, I have the feeling that the success of this venture is more than just business. He's always trying to make it just a bit clearer for the beginner. When AAM first started, he strongly supported the idea that there should be something "for the tenderfoot" and there was. Kids today are smarter, he notes. When they write, their letters are more mature, their ideas bigger and more ambitious. Maybe what he has been preaching all of these years has really done some good.

Bill is the driving force behind JAM. He puts everything together as a package, less art and advertisement.

Art Director Kelly Matthews and his assistant, Carolyn Munson do the layout and paste-up for all Potomac publications. In short, they are the team which takes those funny little bags of copy and pictures from the editorial department and turn them into story layouts, then squeezes and tailors 120 inches of copy into 98 inches of space in what is probably a never-ending series of compromises right up until the time the magazine must go to the printer.

Kelly came into publications work in the roundabout way which is characteristic of many people in the field; working for the past eight years in a variety of graphics positions ranging from technical artist for a research corporation to Graphics Designer/Production Manager at a local design studio.

Carolyn Munson came from the now defunct *Washington Daily News*. Her background is in advertising and copy layout and consequently she was anxious to get into the art department, transferring from her original position as Ed's secretary. Her resume would pro-

(Continued on page 110)

Editor: Carl Wheeley

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

Executive Council Summer Meetings

Meeting No. 1 began at 9:30 pm, August 8, 1973, at the University of Wisconsin–Oshkosh. The following were in attendance: President John Clemens, Dallas, Tex.; Secretary-Treasurer Earl Witt, Chambersburg, Pa.; Executive Director John Worth, Fairfax, Va.; Dist. I Vice-President Cliff Piper, Atkinson, N.H.; Dist. II V.P. Josh Titus, Paramus, N.J.; Dist. III V.P. Ron Morgan, Scotland, Pa.; Dist. IV V.P. John Spalding, Lanham, Md.; Dist. V Associate Vice-President Jim McNeill, Birmingham, Ala. (proxy for V.P. Jim Perdue); Dist. VI V.P. Glenn Lee, Batavia, Ill.; Dist. VII V.P. Jack Josaitis, Dearborn, Mich.; Dist. VIII V.P. Murry Frank, Wichita Falls, Tex.; Dist. VIII A.V.P. Bud Tenny, Richardson, Tex.; Dist IX Contest Coordinator Jim Finley, Wichita, Kans. (proxy for V.P. Stan Chilton); Dist. X V.P. Alex Chisolm, Fresno, Calif.; Dist. XI A.V.P. Homer Smith, Seattle, Wash. (proxy for V.P. Bob Stalick).

Noting that all AMA districts were represented, Clemens opened the meeting to discussion of the following agenda items. (The items are not necessarily in exact order of occurrence; the sequence has been rearranged slightly for grouping of related items and more orderly presentation.)

1974 Dues

This agenda item was a followup to previous council business in which it had been decided that the AMA membership would be given a choice in 1974 concerning whether or not Aircraft Modeler Magazine would be included as a dues benefit. It had been previously agreed that those adult members who chose not to receive AAM would be provided a reprint of the "AMA News" section of the magazine and that the dues for these members would be less than that for those who chose to receive the magazine, including the "AMA News." Discussion focused on two rate structures: one would keep the higher cost the same as current dues–$15 for those getting the magazine and $11 for those not getting it. The other would cost $16 or $12 for the same choices.

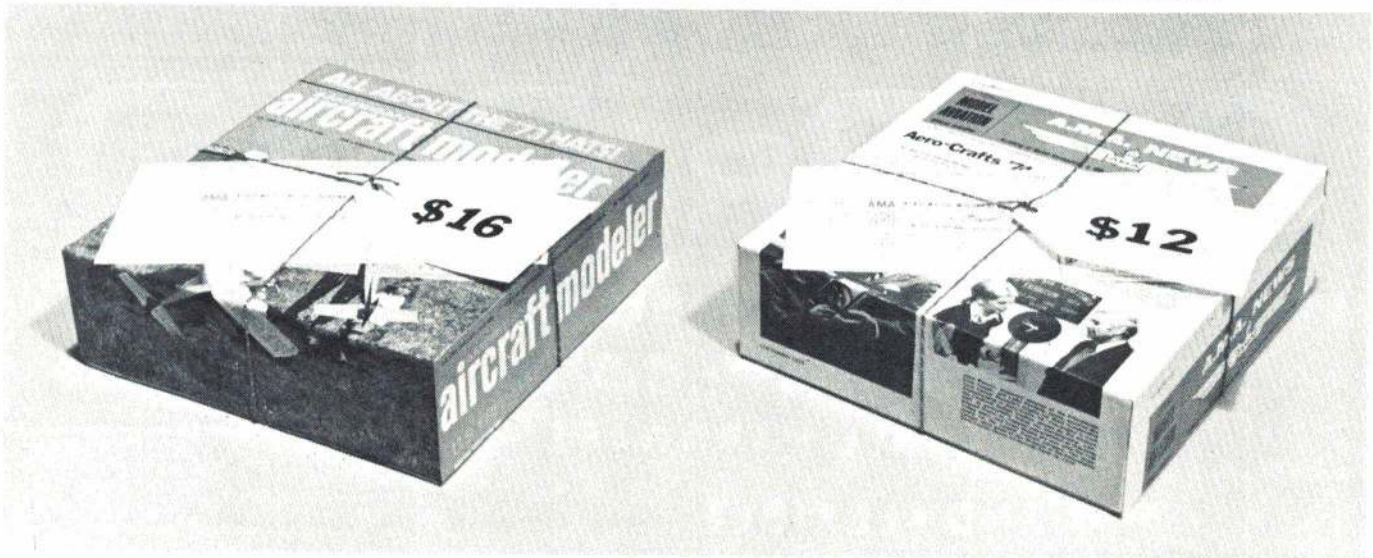
It was pointed out that the lower-priced choice would result in less income to AMA than at present–after deducting the cost of the magazine or the news reprint from the dues, only about $9 would be available for non-magazine benefits. The higher choice would enable the non-publication portion of the dues to remain as now but would have the effect of increasing dues for those preferring to receive the magazine. Considerable discussion indicated no strong preference for either choice–many council members admitted being in a dilemma about which way to go.

Further discussion showed little progress in developing majority support for either choice, so Witt made a motion to approve the $12 - $16 rate structure; seconded by Titus. Voting deadlocked at six for (S-T, Districts II, IV, V, IX, X) and six against (I, III, VI, VII, VIII, XI) with the executive director abstaining, so the president broke the tie by voting in favor of the motion.

Contest Board Voting Clarification

A previous council decision had established that a 2/3 majority vote would decide rules issues. But this had left unclear whether it was intended, for example, that a vote of

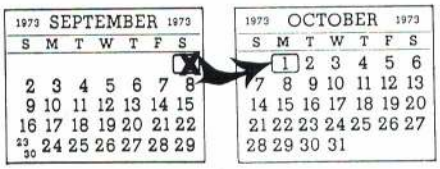
1974 adult AMA membership choices illustrated. Juniors and Seniors, 18 years or under, may obtain AMA membership without publication for $3, with the "AMA News" reprint for $5 or with the full AAM magazine containing the "AMA News" section for $9.



more than 7 out of 11 would be required—it was noted that 7 out of 11 was previously acceptable, but a 2/3 majority would require a minimum of 7.3 votes. Following some discussion, including other examples of confusion in cases of less than full Contest Board voting, Frank made a motion to accept a proposal from Control Line Contest Board Chairman Jean Pailet that the nearest whole number be used in cases of fractional voting questions such as 7 out of 11, 7 out of 10, 6 out of 9, 5 of 8, 5 of 7, etc. Morgan seconded the motion, and the subsequent voting was unanimous in favor.

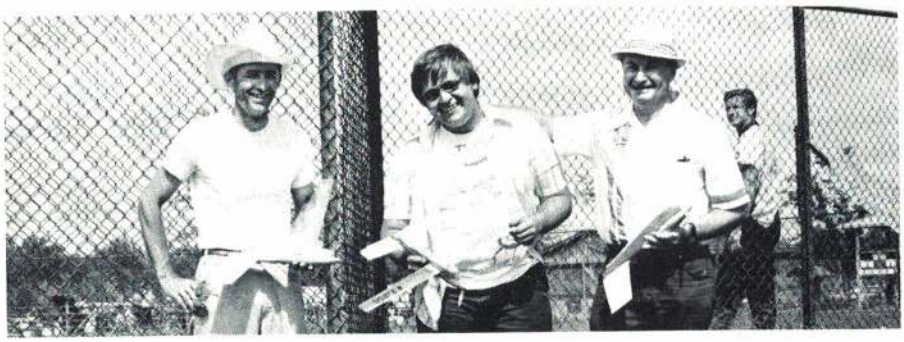
Contest Board Final Voting Deadline

Noting that the Control Line Contest Board had requested more time to complete its work for '73, Spalding made a motion to extend the final voting deadline from Sept. 1 to Oct. 1, 1973. Morgan seconded, and discussion followed concerning whether the extension should apply to all boards or just CL. The motion was amended to apply to all Contest Boards, then approved: nine in favor, two against (X, XI) and one abstained (VIII). A contributing factor to the decision was noted: a final mail ballot had to follow the Nats, and the Nats was two weeks later than normal, making it practically impossible to meet the original deadline.



Control Line Team Finals

The 1973 FAI Control Line Team Finals, the culmination of a two-year AMA program, were held in St. Louis on September 1-2. Twelve men, a combination of newcomers and "veterans," emerged as winners to represent the U.S. in the 1974 CL World Champs. in Czechoslavakia.



U.S. Speed Team (L-R): Bob Spahr, Thousand Oaks, Calif.; Bob Heminway, Pennsauken, N.J.; Chuck Schuette, Santa Monica, Calif. Spahr and Heminway had Rossis, Schuette the ST 15X.

U.S. Stunt Team (L-R): Gene Shaeffer, Astoria, N.Y.; Bob Gieseke, Irving, Tex.; Bill Werwage, Berea, Ohio. Werwage is the reigning Champ, Gieseke has been on team many times.

U.S. Team Race Team (L-R): Fischer/Oesterle, Bronx, N.Y.; Hodgkins/McCollum, Santa Ana, Calif.; Albritton/Joy, Arlington, Va. H/McC used Russian engine for fastest time. F/O and A/J used Bugl engines. Photos by Doc Jackson, CL Team Program administrator.

Contest Board Procedures

The council had previously (last Feb.) authorized former district II V.P. Bill Boss to draft, with the help of current CL Contest Board Chairman Jean Pailet, a new set of Contest Board Procedures. It had been noted that 1974 was to start two-year cycles of rules-making, as compared with previous one-year cycles, so that new procedures would be necessary to accommodate the new time schedule. It had also been generally agreed that the previous procedures had gotten too complicated and confusing, so that a simpler document was desired.

Boss and Pailet submitted a draft for new procedures in July, and copies had been distributed to the council and to Contest Board chairmen before the Nats. Some discussion indicated general council satisfaction with the procedures as submitted. Frank asked the executive director if the proposed rules-making timetable appeared satisfactory from a HQ viewpoint and got an affirmative reply. Worth also noted that while some details in the procedures might need reviewing, there would be time in the following few months for that purpose and that it would be good, in the meantime, to have the procedures adopted as is so that they would have official status. Frank made a motion to accept the procedures as submitted, seconded by Titus; voting was unanimous in favor.

Scale-Pylon World Championships

Worth was asked to review the current status of this project. He noted that the extensive Nats problems for '73 had not permitted much HQ effort to pursue the project and that the outlook was dim for anything positive to be realized soon. He noted that site and manpower problems had not been resolved so that timing and location were still big questions. Furthermore, time was running out because something specific was required to be submitted to the FAI before the end of September if the U.S. offer to host was to be continued.

Worth suggested that Glenview Naval Air Station was a possibility and noted that several Scale meets had been held there since the '72 Nats. He asked that council action be postponed for thirty days while this possibility and any others were checked out. Witt made a motion to accept the 30-day delay and that any request for approval should include information concerning any charter subsidies, what costs would be involved and what income sources would be available. Morgan seconded the motion and also noted that if the timing would be close to the Nats, the factors of manpower and location should be carefully considered. Council voting then approved the delay: 10 for, one against (IX); three abstained (Pres., VIII, XI).

Bonding of Club Treasurers

As a result of a suggestion from a chartered club officer, HQ had asked AMA's insurance agent for a specific quotation covering the bonding of club treasurers. In discussing the proposal, council members indicated a desire to have more information. It was generally agreed that coverage for other club officers besides the treasurer should be included.

Some council members questioned whether most clubs would be interested in such protection and, if so, what dollar amount would be best. When it was apparent that council members were reluctant to vote without better information, Piper made a motion to survey clubs for feedback as to basic interest and degree of protection desired; seconded by Frank. All voted in favor except District II. It was also noted that the survey should express the council's interest in providing additional services for clubs, either in this direction or in others that clubs might indicate a need for.

Scholarship Awards

Acting upon a request from AMA's Scholarship Committee for guidance concerning the number and dollar value of awards for '73, a council consensus appeared to be in favor of duplicating the amount approved for the 1972 program. Frank, therefore, made a motion, seconded by Morgan, that the total amount to be awarded for '73 be limited to the same ($3,500) as that for '72; approved unanimously, with selection for awards to be determined by the Scholarship Committee.

Nats Requirements

Witt led discussion with his report on current requirements. But he noted that the report had been produced prior to the Oshkosh Nats experience and that changes were needed because it had become obvious that requirements were more extensive for a Nats not supported by military facilities. Witt, therefore, said he would modify his requirements report in the light of lessons learned at Oshkosh. Council members urged that the report be modified as soon as possible so that it could be published with copies made available to all potential sponsors.

Finley then inquired as to what had happened in response to a 1972 offer to host by Wichita (Kansas) interests. Worth answered that the offer had been too vague, and that without a list of requirements HQ had been unable to pursue the matter. In the meantime, he noted, specific offers had been received from Air Force interests in Illinois and also the Experimental Aircraft Association at Oshkosh.

McNeill then suggested that the council consider purchase by AMA of its own property for Nats and other use. Considerable discussion ensued with many pros and cons expressed, but no definite consensus. Frank noted that there was a lack of agreement in many areas concerning the Nats–including the size and nature of the event. Worth and Clemens commented that the Nats needed a fresh look at the basic purpose, concerning whether it should be steered in the direction of reducing by emphasizing the championships aspect, or of expanding by adding activities for Sunday-flyer types so as to make the event more of a national convention. Worth further noted that the enormous effort of a Nats would be better justified if more members participated (like EAA) so that 20,000 instead of only 2,000 would be involved.

Further discussion showed no definite direction of action to be taken, so Frank made a motion to table the subject and McNeill seconded; all voted in favor of the motion except that Finley, Titus and Witt abstained.

FAI Programs And Standards

Finley reported for Chilton, the current chairman of a special committee on the subject, that Chilton was unable to continue in the position–due to personal and business pressures–but would like to remain on the committee as a representative for Indoor activities. Discussion indicated that the committee had not produced any recommendations and that a fresh start on the subject was needed.

Tenny then advised that he had a proposal to present, and he was invited by the president to do so. He did, outlining a procedure whereby FAI decisions would be made by the Executive Council and/or an FAI Executive Committee composed of representatives from each modeling category (CL, FF, RC, SC). Considerable discussion then ensued concerning the proposal, previous FAI decisions, the authority (or lack of) for such decisions, by-laws interpretations, and general problems.

Strong differences were noted between Tenny's and Worth's views of these matters. Clemens added comments which indicated that there were great differences of opinion involved which made any decision subject to disagreement. Worth noted problems concerning operations of committees and program administrators which often resulted in presidential or HQ decision-making in order to preserve integrity and objectivity in programs.

Worth further noted that true majority viewpoints were often difficult to determine in team programs due to many differences of opinion, and votes frequently were a matter of very small percentages one way or the other. He recommended that FAI decision-making be in accordance with HQ experience which encompassed many years of objectivity and freedom from personal gain or self-interest on the part of HQ staff members.

Discussion explored possibilities of a czar-type operation, with one person rather than a committee responsible for FAI program decisions. Worth indicated that this might be preferable simply because committees of volunteers typically had difficulty in meeting deadlines due to the spare-time nature of such operations. Following further discussion of the committee vs. one-man concept, McNeill made a motion that one man be appointed to administer FAI team selection programs. Witt seconded the motion, which was then approved by a five to two vote. McNeill then made a motion to have the council appoint Frank Ehling, AMA's technical director, to serve as chief administrator of FAI team selection programs; seconded by Spalding. Voting approved the appointment with nine in favor, none against, and five abstentions (II, VII, VIII, IX, XI).

Another motion was made by McNeill to thank Tenny for his efforts to spur council action on FAI programs; seconded by Smith. Worth noted that Tenny had been one of the most able FAI program administrators, and that if more of the others had devoted equivalent time and energy there would have been fewer problems. Furthermore, he noted that while there had been many controversies involving Tenny and HQ, most of these involved differences of opinion rather than differences of aims or purpose. Clemens noted, too, that such differences needed more positive approaches to solve problems, and that there had been too much tendency on the part of those who disagreed with his or HQ decisions to react negatively. The subject was ended by voting to approve McNeill's motion unanimously.

Muffler Design Contest

Worth proposed that AMA indicate concern for noise and flying site problems by taking a positive action to spur interest and attention on muffler design. He suggested that cash prizes be awarded in a contest for best home-built and also industry designs. McNeill then made a motion to approve such a contest in principle, with further details to be submitted to the council for final approval; seconded by Finley.

Spalding asked for more specific information concerning how the final version of the proposal would be developed. Worth suggested that this be done in a manner similar to that of the Scholarship Committee and recommended that Don Lindley, AMA's Muffler Committee chairman, lead the effort. The council then approved the motion by a vote of 13 for and one abstention (VI). Clemens then formally appointed Lindley as chairman of the committee to work out contest details.

FAI Czar (?) Frank Ehling

NAA Magazine

Worth noted that when the council had voted to approve sending this quarterly magazine to adult AMA members, as both a dues benefit and a PR project, it was to be for a trial period during 1973. It was necessary, therefore, to decide whether to continue the arrangement on the same basis for 1974. Titus made a motion for continuance provided the price (30 cents per copy) remained the same; seconded by McNeill.

Piper questioned the value vs. cost, and discussion ensued concerning pros and cons. Clemens asked each council member to express an opinion prior to voting. Following

(Continued on page 106)

Human Limitations vs. Our Mechanical Expertise

PRESIDENT'S MEMO

To those readers who receive our AMA Monthly Mailing (club officers and model press) some of the following remarks will already seem familiar, but sometimes the messages in those mailings don't filter down to the entire membership. Since safety problems should be brought to the attention of as many of our members as possible, I shall, include here parts of what I have already written to the smaller Monthly Mailing audience.

The membership and leaders of the Academy of Model Aeronautics have a serious responsibility to always keep our mechanical ability and ingenuity within the reasonable human ability limits to control. Staying within these limits totals up to SAFETY and PUBLIC ACCEPTANCE.

It would only take a few "accidents" and some "scare-headline" newspaper articles to put a public-demanded halt to what aeromodeling is all about—a heck of a lot of fun.

Peculiarly, the problem belongs to all of us, the "Sunday flyer" as well as the competition flyer. It is directly from competition flying that fantastic power development has come in our engines and related equipment. It is also from competition flying that our safety regulations have come and under which we all should certainly be flying. The direct result of all of the wonderful technical development is that in nearly everything we fly, we are actually quite overpowered, adding to our personal and collective responsibility to fly with great forethought.

There are many categories of our competition flying in which we have become so technically advanced that if we make a mistake there is no longer time left to make a correction. Our weakness now is the human ability to handle the power device. For a human to think/act or reflex/act has definite limitations, and in many of our endeavors we have reached those limits.

A recent example of exactly this is another power/sport, the 1973 Indianapolis 500-Mile Race. Two of the most expert drivers were killed and a bunch of spectators injured in proving that power development has crossed the line beyond which human ability can handle it. Even such skilled drivers as A.J. Foyt admitted that they "drove scared" because there was no longer a margin of correction left within man's ability.

We have developed exactly this same problem in several of the competition categories of aeromodeling. Through our mechanical ingenuity and technology in speed-related events, the fantastic performance we have developed has, in potential, turned our MODELS into MISSILES—racing beyond our human ability to properly and safely control. Of particular concern are such popular events as RC Pylon Racing, Control Line Speed, Control Line Racing, Control Line Combat, and some of the engine-powered Free Flight classes.

Thankfully the contestants, themselves, and officials are looking hard at these events, and a lot of constructive thinking and awareness is already beginning to come from those who actually participate. In RC Pylon Racing the first and most obvious "cure" was to move the racing course farther from the spectators. But this left the contestants and officials just as vulnerable, the flying machines just as dangerous, and it is certainly not the full answer.

AMA President John Clemens (R) at the Nats, chatting with FF Category Manager Pete Sotich. This month's President's Memo was written prior to extensive surgery in September. Clemens appeared to be making a remarkably fast recovery—typical of the vitality he is known for. But in early October he was again hospitalized, and so we continue our prayers in his behalf.

In Control Line Speed flying the line size requirements have been raised, a safety thong is required from control handle to the flyer's wrist, and proof is required that the model is safely constructed and held together. These safety measures are excellent, but IN NO WAY do they improve the human physical and reflex problem on airplanes that are going ever increasingly fast. Slow-motion movies of the Speed flyer trying to get around a pylon prove that the human factor has reached its limit.

This same goes for the Control Line Racing events. In the past we cut down from four-at-a-time flying to three-at-a-time for safety. Now we have cut down to only two-at-a-time in Rat Racing. The next step, of course, is to cut it to one, and then it is no longer a race. Again, the human ability is the only thing we haven't improved.

Thanks to some far-sighted modelers there have been born a few "safe and sane" events such as Slow Combat in Control Line and "Ugly Stik" racing in Radio Control. These bring the fun of competition flying back to the level of the sport or "Sunday flyer" and away from the all-out professional. Such competitions don't require factory backing, a machine shop, exotic equipment, constant practice, or FLYING ON THE RAZOR EDGE OF MAN'S ABILITY.

The magic of these events is the fact that the flyer still has time to make corrections and avoid accidents or destruction. Yet we are even having trouble proctecting the purity of these events to keep the always-trophy-hungry professional from winning these, too, through his superior knowledge or experience. We badly need these milder events so that flyers can enjoy them and the public can watch and understand them.

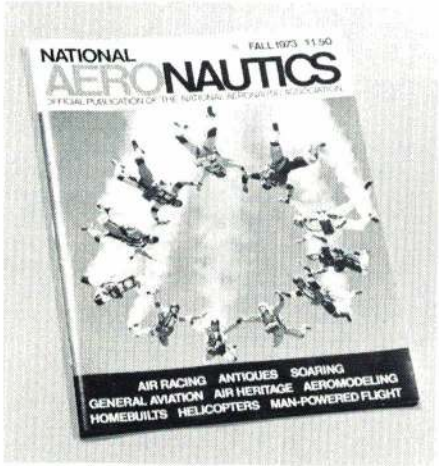
If we de-power or slow down the high performance events there will always be a small group who claim we are destroying the spirit of it all. That is purely selfish thinking, because if they are really superior modelers they will be so at 80 mph, 100 mph, or the 200 mph level at which some of them already are flying.

Summarizing all of this, it is high time that we make an effort to bring the superb mechanical level of our technical ability, and the HUMAN'S ABILITY TO HANDLE IT, closer together. Getting and keeping flying sites is already hard enough, and we should be aiming a lot of technical thinking toward protecting them and being accepted in our communities as an innocent form of leisure-time occupation. We need every member's thinking when it comes to safety.

John E. Clemens
AMA President

Council Meetings (Cont.)

this the motion to continue was voted on and approved by nine to four (S-T, I, IX, XI against).



Contest Director's Handbook

Frank asked Worth for a status report. The latter noted that the project had been stalled because of HQ priorities on other matters and that only a final clean typing was needed to enable reworking into final format. He promised Tenny, the project chairman, a clean copy as soon as possible, with the goal of publication and distribution early in 1974. No other action taken.

Judging Recognition

McNeill proposed that RC judges be recognized in a manner similar to Contest Directors, for prestige and reward; also to make available a list of such judges to all Contest Directors. He asked Worth to comment on the feasibility from a HQ processing standpoint. Worth indicated that identification on the membership card, publication of lists, and processing by the use of forms similar to those used for CD's would be no problem with current computer techniques.

Some discussion ensued concerning whether the recognition should apply to all judges. McNeill made a motion to provide this recognition on a one-year (1974) trial period for RC judges only, with the intent that if the experiment proves satisfactory, it be opened to all categories of judging; seconded by Worth. Voting approved the motion with 11 for, one against, two abstentions (I, IX).

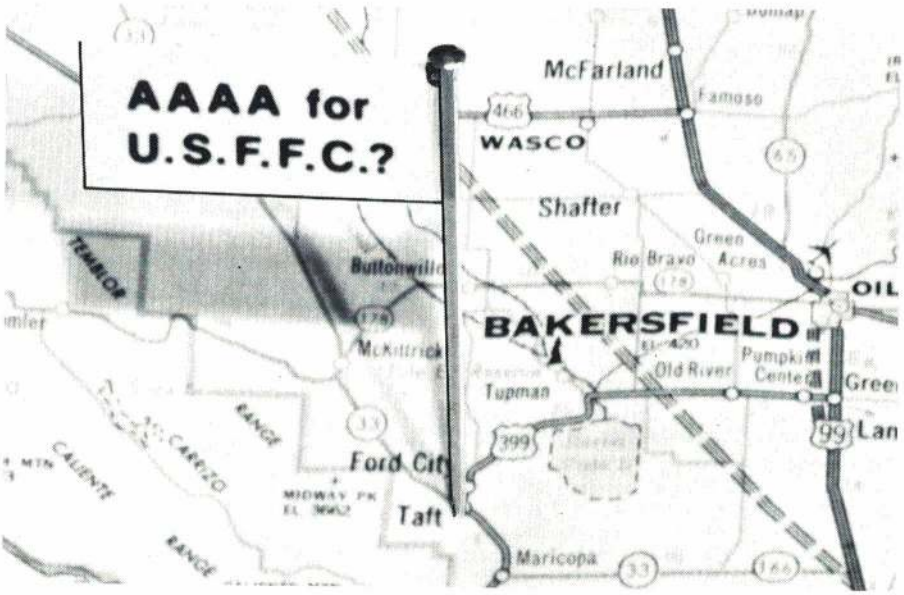
AAAA Status for FF Championships

Chisolm presented this request on behalf of his associate V.P., Jim Scarborough, to recognize this annual meet at Taft, Calif., with the highest AMA meet classification. Discussion brought out that to do so would extend this classification beyond current practice which now recognizes only the Nationals and World Championships with such status. Chisolm asked for opinions from council members whose interest was primarily Free Flight. Two such members (McNeill, Smith) spoke against the request because they felt it was against the rule book intent even though this was not clearly defined, also that there was a lack of definitive information as to why the rating was thought to be necessary. Frank then moved to table the question until the Winter (Feb. '74) council meeting; seconded by McNeill. Tabling was approved by vote of eight for, two against (VI, IX), two abstentions (Pres., I).

Distinguished Service Awards

Two were proposed and approved unanimously, with announcement and publicity concerning details to be withheld–as per normal policy–until the awards are arranged for public presentation.

1:30 am. Meeting adjourned.



Possible Health Hazards

TALCUM POWDER. Dr. Charles W. Kirkland, Jr., AMA 18521, of Chicago, Ill., reports that the February 1973 issue of the Journal of Occupational Medicine implicates talcum powder, commonly used with clear dope as a balsa wood filler, as a causative factor for degenerative lung disease and possibly various forms of cancer. Dr. Kirkland's advice is that we take caution in the use of talcum powder materials: sand in a well ventilated area, outdoors, or use a protective dust mask at all times over the face in order to protect lungs and health.

SPRAY ADHESIVES. Steve Helmick, AMA 7781, Seattle, Wash., passes on information that the U.S. Consumer Products Safety Commission has banned the sale of 13 brands of spray-on contact cement and further recommends that all use of spray adhesives be immediately discontinued. According to Helmick, Scotch 77 and 77N are among those banned, and these are the usually recommended ones for application of clear mylar as a model covering; similar adhesives have been used for applying skins to foam RC wings.

While the evidence concerning spray adhesives is not completely conclusive, and the ingredient which causes chromosome damage has not been determined, early studies have indicated a marked increase in the frequency of birth defects among the offspring of users of these products. Further research is being conducted, but until the cause is pinpointed and eliminated, it would be best not to use them.

Helmick points out that the couples in question were not "sniffers." They were using spray adhesives in a "home hobby" situation.

Meeting No. 2, 8/10/73, began at 9:50 pm. with the following council members present: Pres., Sec.–Treas., Exec. Dir., Districts I, II, III, V, VI, VIII, X, XI. The council continued with agenda items from the previous meeting.

Contest Director Appointments

Titus indicated he did not like the current system whereby a CD could be appointed merely by concurrence of three AMA members and their district V.P., but that he would table this agenda item until the winter council meeting so that the council could devote more time to the next agenda item.

Second N.Y. Incident–Model and Full-scale Aircraft

Titus related circumstances concerning a report by an airline pilot involving sighting of a model near La Guardia Airport on June 26. He then related details involving his 30-day suspension of a club charter, pending council review of the incident.

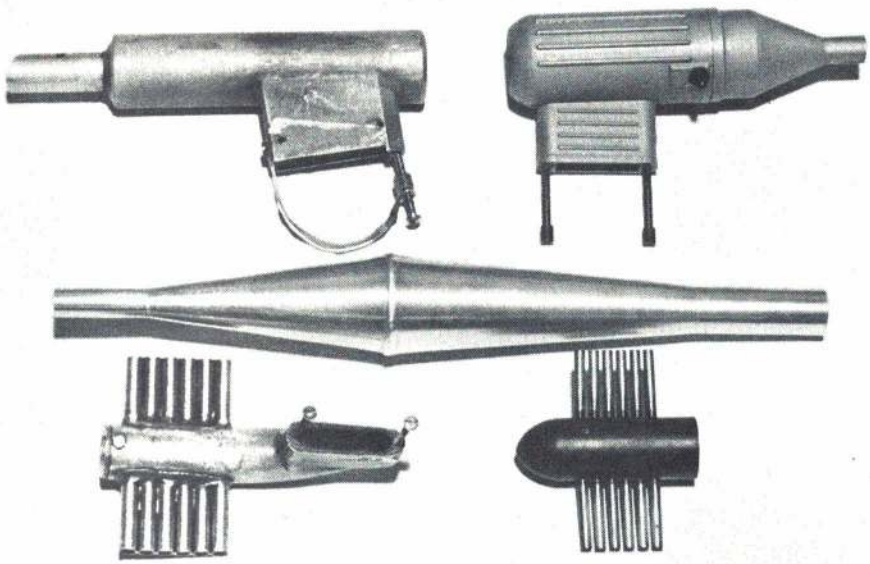
Titus and Worth read telegrams from N.Y. club and model association presidents in which the organizations desired to solve

their own problems. Worth suggested that the association be advised that the council agreed that the V.P.'s action was prudent and justified by the seriousness of the situation which posed a threat to freedom of model flying all across the country, but because the local action following the incident was apparently successful in preventing aggravation of the problem, no further action would be necessary.

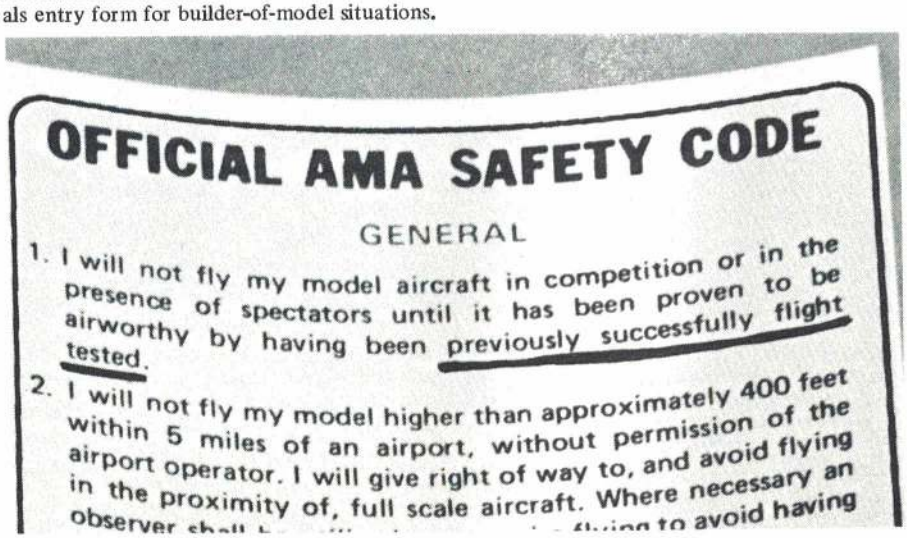
The council concurred but added a request for more information concerning identification of the person who caused the incident. It was noted that the same thing had happened in the JFK Airport incident in 1971: the identity of the person flying the model was deliberately concealed. The council consensus was that unless information concerning identity was forthcoming, further council action would probably be necessary.

Safety Code Enforcement

It was noted that item one of the general section of the code, referring to testing of models prior to flying in competition or in the presence of spectators, was being ignored. General discussion produced a suggestion that a minimum action which should be required by Contest Directors would be to have contestants say, verbally or in writing, whether their entries had been test flown. Worth noted that this could be in the form of a simple affidavit such as has been used on the Nationals entry form for builder-of-model situations.



Improving the breed is the idea behind the muffler design contest instituted by the AMA Executive Council. Awards will be provided for commercially produced units as well as homebuilts. Photo shows two commercial mufflers, two homebuilts by Telford/Violett as used in FAI RC Pylon Racers, and a tuned pipe, presently allowed for AMA use in FAI Pylon Racers.



OFFICIAL AMA SAFETY CODE

GENERAL

1. I will not fly my model aircraft in competition or in the presence of spectators until it has been proven to be airworthy by having been previously successfully flight tested.
2. I will not fly my model higher than approximately 400 feet within 5 miles of an airport, without permission of the airport operator. I will give right of way to, and avoid flying in the proximity of, full scale aircraft. Where necessary an observer shall [illegible] flying to avoid having

Soaring Advisory Council Status

Worth noted a complaint circulated by an SAC member which indicated a desire for more recognition and authority in Contest Board matters. The council then reviewed the original proposal which led to the establishment by the council of the SAC. Subsequent discussion indicated agreement that the SAC must be subordinate to the Contest Board and advisory only, rather than rules-making. Meanwhile, it was noted, the Contest Board was in the process of voting on acceptance of official status for soaring competition rules.

Special Membership

A proposal for a $5 'Booster' membership was reviewed. The intent of such membership was described as merely seeking to provide identity and association with AMA, mostly for former members who had become inactive although still interested. No insurance or competition privileges would be involved and no flying license or publication would be provided. A special card would be issued, of different color, to avoid any confusion with the normal membership card. Frank made a motion to accept the proposal; seconded by McNeill and approved unanimously.

Hall of Fame

Chisolm asked for a review of this activity, noting that there were requests for Hall of Fame nominations but no apparent action. Clemens then announced that he had just appointed former AMA President Walt Good to be chairman of the Hall of Fame Selection Committee. Worth added more information by noting that some action would be taken in '73, with full Hall of Fame Committee operation in 1974.

AMA Museum

McNeill suggested that AMA look into having a permanent model aviation display in Washington D.C. Worth then reviewed possibilities for an AMA display in the new Smithsonian Aviation Museum currently being built; to feature famous models such as those used in World Championships or for record setting. He also noted that AMA was collecting information on the whereabouts of suitable models and that it was intended to work with established model museums such as those of Russ Barrera and Dick Sherman.

Noting that no further agenda items were proposed by the council, Clemens then adjourned the meeting at 11 pm.

Chartered Club officers who receive the AMA Monthly Mailing found out in October what was October's big modeling news. Did you? If not, ask your officers why not!

Hobby Dealers–Clubs–Leaders: need AMA application blanks? For a free supply write to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005. Specify how many are wanted.

Joe Coles Profile of a Life Member

by Jim McNeill

Our fine Academy of Model Aeronautics was not always as healthy as it is now. In 1965, when AMA finances were in a serious deficit condition, a concerned modeler, Joe Coles, walked up to President Howard Johnson at the Nationals and handed him a check for $2,000. A year later Joe presented another $1,000. No special recognition or publicity was involved. Special membership numbers then were unheard-of.

Why the unselfish gifts to AMA's well-being? Let Joe answer in his own words: "The donation was given at a time when I felt the future of the Academy was in doubt. Consciously and subconsciously we have all depended on the AMA to promote the hobby and the associated activities. It would have been a void that could not have been filled, had it failed.

"I honestly believe that had it not been for model airplane building during the period of rebuilding a bankrupt business, I would have ended up in the booby hatch.

"The donation was given not to obtain a Life membership (in fact I did not know lifetime memberships existed); it was given because I felt I owed something to the Academy for what it was trying to do to promote the hobby."

A project engineer in the development of sewerage and water plants, Joe lives in Moorestown, N.J. Along with his wife, Janice, and four children (Charles, 21; Mary, 19; Nancy, 18; and Anne, 11) he enjoys Radio Control model sailboats, game fishing, and most of all—model airplanes.

How good a modeler is he? Joe won the Testor's Trophy for best model finish at the National Contest in 1957, 1958 and 1961. Also, he was 1st in Control Line Scale at the 1961 Nats.

For his contribution to the AMA Joe Cole is now enshrined forever on its Life member scroll and is permanently assigned the enviable membership number, L-3, a number never ever to be reassigned to anyone.

And more than any number can express—our undying thanks, Joe, for your thoughtfulness during AMA's dark hour.

Above: 14-year-old Billy West's .02-powered "Dick's Dream" has simple gimmick to prevent loss in soybeans of his father's flying field/farm in Cambridge, Md.—a bright colored ribbon which the model tows. Hobie Steel photo. Left: Joseph Naber of Manchester, Mo., with a nice ST 60-powered Cutlass Supreme. Wing emblems are an adaptation of the 1971 RC World Championships logo.

Japan Wins RC World Champs

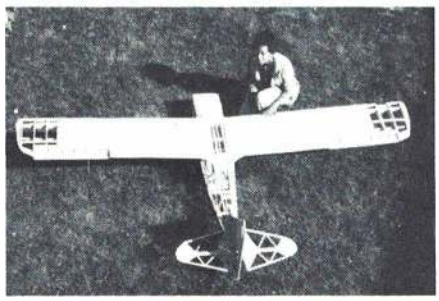
Tsugutaka Yoshioka of Japan has been crowned the Individual RC Aerobatics World Champion for 1973; high scoring by his teammates also secured the Team World Championship for his country.

Only Norm Page of the U.S. team had a two-flight score high enough to win a spot in the five-man flyoff for the title of World Champion. In this he placed 5th—ahead of him, in addition to Yoshioka, were Wolfgang Matt of Lichtenstein, 2nd; Hanno Prettner of Austria, 3rd; and Harald Neckar of W. Germany, 4th.

The U.S. team placed 2nd. Jim Whitley and Jim Martin of the U.S. team placed 8th and 12th, respectively.

The 1973 RC Aerobatics World Championships at Gorizia, Italy, September 11-16, was the biggest ever, with 78 flyers entered from 28 countries.

Nice looking Sig J-3 Cub by builder-photographer Andrew Fracica is finished with Super MonoKote, has OS Max .35 power.



Donna Batch posed with hubby Juan's nearly finished 1/3rd size Citabria—11-ft. span! Has since been flown with ST 60 and OS 80.

The AMA chartered Kokomo Aero Team's silver anniversary was celebrated in 1973—25 years of continuous activity! Guests of honor at the club's earlier Awards Banquet in celebration of the occasion were many of the area's hobby dealers in recognition of their being the hobby's backbone. Serious awards were presented as well as amusing ones. Among the latter, shown, was the Dead Battery Award to Roger Kendall (L) and the Bolt & Nut Award to Ron Ridgeway. Our congratulations to the KAT as it approaches the close of its 25th year!

Dean Klein holds Fred Fehling's slightly modified Midwest Jodel—good aerobatics with only rudder and elevator. F. Fehling photo.

Official Sanctioned Contests of the Academy of Model Aeronautics

Note: For quick response and as a favor to those staging, administering and directing the contest, be certain to send a stamped, self-addressed envelope along with your request to the listed Contest Director (CD) for additional information.

NOV. 4—TAFT, CALIF. (A) 7th Annual Texaco Class Event. Site: Taft. B. Chandler, Sr. CD, 7858 Farralone Ave., Canoga Park, Calif. 91304. Sponsor: Southern Calif. Ignition Flyers.

NOV. 4—PALOS PARK, ILL. (A) 2nd Annual Turkey Fun Fly. Site: 107th St. & Rt. 45. B. Johnson CD, 1004 61st St., Downers Grove, Ill. 60515. Sponsor: Palos Park RC Club.

NOV. 4—LAKEHURST, N.J. Old Timers by RC Meet. Site: Lakehurst, N.A.S. A. Thoms CD, 33 Cambridge Dr., Berkeley Hgts., N.J. 07922. Sponsor: Old Time Eagles.

NOV. 10-11—HONOLULU, HI. (B) 5th Annual 50th State RC Contest. Site: Honolulu. W. Fuchsberger CD, 87-263 Heleuma St., Waianae, Hi. 96792. Sponsor: Hawaii RC Club.

NOV. 11—JACKSONVILLE, FLA. (A) Greater Jacksonville RC Sailplane Meet. Site: 103 St. Flying Field. C. Loftis CD, 5921 Wending Dr., Jacksonville, Fla. 32210. Sponsor: Gateway RC Club, Inc.

NOV. 18—GLASTONBURY, CONN. (AA) Fall Indoor Ceiling Banger for Cat. II. Site: Glastonbury High School Gym. G. Armstead, Jr. CD, 89 Harvest Ln., Glastonbury, Conn. 06033. Sponsor: Glastonbury Modelers.

NOV. 23-25—TUCSON, ARIZ. (AA) Winter RC Nationals. Site: Marana Airpark. W. Hempel CD 6370 E. 22nd St., Tucson, Ariz. 85710. Sponsor: Tucson Radio Control Club.

NOV. 25—FRESNO, CALIF. (A) F.G.M.C. Monthly FF (Cat. II) Meet. Site: Ave. 12, Road 37½. F. Ginder, Jr. CD, 5740 E. Ashlan Ave., Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

NOV. 25—VAN NUYS, CALIF. Northrop M.A.C. 7th Annual "Flying Wing Contest". Site: Sepulveda Basin. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: Northrop Model Aircraft Club.

DEC. 2—TUCSON, ARIZ. (A) Cholla Choppers M.A.C. Winter Slow CL Fest. Site: Rodeo Park. B. Reynolds CD, Rt. 8, Box 51, Tucson, Ariz. 85710. Sponsor: Cholla Choppers M.A.C.

DEC. 2—HOMESTEAD, FLA. (A) AMP'S 3rd Annual RC Fly-In. Site: AMP'S Field. P. Hendricks CD, 11742 SW 176th Terr., Miami, Fla. 33157. Sponsor: Aero-Modelers of Perrine.

DEC. 9—MESA, ARIZ. (AA) Tri-City Winter CL Invitational. Site: Mesa Community College. M. Sledge CD, 1755 W. Auburn, Mesa, Ariz. 85201.

DEC. 9—ELSINORE, CALIF. (A) Jumbo/Peanut Scale 5th Annual FF Contest. Site: Lake Elsinore. C. Hatrak CD, 3825 W. 144th St., Hawthorne. Calif. 90250. Sponsor: N.A.R. Flightmasters.

DEC. 30—FRESNO, CALIF. (A) F.G.M.C. Monthly FF (Cat II) Meet. Site: Ave. 12, Road 37½. F. Ginder, Jr. CD, 5740 E. Ashlan Ave., Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

JAN. 26-27—PHOENIX, ARIZ. (AA) 3rd Annual Southwestern RC Championships. Site: Aux. 2. K. Peterson CD, 4202 W. State Ave., Phoenix, Ariz. 85021.

THOSE PEOPLE AT POTOMAC

(Continued from page 101)

bably fill three pages of typing—one unusual job after another, a tour of duty with the Waves which landed her in Washington, time with a public relations firm, then the *Daily News*, all performed with a basic interest and involvement with people—still her primary interest.

Joe Wright, Circulation Development, is another person with impressive credentials in the newspaper world before he came to Potomac. A modeler himself and a contributor to **Junior American Modeler**, Joe is in charge of upgrading AAM's image with the modeling public. He is the liaison between the magazine and its distribution network and this involves monitoring newsstand sales, finding out what people want at the retail level and looking into the numerous, almost unbelievable, complexities of sales and circulation.

Joe is a specialist in a unique field at Potomac—Demographics, the science of defining the reactions of people according to their place and mode of living. Demographics is an important consideration when you are trying to favorably influence a large body of people (sometimes called "the readership") with your product. The problem is getting to know the readership better so you can serve them better. And this is where Joe with his awe-inspiring knowledge of the likes, dislikes, needs and wants of people all over the country comes in. Joe can give Ed a quick thumbnail sketch of a typical modeler/flier/reader in Hammond, Indiana and how his reactions differ from his counterpart in Brooklyn, New York or Brockhaven, Mississippi. Joe knows how to conduct surveys. He helped analyze the AAM reader who turned out to be a surprisingly literate, well-educated and enthusiastic hobbyist. In addition to finding out what the readers like, Joe works the opposite side of the street—the public relations of providing a good image of the magazine to the reader, attending meets and organizing trade shows, talking, listening, and providing the "two-way street" between the readers and Potomac which is so important in keeping AAM number one in its field.

To use a worn expression, "It's a going team." It comes in large measure from the enthusiasm which the staff generates within itself. Jane Blitch, blond, trim, nearly twenty and just out of one of the better secretarial schools might be excused if she just handled Ed's filing and dictation, but even Jane has been captured by the magic of putting a plane together and seeing it fly. Jane answers the phone in a most charming manner. She is, by Ed's account, the best secretary he has had, and by almost everybody else's, mine included, a very pretty young lady, which can certainly be an asset at trade shows. At these shows she is constantly busy, taking dictation, meeting friends of AAM, helping the younger fliers with their Delta Darts. In typical reaction to the photo I made of her for this article, she wrinkled her nose just a bit and

said: "Oh, for Heaven's sake, I look terrible." Let the reader judge.

It is this type of involvement of doing things with and for and about model aviation, which brings everyone together as a cohesive, functioning group rather than a disparate group of employees.

Potomac Aviation Publications is located on the fifth floor of a solid old Washington landmark, the Woodward Building, just north of the financial district and a five-minute walk from the White House. Leave the elevator, turn right, and there at the end of the hall are the huge double doors with the raised letters announcing it as the home of Potomac Aviation Publications. You'd better believe it.

STALICK ON FF

(Continued from page 42)

I haven't had too much trouble with this system, but it does take some getting used to for starting. It is lightweight, produces good steady engine power, and is reasonably clean.

There are disadvantages, however, in that it looks like hell with the bladder hanging below the fuselage, and when it is used with really hot fuels and/or with inverted engine mountings, it's pretty hard on plugs. If these problems exist, you would be advised to use the bladder tank in conjunction with a flood-off system or to go to a standard hard pressure tank setup.

Statement Required by the Act of August 12, 1970; Section 3685, Title 39, United States Code showing the Ownership, Management and Circulation.

1. Date of Filing: October 1, 1973

2. Title of Publication: American Aircraft Modeler

3. Frequency of Issue: Monthly

4. Location of Known Office of Publication: 733 Fifteenth Street, N.W., Washington, D.C. 20005.

6. Names and Addresses of the Publisher, Editor and Managing Editor: Publisher, Edward C. Sweeney, Jr., 5026 Eskridge Terrace, N.W., Washington, D.C. 20016; Editor: Edward C. Sweeney, Jr., 5026 Eskridge Terrace, N.W., Washington, D.C. 20016; Managing Editor: Anna M. Nunez, 2814½ Olive St., N.W., Washington, D.C. 20007.

7. Owner: Potomac Aviation Publications, Inc., 733 Fifteenth Street, N.W., Washington, D.C. 20005. Stockholders: Edward C. Sweeney, Jr., 5026 Eskridge Terrace, N.W., Washington, D.C. 20016; Catherine H. Sweeney, 4013 Douglas Rd., Coconut Grove, Flordia 33133.

8. Known Bondholders, Mortgagees, and other Security Holders, Owning or Holding 1 Percent or more of Total Amount of Bonds, Mortgages and Other Securities: None.

11. Extent and Nature of Circulation:

		Average No. Copies each issue during preceding 12 months	Actual No. copies of single issue published nearest to filing date
A.	Total No. Copies Printed	129,454	132,144
B.	Paid Circulation		
	1. Sales through Dealers and Carriers, Street Vendors and Counter	35,242	36,400
	2. Mail Subscriptions	47,531	50,025
C.	Total Paid Circulation	82,773	86,425
D.	Free Distribution by Mail, Carrier or Other Means		
	1. Samples, Complimentary, and Other Free Copies	375	375
	2. Copies Distributed to News Agents, but not Sold.	44,158	43,000
E.	Total Distribution	127,306	129,800
F.	Office Use, left-over, Unaccounted Spoiled After Printing	2,148	2,344
G.	Total	129,454	132,144

I certify that the statements made by me above are correct and complete.

(Signed) Harvey E. Cantrell
Business Manager

Order the plans for your next model from our plans service on page 84

BLUM ON CL CARRIER

(Continued from page 42)

records and comparing all flights—it offers the sponsor the advantage of better meet economy. It also permits the contestant not only to compete against the present competition, but reflects against the best national level flights in each respective category.

Since Profile exists, at least in rules and organizations, as a single class, it can be maintained as an individual event. However, a mathematician might create a factorial system through which all Carrier might compete as a single event. The object of this is not to make the event participation difficult, but to offer a compromise with the contest organization and administration. Food for thought! Any takers?

Info Data Low: Come on fliers, what's going on? Participate in this AAM column by sending ideas and pics to John Blum, 2417 Glen Pl., Granite City, Ill. 62040.

EDITORIAL

(Continued from page 6)

when mentioned as an integral part of sentence structure; for example, Ohio event, California team. No comma appears between state and zip code. United States is abbreviated U.S., but

INDEX TO ADVERTISERS

U.S. Navy appears as USN and U.S. Air Force as USAF.

NUMBERS: Write out ten and under, except when giving dimensions. Use digits to indicate numbers larger than ten.

ENGINE SIZES: Omit the initial decimal point—19, 049, 60.

CAPITALIZATION: Brand name products (Scotch Tape) are capitalized, but not those in common usage (nylon). Names of events (Stunt) should begin with a capital.

ORGANIZATIONS: Well-known organizations are referred to by initials: AMA, FAI, ROAR. No periods are used. Titles of other groups should be written out when first mentioned and thereafter referred to by initials.

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—Joe Wright

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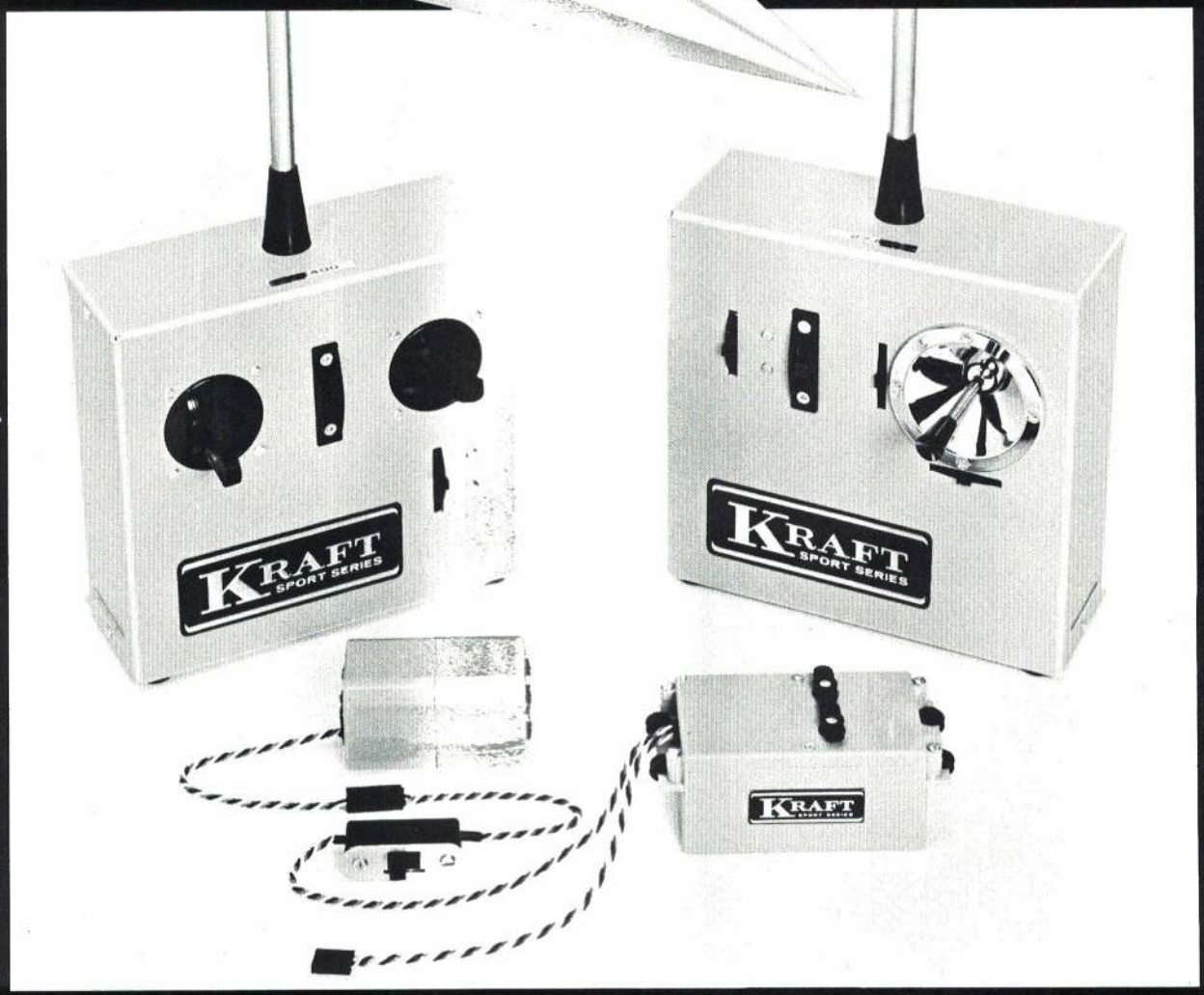

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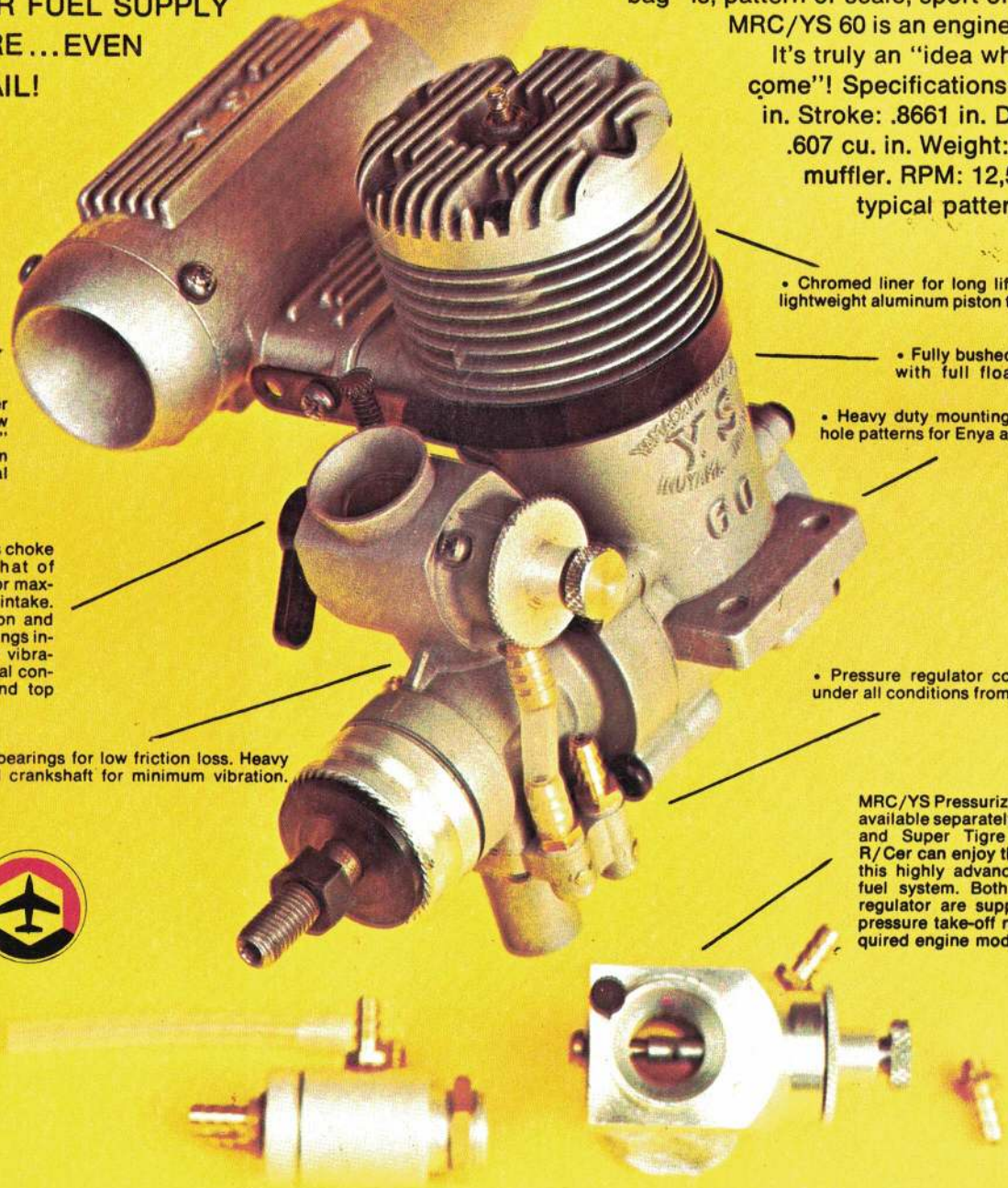

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