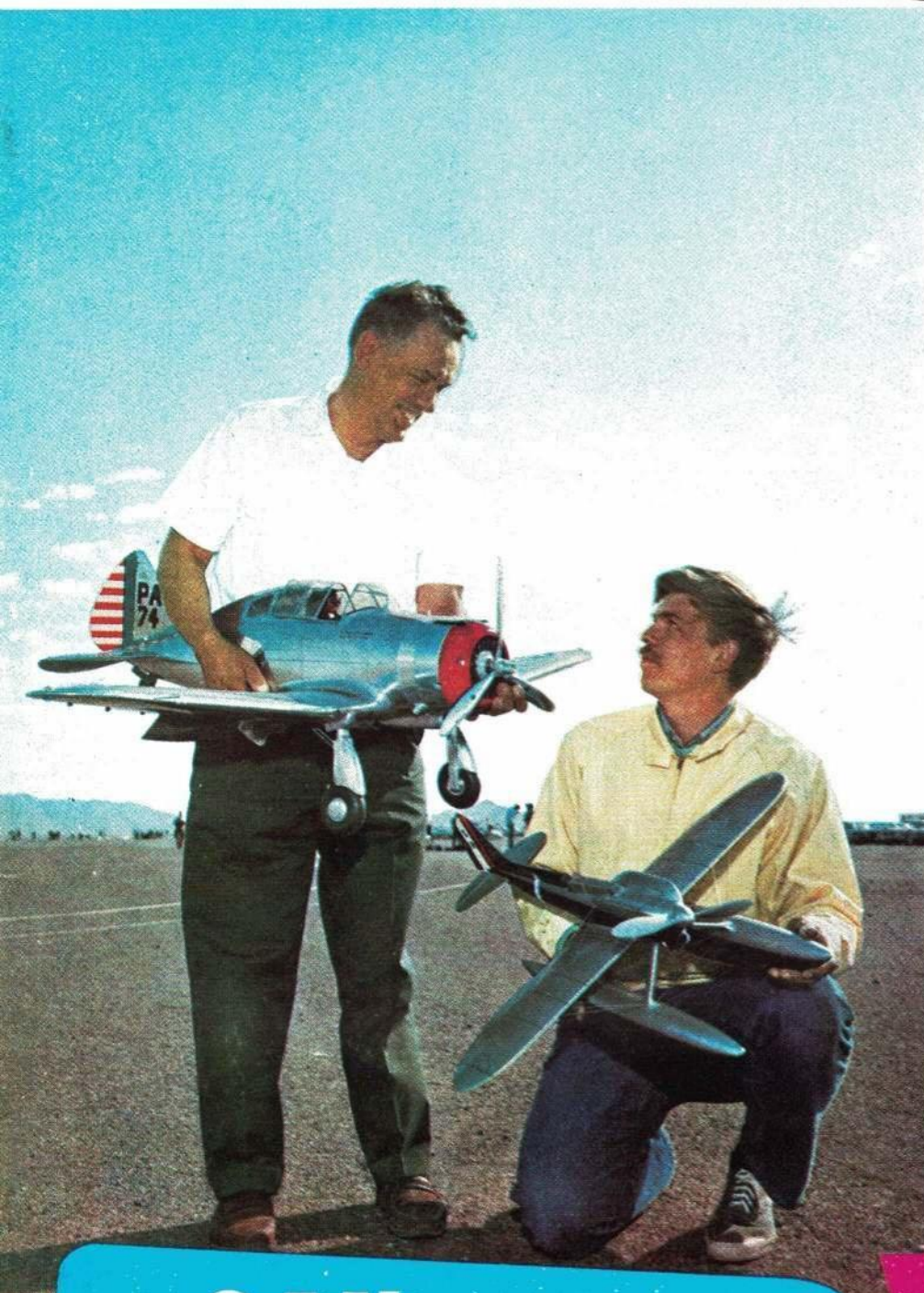


75c (8/3)

JUNE 1970

AMERICAN aircraft modeler



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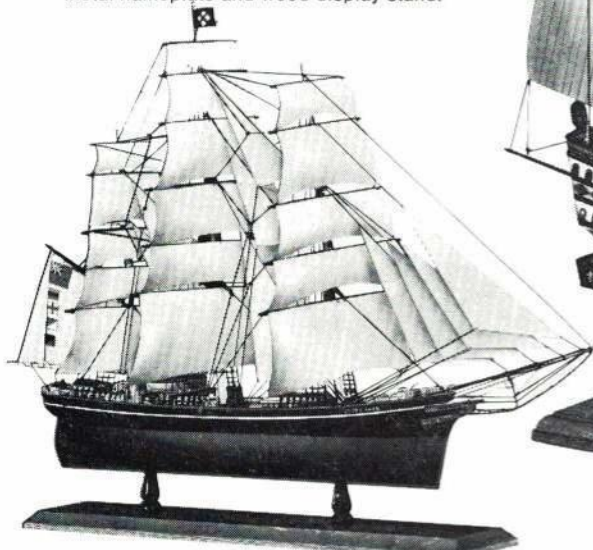
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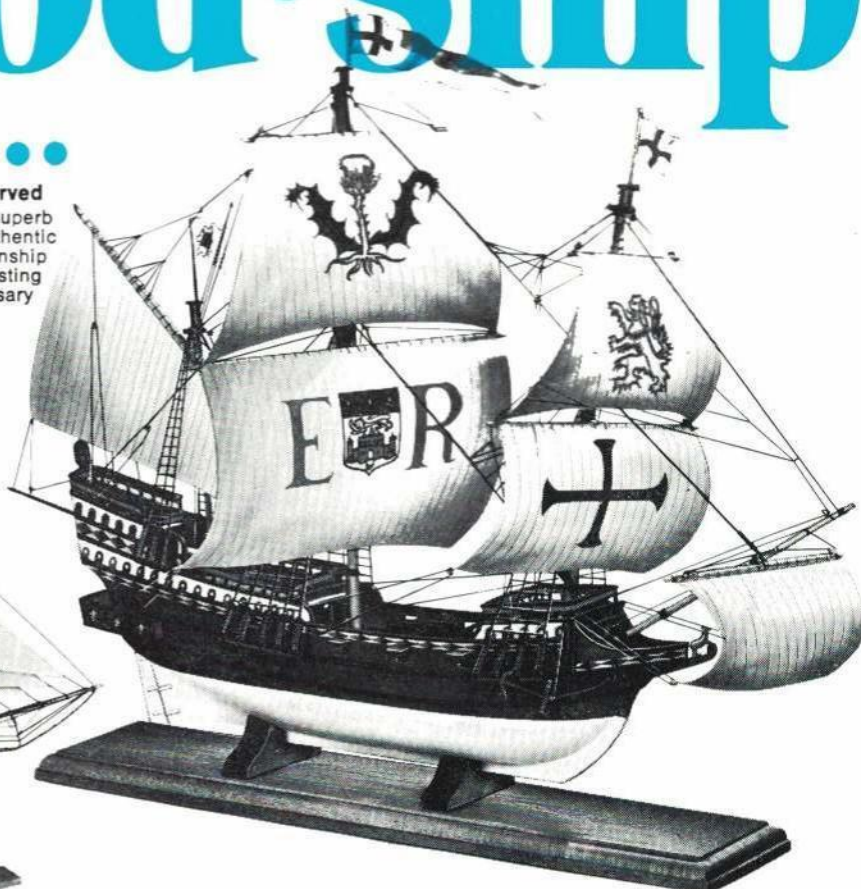
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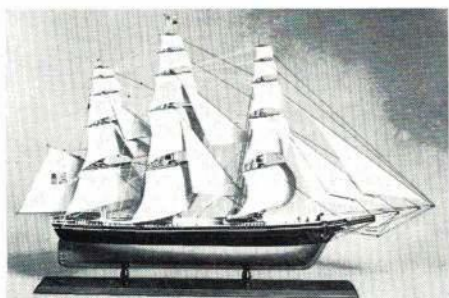
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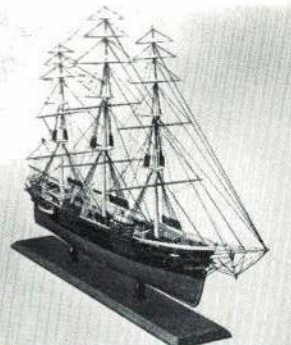


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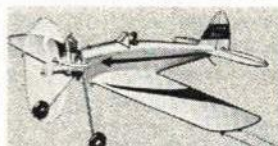
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COVER PHOTO: At Southwestern Championships, Noel Hess holds winning P-35A, while son Allan displays beautiful Supermarine 56B. P-35A has foil covering, shock-absorbing gear, lights, brakes. Photo by Terry Aldrich.

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VOLUME 70, NUMBER 6

JUNE 1970

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STRAIGHT...**...AND LEVEL**

Speaking of R/C club newsletter editors, their reports should not prove there are more judges than jurors.

THERE is an old saying that the floor of the sub-sub basement, where one finds the furnace room if he forgets to get off at the lobby, is paved with the best intentions of mice and men. Now this is a heck of a thought to have on a nice Sunday morning upon reading the January-February issue of *R/C Cue* — newsletter of the Editors and Writers Society. The sticker which bears this editorialist's name — at a more than year-old address — honors us to the extent that we are meant to see it. We ain't a member — but maybe that's because our personal pronoun is, by designation, publisher, and not editor (and not of a newsletter).

We've been an editor for 35 years, and that makes it kinda difficult to know whether the crate is rightside up or inverted. (We once went through a pattern, made a nifty overhead 180 to swing into the landing approach only to find that some gremlin had put the durn wheels on top of the airplane!)

R/C Cue collects gems of information which appear in various club newsletters, and any newsletter is free to publish for its members, say in Oskosh, something which appeared in Bangor, Maine. In this way you 250,000 guys who (as a conglomerate, if you'll pardon the name-calling) don't get to see anything in all those magazines you buy, won't be pushing sticks when the *R/C* world is using just mental telepathy with servos. Phil Heller does about as well as you could fairly ask any man to do, in a nearly impossible assignment. *R/C Cue* wears a white hat; so does Phil. So do we, come to think of it — which means that black hats must be going at bargain-basement rates.

We like Phil — tho we've not met him (we think). The guy is aware of what it means to be an editor. Not being sure whether his last issue was handed to old square and square (by the passee) in praise or indignation, we are free to draw conclusions. He has a lot to say. We agree with much of it — which is as much as can be said for the six readers who follow *Straight and Level* because that bird at the top put the glom on 'em.

He raises issues — by gosh. And he already has given us enough to prattle about for the rest of this year. Which we may do. We shall not be mentioning *R/C Cue* by name in later months, or Phil, but if the issues raised deserve more light of day it's time for a smidgin of "dialogue." If they are all wet, we'll say so, too.

Space does not permit a fuller explanation of the noble reasons for *R/C Cue*, or of the typical contents, including product mentions, reports, etc. which can be franker (alas, because industry cancels advertisements, and then you'd have no magazine, to be brutally frank about it), than any magazine dare be. (Protest! protest! — everybody

does it.) But the industry cannot stand condemned without trial. Technocracy does not protect against a flyer's blind stupidity either. That's not in short supply, believe us. We all know our own goofs.

Now let's talk a bit about Bob Talley, Editor, Port Arthur Oily Birds *Squawk Sheet*. This guy is good. His classic editorial printed in *R/C Cue* has given us inescapable things to go into at length in future issues. (But who is the judge of what is bad, or what is mis-used?) For now, we'd merely like to quote him.

"Now that you're the editor in chief of *The Club Newsletter* you feel like the dog that finally caught the car he was chasing. . . . what are you going to do with it?" He went on to write a great editorial for a club editor. He'd run a draw-play that would make monkeys out of the Chiefs. Don't rush this quarterback!

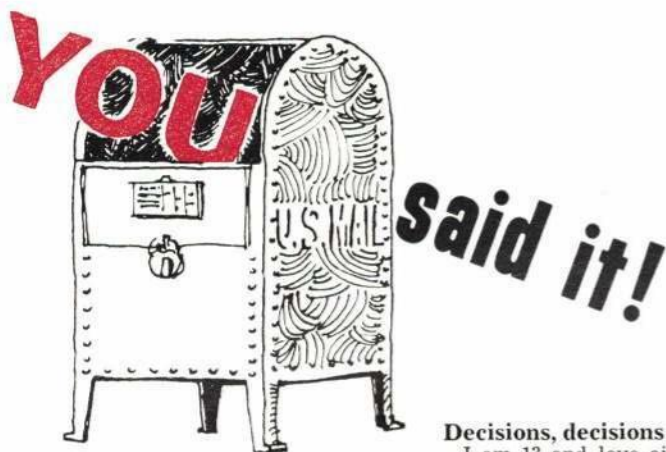
The only trouble, Bob is so subtle, that some of his customers won't know he was scratching their backs. Briefly, he shows how easy it ought to be — and that's the way they think it is. He asks "Man, do you realize what a responsibility you really have as a Newsletter Editor? (Bob, don't think we "Mafia" types don't know it all ain't pabulum.)

So he tells them. Inch by inch. By the time he gets done telling them what's wrong and what they should do, with three bold-type words: "It's your responsibility," you feel personally responsible for western California sliding into the Pacific. (Our admonition is: Know what you are talking about — facts not words.)

Bob Talley is qualified, having got a prop in the eye back in 1946. He's talking about horns, so-called glitches, you name it. But only from the point of view of facing up to the "why's." He tells "his editors". . . "dagnabit tell the world about it. . . in your newsletter. It's your responsibility." No one has an exclusive on responsibility. Phil . . . Bob . . . see you at the forum.

BILL HANNAN, an historical buff, had special interest in recent editorials about old-timers. To set the record straight, it is his understanding that Cecil Peoli was not killed in Japan while barnstorming, but at College Park, Md. What bugs us, is that Doc Walden, a contemporary of the Wrights, made that off-hand remark to us in 1961. Walden, a great old plane builder and barnstormer, is gone. It puzzled us what Peoli was doing in Japan in 1913. What are the facts? Incidentally, Walden, whom we interviewed, was miffed that Hollywood made a movie on "those Wright fellows." Walden declined because the moviemakers insisted on a phony romance.

— The Publisher.



Views from another land

For the last three or four years I have been a dedicated reader of your magazine and I wish to congratulate you in particular for the help you give the youngsters. To my mind this is a very important sphere of activity and one that needs as much attention as we can give it. The current Tenderfoot series is great stuff!

I am very much a backwoods modeler, living as I do 60 miles in what one may well term the "bush." I have never met or spoken to a fellow modeler and my only contact with the modeling world is through your magazine and others in the field.

My interest in aeroplanes arises out of my father's wartime service as a mechanic in 617 Squadron of the R.A.F. and the many stories he can tell of his experiences.

I got off to a fairly early start with models but expense has kept me down, not to mention the complete lack of knowledge. Many are the planes that went together quickly and unskillfully and landed up with fractures of various sorts and sizes. It was only when I got to South Africa to study at the Rhodes University that I realized that there were such things as modeling books and magazines and then began these last few years of Enlightenment.

At the age of 23, I'm starting again with your Tenderfoot series and this time I'm going to work my way up slowly and patiently and a great deal more happily.

Having thus introduced myself as a not-so-hot modeler but an out-and-out trier, I would like to bring up my real problem in the hope that it is a sufficiently common one and important enough to raise a reaction through your magazine or direct to me.

In January next year I begin my first teaching job in Bulawayo and I would dearly love to get a model aeroplane club started just as soon as I get settled in the school routine. The question arises how to get it started? and then: what to teach? ... what age would be the best to start kids off? ... when to introduce theory and what to include? There must be many modelers either in education or out of it that have started a group of kids off in the hobby and they must have many ideas and practical hints to give to the equally many of us who would like to undertake such a task.

I don't for a minute suggest that we modelers have the only solution to the crises of today's youth, but I reckon we can help quite a bit by getting them interested in something that will give them a lifetime of pleasure.

Should anyone wish to drop me a line direct, a letter to Marvel Mine, Filabusi, Rhodesia, will be gratefully received.

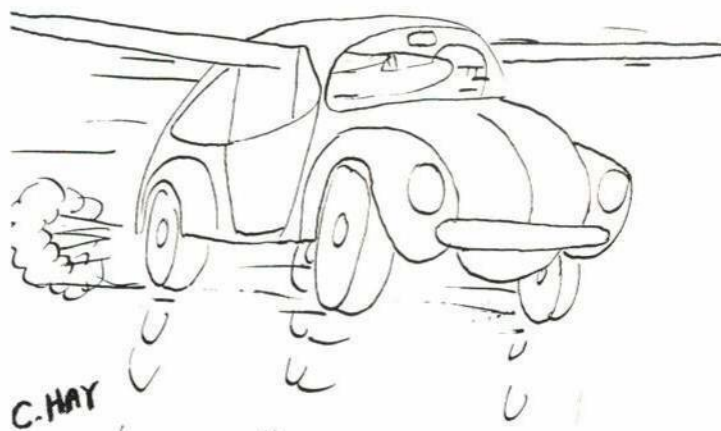
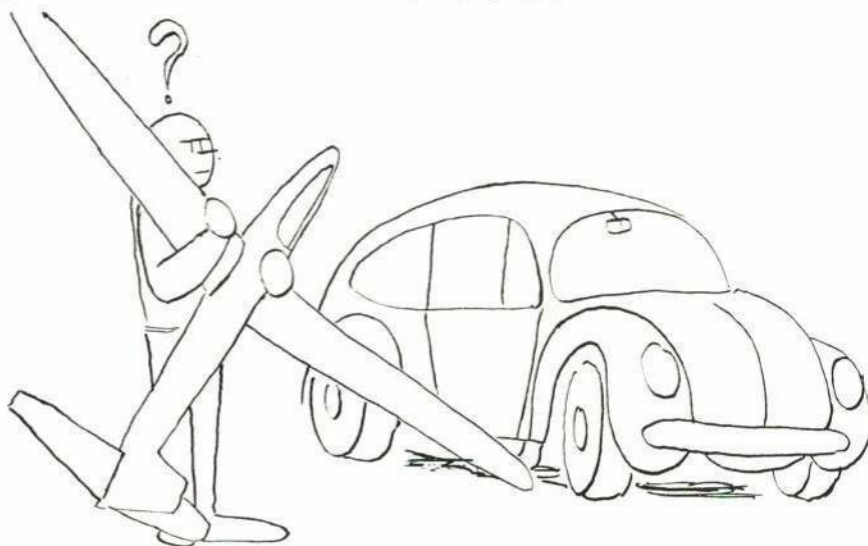
Robert A. Bing, South Africa

Decisions, decisions

I am 13 and love airplanes. I have been building plastic kits for years and feel I am an expert. Flying models in your magazine have caught my eye and I want to get started in R/C. Please tell me whether I should start with gliders, rubber band-powered planes, C/L, or start directly with radio-controlled aircraft.

I would like your decision because I don't know which is best. Any suggestions as to which plane I should start with and what equipment I should buy will be greatly appreciated.

My personal goal is to build and fly an R/C Focke Wulf FW-190 with a 68 inch wing



span. This is something I've always wanted to do and I feel asking the experts will help me.

Thank you and *American Aircraft Modeler* forever!

Ronnie Inselman, Enid, Okla.

Our answer is to obtain a copy of Howard McEntee's "Getting Started in R/C" book. Some manufacturers have literature, such as the 10 cent pamphlet by Goldberg Models. Manufacturers should note that this is a question frequently asked by this age group. — Publisher.

Down to the sea in flying ships

I live on a lake and my R/C flying is devoted solely to flying from the water. I find that the water is a whole lot softer and kinder to the plane when you crash. I don't have to load the car and drive 20 miles to the field when I want to fly, or wait until it is my turn. I have learned all that I know about flying from the water strictly by the hit-and-miss method. There is no one around to help me and few magazines publish much information about this type of flying. There are over 30 lakes in the city of Orlando and yet out of the 52 members of my R/C club I am the only one that flies from the water.

The first R/C plane that I ever flew was a Jr. Falcon on the small Gee Bee floats. It was so underpowered that I had to run across the top of my boathouse and hand-launch at the edge of the roof. This way, the plane had enough altitude to start, so that it could drop a short distance to pick up flying speed before it hit the water. Then

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I would get a flight from it. Right now I am flying the 10-foot Custom Privateer.

I let all the kids in the neighborhood come around when I fly. Some even go out in the boat to pick up the plane when it lands. This way you reduce the chances of the neighbors getting mad at you. For the three years that I have been flying I have yet to receive a complaint about the flying.

Many times in your column you write and ask what is happening to the Juniors. Why aren't they coming along? In the early forties when I was flying free flight, when you went into a dime store or any type of hobby shop or toy store there were finished rubber powered models hanging from the ceiling. There were nothing but airplanes.

Today we find nothing but plastic cars of all sizes, shapes and forms. You push and carry what sells. I don't know if you push it because it sells or it sells because you push. But really, how many decent rubber-powered flyable kits do you think you can find on the market today? Very few.

Ernest L. DeBardeleben, Orlando, Fla.

Problem? Schmoblem!

I am working on a series of three articles, all of them about small hand-launch gliders. They are all original and simple designs, which are at biggest a foot across, some only two inches across.

If you want to know the reasons for this letter, it is primarily your fault. A friend of mine gave me several of your magazines and in almost every one of them some modeler is crying about the "junior problem."

My question is: "WHAT junior problem?"

After all, I've been modeling for four months and I'm ready to write for your magazine, so why can't others?

Tom Stead, Suffern, N. Y.

'Nevermore!' quoth the Oily Bird

Some time ago, my little brother bought a copy of the magazine that had the plans for the .020 powered free-flight, "Oily Bird."

I would like to compliment you on your well-designed airplane, as it flew only three times. On the third flight we lost it.

Just last week (5 months later) a friend of mine found it near his house, about a mile north of where we let it go.

It is a strong plane when built by the plans (he found it 50 feet into a sewage pipe). It came back in two pieces: the .020 and the plane.

One word of caution to potential Oily Bird flyers—put your name, address and telephone number on it!

Randy Farmer, Sunnyvale, Calif.

AG-knowledge

I think AAM is the best. "Getting Started in R/C" really has helped me a great deal.

I am 30 years old and have been crop-dusting for eight years. I love AG-flying and have flown all the AG aircraft.

My second love is plastic display models. I now have 52 hanging from the ceiling. Most of these are fighters.

What I am getting at is: why have model companies overlooked the AG-plane as a model? This may sound silly, but the AG is also a fighter. It kills many insects every year and saves many crops. Without it many farmers couldn't make it.

Only one of these many aircraft have been modeled—the Stearman PT-17 by Lindbergh. It is in the original two-hole model, but by covering the cockpit and adding a spreader it becomes an AG-plane.

I know the cost of putting a model into production is great, but it looks like we could have at least one such as Piper's famous J-3 or Super Cub or the original AG-plane, the Pawnee; or Cessna's AG-wagon; or the Grumman AG-CAT or Aero Commanders' great line of AG-planes: the A-9, Super A-9, B-1 or Snow.

Richard Lott, Ochlocknee, Ga.

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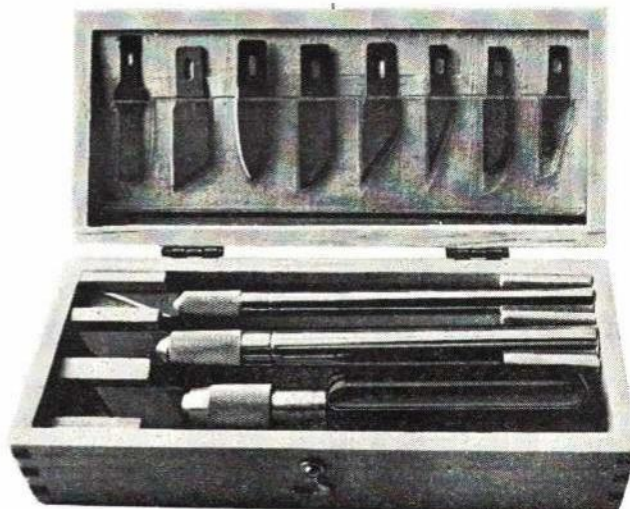
X-acto makes 28 different blades and a variety of handles to cut through all sorts of hobby problems. You can pick the set with exactly the right combination of knives and blades for your hobby.

Shown here is the #82 knife chest. It contains three knives and nine blades in a handy wood chest so you'll never have to hunt around for the right tool. The #82 is just \$4.95. Other X-acto tool sets from \$2.75 to \$60.00.

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10 June 1970

SPECIALS

11

ON THE SCENE

Toledo Conference 1970

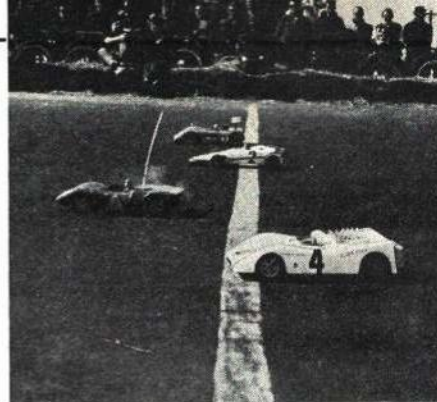
Overwhelming industry and modeler support with something for everyone made this annual affair the greatest yet. See coming issues for product views.

BILL COONS

THE 16th annual mid-winter R/C conference and exposition opened Friday, Feb. 27. New products were shown by over eighty manufacturers who had exhibits. On Saturday, attendance was over 4500, more than the two-day total of last year. Speakers included Phil Kraft and Maynard Hill, on the 1970 World Championships; Dave Roblen on the miniature airplane; Vern Krehbiel and Bernie Murphy on the WW I meet at Rhinebeck; and Dave Platt on how to win in R/C Scale. Flying demonstrations began with two Dee Bee ships breaking ground within 20 feet, flying vertically to at least 600 ft.

Moments to remember include: tiny F6F Hellcat flown by Charles Fox weighed 12½ oz., spanned 26 in. was built from a Comet rubber kit; Al Signirino's giant Antoinette's taking off, holding your breath till it cleared the trees; the heartbreak of Walt Moucha's well-known Jenny's crash.

Something new: RC combat models with
Continued on page 89

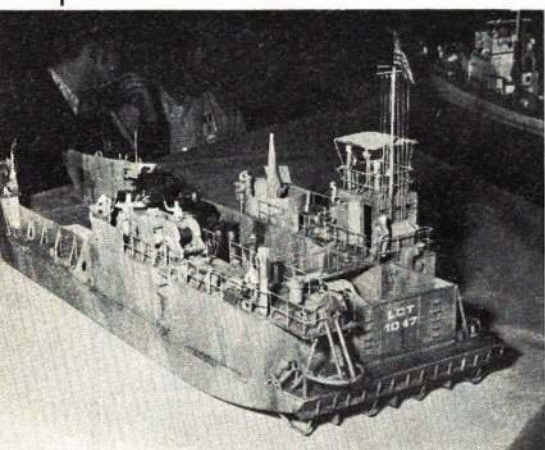


PHOTOS BY AUTHOR

R/C car racing enthusiasts had a ball running 19-powered cars on quarter midget oval track.



Best pattern design award to Jerry Worth for 720 sq. in. Rampage Hobbypoxy finish, ST 60.



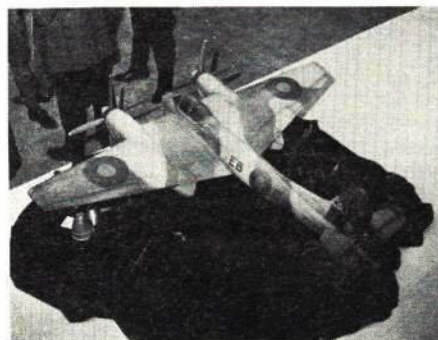
Best R/C boat, Glen Staubit's plexiglass Landing Craft Tank. Pitman electric motors.



Ed Sweeney's radio-equipped Voodoos, with 19's and 6' streamers, are fun, fast and safe.



Al Signirino lines up Antionette for takeoff. Climb is slow and realistic on Fox 36 power.



Best in R/C scale, Dario Brisighella's de Havilland Hornet. Two Webra 60's, 3500 hours.



Junior Builder Award, 8 lb. Super Skymaster by Ray Hostetler, 14. Enya 60 and 29 engines.



R/C Dune Buggy race, sponsored by AAM and Cox, was won by Bob Dunham of Orbit.



CARL GOLDBERG

New! RANGER 42

The Versatile *Almost-Ready-To-Fly* Fun Model

For Single or Multi-Channel
Radio Control; Also Free-Flight

Span 42"
Length 31"
Area 240 sq. in.
Weight 26-36 oz.

Can be flown 6 ways:

1. Single Channel Radio, Rudder Only
2. Single Channel Radio, Galloping Ghost
3. Two Channels, Rudder and Elevator
4. Three Channels; Rudder, Elevator, Engine Throttle
5. Four Channels; Rudder, Elevator, Engine Throttle, and Ailerons
6. Free Flight

Full explanation of each method given on plan.

FEATURES:

- One-piece molded Wing, high-lift
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- Molded Fuselage, completely assembled with firewall, nose gear, plywood floor, side rails, and main landing gear block already installed
- Complete fittings — nylon links, horns and keepers; nylon hinge material, screws, blind nuts, washers, eyelets, retaining springs, etc.
- Complete plans, with step-by-step illustrations
- Instructions on Operating Radio Control Models

For .049 to .10 Engines

Only **\$17⁹⁵** PRC1

Radio Control Flying is Fun! You can actually feel the thrill of controlling an airplane in flight — doing stunts, loops and rolls — and making it come back to you and land where you want. And the shortest way to success is with the unique new RANGER 42. This model has been carefully engineered, leaving only the simplest final assembly steps, all clearly illustrated. Flight stability is exceptional, as well as response to control. **All you have to do is add your engine, wheels, and radio control — only 6 to 8 hours work — and you're ready to go FLYING!** Just ask your hobby dealer — he'll be glad to show you the features.

SKYLANE 62

Semi-Scale Beauty in A
Great Flying Model!

DELUXE — Includes New Fittings

1/2A SKYLANE \$9⁹⁵

For Single Channel —
Escapement, Servo or Pulse
Span 42" Area 244 sq. in.
Length 35" Weight 22 oz.
For .049 Engines

Tough, roomy cabin and front end, takes single
to 10 channels or proportional.
Steerable nose gear.

SPAN 62" AREA 540 sq. in.
LENGTH 50" WEIGHT 4½-5 lbs.
FOR ENGINES FROM .19 to .35

\$34⁹⁵

The Design That
Makes The
Simplest, Sound,
Attractive Airplane

THE FAMOUS FALCON

SR. FALCON \$34⁹⁵

DELUXE — Includes New Fittings.
For 10 Channels or
Proportional
Span 69" Area 810 Sq. In.
Length 53" Weight 6¼ Lbs.
For .35 to .45 Engines

FALCON 56 \$18⁹⁵

DELUXE — Includes New Fittings.
Takes Single to 10 Channels or
Proportional
Rudder-Only or Multi-Training
Span 56" Area 558 sq. in.
Length 43" Weight 3½ lbs.
For .09-.15-.19 Engines

Junior FALCON \$6⁹⁵

DELUXE — Includes New Fittings.
For Single Channel —
Escapement, Servo or Pulse
Span 37" Area 250 sq. in.
Length 28" Weight 16 oz.
For .049 Engines

The Goodyear Racer with
Enough Wing Area and
Stability so YOU
Can Fly It!

\$27⁵⁰

DELUXE — Includes New Fittings

FOR 6, 8, 10 CHANNELS OR PROPORTIONAL

SPAN 54" AREA 540 Sq. In.
LENGTH 44" WEIGHT 4½-5 Lbs.

FOR .19-.40 ENGINES

Most Beautiful R/C
Ever Kitted!

Shoestring

World's FIRST
Single or
Twin Engine
R/C Models

SKYLARK

DELUXE — Includes New Fittings

SKYLARK 56 \$21⁵⁰

Takes Single to 10 Channels
or Proportional
Span 56" Area 528 sq. in.
Length 44" Weight 3½-4½ lbs.
For Single Eng. .09, .15, or .19
For Twin Eng. Use Two .09's or .15's

JR. SKYLARK \$7⁹⁵

For Single Channel —
Escapement, Servo or Pulse
Span 37" Area 235 sq. in.
Length 29" Weight 18 oz.
For Single Engine Use .049
For Twin Eng. Use Two .01's or .02's

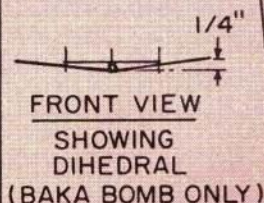
• P.S. For best service, see your dealer for kits you want. If not available, write direct; add 35c per kit in U.S., 75c outside U.S. Minimum order \$1.

• Send 10c for 4 pg. illustrated Catalog with "Recommendations on Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

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2545 WEST CERMAK ROAD • CHICAGO, ILLINOIS 60608

**FULL SIZE
DRAWINGS**
SODA-JETS

COLOR: GREEN
INSIGNIA: RED



TYPICAL
ASSEMBLY

BEND UP
SLIGHTLY

ALL FUSELAGES ARE MADE
FROM PLASTIC SODA STRAWS.
WINGS, TAILS, AND CANOPIES
ARE STIFF PAPER.
NOSE PLUGS ARE BALSA.

BOTTOM VIEW

"BAKA BOMB"
JAPAN, WW II

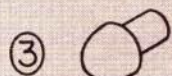
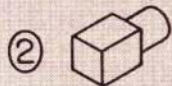
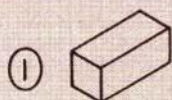
FOLD TAB
AND GLUE
IN PLACE

FOLD TABS

MAKE
TWO

POSITION OF STABILIZER

WING POSITION



TYPICAL NOSE PLUG
CONSTRUCTION

COLOR:
SILVER
INSIGNIA:
BLUE
WITH
RED
BAR

USAF

BEND BOTH SIDES
SLIGHTLY TOWARD
TOP OF MODEL

CONVAIR
"DELTA DART" (REALLY!)
U.S.A.

SUKHOI
"FISHPOT"
U.S.S.R.

COLOR:
SILVER
INSIGNIA AND
NOSE: RED

CAUTION: DO NOT
AIM AT ANYONE!



Soda Jet-the Last Straw!

Ever blow the cover off a soda straw? Why not use two straws with wings on one and catapult it off the other?

BILL HANNAN

WHEN Editor Ed Sweeney suggested that we experiment with lung-powered models, we were a bit dubious but, after constructing a few, it became evident that he had a winning idea!

These little models are a snap to build, and certainly must be the lowest-cost flying models this side of folded paper gliders. Soda straws are manufactured in several sizes, of both plastic and paper. We found the plastic variety to be much more rugged, and the difference in weight does not seem to matter. If you can obtain two different sizes of straw, the smaller ones can be used as launchers. Or, aluminum tubing from a hobby store can be used for the launcher.

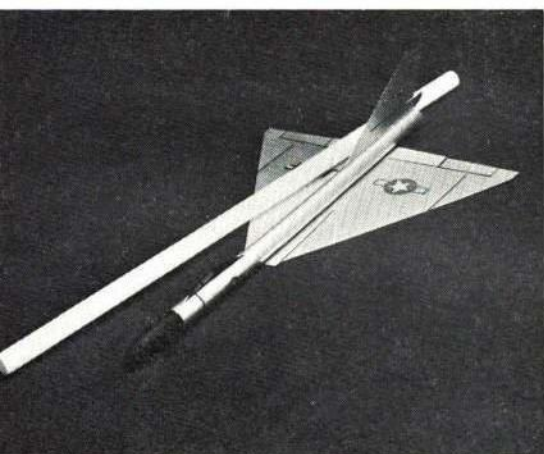
Although it would be possible to cut the wing and tail parts directly from the drawings, it is suggested that you trace them and transfer the shapes to stiffer paper. The various markings can be colored with felt pens or colored pencils or, if preferred, cut from paper and glued on the finished model. Our models were assembled with contact cement, since some glues of other types

do not work well with plastic. If you decide to paint your aircraft, plastic model paint such as enamel should be used rather than dope.

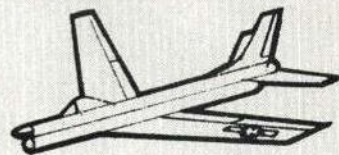
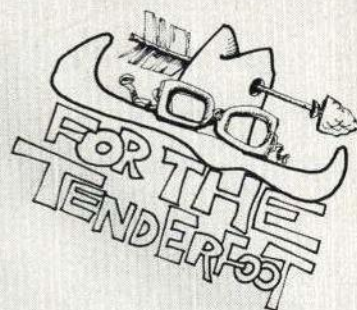
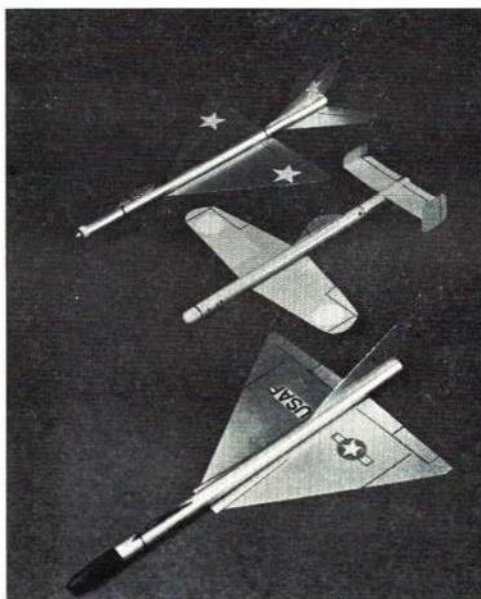
The nose plugs can be carved and sanded from balsa wood and should be a snug fit into the straws. On some models, the plug will weigh enough to function as nose ballast, but on others it may be necessary to add a bit of modeling clay. This can be placed inside the straw behind the nose plug.

Hand glide the models until they have been adjusted. Slight upward bending of the elevators will probably be required in addition to the addition or subtraction of nose weight. Next, try launching the models with the "blow-pipe." Our best results were obtained by starting the aircraft off in a left-hand bank. Turns can be obtained by bending the rudders, and deflection of the ailerons can produce snap rolls!

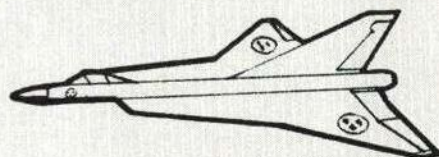
After trying a couple of ours, why not try designing a few of your own? Be the "straw boss" of your own air force!



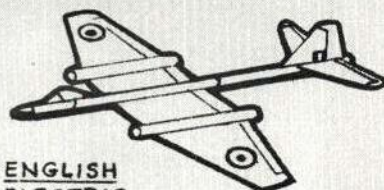
After assembling the balsa parts with water-based glue, sand and give one light spray-coat of enamel paint. Detail with ball-point pen. Shown are models made from plans, but you can design your own air force of semi-scale planes.



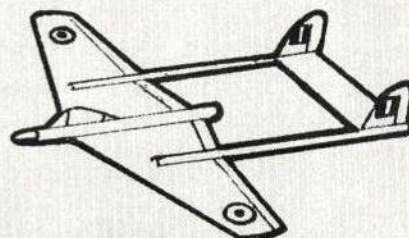
SABRE "D"
(TWO STRAWS)



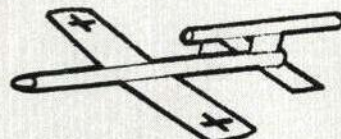
SAAB
"DRAGEN"



ENGLISH
ELECTRIC
"CANNBERRA"

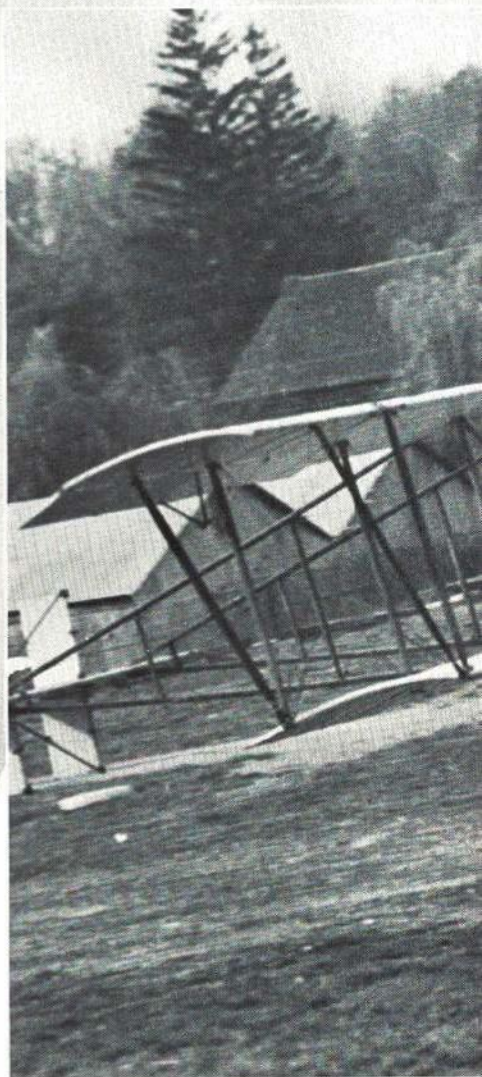


DE HAVILLAND
"VAMPIRE"



V-1 "BUZZ BOMB"

THOUGHT
STARTERS



The days of peanut **WORLD**

JIM LEGGETT

ALL PHOTOS / THE AUTHOR

TEN years ago, no one, least of all Cole Palen, dreamed that Old Rhinebeck Aerodrome might become world famous as a living museum of the air and attract visitors by the thousands. In the spring of 1959 Cole was just another guy who loved old aeroplanes and who got a big kick out of rebuilding them from scratch.

In those days his aerodrome consisted of a rough tree-lined runway of sorts, a lone hangar, and one or two biplanes. On Sunday afternoons Cole would tinker with one of his machines, get it running at last, and take off for a short flight. Perhaps a dozen curious residents would come over to watch,

Not the Red Baron of 1917 chasing a hapless victim low in the Somme Valley, but Palen himself flying his Fokker Triplane. Off photo to right was Sopwith Pup on his tail.



Left: Taking off in his 1912 Thomas Model 2, Palen demonstrates for ABC's television cameras. (Copyright in 1968 by Jim Leggett.) Above: Made up as the "Black Baron" Cole scowls menacingly from cockpit of Tripe. The black scarf fluttering in wind was given him by Richthofen's niece! She came to see replica of her Uncle's plane.

butter sandwiches and jelly....

WAR I MATINEE

The ghosts of old planes and pilots haunt Cole Palen's 'Aerodrome.'

and once in a while they would chip in to help pay for the gas. Cole recalls, "Those were the days of peanut butter and jelly sandwiches, and little else."

Today his aerodrome has been featured on television, in newspapers and in magazines all over the world. He owns half-a-dozen hangars, 20 or 30 antique aeroplanes, five antique cars and a 1917 Renault tank. He has a narrow gauge locomotive and baggage car too.

However, of the thousands of visitors who flock to his Aerodrome, not that many are keen on vintage aircraft. They certainly do not come to pore over Cole's collection of old aviation engines or the display featuring odd-looking propellers which hangs on the museum's walls. The real secret of Old Rhinebeck Aerodrome's success is that Cole flies most of his antique machines in an airshow each Sunday.

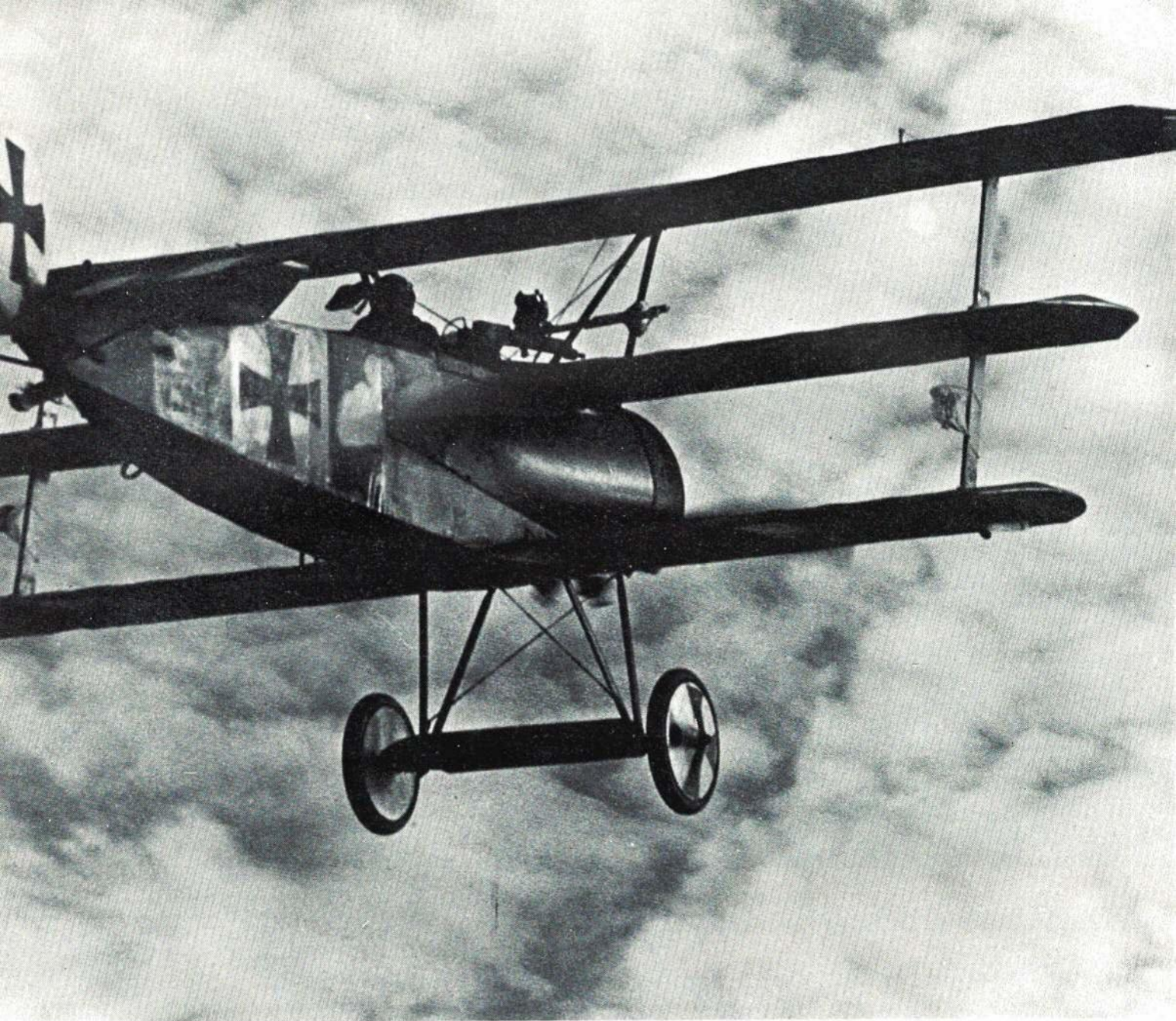
The Aerodrome is located a few miles east of the Hudson River, on the outskirts of the sleepy village of Rhinebeck, about a two-hour drive from New York City. Visitors who arrive before 2 p.m. are in time for the Sunday afternoon fashion show of clothing from the 1914-18 era and for the two-hour WW I airshow, complete with old cars, trucks, and the barnstormers and fighters of a bygone year.

With the help of his skilled ground crew and two dedicated pilots, Richard King, a local schoolteacher, and Dave Fox, an engineer for IBM, Cole puts on an extraordinary flying demonstration. The fragile aircraft shown in action are rarely seen elsewhere, except hanging lifeless in musty museums. The Shuttleworth Collection in England may be the sole exception. Gordon Bainbridge, the announcer, describes each of the dozen antique aeroplanes lined up

along the grass runway. Mechanics are busy topping off gas tanks and checking oil levels, then checking to make sure each engine is ready to go when the time comes for the aeroplane to perform. Oil spots are wiped from the small windshields, and the aircraft are ready for flight.

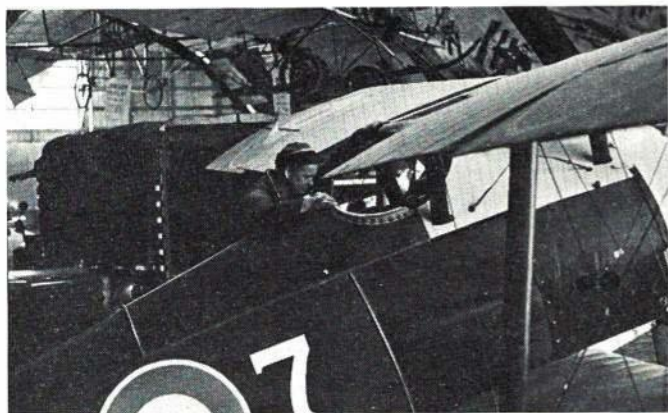
The collection of planes may include one of Cole's 1909 Bleriot, which is started up and even taxied down the runway but is not flown. Perhaps his 1912 Thomas Model 2 pusher will come next. This machine does fly but is so tricky that its flights are exceptionally rare. A yellow 1931 Kinner Bird biplane and the 1929 Fleet Finch are among the more recent machines in the collection, and these perform weekly. A lineup of WW I fighters stands poised for action and gets most of the visitors' attention. These aircraft, too, are flown weekly.

Eyecatcher of the group is a 1917 German



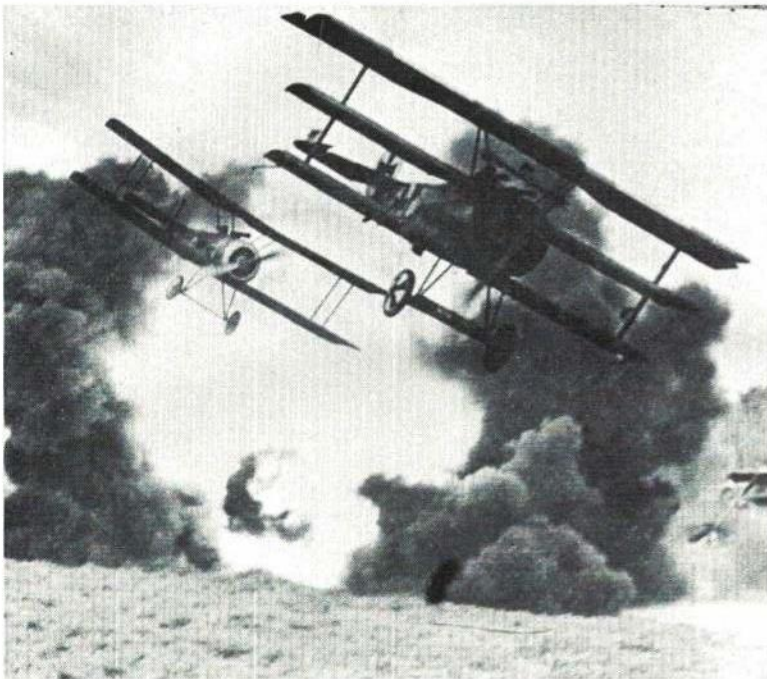
Heading out for a battle — and, man, look at the amount of down-elevator — the Black Baron's Tripe carries a movie camera

mounted above the gun. Camera was used to film a dogfight sequence for a TV show. Whirling rotary cylinders show as blur.



Above: In pensive mood Palen inspects cockpit of Sopwith Snipe in his hangar-shaped museum. Thomas Pusher hangs above. Stern gent, right, in French regalia — with medals of course — is Dave Fox. If he doesn't pass for French ace Rene Fonck, don't blame Palen.





Left: Blur your vision just a little and King's Sopwith Pup could easily be Brown's Camel behind Richthofen's Triplane on that fatal day long ago. Actually, Brown fired from afar, and there is no fire from ground.



Palen's boxer Vimmy doesn't seem too concerned about his master's unusual egress from nosed-over Triplane. The Fokker was bad ground looper. Take-offs dead into wind in those days, so tread was narrow.

Left: Making a low pass over the rural air strip of the Rhinebeck, N. Y. Aerodrome, Dick King pilots Sopwith Pup which he built from scratch. A closer examination of the left wheel reveals authentic spokes.

Fokker Dr.1, the type favored by WW I ace Baron Manfred Von Richthofen. This triplane was built from plans captured from the Germans during WW I and obtained from British archives by Cole Palen. An original 1917 Gnome rotary engine is installed, and a pair of Spandau machine guns completes the reproduction.

Richard King was fortunate in finding a new (in 1917, that is) LeRhône rotary engine, still in its original packing case. This was the type used in the famous Sopwith Pup, so he set about building one for himself. The Pup is now a star performer in the airshows.

Cole's 1918 SPAD XIII is ready for flight. Pilot Dave Fox swings himself into the cockpit and fastens his seat belt. He fumbles with the chin strap of his flying helmet, gets it fastened then pulls his goggles down over his eyes. The engine is propped into thundering life, the chocks are removed and the biplane rumbles off down the runway.

The machine climbs swiftly, soon reaching 1000 feet where Dave levels off and begins

his demonstration of mild maneuvers with the 50-year-old treasure. No fancy flying upside down, no tailspins or steep dives. This old fighting lady should have retired years ago, and Dave shows respect for her advanced age while allowing her some freedom of movement. The spectacle is a beauty to behold and, as she swoops in for a low pass at the field, photographers by the hundred record the historic sight. Similar flights are made using the 1918 Hisso-Jenny, and perhaps the neat little Nieuport 28 will go aloft too. Cole tries to fly at least four of his old fighters each week.

Climax to the afternoon's entertainment is the realistic dogfight between the German Fokker triplane and the Sopwith Pup. Cole plays the part of the dastardly Black Baron, strutting towards his machine and shouting insults in German at Sir Percy, who is having a cup of tea next to his Sopwith. In minutes the two are strapped into their warplanes and are headed downwind for their takeoff. No sooner are they airborne

Continued on page 88



A 1917 Nieuport, apparently a 28, forms the backdrop as "Chapee" models typical WW-I flying gear. Note gun on left side of fuselage.

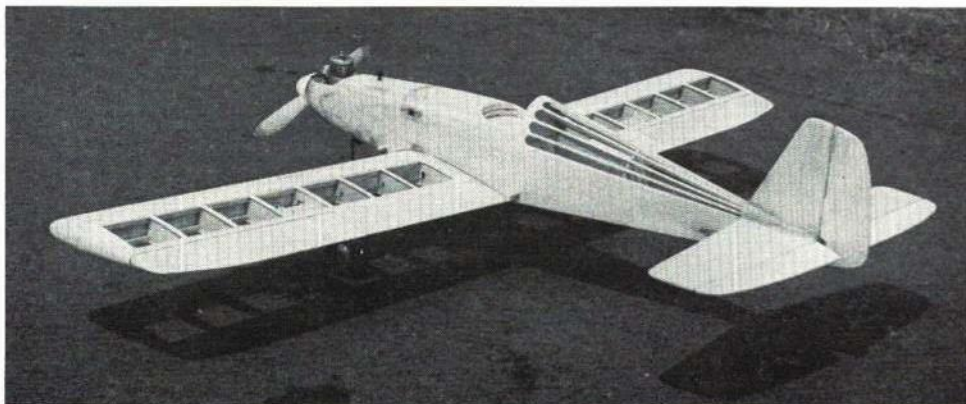
Flower Power II

Nimble flyer for full-house gear and 35 engine is inexpensive sport model.

JAMES TROVILLION



Look closely, it has flowers all over and what's more, the background color of the model is purple!



THE name of the plane has no real significance except that it is the result of a family discussion during dinner one evening. My wife has always wanted me to paint one of my models purple. I asked, "How shall I trim it?" The fourteen-year-old daughter says, "Paint daisies on it, Dad." I say, "Egads, what would we call a thing like that?" The thirteen-year-old daughter says, "Call it Flower Power." With the help of number three daughter and number one and only son, that was five against one. The name stuck. Now, no one can say I am dragging my feet in trying to narrow the generation gap.

There is not an abundance of original thinking in this design. But, after all, the purpose of any new design is to obtain what the designer wants in performance, size, construction, appearance and compatibility with his radio gear. Flower Power fits all these for me, and I hope it will fill a gap for many others. Many, many designs have come and gone for the 45 to 60 engines and now, with the new small R/C equipment, designs for the 19 engines are beginning to flourish. Most of us fly from grass strips. There are not many 19 designs which will get out of the grass very well. Personally, the price and the appetite of the 60's just doesn't appeal to me, so I decided to work on something in between.

I must give credit to a few people for their influence on this design. One was George Harris for his Firefly, with the surface shapes and the washout idea in the ailerons. (This really pays off in slow-speed stability.) Another was Maurice Franklin for his Henchman, with its low thrustline and low stab and centerline coupled for a zero-zero-zero (engine, wing, stab) relationship. (Result here is space to mount the fuel tank in proper relationship to an upright engine and a more mid-wing type performance.) Also Jerry Hilliard and his Sky Mite (Dec. 1968 AAM) for his turned-in main gear. (These are not so easily knocked out of alignment.)

Flower Power will fly straight out with very little trim adjustment. Of course, any aerodynamically sound ship will if it is built true and balanced properly. The outstanding trait is its linear response to stick movements. Axial rolls are smooth and will stop, with no rocking or overshoot, the instant the stick is returned to neutral. Inverted flight is as good as any ship with a symmetrical airfoil. Outside loops are as easy as inside, and no aileron corrections are needed. If a wing is low when entering it will still be near the same position when the loop is completed. Point rolls are precise and business-like. A Supertigre 35 makes this little machine move quite lively. It will point-roll going straight up. Yet it will slow up nicely for good landings.

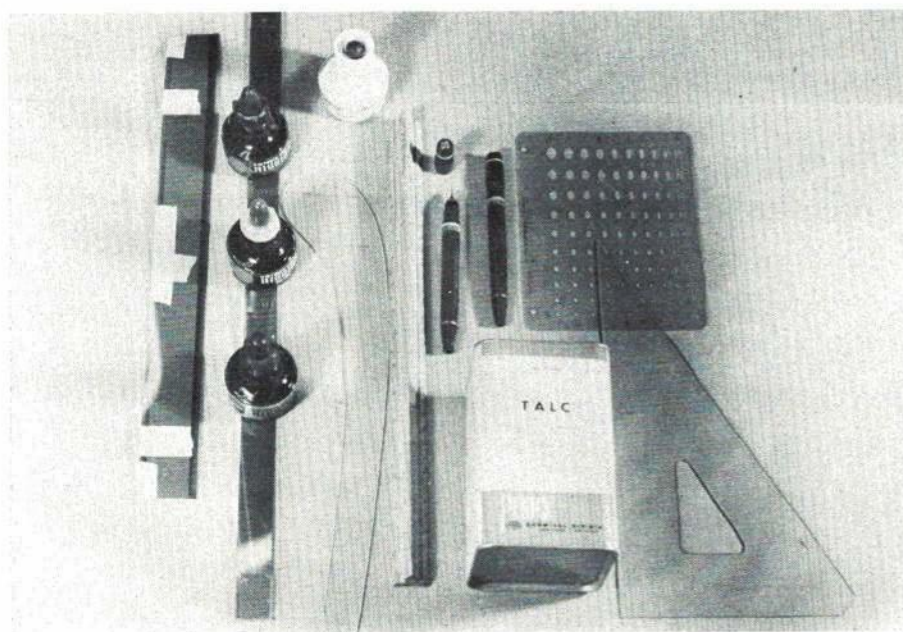
Flower Power II has only slight modifications from the first. It has more dorsal area behind the cockpit and increased rudder area. This change is incorporated on the plans. The initial model would not quite hold true knife-edge flight and would not spin well to the left. It spins fast to the right and recovers instantly when the controls are neutralized. The controls are sensitive but solid, which is necessary for full aerobatic capability. There is no tendency to overshoot when a control position change is stopped. Nor does this plane wiggle or buffet in turbulent wind conditions. I can give no scientific explanation for this unless it is the relatively high wing loading coupled with the high lift of the semi-symmetrical airfoil at zero incidence. The wing loading at 4½ lbs. is 26.2 oz. per sq. ft. Sounds heavy, but it slows up nicely with no tendency to fall off to either side. Quite a variety of R/C equipment will fit, although the plane is fairly small. It actually was built around the old large Heathkit GD-47.

Continued on page 73



Gild the Lily

India Ink is Magic



The technique of using India ink for putting on fine lines, rivet marks, and lettering will add realism to your next model. You'll feel groovy!

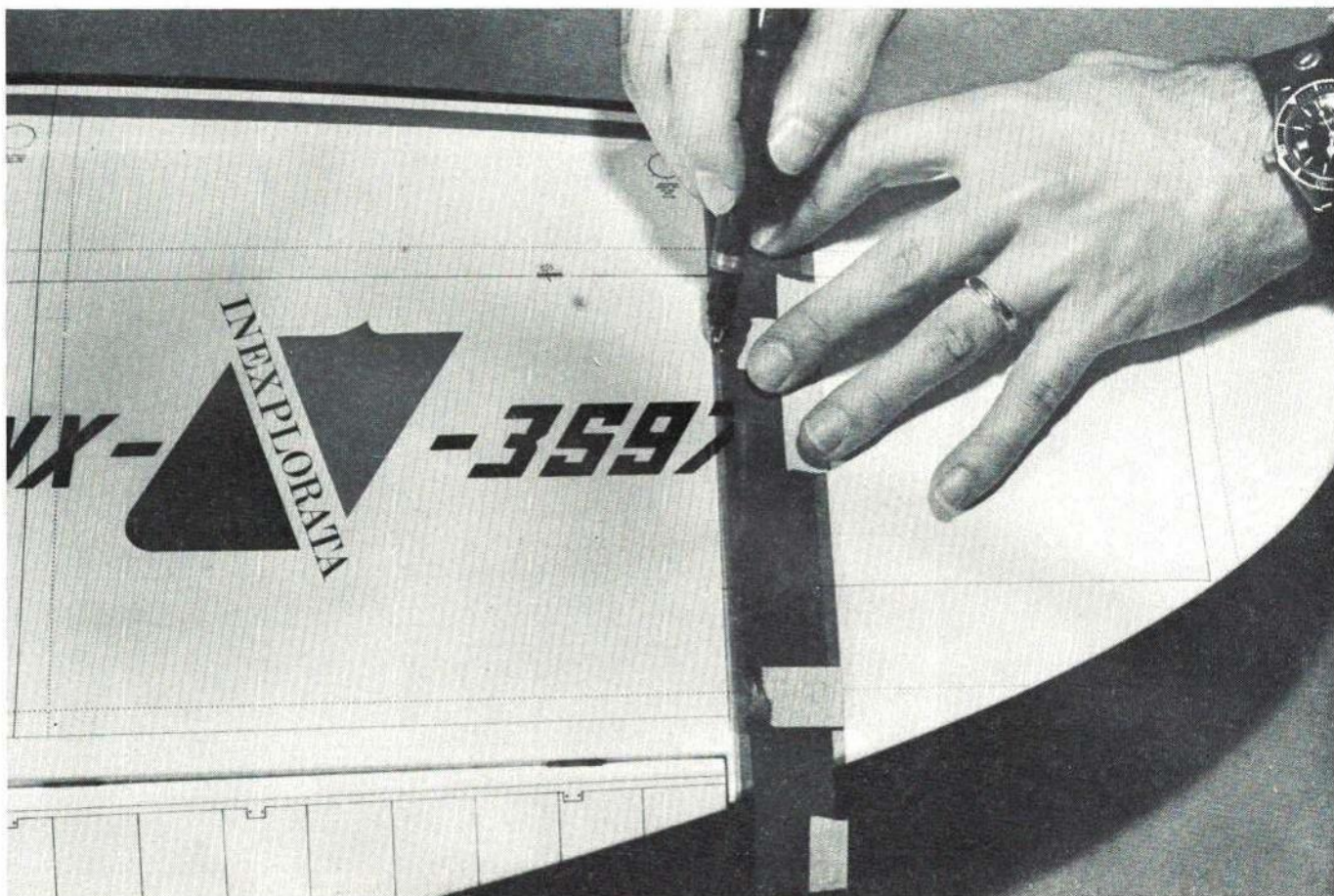
C. DAVID GIERKE

MANY individuals have used the India ink technique for years with varying success. However, to my knowledge nothing has appeared in print as to materials and method of application.

Other methods have been tried. Various ballpoint pens of several colors were used with poor results. The excessive pressure required caused damage to the model's surface. Skipping was also a pronounced problem. Another unsuccessful method tried was the soft carbon pencil. It was simple to apply but did not maintain uniform color and width of line.

Finally, I decided upon India ink. Its desirable qualities include uniform color and line weight. Ease of application is also

Materials and Instruments: India ink, straight edges, curves, rule for measuring, talc powder, Rapidograph pens, and circle template. Use other templates for special effects.



Left: Author carefully airbrushes clear sealer over just-dried trim lines. Obviously this picture is posed, normally the not-to-be sprayed areas of model would be masked off. It is a slow process.

Author uses Rapidograph pen to put line on wing to simulate an aluminum panel. When detailing your model in this way, be sure the lines are appropriate. Keep it simple.

desirable. This required a trial and error approach, but the results were gratifying. Admittedly, my experience with technical drawing and instruments was of considerable benefit. However, with the use of templates and guides, the same results may also be achieved.

Tools and Materials Needed

Pen: Use the ruling type from a technical drawing set or, preferably, the orifice valve fountain pen, which may be purchased for about \$6.00. It may be found at a local stationery store or art supply center. The 0-0 and/or 0 orifice sizes are desired.

Straight edges: These raised plastic strips

of various size are elevated slightly from the model's surface, thus preventing ink cohesion and running.

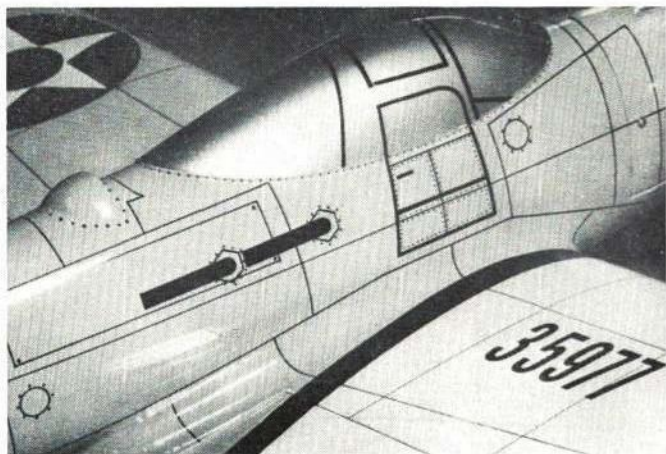
Talcum powder: Spread thinly over the model's surface where ink is to be applied. Apply as needed and in sections as inking progresses. Powder helps the ink adhere to the surface without skipping.

Waterproof India ink: Do not purchase non-waterproof ink. It is extremely difficult to work with and smears badly upon contact with fingers. Inks may be purchased in many colors other than black. I have also used red, white and blue. However, the lighter colors do not cover as well as the

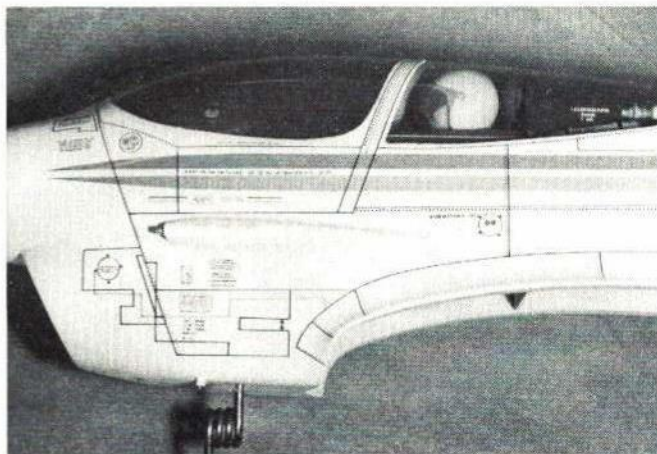
darker, more opaque inks. Black works best.

Sealer: This is the one primary requirement when using ink. Ink, used by itself without a protective coating, will obviously wipe off the surface. The sealer used depends upon the type of finish on the model. A dope finish requires a clear dope sealer sprayed directly over the ink line. Brushing smears the ink. Similarly, an acrylic finish requires a clear acrylic sealer; Hobbypoxy, a Hobbypoxy clear sealer. Obviously, a compatible sealer must be used for any particular finish. Don't worry — the ink will not

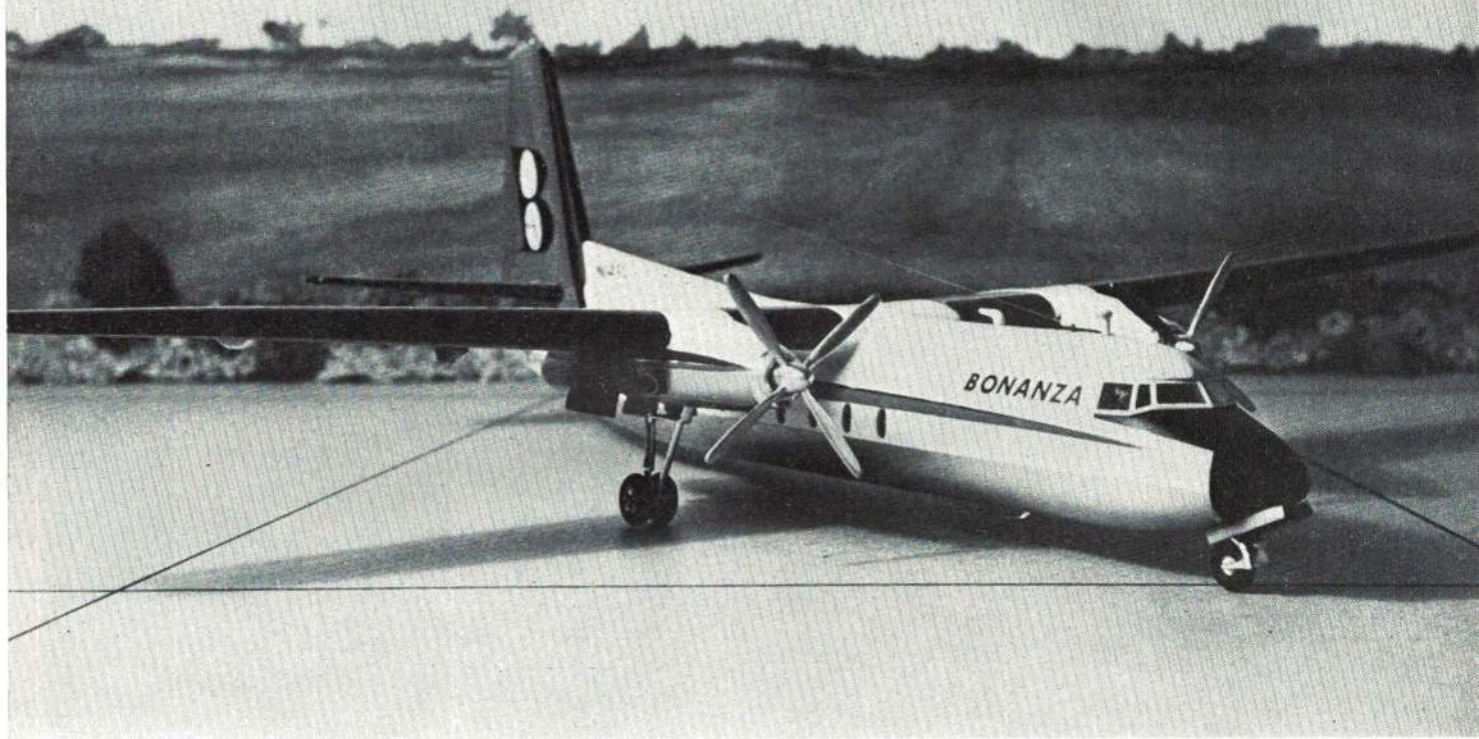
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Here a Navy Carrier model has been detailed. Note canopy is painted silver. Shine results from many after-coats of clear.



Even the nose of Dave's R/C job gets the treatment. Canopy is fully faired-in and it, too, is clear sprayed after detailing.



Life-like photos of plastic models are quite easy to make. Here F-27 is located in front of a painting. The closer the camera is placed to model, the more life-like it will seem to the eye.

A Little 'Friendship'

Intended to replace the DC-3, the Fokker/Fairchild F-27 makes an appealing 1/72 scale airline display-type model.

BEN MILLSPAUGH

IT all began after the "Great Hate Number Two!" Everyone was scrambling to find the right plane for the projected boom in commercial aviation. Fokker, a Dutch company, had new plant in Amsterdam and within this facility many Gooney Birds (DC-3) were converted for airliner use. It seemed only natural that Fokker wanted to make its bid with a brand new airplane.

In 1950, Fokker began to draw up final designs for its answer to the famed DC-3. Many designs were considered but eventually type 275 was accepted and work begun on a prototype. The plane, a high-wing, tricycle landing gear craft with two Rolls-Royce Dart R.Da3 engines, first took flight on Nov. 24, 1955. About the same time, Fokker and Fairchild signed a license contract so that Fairchild could build the plane in the U. S.

Production was slow and the first airliner, scheduled for Aer Lingus, flew on March 28, 1958. The American version flew on April 12 of the same year. West Coast Airlines received the first F-27 and Aer Lingus soon followed. Several modifications made to the basic F-27 were distinguished by mark

numbers: Mark 100, 200, etc.

The specs for this neat little bird are quite impressive. For a smaller airline, the F-27 seemed to fill the bill. An example of performance are these figures from the Mark 200: engine takeoff thrust, 2250 hp with a 12-ft. Rotol four-blade prop. The span was 95 ft. 2 in. and the length, 77 ft. 1.5 in. Accommodations allowed 40 to 52 passengers. The cruise was good for short runs at 295 mph and allowed for a lot of hopping in the 1285 mi. range.

When building Airfix's superb 1/72 scale F-27, either use our pictures for reference or, if available, see the color photos on page 386, *Flying Review International*, Vol. 22, No. 6. First mount the side windows as shown in the instructions but do not cement. When properly installed, put a piece of Scotch Foggy (Green Plaid) or masking tape across the back of the windows with the sticky side toward the fuselage. Leave about 1/2" on each end. The windows are now removed and will be positioned later after painting. They will still stay clear and the tape will hold them in position.

Using a good quality cement such as Ambroid or Revell, assemble the fuselage only. Do not install the wings or empennage as they will hamper the intricate masking

process of the fuselage. To keep the panel lines and rivets intact, use No. 000 steel wool to "sand" out the center seam instead of a sanding block. Gaps and imperfections can be worked out with AMT Customizing putty or the commercial Green Stuff.

The fuselage, after careful sanding and fitting, can be sprayed with a high quality of white enamel. For the red and black bands on the side and fin surfaces, first mask the line using 1/32" black or colored striping tape. Masking tape is then used to back up the striping tape and, finally, masking tape and paper will completely mask the white part of the fuselage. Make sure that the fuselage is thoroughly masked as any red overspray will make a pink mess on the white fuselage.

Pactra's Insignia Red or any good quality gloss bright red will work. The black line adjacent to the red is masked in a similar manner and shot with Pactra's Gloss Black. A beginner should remember that masking tape over any new paint will ruin it unless it is cured, not just dry. At least three days should elapse before masking over any enamel.

The region below and aft of the Radome is shot with Testor's Silver as this seems to be the easiest of the silver spray paints to work with. For the lettering "Bonanza Air Lines," try Letraset's Futura Bold No. 28-18 CIN. This lettering is slanted to the proper angle and when applied looks like perfect hand lettering. Clear nylon thread was used for the antennae. If done right, the fuselage



Author purposely sanded off rivet and metal seam lines to present the model as it would appear at an airline ticket office. Note delicate hand-painting of "B" and emblem on rudder.

from Bonanza

now should be ready for the final touch.

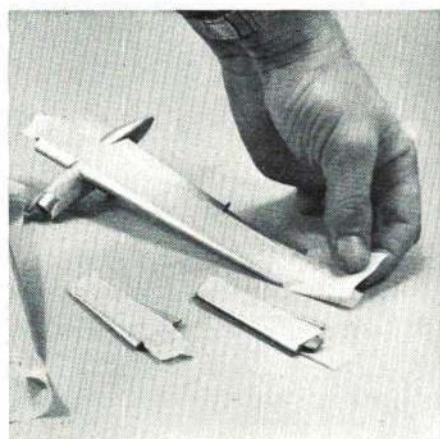
The B on the vertical fin is somewhat tricky and calls for some artistic talent. Using a piece of masking paper (such as Frescit), peel off the backing and press onto a clean window glass or similar super-smooth surface. Now, using a felt pen such as a Flair, draw the outline of the B. A sharp X-acto knife with a No. 11 blade will cut the

outline perfectly. Remove the B and keep the outline paper. When the outline paper is applied to the tail and the area is sprayed, the result will be a perfect slanted B when sprayed gloss black. Now, using the B that was cut from the backing paper, mark off the egg-shaped dots inside the B and apply the B to the fin after cutting these out. The holes are shot white and the whole masking

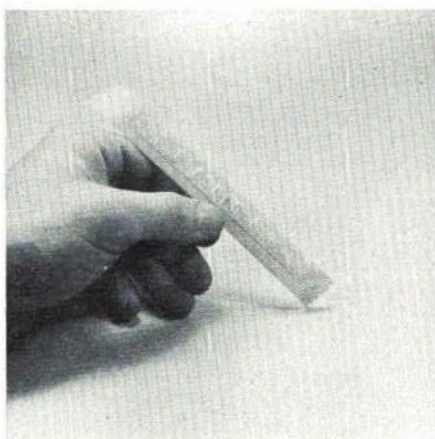
is removed leaving a perfect figure.

The wings are now ready for finishing and, after an overall coat of silver, the builder can mask the nacelles and paint them white. The same basic process of masking is used on the nacelle as was used on the fuselage: first the white, then the red, and finally the black.

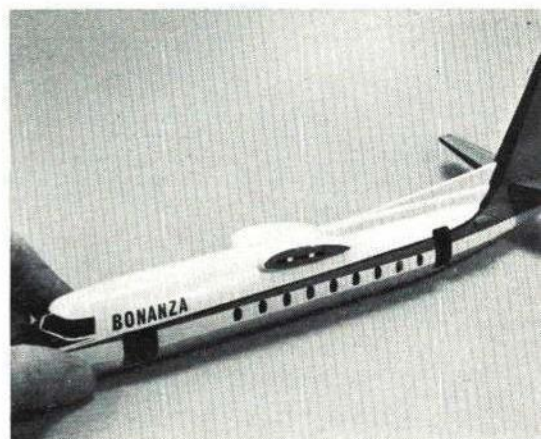
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The wings and tail surfaces are first sprayed with silver then masked to paint on the device boots in black. Assembly comes last.



Windows are installed after assembling and painting fuselage. Here tape is put on back of clear plastic for press-in installation.



Fuselage should be completed to this stage before installing windows through the cargo door. This avoids masking windows.



You CAN Fly Carrier!

All the info you've ever searched for: Ships, Systems, Engines, Tricks, Secrets—and in plain English!

CARLIN HULICK

ONE of the most challenging U-control events where a relative newcomer has a chance for success is Navy Carrier. This event has been around since 1948 and is really taking off in popularity. While good equipment and real flying skill are needed to win, the years of practice and the numerous model airplanes required to gain top competitive skill in Stunt, Rat Race, and Combat are not required in Navy Carrier.

This event appeals to all types of modelers. It calls for a scale model, but it does not require the strict adherence to detail of exclusive scale. Speed is an important requirement as well. A real test of flying skill, it requires instant reaction to the situation, rather than the present pattern of stunt flying. Navy Carrier has something for everybody, combined into one event with tremendous spectator appeal and simple quantitative judging. It is the most exciting U-control event going today.

Basically the Navy Carrier event tests the performance of a model airplane in meeting the flight requirements of a full-scale carrier airplane. Takeoff is within a limited run, and as high a top speed as possible must be reached. Speed timing includes the takeoff run so its smoothness and acceleration, as well as ultimate top speed, affect the score. Next, with the throttle back, the plane is flown as slowly as possible. Flying at minimum speed skill is required for a really good low-speed run. For the

landing, the deck uses strings tied to sandbags stretched across the area to act as arresting gear. The model lands on the deck and catches the string with its hook, just as a real Navy plane does.

Sound like fun? It is! However, performing this event keeps the flyer as busy as a one-armed paper hanger. There is much to do, usually several things at once: quick—throttle—it's going too slow! Up—before it hits the ground (water that is). Now level off—back off on the power before the plane does a non-scale loop! Master carrier and at last become a really hot pilot.

Competition follows the established classes set up by the AMA. Even when flying only for fun, it is wise to build to the established sizes. The AMA rule book has complete details, but the following simplifies the rules for a quick understanding of the model requirements and the scoring.

AMA has defined three classes. Class II is for models with over .40 displacement. Class I is for .40 and under displacement. Profile class is for profile models of .36 and under displacement and with a minimum wing area of 300 sq. in. This class was designed for beginners with a big slow ship that requires the same flying skill but not the quick reaction time of the hot Class I and II models. Scoring is simple and requires only a stop watch and speed tables.

Typical score is as follows for a model that was scale, went 85 mph top speed, slowed down to 30 mph, and made a good arrested landing: top speed, 1 point per mph (85 mph) or 85 points; low speed, 3 points for each mph difference between top

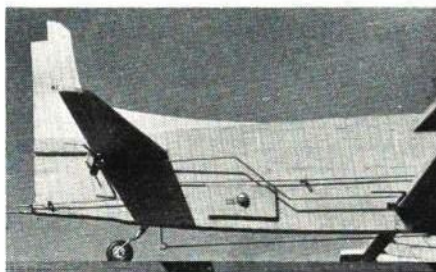
speed and low speed, 3 (85-30 mph) or 165 points; landing, 100; scale bonus, 100. Total score is 450 points.

To qualify for the scale bonus points a Navy Carrier model must be a scale copy of an actual airplane used on a carrier. Many scale models are available but some are not adapted to this event because of small surfaces, short moments, and narrow gear. However, a number of good subjects are available with more being found every year.

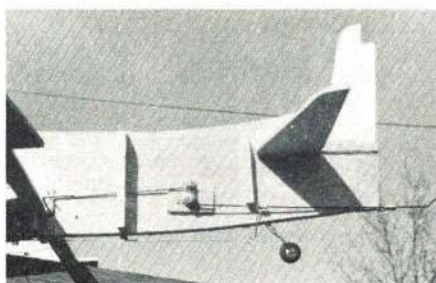
A 5% tolerance on profile dimensions is allowed. Maximum wingspan is 44 in. The model must be finished in a standard Navy paint scheme and the cockpit must be indicated at least with paint, if not constructed. Landing gear must be attached at scale location but can be modified in shape. The burden for proof of scale is on the builder who must provide plans, three views, or photos to authenticate measurements.

The example above shows how each portion of the event is important to the total score. Good performance on all parts of the flight is a must. Here is where a newer flyer has a better chance than in other events. A consistent flyer who scores good points in all categories can often beat a hot flyer who fails to get a good landing or who has a poor idle on his engine in low speed. The more performance demanded from these Navy Carrier bombs, the trickier they get and the better the chances for not scoring in all categories. Many flyers place and win in big contests with consistent flights that do not achieve fantastic speed levels.

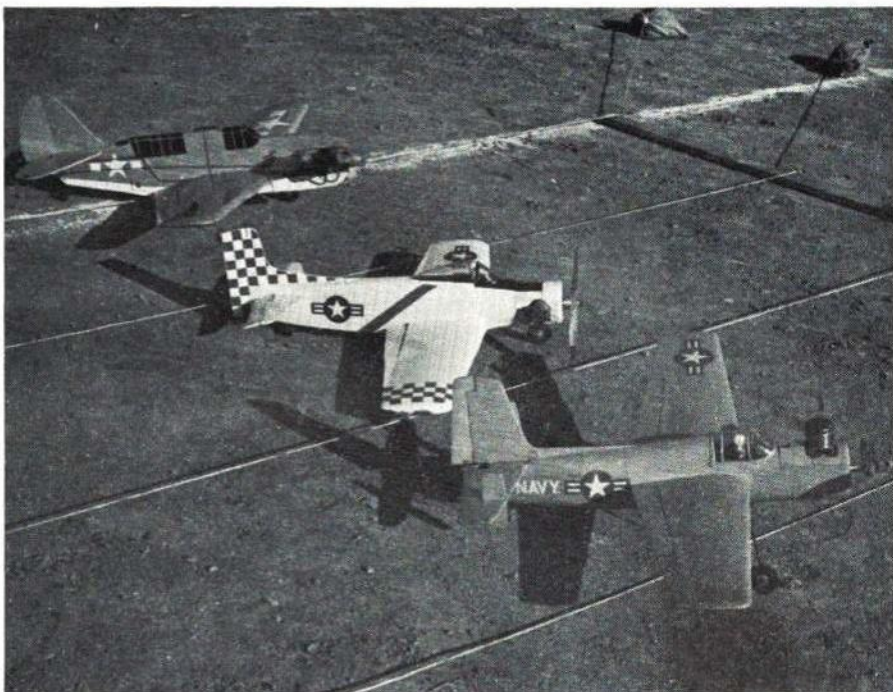
To begin in this event build a reasonable plane, fly it with a stock motor and fuel while learning to fly slowly and to make landings consistently. This type of flying can bring in top scores. Then by increasing performance championship runs can be flown. For high performance all kinds of hopped-up engines and special hot fuels are used. This is fine for the ultimate in speed, but novices should use a stock engine and regular R/C fuel so that power



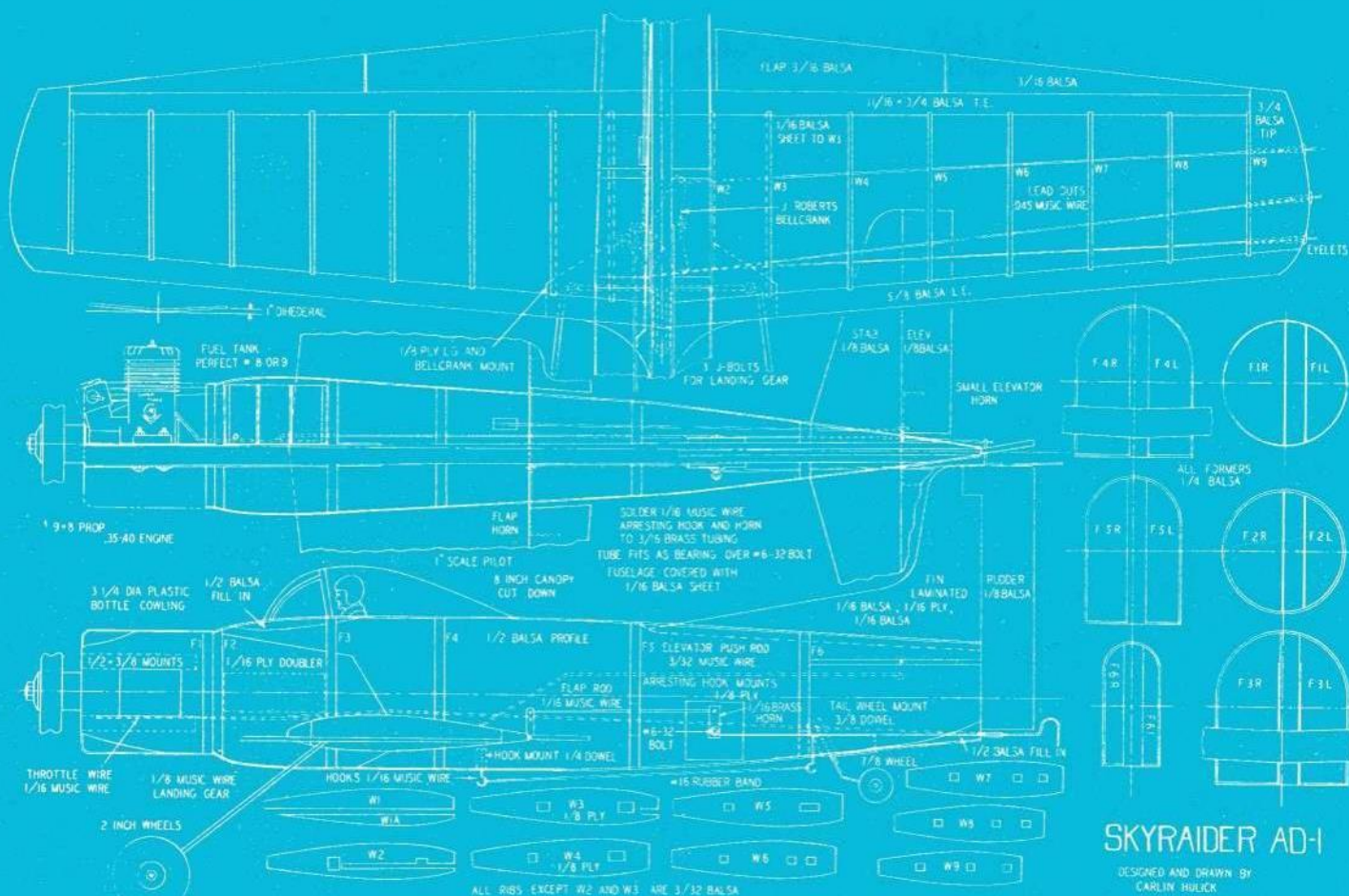
Wire from throttle engages and holds up loop on arresting hook. First low-throttle command pulls wire forward to drop hook.



Dropping the hook also drops the flaps, which are interconnected. Note pivot of the hook is very firmly anchored to the fuselage.

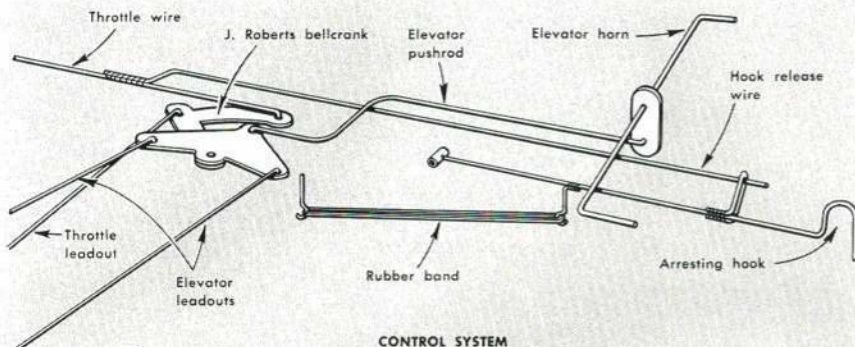


Three classes of AMA Navy Carrier competition. Left to right: Profile 35-powered Helldiver, Class I 40-powered Skyraider, and Class II 60-powered Guardian. These classes offer flying and modeling expenses to suit the individual. Top speed of Class II job is nearly 100 mph.



This Skyraider is basically a profile kit model adapted to fully shaped form by adding half-circle bulkheads and sheeting between them. The profile crutch is off-center to the engine shaft but comes out centered in the cowl. A beginner could make both profile and built-up versions from these plans.

Rugged Skyraider



will be dependable and not touchy. This enables the pilot to concentrate on required flying skills. By tackling one step at a time, there is a much better chance for success.

Models must go fast so small size and streamlining are important. Slow speed flying requires a good throttle on the engine

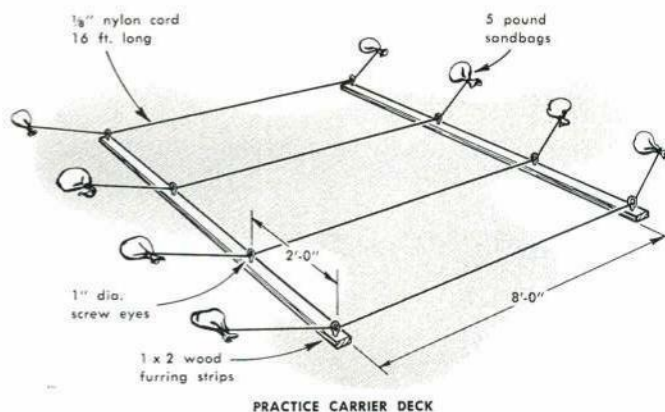
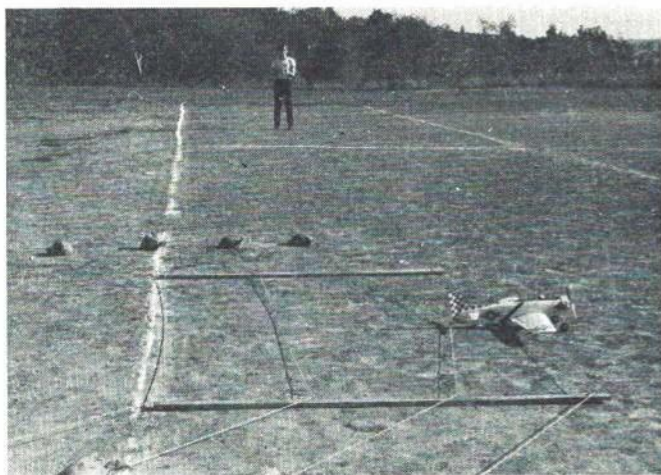
as well as enough wing area, aided perhaps by flaps, to keep the model in the air at as low a speed as possible. For landing slow speed, responsiveness to control at close to stalling speed is essential. Rugged construction is necessary because even a good landing hits the deck hard. These requirements

are somewhat contradictory in the high- and low-speed categories which make model design a compromise, just as it is for a real carrier airplane. A suitable balance must be achieved to be successful.

Model kits for Carrier are on the market and others can be modified. By far the most popular plane is the Grumman Guardian. Built from Sterling's kit, the big Guardian comprises about 90% of the ships in Class II and many in Class I. A smaller Guardian plan, published in *American Aircraft Modeler*, is quite popular in Class I. Sturdi-Built has available kits for the Corsair and Mauler which is second in popularity to the Guardian. Consolidated made Avenger and Dark Shark kits popular some years back but these are difficult to find today. Some scale Berkeley-Sig kits can be used with modifications. Sterling also has a profile Sky Shark kit which is not large enough for the new profile rules, but it can be the basis for an excellent scale ship, as well as the trainer it was originally intended for.

Numerous designs, with the small Guardian the most popular, have been published in the model magazines. Recently the Mar-

Continued on page 74



Now that you have the plane, get some practice on this easily prepared carrier deck. Objective is to catch the first cable.

A Practice Deck

ACTUAL decks have 11 strings at two-ft. intervals for a total length of 20 ft. The practice deck shown is only six ft. long with four strings. Though harder to hit, this short deck is not too difficult to use. Experience in hitting this deck makes landing on the real one easy. My deck is portable, easy to make, and inexpensive.

To build this practice area, put 1-in. screw eyes two ft. apart in two pieces of 1x2" furring strips six ft. long. Make four lengths (about 16 ft. long) of 1/8" nylon cord and tie sandbags to the ends. The bags should weigh about five lbs. each. Mailing sacks are good for the sand bags, or bags can be sewn out of heavy denim or other cloth. Put this assembly down on the field with the wood sticks eight ft. apart, pull the strings taut with the sandbags. It's simple enough to make two decks, or have a buddy make a second one. Two together, or even three, will make a full-size deck. It can be easily carried in a car.

Before a landing, have a helper line the plane up on deck center. Then make slower and slower passes over the arresting gear until power is cut and bang!—the ship is

on the deck, hooked to a line. It all happens in a split-second. Practice is the key.

This practice and knowing the flying characteristics of the plane are essential to success. Use a 9-8 prop for 35 and 40's. Adjust the needle for maximum revs. Because timing for scores begins at release, full power is needed at once. The lean part of the tank run will come during the low-speed portion of the flight when plenty of fuel is running through the engine. Do not run continuous full speed laps toward the end of the flight, because the fuel will be quite lean and could overheat and damage the engine.

Now try low speeds. Set the idle speed screw to stop throttle at the lowest speed at which the engine will continue to run steadily. If the engine has an idle mixture, adjust it for smoothness at this speed. Then check the response to change from high to low and back. If the engine cuts out after a low-speed run followed by quick throttle opening, try a hotter plug. Shielded hot plugs are almost a must.

Once the engine is performing well, try flights. Without throttle it is just a hot, scale C/L. If the engine goes rich or lean on the first laps adjust the needle valve so maximum power is obtained as soon after takeoff as possible.

Takeoff must be smooth for best acceleration. The model should not be forced into

the air. With 24 ft. on the deck, getting airborne is no problem. Try clearing a strip of crepe paper or balsa wood 24 ft. from launch point to see how simple takeoff is.

Now try low speed. Slow the engine down with the third line and feel the response. As the speed lowers, flight must be a steeper angle to get the needed lift. Keep slowing down. Practice repeated laps at a low speed. If, on reaching the lowest speed of the motor, the model is still flying, set the idle speed lower or the ship will not land. When flying slowly in the wind, speed up slightly going into the wind, so you will fly with taut lines across the wind, then slow down to a minimum as the wind pushes the model out on the lines.

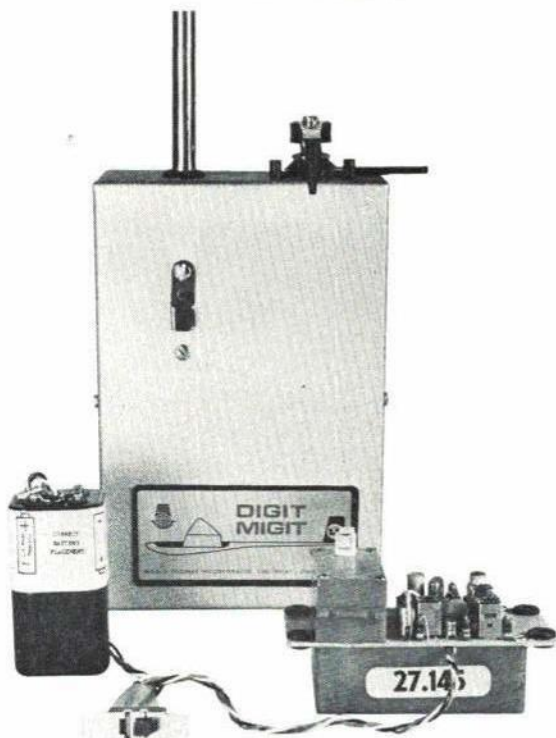
At low speed there is less line tension when needed most for control. If line tension gets slack and control problems develop, several things can be done. An offset rudder or engine is most effective, but will increase line pull at high speed. An engine offset of two washers under the front mounting holes is about right on most profiles.

Once low speed is mastered, come in low and practice landing on a given spot on the field. Cut the throttle and let the model settle down onto the spot. If the angle of attack is right for low speed, a further cut of throttle will let the model drop down onto the carrier deck.

Digit Migrit

Blue Ribbon Review

FRED M. MARKS



MANY are entering radio control. Some purchase used equipment, others kit systems. And, in these affluent times, many purchase full-house commercial systems and ARF airplanes. For potential users there often is the question of finances and the initial doubt that R/C is really for them.

The system tested and reviewed this month, the Digit Migrit, was designed specifically to resolve these doubts. It does so admirably.

The limitations of single-function control must be accepted but, once mastered, full-house operation of the multi-ship will be much easier and less expensive when that stage is reached. The junior starting out, or the beginner of any age, now can have a fully operational model—including engine, radio system, and model—for under \$100. Yet it has all the reliability and control power of a digital system. Further, the Digit Migrit can be traded in at full value (\$69.00) on a Controaire four-channel system.

Although the Digit Migrit tested is a single-channel digital system designed for minimum cost it has no short cuts in circuit design. Strictly digital techniques are used. The transmitter is designed to operate in the 27 MHz band only, at an output of about 500 milliwatts. (An examination-free Citizens Class C, FCC license is required.)

A free-running multi-vibrator (clock) sets the repetition rate at approximately 30 frames per second. This is followed by a half-shot multi-vibrator which is triggered by the clock pulse and remains on for nominally 1.5 milliseconds, plus or minus 0.5 millisecond. The variation is determined by a single control potentiometer operated for both trim and self-centering control via a simple control lever. The trailing edge of pulses generated by the clock and half-shot are coupled to a Schmidt trigger which squares them and drives a modulator which, in turn, modulates the RF oscillator output. Note: the oscillator is not turned on and off; the output is merely shunted for the duration of the pulse.

The receiver is a straightforward MAN 2-3-4 receiver. A special single-channel de-

Transmitter has off-gold color vinyl covering which we certainly appreciated when flying in sub-freezing temperatures. Stick on top has wide-range trim also.

coder utilizes two integrated circuits preceded by a two-transistor squaring amplifier. It's hard to find anything simpler than the decoder with just 14 components, only four of these active, the rest passive.

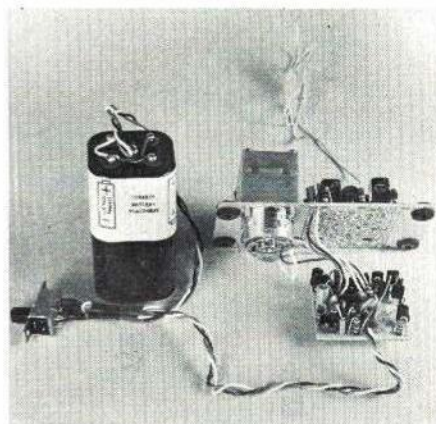
The servo is basically an S4-a servo amplifier built onto the same board as the decoder and utilizing the S4-a mechanics.

Physically the system is a study in simplicity. The transmitter is a gold vinyl-clad box 2 x 4 x 6" with the single control lever, with mechanical trim mounted at the top, right-hand side of the case. An on-off switch with switch lock is located on the transmitter face and the antenna extends from its PC board mount through a grommet at the top of the case. Internally, the PC board mounts to the switch and potentiometer. Snap leads are provided for a 9V dry cell. (Both the transmitter and receiver units are powered by dry cells, packed separately to insure their freshness.)

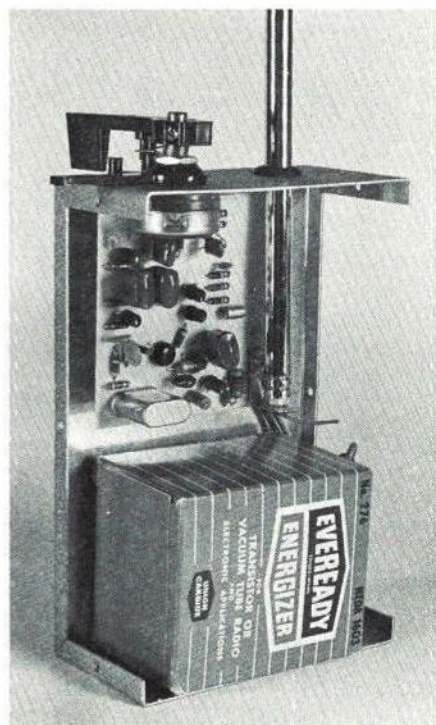
The airborne pack is a "semi-brick" unit with all components mounted on a 1½ x 3¼ x 1/16" glass-epoxy printed-circuit board. Receiver components are built onto this board. The servo mechanics are mounted at one end. The decoder/servo amplifier is packed in adhesive-backed foam beneath the receiver. A blue plastic cover forms the bottom half of the "semi-brick" to protect these components and to retain the servo motor and mechanics via mounting screws. A miniature DPDT slide switch is provided in the wiring harness to a nylon battery case for four dry pencils.

The system tested proved pleasant to work with and to fly. A complete set of schematics, with component values, is provided. Thus, with access to a scope, it demonstrates in simplest form how digital works. This set is steady and not at all fussy when its waveforms are traced on an inexpen-

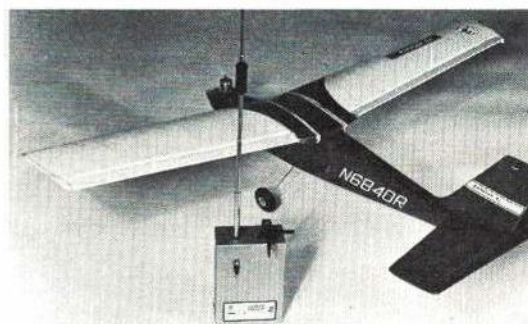
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With plastic bottom case removed from servo/receiver pack, one finds a complete digital feedback servo, amplifier-decoder. Receiver is on top of PC mounting plate.



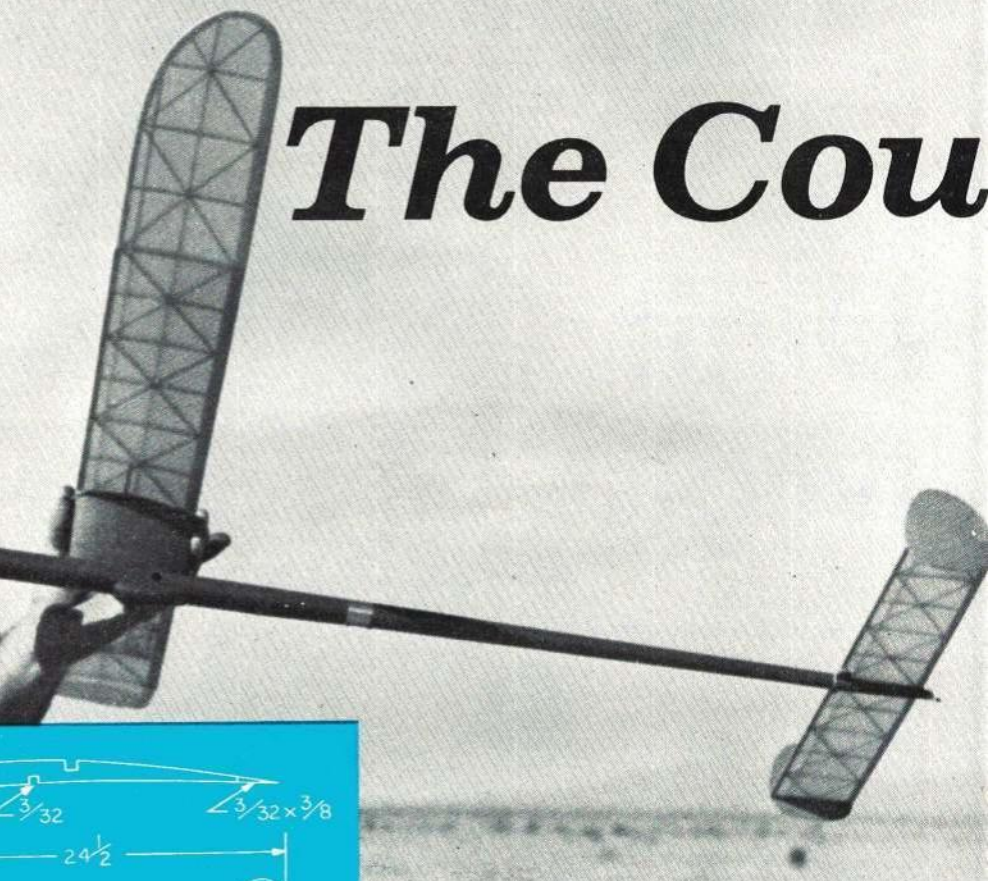
Transmitter has familiar high-output circuit as in all Controaire rigs. Second function available for either blip elevator or two-position throttle.



Testing was done in over-powered strip-aileron-only equipped Ranger 42. Fine combo for expert flyers only. This plane, 049 engine, Digit Migrit great for beginners.

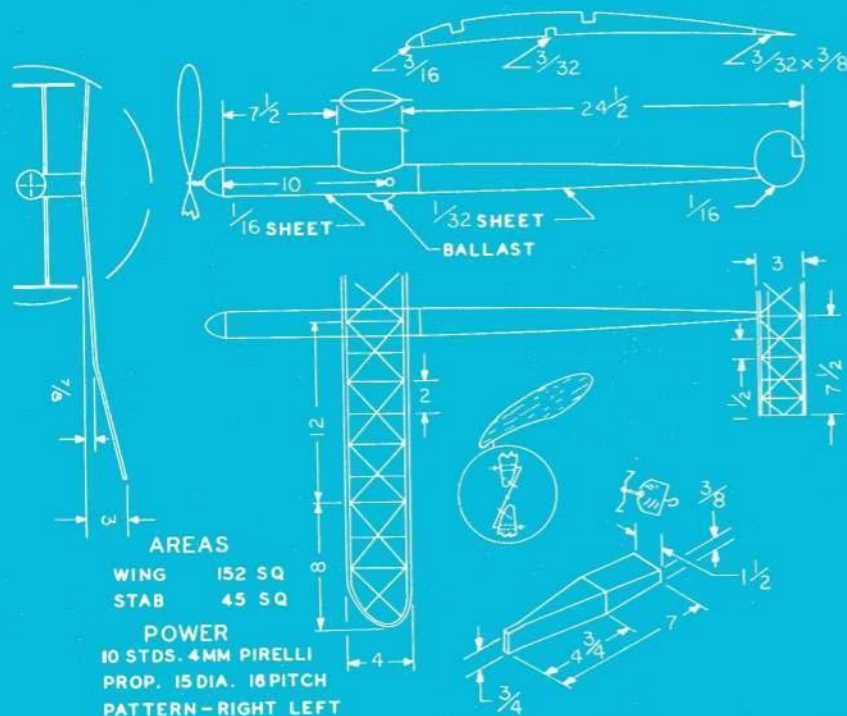


The Cou



Fudo Takagi

The thin, slightly undercambered airfoil on Bob White's model lets it fly fairly fast. Fuselage is rolled light balsa—streamlined and strong. Ballast added to bring it up to required weight and to adjust. Note how short the motor is compared to overall fuselage length. Wing pylon controls power bursts.



"POOL" CUE COUPE D'HIVER BY BOB WHITE



Fudo Takagi

ED DOLBY

WHILE the Winter Cup event, held in France every February, can be very cold and windy, the U.S. version was held in January under calm and balmy conditions. The Coupe D'Challenge was part of the 4th Annual Desert Challenge at a site about 35 miles west of the Colorado River on the California desert. The site was a dry lake devoid of bushes and trees.

The challenge is for three-man teams only. The competition included two teams

from the San Diego Orbiters, two teams from S.C.A.T., and one team from the Phoenix MAC.

The event was a good opportunity to observe flying under the new rule changes. Eliminating the ROG requirement was the most important change, but adding two additional flights also may produce changes. Several new designs were evident such as Bill Bogart's high aspect ratio model which was designed specifically to cope with the rule changes. Many others had their models when the rule changes were announced and could compare their present perfor-

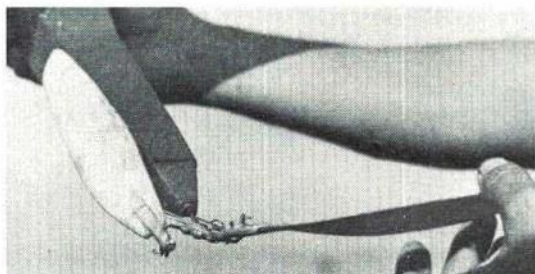
mances with the old rules.

What with 15 modelers with Coupes, quite a variety of ideas and opinions were expressed. Almost everyone felt that the elimination of the ROG would make it easier to obtain the 120-second max. Simply stated, the extra power required to get the model up and moving from the ROG can now be used to get the model higher from a "shove" hand launch. More height means more seconds and in the case of Coupe, with its low max, the percent of increase can be important. The five-flight rule will mean more consideration must be given to the motor

DESERT SHOWDOWN—Coupe D' Challenge

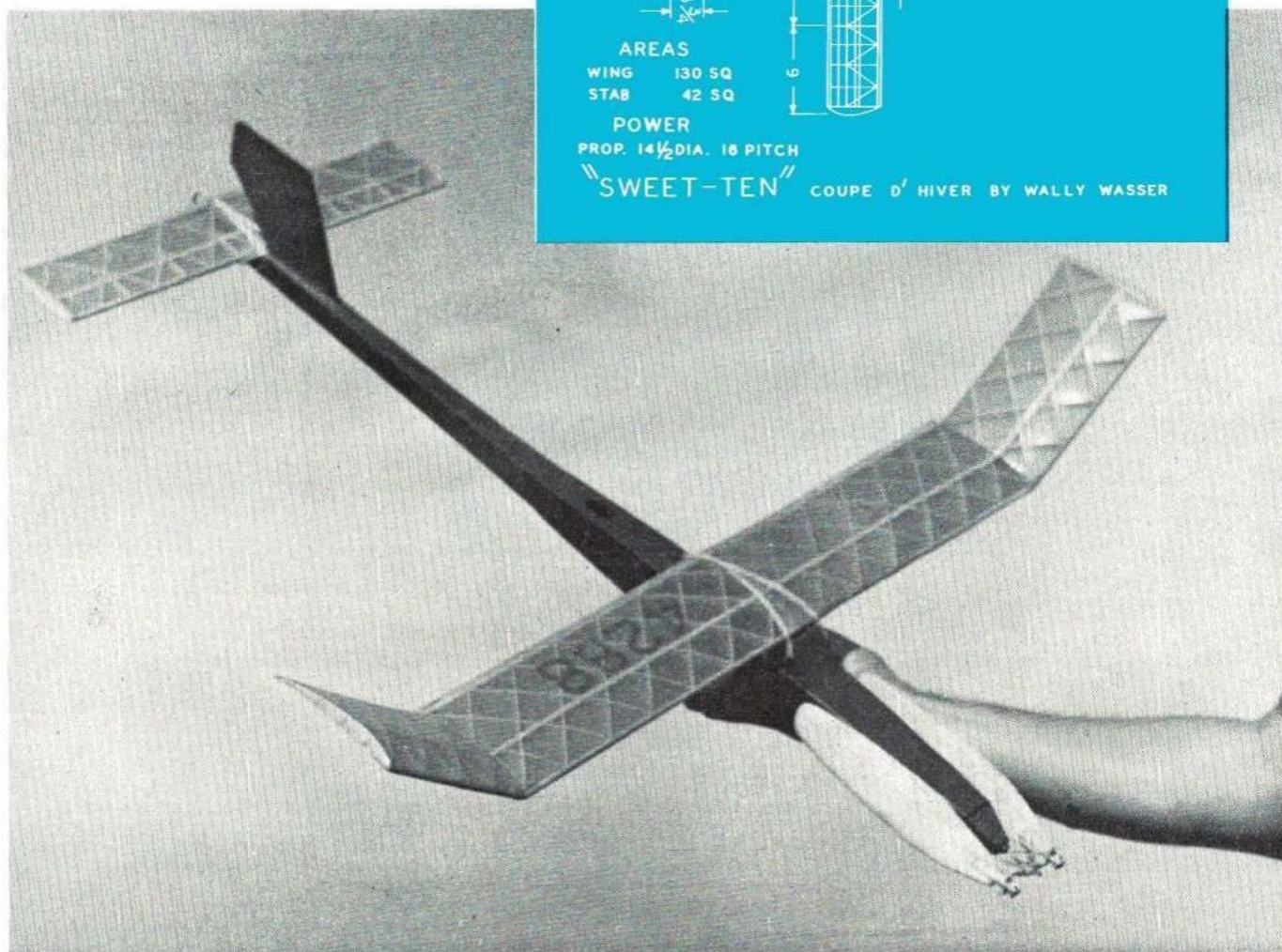
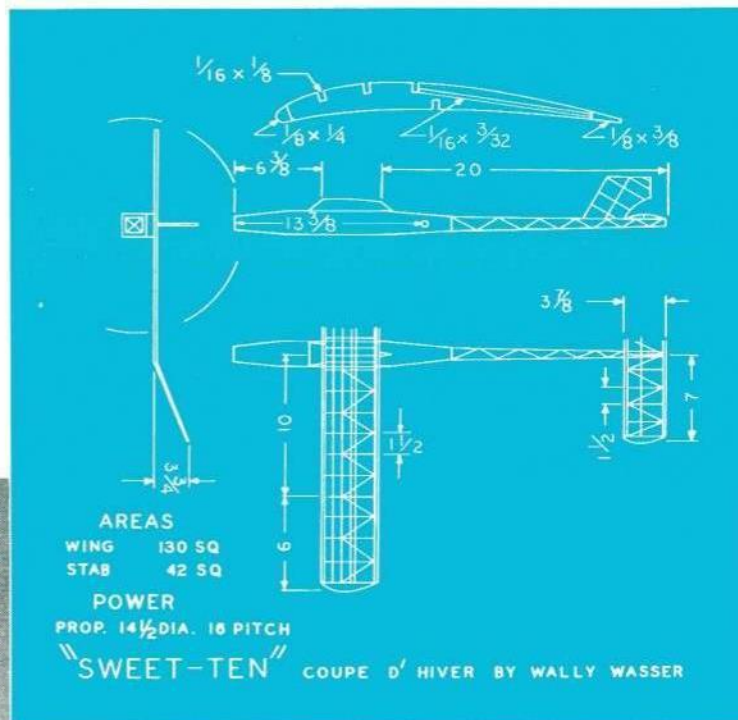
pe's are Coming

Small, fast-climbing, long-lasting Coupe d'Hiver models come into their own thanks to new official rules.



Fudo Takagi

Wally Wasser's model may be tough to build because of its diagonal bracing, but it won't warp. He recommends building the model to fit the weight rule, so makes wing and tail first then weighs them to know how much he can beef up the fuselage. Motor length is a bit long, runs longer and steadier.



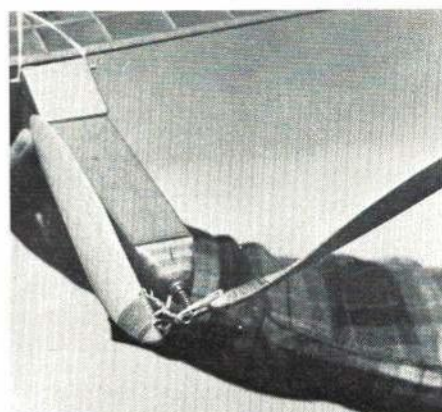
Fudo Takagi



Information for Pirelli Rubber

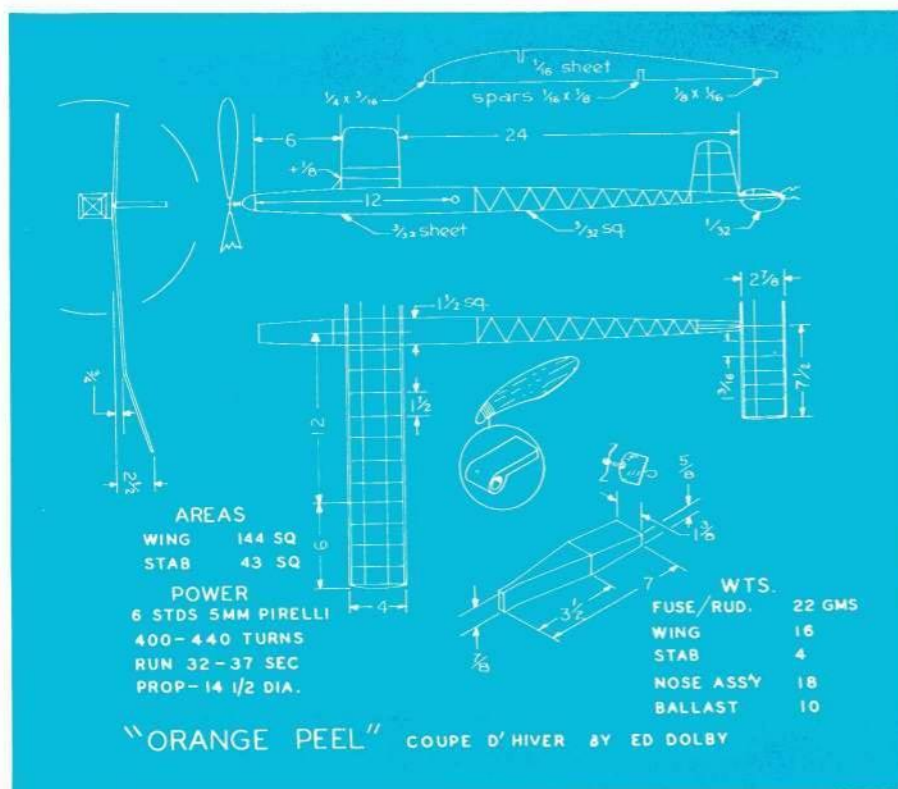
Size	No. of Strands	Length	Max turns
4 mm	8	12.0"	430-450
4 mm	10	9.6	315-330
5 mm	6	12.3	440-460
5 mm	8	9.4	320-350
6 mm	4	16.2	675-700
6 mm	6	10.7	360-380

Motor weight, ready to use, is 10 grams including lube. Dry weight should be 9.5 grams. Due to variation in thickness and width the motor lengths sometimes may vary slightly within the hank.



Fudo Takagi

Ed Dolby designed a very simple model. Wing has flat-bottom airfoil and nontapering planform. Fuselage is balsa box in front with built-up rear section. Even the prop and hub assembly is simplified. To change climb characteristics, one merely changes the prop blades. The special requirements of the Coupe d'Hiver event result in a wide variety of designs but no gadgets.



tube to insure reliability by preventing motor breakage.

The appeal of the Coupe event to the general modeler is now greater because of the elimination of the ROG. Space does not permit complete detailed drawings of three models designed for the use with the new rules. What is presented should be an aid in constructing an original design.

Except for Bill Bogart, most contestants used smaller wings, down to 120 sq. in. and most were undercambered. Dolby used a 140-sq.-in. wing with flat-bottom section. White had a 150-sq.-in. wing, but with a very thin section. He also uses a high pylon to control power bursts. White uses a rear fuselage section of 1/32-in. sheet formed around a pool cue, which gives excellent

strength and lightness. His ten-strand four-millimeter motor can be alternated with one of eight strands of five mm or six strands of six mm.

All of the models presented here are capable of maximum performance without thermals but excluding downdrafts. Although these models are small and may be deceptively simple, much care is taken in building to insure a light but strong structure. Light contest-type balsa is necessary to obtain some of the desired results. Once one is built, experience will show that due to their light weight they are resistant to damage. None was overweight. In fact two were built somewhat underweight and ballast added.

Wasser, for instance, recommends that

the fuselage section be built last, after all the other components are complete and weighed. He then knows how much weight is left over, and can act accordingly in building a beefed-up fuselage motor section. Dolby built light so he could get his wing as far forward as possible. Ballast added forward of the CG brings the balance point back to about 80%. It has a long tail-moment. All of the models had lightly doped surfaces.

The glide of a carefully adjusted 80-gram Coupe can be a thing of beauty. Their light flying weight permits them to outglide almost anything around, and they will bump and float on the slightest patch of warm air.

As in every other type of rubber model, the power train—prop and motor combination—is all important. Pirelli rubber comes in three popular sizes as shown on the general motor information. Because of the small amount of rubber allowed (ten grams), adding or subtracting one loop is apt to change the power by 25%. While it may be nice to have all of the rubber sizes to play with, in the practical world, most must make do with one width. The six millimeter seems to be the most popular. Therefore, it is not strange that all three models feature removable prop blades. Instead of changing motor sizes, the alternate is changing blades. An even easier alternative is to adjust the pitch. These models use wire hubs which are simple and adapt well to this class. The 1/16-in. wire hub arms can be formed up or down to change pitch, thus allowing a better performance from a chosen motor size.

Continued on page 72



Bob Green's exquisite Gypsy Moth RC entry is judged. Slow flyer is pulled aloft by ST 56.

Phoenix— Something for Everyone



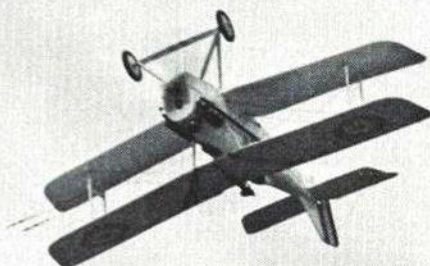
Hess' P-35A placed first in CL scale. It is metal-foil covered. Nine pounds, Enya 60.



Dick Schofield's "Sweeper" shows strikingly clean lines. Must be fast through RC maneuvers. Mike Sadler with O.S. 80-powered Mentor from AAM article has very smooth Hobbypoxy finish.



Sellick's SE-5A from Sterling kit flew full CL stunt pattern!



On the Scene at 20th Southwestern Championships.

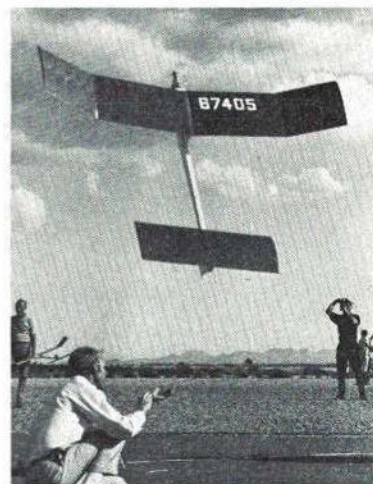
ROBERT ANGEL

PHOTOS/TERRY ALDRICH

THE 20th Southwestern (Feb. 21-22) was co-sponsored by the Air-zona M.A.C. and the Airazona R. C. Society. Events included most AMA and some FAI categories — 54 events and classes of F/F, C/L, and R/C.

It was cloudy and windy, but no showers. Saturday began cool, cloudy, with winds to 20 mph. Only R/C flew until 2:00, when the rat racers roared out of the chutes. By 4:00 the free flighters could start. Sunday was clear, fair, a bit windy 'til 1:00 p.m. The judging brought no criticism; R/C judges were German student pilots training at Luke AFB.

Sights and sounds included: Nice looking twin-engine C/L stunter putting on precision exhibition. Rubber-powered ship climbing straight up into a cloud. Red-hot R/C flying. Refreshment booths, manned by the 4H club. As they say at the Indianapolis 500, "we'll be back next year."



Typical FF takeoff. Some models got into the low clouds and disappeared.



Mrs. Larry Stephens helps husband's Skyraider with an expert launch. Ballet anyone?





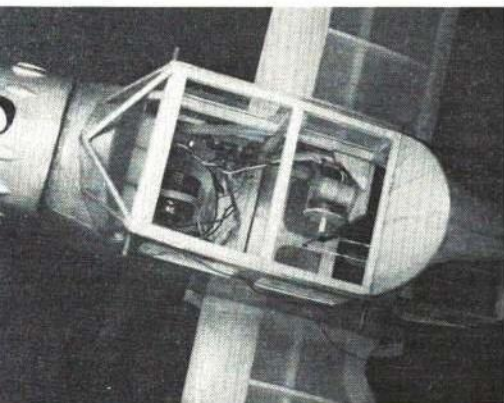
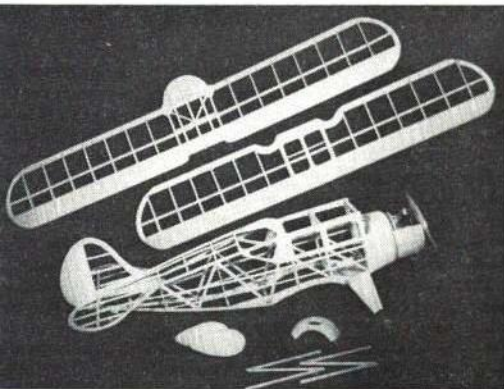
A balmy spring evening and the Waco glides home. Pulsing of rudder is not objectionable in flight and helps locate model in tall weeds. With practice loops, Immelmans, wing-overs, etc., can be done.

Waco YKC-S

All-time favorite from the 1930's makes delightful 049-powered rudder-only job.



TED SCHREYER AND ELIOT KIMBLE



Sticks and bones a-plenty, with covering it's lovely. Note thread from actuator to rudder.

THE Waco YKC-S cabin biplane was chosen for a radio control flying scale model because of its similarity in planform to that of a highly successful non-scale biplane. The important features were a cabin fuselage for a rigid and sturdy top wing mount, plus a similar wing area, stagger, gap, dihedral, and equal- and constant-chord wings for easy building. The tail-moment arm and short nose also had to approximate that of the non-scale model. The Waco YKC-S aircraft fits the design requirements perfectly.

Eliot Kimble, long-time modeler, R/C enthusiast, and partner in this project, expressed interest in the Waco design possibilities as we flew the non-scale model. He went so far as to volunteer to build the model if I would draw up working plans. The photos show his handiwork.

As the model took form, Eliot worked out the details of R/C installation, strut attachment, cowl construction, and so forth. Covered with blue and yellow silk and clear-doped to a lustrous finish, the Waco has an eye-catching appearance and often steals the show from the bigger multi jobs at the local flying field.

The real enjoyment comes when flying the Waco, for it has a smooth and steady powered flight, easily controlled with the pulsed rudder system. The glide has a gentle, almost floating, quality. We wondered whether it might come out too heavy, but at 17½ oz. it flew beautifully, even with the 049 at reduced power.

Actually, the Waco could be flown free flight, but the addition of the simple and relatively inexpensive rudder-only R/C system makes it much more enjoyable to

fly. With rudder control the model can be turned, circled, dived, and put through other maneuvers at the pilot's command. Best of all, the model can be landed near at hand.

The Waco has proved to be an excellent subject for rudder-only because it has the good maneuverability of a biplane and the reserve stability that makes even low-altitude turns in the landing approach an easy matter. Those who decide to build the Waco will be pleasantly surprised to find that a scale job can perform as well as a functionally designed model.

The R/C equipment consisted of an Adams actuator with a double-arm added to work two threads to the rudder horn, a Controlaire-5 receiver, add-on switcher, Ni-Cad button battery, and on-off switch. A super-regen receiver was used, but a superhet receiver would be better for near-city or crowded flying sites. An escapement-operated R/C unit will work well in the Waco. However, the pulsed system gives smoother flight control.

An 049 engine gives satisfactory and realistic flying performance. It is recommended that an 049 be used to properly adjust model, R/C system, and flier to each other. For those who want more power to put their model through loops, rolls, or other maneuvers requiring power in excess of normal flying, an 06 or 074 would be right.

It might do to mention a few things the author found by experience with biplanes. Since there are really four wing panels developing lift and providing lateral stability, careful alignment of these panels is necessary, as is the elimination of warps, with the exception of washout which will be mentioned later.

Continued on page 64

R/C DON LOWE

General Correspondent
SPORT and PATTERN

The Mailbag: Thanks to those of you who filled this month's mailbag with items and ideas. This column is to be your forum as much as possible—to communicate ideas and knowledge to fellow R/C modelers. Often gimmicks and gadgets may seem trivial or certainly not earth-shaking, but to the poor guy who is struggling with the problem or to a fledgling the idea is invaluable. So, don't be bashful, let's have it! ...

New Competition Events: The great variety of things that can be done with a model airplane keeps the hobby going. Competition event ideas are myriad with new schemes and variations of old ones. For a departure from official AMA events, many clubs set up special competitions either to spice a standard schedule or as a complete contest. Over the years the Indian City R/C Club of Wyandotte, Mich., has had events such as limbo, spin, combat, carrier landing, altitude run (measured-altitude), pylon with pit stop, timed flight (trying to fly for a prescribed time without the help of a watch) and many others. These fun events appeal to the Sunday flyer as well as the expert.

Variations of the scale event have been designed to attract those without the dedication to create a masterpiece. These ideas have ranged all the way from playing down the scale requirements to emphasizing the flying aspect. JEFCO R/C of Denver, Colo., and Royal Electronics are sponsoring a contest August 23, which will feature Eyeball Scale. Essentially it is a return to full-scale aircraft flying characteristics and appearance is emphasized. The club considers it an event "designed to feature aerobically flying of R/C aircraft that are recognizable as models of full-scale airplanes."

An event proposed some time back, called "prototype Pattern," had precisely the same objective. It was an attempt to insert realism into pattern flying. To be realistic, the model first of all must look like a full-scale aircraft and, second, it must fly like one. This definitely includes entering maneuvers in a scale fashion, diving to gain airspeed and flying at scale speeds. Models of this nature are power-limited and require real skill to execute maneuvers with precision.

JEFCO R/C proposes to award a maximum of 25 points for each of eight appearance and workmanship categories when

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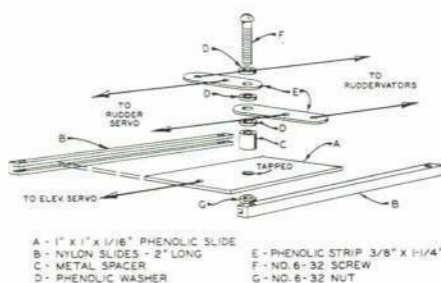
Schoonard's X-2 has done 1:37 in Open Pylon. An Aldrich-ST G-60 ABC. Future AAM plan.

R/C HOWARD McENTEE

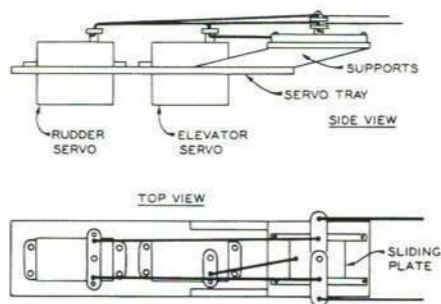
Specialist Correspondent
GLIDERS and FAI

V-Tail Linkage: As developed by Joe Friend for use on a glider, the arrangement seen in the drawings was most successful after slop had been taken out of many components and friction eliminated from curved Gold-N-Rods. Joe suggests: keep wires connecting moving plate and its arms to the servos short, stiff and straight; drill holes for moving parts to allow free movement but no slop; space nylon slides so plate can move freely, but can't wiggle from side to side; pushrods to the two ruddervators must move freely. One sketch shows the transmission itself, the other shows how Joe assembled the unit with two servos on a single sturdy tray. Though intended for a V-tail glider, this linkage also should be useful for power planes, flying wings, deltas, etc. ...

FAI R/C Glider Rules: Comments come from Lee Messick (23 Briar Ln., Dover, Del.) who CD'ed an excellent R/C Glider meet for the Dover Mosquitos last Fall. Lee is in some doubt on the six min. flight max, 150-meter towline, and a specified number of points for spot landing. He feels these rules are best suited to R/C Nordic gliders, not the big jobs popular in the Northeast. The 150-meter line won't get them up high enough to catch really good thermals, and the short flight max favors smaller and lighter craft. Lee points out that the fixed number of points for spot won't help to break ties as well as does a score based upon actual distance from spot center. He also comments that FAI rules make no mention of high start or winch launch and wonders how many older glider pilots could stand to run and tow aloft a 12-ft. craft! Several U.S. groups are adopting the FAI rules with modifications of the questioned provisions to more closely follow U.S. practice. Perhaps after a season of experience on these models, we can persuade the FAI



Another "better mousetrap"—this time a control setup for elevons with rudder/elevator function mixing. Operates with sliding pivot instead of sliding servo.



to do likewise. ...

Bertrand R/C Distance Record: Some confusion exists as to whether Bill Bertrand's fine 226.8-mi. flight from Windsor to Toronto, Ontario, Canada, has actually been accepted by the FAI. It was thought that Bill did indeed establish a new record, but the FAI initially turned it down. Meantime, an Italian flier flew a distance of over 198 miles and applied for the record. Close cooperation between AMA and the Model Aeronautical Association of Canada, under the leadership of President Dave Henshaw, got the matter cleared up for approval by MAAC as required under FAI regulations. So Bertrand was the official record holder. However, unofficial word now has reached AMA that another Italian try topped Bill's distance. FAI has made no official comment as yet. We advise anyone from the U.S. attempt-

Continued on page 79

R/C CLAUDE McCULLOUGH

Specialist Correspondent
SCALE

Multi-Engine Fan: Robin Lehman, living in London, was the only U.S. entrant in the Metz International RC Scale Contest last year. He used the Sopwith Triplane he later brought to the Rhinebeck WW I meet. One of the top experts in the multi-engine RC Scale field, his stable includes no less than four twins, so the following tips from him carry considerable weight:

(1) Engines must be well broken-in. Electric starters are recommended, particularly for inverted installations.

(2) Tune engines so that each is at its maximum power. Do not detune to achieve synchronization. The rudder can be trimmed to correct the slight effects of un-synchronized power.

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Full-house radio lost inside Robin Lehman's big twin! Has same flight characteristics on one engine as the real aircraft.

R/C FRED MARKS

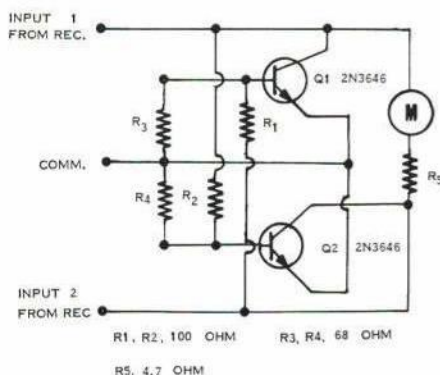
Specialist Correspondent
TECHNICAL ITEMS
AERODYNAMICS

At one time or another, I have had lying in my shop just about every type control arrangement from escapements, to reed systems, to digital and have enjoyed learning and flying each. Many may be surprised to find that there is a world of enjoyment in something besides a full house digital. This is not just my intuition. One manufacturer of pulse equipment has been delivering around 200 sets per month of the simplest practical pulse equipment! Add many manufacturers, and many types of sets, and it becomes phenomenal.

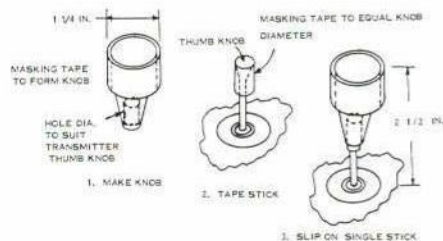
One idea related to simple pulse comes from Mr. Robert May. Mr. May has a stable of pulse systems ranging from magnetic actuators to galloping ghost and is in the process of building the Versapro transmitter. He writes: "... I have sketched my idea of switching the ACE Mini-Max GG actuator from their Commander DE Superhet receiver. Since I won't be able to apply the trial and error method of testing until I build my transmitter, I wondered if you could tell me if it should work OK. ..."

Fig. 1 presents Mr. May's circuit. I question the capability of the 2N3646 to carry the necessary current. However, I built up and checked the circuit using the 2N2430 NPN germanium complement of the 2N2431 PNP used in the output of the Commander DE superhet. R_3 and R_4 were reduced to 47 ohms. This arrangement worked quite well on 2.4 volts without center tap, thus providing a light weight, low drain approach to galloping ghost. My tests were with the Rand LR-3. The Mini-Max servo should have the equivalent arc suppression added.

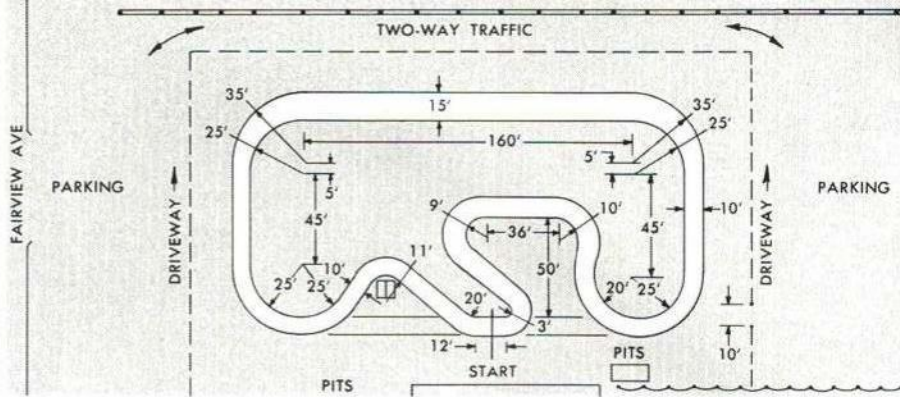
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This circuit by Robert May added to ACE DE Commander gives efficient GG operation with non-center-tapped 2.4V battery.



You want to fly Single Stick? Before buying a new transmitter, make a removable stick, know and fly with it.



Costa Mesa car club has this permanent painted track on school parking lot provided by the city recreation department. Can be either Indy or 747-ft.-long Road course.

R/C GEORGE SIPOSS

Specialist Correspondent
R/C CAR RACING

New Car Kits: Several car manufacturers exhibited their wares at the Toledo Conference, and a special area was assigned to car demonstrations. Heathkit has a new car kit. Dynamic Models has announced its latest car.

This is an all die-cast construction model with outriggers to allow mounting of a sports-type body. The car, without an engine and flywheel, is offered in the \$110-127 range. A novel feature is the torque converter which eliminates clutch and gearbox. It looks like a beautiful car and we hope it goes as well as it looks.

Delta Specialties is releasing a new car kit for approximately \$75, without engine. It allows the home builder plenty of scope for creative expression. Delta wheels are molded plastic, guaranteed against breakage.

Ra/Car Developments has announced its latest car kit, designed as a starter kit for those who have a spare 19 engine and wish to buy or build the body. The basic car kit sells for \$69.95 and includes front and rear suspension, clutch, chassis, flywheel, etc. ...

Racing Track: The Costa Mesa, Calif., R/C Car Club, in cooperation with the city's Recreation Department, recently finished painting a huge track on a school parking lot. The track has an Indy-type four-corner course as well as several turns and switchbacks, which makes it a challenge to drive. The road course measures 747 ft. to the lap. The drivers stand on a raised mound about three ft. above track level, thus visibility is no problem. For today's high speeds the track is fairly bumpy but plans are now being made for a steamroller to smooth the course. At 30 mph a 1/8-scale car feels every little pebble. ...

ROAR Rules: The 1970 ROAR racing rules, distributed to members, are the basis of much controversy. For instance: the maximum displacement is limited to .2 cu. in. Rules also state that one or two cylinders may be used. A complaint that this discriminates against four-cylinder engines has been received. Apparently a fellow in Chicago is building a four-cylinder job! At this point the sport is still young. Rather than defining every little point, we are trying to compile a workable set of rules that will make for good racing. We feel this is the year R/C cars will become popular and then, perhaps in 1971, we will be able to publish rules which are air-tight and unchangeable. Until then we must make every effort to help the beginners. After each race, our club conducts a clinic for newcomers where engine tuning, radio installation and driving techniques are taught. ...

Newsletter: The latest issue of the REVUP (the official newsletter of the Radio Operated Auto Racing Association) has been published in newspaper format and contains more pages and pictures than ever before. For the beginner, this is a good way to learn about R/C cars. The newsletter includes pictures of famous names in the sport, construction and tuning hints, even plans for making an electric starter. This timeless issue has information for the beginner and advanced modeler alike. Copies are available by sending 50 cents to R.O.A.R.,

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R/C JIM MOYNIHAN

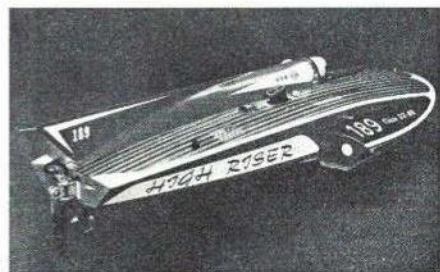
Specialist Correspondent
R/C BOATING

Building Season: The roostertails will be flying as you read this, but, as it is being written, even the birds are walking in the blanket of white that has descended upon this part of the land. Traditionally, this is the building season, and again new hydros take shape. Twin engines geared to a single prop are gaining popularity, with many being built to achieve that 70 mph in 1970 goal.

Del Park used a twin Rossi to set the existing F Class record of 65.4 mph, and one run was over 68! But our money is on Steady Ed Kalfus to do it first with his fantastic home-built 90 engine in a new boat. To run with the record setters today, everything must be right. Ball bearing struts and logs are increasingly in evidence, as are metal props. With so many of them being offered this year, a lot of records will tumble. ...

Answers for Beginners: Many letters from would-be boaters ask about getting started in the hobby. Most questions are the same, so we will try to answer them next. First, the International Model Power Boat Association is the central ruling body. To join,

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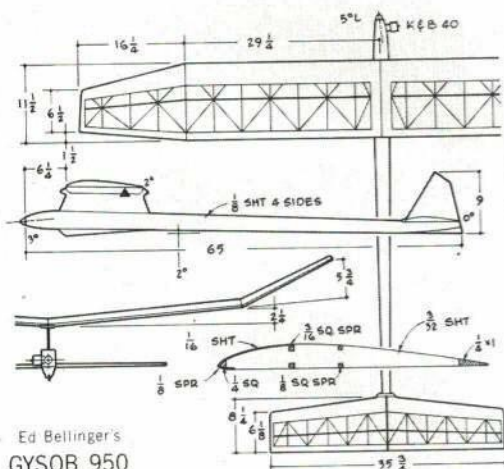
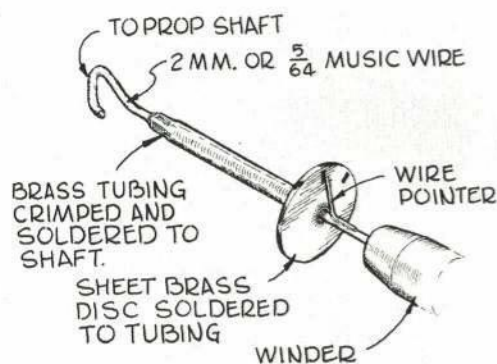


Brounshidle's High Riser is glassed light and dark woods. Dual-carb K&B 40 for power.

F/F BOB MEUSER
General Correspondent
SPORT

GYSOB: Mini-Plan of the Month, the GYSOB, in the hands of Chuck Broadhurst or its designer, Ed Bellinger, has proved itself to be one of the hottest new designs seen in the West in some time. It climbs quite steeply, the slight right rudder tab giving it about one right turn in ten seconds. When the engine cuts, with the left thrust no longer present, the right turn tightens, laying the model smoothly into its glide pattern. Slight wash-in of the right tip keeps it from dropping during the climb, and its drag contributes to the right turning tendency in the glide. A ten-in. prop is used, with a six-in. pitch for a 15-sec. engine run and a four-in. pitch for a ten-sec. run, but Ed feels the optimum props have not been found yet. Ken Oliver has built a 1½A version with about 280 sq. in. wing area and with the rudder mounted on the fuselage ahead of the stabilizer. The Cox 049 pulls Oliver's seven-ouncer up so high in 15 sec. that it is difficult to keep it in sight for five minutes. Trouble like that I should have! . . .

Mylar Tape: Aluminized polyester (Mylar) tape, guaranteed to flash in the sunlight just as the timer is about to declare a model out of sight, can be obtained at the larger photographic supply houses. If the local photo shop doesn't carry it, it can probably be ordered. It is used for slide binding. A 200-ft. roll 1/2-in. wide costs under four dollars and should take care of a whole club



Ed Bellinger's
GYSOB 950

for quite some time. . . .

Torquemeter: At the 1969 Nats indoor events, the large number of contestants who used torquemeters was impressive. Jim Richmond, who won nearly everything in sight, used one, as did Ron Plotzke, who made a 43-min. flight to take first in the Stick event. In the outdoor rubber events, there was one in Wakefield, one in the unofficial Coupe d'Hiver event, and one in Unlimited Rubber—used by your General Correspondent in all three cases.

Torque as registered on a torque-meter is a much better indicator of when a motor has reached its limit than is the number of turns, or the "feel" of the motor on the winder handle. For indoor flying the torque-

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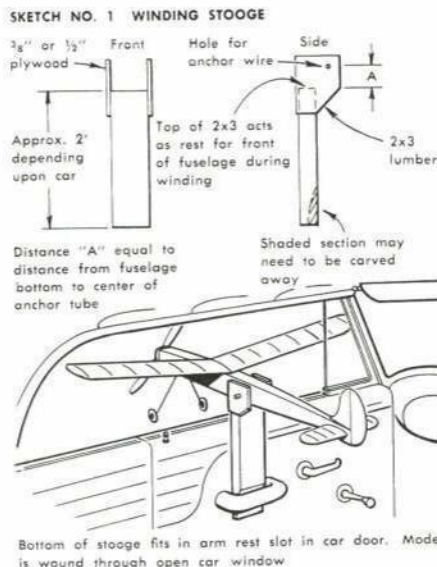
The moment of truth. A big Old-Timer gets aloft. What a difference from the small, fast-climbing Coupes. See article, p. 30.

F/F BOB STALICK
Specialist Correspondent
GLIDER and RUBBER

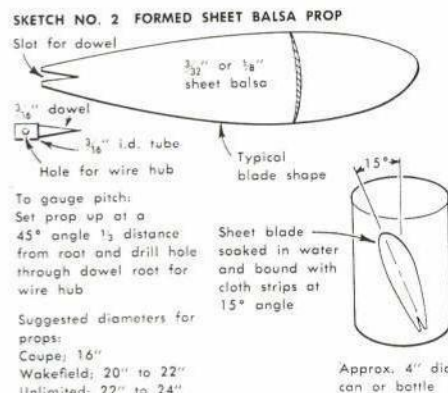
Rubber-Powered Flights: This month we'll focus on the rubber-powered model, a form which has been with us longer than any other. Present-day proponents have refined this propulsion system to a fine art. The writer was fortunate enough to participate, to a small degree, in a fantastic performance of record-setting in AMA's newest official rubber category—Coupe d'Hiver. (As of January 1, 1970 Coupe was no longer a provisional event.)

At the Kent, Wash., Strat-O-Bats (S.O.B.'s for short) Annual Misery Meet, Jan. 18th, John Lenderman, flying an original but standard-design Coupe, set a new AMA record with 18 consecutive two-minute maximum flights. He was stopped only by the new AMA rule stipulating all record attempts must be completed by official sundown. Speculation was that if existing conditions, light wind, 40-degree temperature and non-thermal but buoyant air, had continued, John could have continued indefinitely, as his model was ideally trimmed for these conditions. This suggests that, perhaps, Coupe should have a progressive flyoff system as do most of AMA and FAI F/F categories....

Winding Stooze: Although most contest rubber flyers have a helper hold a model while winding, many modelers are solving



Bottom of stooge fits in arm rest slot in car door. Model is wound through open car window



Approx. 4" dia
can or bottle

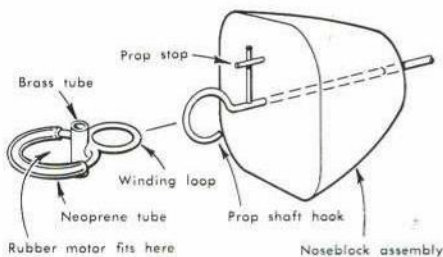
this problem by constructing a winding stooge which holds the model. Such a stooge was recently detailed in this magazine by Frank Heeb. A simple one is shown in Sketch No. 1. Its drawback is that it must be mounted in a car. . .

Props: Rubber-model props have always been approached with much trepidation, but simple, formed props can be made from sheet balsa as in Sketch No. 2. A similar formed prop is featured in the 1969 *American Modeler Annual* in Charlie Sotich's article on his Coupe, "The Dwarf Dip."

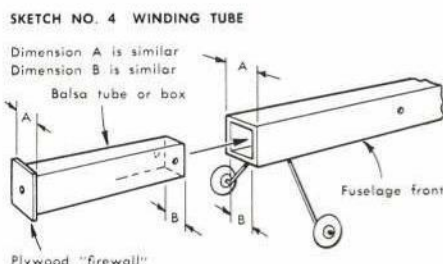
Winding without Prop: The writer vividly recalls one of his early rubber models, a Midwest "Gollywock," which suffered a complete wipeout of prop assembly and fuselage because of rubber breakage. One way of avoiding at least the prop-assembly destruction when the motor breaks is to wind without the prop. Such a device, formed of wire, is shown in Sketch No. 3. . . .

Winding Tubes: To keep the fuselage from looking like last Christmas' wrapping paper after a blown motor, silk-wrapped all-balsa sheet fuselages are common. They are strong enough to withstand the breakage of a fully wound 16-strand motor. Not so common in this country are so-called winding tubes, which allow the motor to be wound outside the fuselage — then inserted into the fuselage when winding is complete. If a motor blows, all you lose is a replaceable balsa tube, not a whole fuselage. (Sketch shows a typical winding tube.) With a tube you must have a helper. . .

Hand-drill for Winding: By the way, most rubber modelers use a rebuilt hand-drill for motor winding. The best way to adapt a hand-drill is to extend the crank handle for more leverage (less tiring) while winding, and to remove the chuck assembly completely. Then firmly wire and solder a $\frac{3}{32}$ to $\frac{1}{8}$ " music wire winding shaft to the drill shaft. A good commercial drill adaptable as a rubber winder is the Sears Ro-



Motor is wound with winding loop. When completed, a wire is inserted in brass tube, winder detached and propshaft hook is inserted in winding loop. Wire holder is removed. Motor and assembly are now ready for action.



Motor is wound in tube. Tube is inserted into fuselage and additional aluminum tube is inserted through both the winding tube and fuselage rubber anchor.

buck cabinet drill. (A ready-made rubber winder, as well as many rubber-model accessories, from bearings to Pirelli rubber, is available from FAI Model Supply.). . .

Winding Pirelli: Pirelli rubber is the most used contest rubber, because of its high-power output. It also has the distinction of being somewhat unpredictable. The following guide will clue you as to how far you can wind this springy stuff.

**Recommended safe (5% margin) max.
Turns per in. lubricated Pirelli.**

Strands	1/4" (6mm)	3/16" (4mm)
4	46	49
6	36	41
8	30	35
10	26	31
12	24	29
14	22	27
16	20	26
18	- -	24
20	- -	23

Next time around, we'll take you through some of the interesting aspects of one of the simplest, yet most challenging, events on the AMA schedule — Hand-Launch Glider.

F/F **CHUCK BROADHURST**
Specialist Correspondent
POWER

Meta-Nemesis: Bill Gieskieng's fabulous Meta-Nemesis flapper FAI Power model is the ship that won the Western Free Flight Association's All-FAI Annual last Nov. 9, at Taft, Calif. The Meta-Nemesis is the only existing example of an advanced design (in my opinion) in the world. It features such things as full wing-flaps, one-bladed prop, recessed Seelig timer, auto rudder, auto stab, fully cowled engine, tuned ex-

haust (built-in) and even a place (hatch) for one's index finger when model is being launched. It is not a design AAM's readers are likely to want to build. But this 3-view is the type of thing FAI power enthusiasts will talk about for years. . . .

Banning of "The Pipe": Those who happened to read this column in the April, 1970 AAM will remember we urged AMA to "show real leadership" by permitting piped models to fly on a handicap basis in the U. S. this year. We were not asking AMA to permit pipes in the FAI Team Selection Program. Our suggestion was confined to permitting them in FAI Power events at AMA-sanctioned contests only.

The intent of this suggestion was that 1970 be used as a period of experimentation to determine — through actual experience under competitive conditions — whether it is feasible to fly piped and non-piped models in the FAI Power event (with the pipe entries under a one- or two-second engine run handicap). Were such experience successful, then the U. S. would be in a position to make a sound proposal to the Committee for International Aeromodeling (CIAM) that the pipe should again be permitted in international competition, but on a handicap basis.

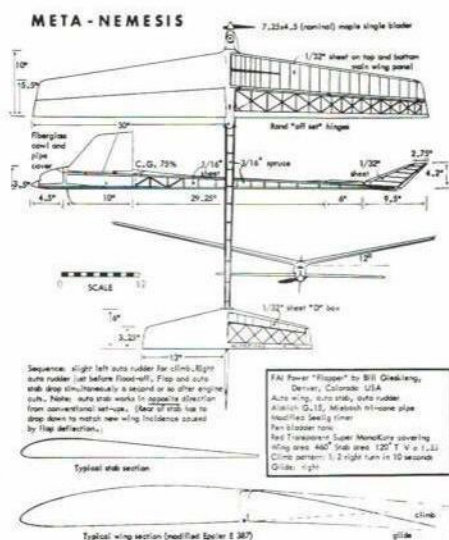
AMA President John Patton has referred the handicap suggestion to the Free Flight Contest Board for a decision. The Board voted 6 to 5 in favor of permitting the pipe to be used this year. But then, after the vote, AMA Headquarters made this announcement: "A majority of seven votes out of eleven was required to effect a change, according to normal Contest Board procedure. Therefore, it is required that FAI Power models not be equipped with tuned pipe exhaust systems for AMA meets in 1970."

Seven votes out of eleven, instead of six, constitutes a majority? Incredible! One might wonder what other "normal" Free Flight Contest Board procedures are in need of reexamination....

Ultrasonic Cleaner: Having problems keeping engine and DT timers clean? Sears Roebuck is advertising its "all new" solid state (transistorized) ultrasonic cleaner. Only thing is, it sells for around \$40, although I picked one up in the mail-order catalogue for \$27.08, including 5% sales tax and 88 cents shipping charges.

Power fliers will find this cleaner to be the slickest thing going. It's great for cleaning Seelig Timers, engine parts, costume jewelry, etc. The cleaning agents I use are L & R Cleaner No. 1 and L & R Rinse No. 3, available from dental supply houses. Be-

Continued on page 84



Bill Gieskieng's automated FAI is loaded-to-the-gills with timers. Uses MonoKote.

F/F **WALT MOONEY**
Specialist Correspondent
SCALE

San Diego Indoor Meet: The San Diego Orbiters' indoor scale meet, Feb. 20, had 15 official entries and half a dozen other scale models that were not entered. Peanut scale had a total of 11 entries, six Open class and the others Juniors. All models had to ROG. Under the 25-ft. ceiling, times obtained were quite good. First in Junior was taken by Kenny Hannan flying a Turbo-Porter designed by his father. His top time was 23.5 sec. Kim Mather had a time of 36 sec. but lost out in the scale judging.

In Open Peanut scale Bob Peck took first and also had the high time of 45 sec. with his Pietenpol Aircamper. This time was equaled by Howard Haupt's Volksplane. In rubber scale, Ernie Wrisley's Beardmore Wee Bee turned in a time of 100 sec. to clean up on the competition.

Peanut scale trophies, crafted by the Orbiters' treasurer, Fudo Takagi, consisted of a plastic "Planters Peanut Man" mounted on a mahogany plaque. They stood about a foot high. These original prizes inspired the competitors to put out their best efforts, and the times for small scale airplanes under a low ceiling were creditable.

Scale judging was by the Mooney simplified system. I line the models up in order of quality, give them points to match their positions in the row. Flight points are given in the same manner: 1 for high time, 2 for second, etc. Scale and flight points are added, and the low scorer wins. Ties are

Continued on page 84

F/F **BUD TENNY**
Specialist Correspondent
INDOOR

Volunteer Instructors: Our opening column (April 1970 AAM) said that indoor modeling isn't hard — just different. Because it is different, the beginner needs two things to succeed: coaching (or "how to" information from some source) and practice. How much practice he gets is up to him and how often he can find a site to fly in, but some special efforts are being made to see that he gets the coaching.

The National Indoor Model Airplane Society is now assembling information and organizing volunteer instructors to help beginners learn indoor techniques. This effort, known as the "Special Action Committee," evolved out of the question, "What are we doing to help beginners in indoor?" Those who asked it, Tedd Kubit, Phill Lawry and Roger Schroeder, were "volunteered" to be a committee to provide the answer.

They have planned a packet of material for the use of local instructors. It will cover building four models of increasing complexity. In addition, the packet will list sources of indoor material and will contain articles by Charlie Sotich. Hopefully, the material will be printed soon and be available to the instructors. Twenty-three instructors have volunteered so far. For list of names and their addresses, write to Editor of AAM

Continued on page 86

C/L**BILL BOSS****General Correspondent
SPORT and SCALE**

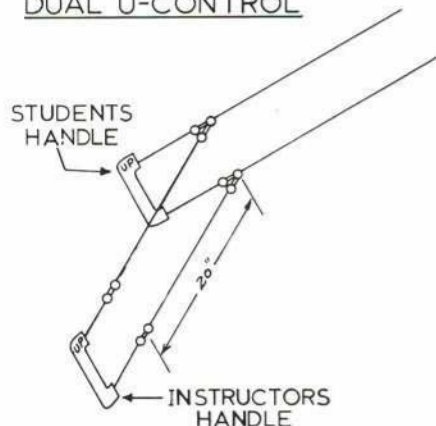
Club Champion Program: The Cholla Choppers MAC, Tucson, Ariz. has a club championship program going that's stirred up plenty of action and enthusiasm. It might be just the thing for a club that needs to revitalize its flying activities. Besides promoting club flying activities, the program also encourages members to greater participation in competition flying.

The Cholla Choppers select two Club Champions (Junior and Senior-Open) based on scores for competitive flying during the calendar year. The point system is based on the type of contest entered and the place won. It is as follows: setting a National or World record, 20 points; winning first through fifth place, 5 to 1 points, respectively. Points also are awarded for placing in an AAAA meet, 10; AAA meet, 5; setting a club record, 2; and 1/2 point just for an official flight in a contest.

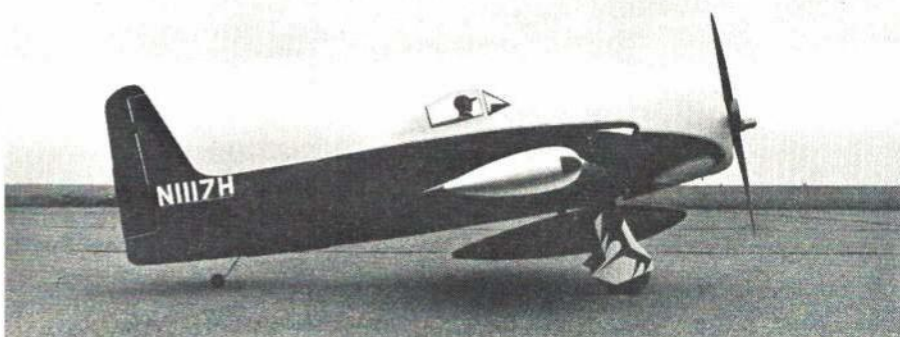
While the Cholla Choppers have restricted their club champions program to control line flying, the concept should work with F/F and R/C, as well. The program covers all facets of competition flying and includes club record activities. Not mentioned in their program is the presentation of awards at an annual dinner, which would certainly top the program off in fine style. Experience shows such a program does create more interest and does provide incentive for flyers to break into events other than their specialty. All that is needed are a few dollars for the annual awards and a willing body to keep the records when the wins are reported at club meetings. (Reported from Cholla Choppers MAC Newsletter.)

Dual U-Control: Jack D. Easley (Ozark, Ala.) wants to keep the beginners flying and that's the reason for a simple but adequate dual-control system. One of the biggest problems facing the instructor and beginner is getting the latter through the first few flights successfully. This is usually a time when many planes are lost and beginners can be discouraged to the point where they won't try again.

Jack feels his control system solves the problem by permitting the instructor to take over control of the plane at any time. To use the control system, the instructor, who stands away from and behind the stu-

DUAL U-CONTROL

One of the best systems seen yet for dual instruction in control line. It is crash stopper.



Rabe and the Bearcat won stunt at King Orange. Eyecatching model is quite near scale. Drop tank added for looks. In spite of weight and drag, it has no adverse effects.

dent, can take over control simply by taking up line tension, give the necessary instruction, and then return the flying to the student by release of the line tension on his handle.

This system's chief advantage is that the beginner walks away from the circle with a plane that can be flown another day, thus encouraging him to stay with the hobby.

Rabe's Bearcat Takes King Orange: Al Rabe won the King Orange with his scale-like Stunt Bearcat, featured in the March 1970 AAM. Rabe had added a drop tank to the underside of the fuselage to improve the Bearcat's already good scale appearance. This increased plane weight only 1 1/2 oz. and had no adverse effect on its flyability. It did not seem to fly slower or encounter vibration or airframe buffeting. Rabe's success shows that a plane can look like the real thing, fly well and win. Perhaps more scale-like planes will be seen during the 1970 season.

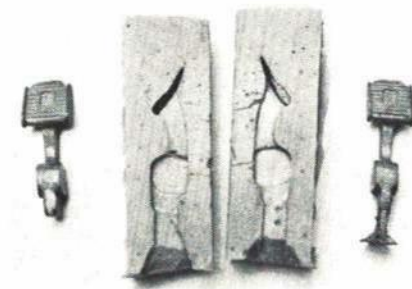
Quick Holes: Thomas Black (Carmichael, Calif.) suggest a way of making holes in wood, such as lightweight plywood firewalls, when a drill is not available. A nail or piece of piano wire the appropriate size can be used to make the required hole. Tom says, "All you do is heat the nail or wire until it is red hot, hold it with a pair of pliers and push it through the wood at the desired location." Experiment on a piece of scrap to make sure the hole will be the proper size. Because of the possibility of

usually is available in arts and crafts stores.)

First, obtain a photograph or drawing of the rudder pedal. Make a hardwood carving in the proper scale size to serve as a molding pattern. Be sure to get all possible detail in the carving, making it as accurate as possible. When finished, sand and cover the wood with several coats of clear dope.

Next, make a soft cardboard box about 1/2" larger than the pedal pattern on all sides, and with the top open lengthwise. Using straight pins through the ends of the box, suspend the pattern in the center of the box. Mix the Silastic rubber according to instructions and in the amount required to fill the box. After compound has cured the proper length of time, remove the cardboard box. To remove the pattern from the rubber, take a single-edge razor blade and, starting on one end, carefully cut through the rubber until the cutting blade just touches the pattern. Continue cutting around the rubber block to the starting point. Note: do not cut too deep or too fast, else the pattern or rubber block for the mold will be destroyed. Once the cutting operation is complete, separate the two halves of the rubber mold and remove pattern. An opening or channel must be cut on one end of the mold. To make the pedals, accurately line up the two halves of the rubber mold and hold them together with small rubber bands. Mix an appropriate amount of resin, pour into mold, let cure over night in a warm place. Remove the cured pedal, paint as desired, and mount in plane. With care the mold can be used to make as many pedals as required.

Mounting the pedals is up to the modeler. Some might want to set them in solidly for that scale look, while others might want to make them operational.



Homemade silicone molds make epoxy rudder pedals. Easy, make anything, see text.

burns or fire, caution must be exercised if this procedure is used.

Scale Rudder Pedals: Here's an item for ardent scale modelers to try. Many vintage model planes have rudder pedals that come through the cockpit much like the clutch and brake pedals of older cars. This type of rudder pedal can be duplicated by use of fiberglass resin and Silastic rubber molding compound. (Silastic rubber compound

C/L**JOHN SMITH****Specialist Correspondent
SPEED and RACING**

Fathers and Sons: This month we have a couple of very special photos. One shows a fine lineup of Goodyears built and flown by the father-and-son team of Gene and Bob Patty, members of the Key City Prop Twisters of Abilene, Texas.

The second shows another father-son team from Worridge, Ill. Mark and his father, Chuck Bauer, check out another Goodyear racer for the coming season. Both pictures



Goodyear is ideal event for father and son teams. Here Mike and Charles Bauer check glow plug. Guess who does the flying?

show fathers and sons working together in a mighty fine hobby.

New Products: Midwest Products, Hobart, Ind. Proto speed pans, magnesium castings, \$4.95. These will make good pans for 40-class speed models. Also has a nice tap-and-die set that will come in handy to tap the pans. (Set of three taps and dies with tap wrench for \$6.95.)

K&B Engines, Downey, Calif. still have some piped 15's for FAI speed at \$100.00 each. These are all handmade by the master of FAI, Uncle Willie Wisniewski. Also reports that piped 29's and piped 60's will be available late this summer.

Dale Kirn tells me he is building a new single-line control unit. More to come. . .

Contest Preparations: Contest season is here, so let's get everything nailed, glued, screwed, and bolted together in a neat and orderly way. Not only does this make things go faster, it makes them safer. Don't start off the summer with an accident. For beginners in speed, balance your props well with one of the many good balancers on the market. These speed engines turn up pretty fast and will shed blades of an out-of-balance prop. Remember, no plastic props on these big engines. When you adjust the needle on the engine, stand behind the prop arc, just in case.

Building tip: for those who use clear resin for a finish, try using it as a glue. This works well for those who build with different kinds of wood, and who like the laminated look. With this system no glue joint shows through the clear finish.



The variety of real subjects and bright colors make Goodyear popular. Planes use 15 engines, are easy to make and fly.

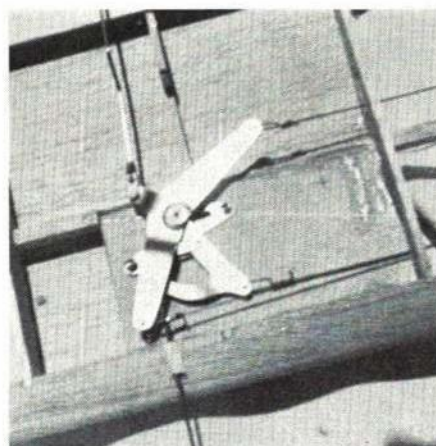
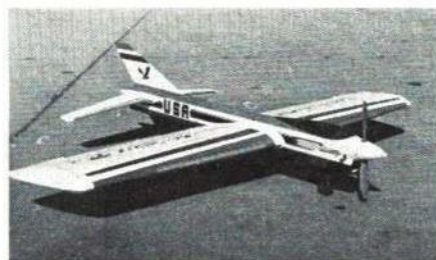
C/L JOHN BLUM Specialist Correspondent CARRIER and STUNT

Acrobatic Rules: Letters on the same subject arrived in the same mail from two modelers in different parts of the country. Jim Silhavy (475 Meadowlane Rd., Seven Hills, Ohio 44131) and Tom Niebuhr (301 Avant Dr., Hazelwood, Mo. 63042) voiced opinions and suggestions on comparing AMA precision Acrobatics rules to the rules of FAI Precision Acrobatics.

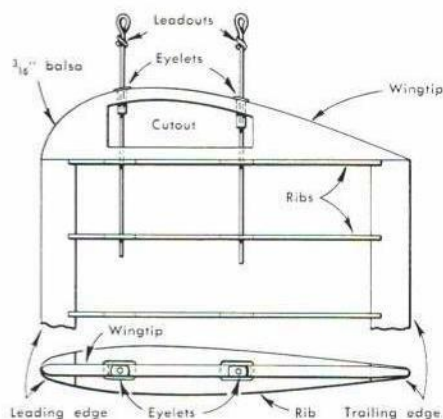
Jim, well-known in Nats stunt competition and an FAI team member, strongly suggests certain rules changes to AMA. The first proposal covers the rules governing the scoring of appearance of models. Jim feels all appearance points should be eliminated from the contestants' scores. His intentions are to: (1) place emphasis on flying; (2) prevent discouragement of novices because their models are not competitive in appearance; (3) stop the "daddy-builds" from gaining 10 to 15 appearance points over those flyers who build their own; (4) compare with FAI which awards no appearance points.

Tom, an experienced judge, agrees with Jim and notes that the beauty (appearance) points are hardest to determine. Establishing criteria (ground rules) in order to be completely fair is most difficult. He cites the Builder of the Model rule and the necessity for drawing a line between the completely built-up model and the one with the foam wing, as well as the MonoKote versus the hand-rubbed finish. Is it from a kit, magazine plans or is it an original? These reasons are sound and agree with mine. Some have expressed the philosophy that a modeler, regardless of competition scor-

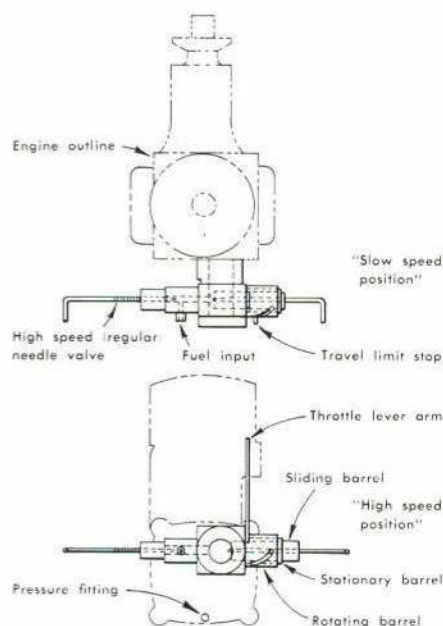
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Heart of most carrier models is a J. Roberts or similar crank system. Needs three lines.



Anonymous reader suggests gluing leadout eyelets in place after covering. See text.



Homemade dual-needle throttle setup by the Wilsons is similar to several commercial units but has the best features of each and is for use with pressure fuel systems. Used on converted Rat Race K&B 40, it gives dependable variable-speed operation.

Gierke's beautiful All-American Eagle. Don't miss his article on finishing—this issue.



Athens, Greece. Eighth Panhellenic Aero-modeling meet. Lots of Noblers and O.S. 35's.

Where the action is... Control Line

GETTING STARTED IN R/C

How transmitters function.

HOWARD McENTEE

BACK in Part 28 we discussed in modest detail how R/C receivers work. Now let's take a look into the gadget that provides the signal—the R/C transmitter. We can break this unit down into some four parts—the RF section (includes the antenna), the modulator, the encoder, the power supply. The latter is simply a battery, either the dry type or nickel-cad, so we have three sections to discuss.

The RF (radio frequency—see Glossary, Part 29, April 1970 AAM) department in most transmitters consists of two parts—the oscillator and its circuitry, and the power amplifier and its circuitry. All our R/C transmitters are crystal-controlled; this means that a tiny quartz crystal, cut to extremely close tolerances, determines the transmitter output frequency, provided everything is tuned properly. The oscillator circuit is simply an amplifier, with some of the output coupled back to the input. Those who remember when house telephones had a separate receiver will recall that if the receiver were brought very near the transmitter a howl developed; this action produced an audio oscillator because some of the output from the receiver (which, with the other inner circuitry, is a modest amplifier) was fed back to the input—the microphone. Therefore, the crystal circuit in the transmitter oscillates, producing RF output at the exact required frequency. The crystal itself acts as an extremely efficient and sharply tuned circuit; its characteristics lock the output onto the desired frequency.

In our sketch we couple the oscillator output to the PA (power amplifier) via a tuned circuit. The latter functions mainly to match the two transistors more efficiently. The PA is simply an amplifier—we don't want it to oscillate. Through poor design or faulty components it can do so and usually on a frequency we don't want! The PA should provide an exact duplicate of the signal it receives from the crystal oscillator, but boosted several times in power. How can that little transistor do such boosting? It draws more current from the battery to do the job. Most transmitters have a tuned circuit on the output; again, this is mainly to match the transistor output circuit to the antenna. They would be a poor match otherwise, and power would be wasted (turned into heat in the transistor, not utilized to project a signal outward from the antenna). Some R/C makers warn the user not to do extensive testing with the transmitter antenna collapsed, as it would be for short-range checks. Collapsing the antenna detunes the entire output circuit, and the net result is often transistor overheating.

So much for the RF section. Now the modulator; in the simpler transmitters (those used with escapements, sequence servos or pulse propo) the modulator impresses an audio tone on the RF output. The tone might be generated by the modulator transistor itself, or it could come from a separate AF oscillator. This tone may be fed to the oscillator as we show here, to the PA, or to both. In any case, the result is to turn the

PA on and off smoothly at an audio tone. You might wonder how this is possible, if the modulator is connected only to the oscillator. Transistor PA's have the unique property of drawing very low current—often only a few milliamps—unless they are being driven by RF from the oscillator. The latter, in turn, can be turned on and off at an audio frequency by the modulator, and the PA will then follow right in step to produce a modulated RF output. In low power transmitters, the PA is often modulated directly, allowing the oscillator to run steadily at its selected radio frequency.

The modulator must in turn be controlled by an encoder, a unit which sends the proper sequence of pulses to trigger the control movers in the model. For escapement systems, the encoder is usually simply a push-button, coupled closely to the pilot's thumb. In pulse propo, the pulser is the encoder, and the modeler moves a lever or knob connected to a variable resistor in the pulser circuitry to handle the surface mover in the model. Thus we have a complete transmitter, consisting of all components in our sketch to the right of the vertical dotted line.

There are several added points we should mention here. Some transmitter RF units may have more than two transistors. For example, many 72 MHz units have an extra transistor stage between oscillator and PA; its main function is to "double" the output frequency of the oscillator. The crystal in such a transmitter will be marked for one half of the actual output frequency. Higher frequency crystals are more expensive, more fragile, and less efficient; thus it is preferable to use the doubler for 72 MHz transmitters.

The tuned circuit between PA and antenna, as we noted above, serves mainly as a medium for more efficient coupling; but it also helps to suppress undesired harmonics. Imperfect amplifiers produce not only an amplified copy of the desired frequency, they also produce (usually at a considerably lower level) second, third and other harmonics. Thus a 27 MHz transmitter can put out quite a strong signal on 54 MHz, also on 81 MHz, etc. Proper design and tuning in the

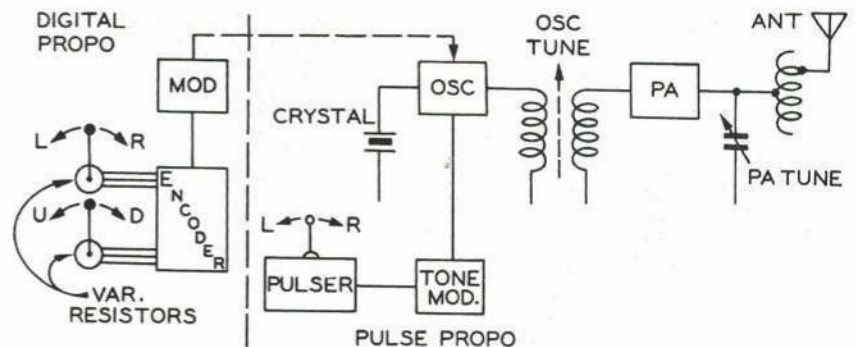
PA output and antenna reduce these harmonics to a very low level.

The simpler pulse propo systems vary just the pulse length. More complex systems also vary the pulse rate. They might also have provisions for sending steady audio tone or for cutting the tone off entirely (usually used to move the engine throttle). All this pulse variation occurs in the encoder department; the RF section of the transmitter simply follows along, as controlled by the modulator.

Now what about the more complex digital transmitters? Most of them have an RF section just about as we have described and a modulator to turn the RF output on and off. Thus a digital transmitter would include the upper components to the right of the vertical dotted line, but we drop the pulser and its connected modulator and, instead, add the modulator and components to the left of the dotted line. Here again, the modulator simply turns the transmitter on and off as the system requires. For reasons mainly of greater immunity to interference, digital transmitters send out a steady RF signal, which is cut off for extremely brief and precisely timed intervals by the modulator, under the influence of the encoder. The latter produces a pulse train (See Part 27 of this series, Feb. 1970 AAM), the individual pulses of which are varied in timing by variable resistors linked to the control sticks. We have indicated only two such controls, but there can be as many as 10—one for each control that the system can handle.

While all modulation of a pulse propo transmitter (or one that controls an escapement) is accomplished by turning an audio tone on and off by push-button, keyer or pulser, digital modulation acts a bit differently. The encoder always sends the same number of pulses in a continuous string; the pulses are moved a bit in reference to each other in the string. Thus, while we don't actually have an audio oscillator as such in a digital transmitter, the string of off-pulses does produce what amounts to an audio tone, which you can hear by listening into a monitor. You can also hear slight variations of the overall composite modula-

Continued on page 73



royal will get you off to a flying start in the 70's



Look for
this symbol,
it's your
best choice
in radio
equipment
by the
engineering
leaders of
the 70's.



The Royal Classic 70 Series is a unique combination of innovation and reliability.

The receiver features high quality components and a six channel decoder in a single deck. The case measures 2 1/8" by 1 1/2" by 3/4" and weighs only 1.7 oz. It also features a separate charge plug on the switch harness.

The Classic 70 Transmitter has been reduced to 6" tall, 7 1/2" wide, and only 2" thick. The dark metallic blue vinyl case features an exclusive recessed antenna mount. Choice of stick assemblies includes Kraft 2 Axis, (4 and 6 ch) Kraft

3 Axis, (4 and 6 ch) and Royal 2 Axis, (3, 4, and 6 ch). Available in all the standard frequencies.

All the Classic Servos contain Royal 10 Silicon Transistors and a high power, high resolution amplifier. Available in Orbit PS-3, and PS-4, Kraft KPS-10, KPS-11, and KPS-12 and EK MM-4 mechanics.

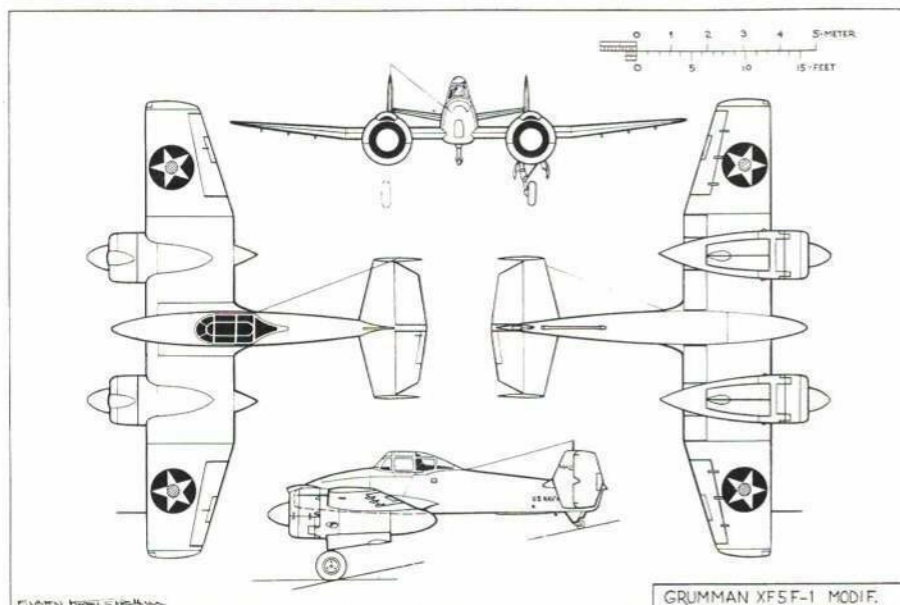
The airborne power pack is the smallest and lightest available for a normal day's flying time. It weighs only 3 oz. with connector and is 2-1/2" by 1-7/16" and 13/16".

Stick Type

	Kraft Two St.	Kraft Single	Royal Dual
3CH	—	—	\$289.95
4CH	\$389.95	\$409.95	\$349.95
6CH	\$419.95	\$439.95	\$379.95

System includes Transmitter, Receiver, Switch Harness, Charger, Rechargeable Battery, and 4 Servos.

Royal Electronics Corporation, 2119 So. Hudson St., Box 22204, Denver, Colorado 80222



From Skyrocket

GRUMMAN HAD TWIN

When single-seat Navy monoplane fighters were beginning sea tests, the inauguration of heavier twins was a bold venture.

BJORN KARLSTROM

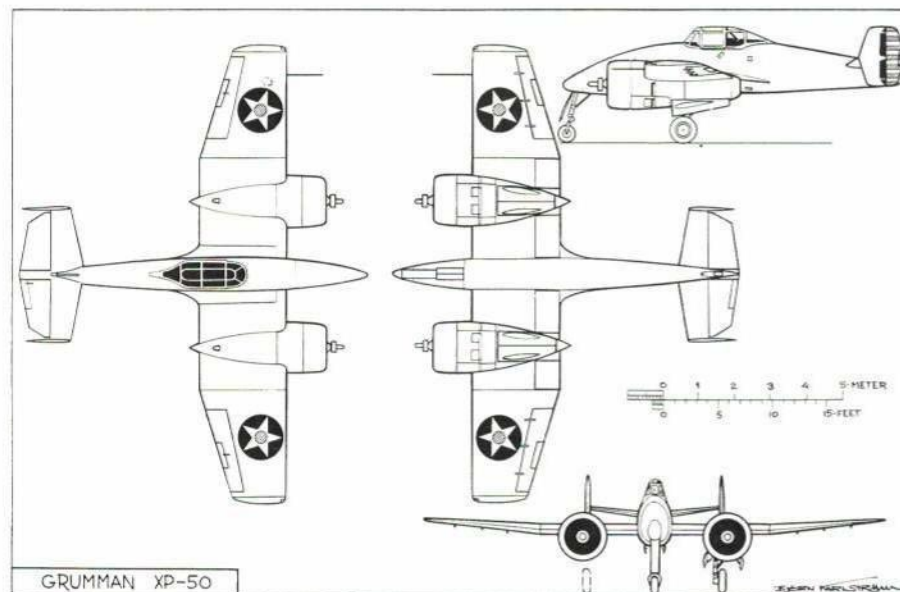
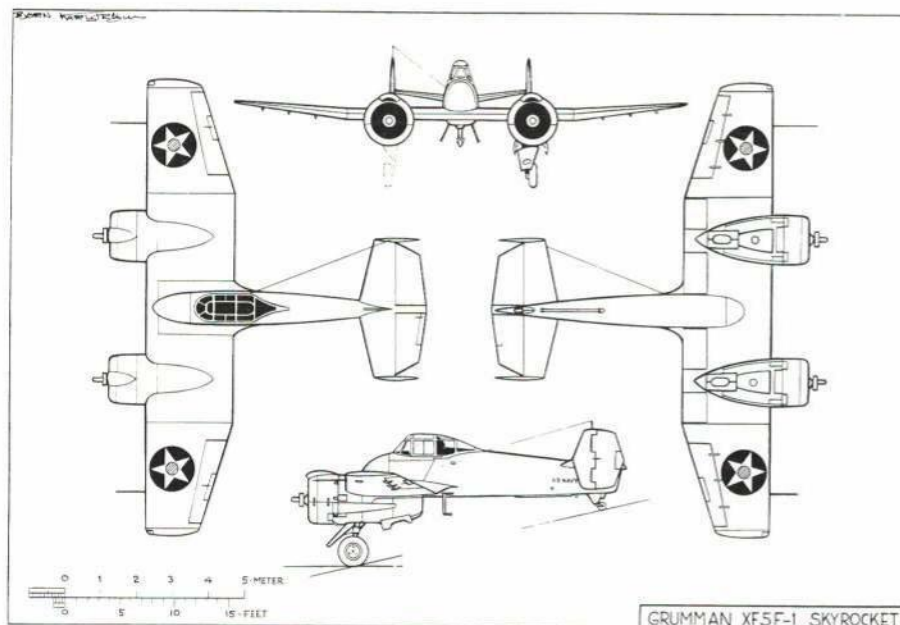
ON June 30, 1938 the U. S. Navy ordered a revolutionary, if not extreme, prototype from the Grumman Aircraft Engineering Corp. This new shipboard fighter was designated the G-34 and had a twin-engine layout, very bold for a time when the single-engined shipboard-fighter monoplanes were just commencing trials.

The G-34 was flown for the first time on April 1, 1940 under the Navy designation XF5F-1. No armament was fitted, but provision was made for the installation of twin 23-mm Madsen cannons. Cooling troubles immediately manifested themselves and modifications to the oil-cooling ducts delayed the test program until February 1941. Further modifications proposed by the Navy included new armament, a longer fuselage nose, and lengthened engine nacelles fitted with spinners.

Flight tests resumed on January 15, 1942, but by this time Grumman already had begun working on another, more advanced twin-engined shipboard fighter, the G-51, later to be the F7F Tigercat. The XF5F-1 test program was continued to provide information for the development of the later prototype.

On February 3, 1942, the Skyrocket's undercarriage was torn off during platform landings, and the airframe badly damaged. Repairs were carried out but a similar accident happened on May 18, 1942. After further repairs the flight trials continued until June 13, 1944, when the undercarriage collapsed while the machine was parked at Anacostia. After an undercarriage failure on December 11, 1944, when the aircraft belly-landed at New York, it was written off the active list the following day.

While building the prototype XF5F-1



to Tigercat

Grumman offered a similar machine, the G-46, to the Army Air Corps in 1939. On November 25 a prototype was ordered under the designation XP-50. This design was essentially similar to its shipboard counterpart but to provide a housing for a nose-wheel, the nose was lengthened and provision made for self-sealing gas tanks and pilot armor.

The XP-50 flew for the first time on May 14, 1941, but the aircraft was destroyed during this initial flight by a turbo-supercharger explosion. No further experiments were carried out with this design.

Meantime, work progressed on the project G-51. This design owed much to the G-34 (XF5F-1 Skyrocket) but bore little resemblance to the earlier shipboard twin-engined fighter. Two prototypes were ordered on June 30, 1941, under the designation XF7F-1, the first flying in December 1943.

The Marine Corps ordered 500 production machines to equip their shore-based units, and the first F7F-1 Tigercats appeared in April 1944. Like the prototype, it and the next 33 airframes were single-seaters. The 35th production machine was completed as a two-seater and designated F7F-2N. The second seat for the radar operator occupied the space behind the pilot which originally housed a big fuel tank. Therefore the original fuel capacity of 430 gal. was reduced to 380 gal. Furthermore, the nose-mounted battery of machine guns was deleted. In 1944, 30 two-seaters were produced and by March 1945 another batch of 34 had been completed.

Next on the production list came the F7F-3 which essentially was similar to the single-seat F7F-1 but fitted with R-2800-34W engines. Compared with the earlier Double Wasp engines (-22W) of 1600 hp the new engine offered 1850 hp at 15,500 ft. Fuel tankage also was increased to 460 gal.

The F7F was too late to see operational service with the Marine Corps squadrons, and post V-J Day cancellations restricted the production of the F7F-3 to 183 machines.

A postwar version, -3N two-seat night fighter development was built in 60 examples in 1946 and the production terminated with 13 -4N two-seaters which had a re-designed radar nose. Those last 13 Tigercats were the only ones equipped for shipboard use!

XF5F-1 SKYROCKET

Single-seat shipboard interceptor prototype. Dimensions: Span 42' 0"; length 28' 8½"; height 11' 4"; wing area 303.5 sq. ft.

Weights: Empty 8107 lbs.; loaded 10,138 lbs. Powerplants: Two 1200 hp Wright XR-1820-40/42, 9-cyl. radial aircooled engines.

Performance: Max. speed 383 mph at sea level, 380 mph at 16,500 ft.; range 1,200 miles at 210 mph; max. climb rate 4000 ft./min.; service ceiling 33,000 ft.; absolute ceiling 34,200 ft.

Armament: Four 0.5-in. machine guns with 400 r.p.g. plus two 165-lb. bombs.

XP-50

Single-seat interceptor / fighter-bomber. Dimensions: Span 42' 0"; length 31' 11"; height 12' 0"; wing area 304 sq. ft.

Weights: Empty 8307 lbs.; normal loaded 10,558 lbs.; max. loaded 13,060 lbs.

Powerplants: Two 1200 hp Wright R-1820-67/69, 9-cyl. aircooled radial engines.

Performance: Max. speed 424 mph at 25,000 ft.; range (light fuel-load, 220 gal.) 585

Continued on page 90



All photos Howard Levy

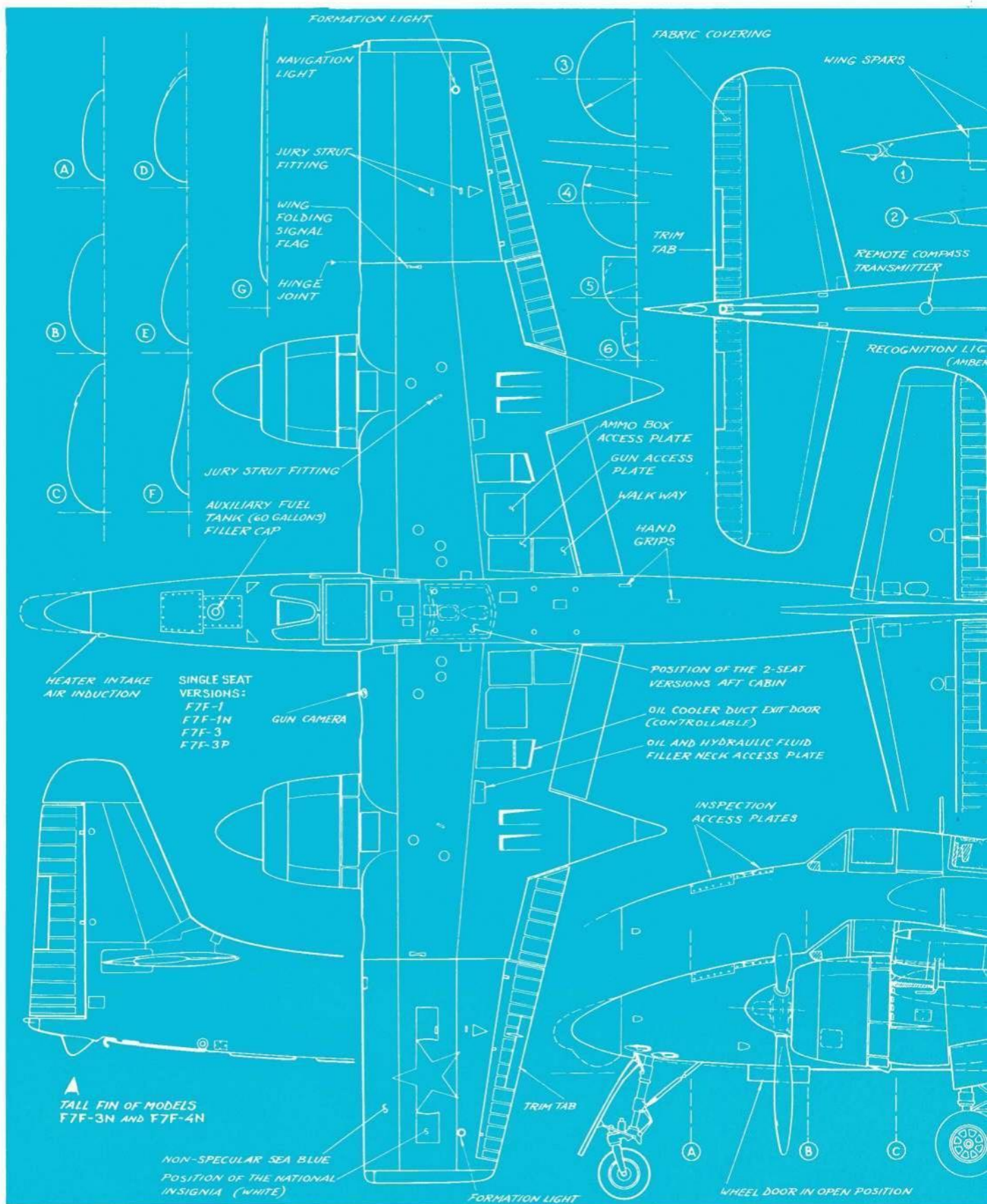
XF5F-1, first flown on April Fool's Day, 1940, was ill-fated from the start but contributed heavily toward the F7F know-how. Well named, Skyrocket climbed 4,000 ft./min.



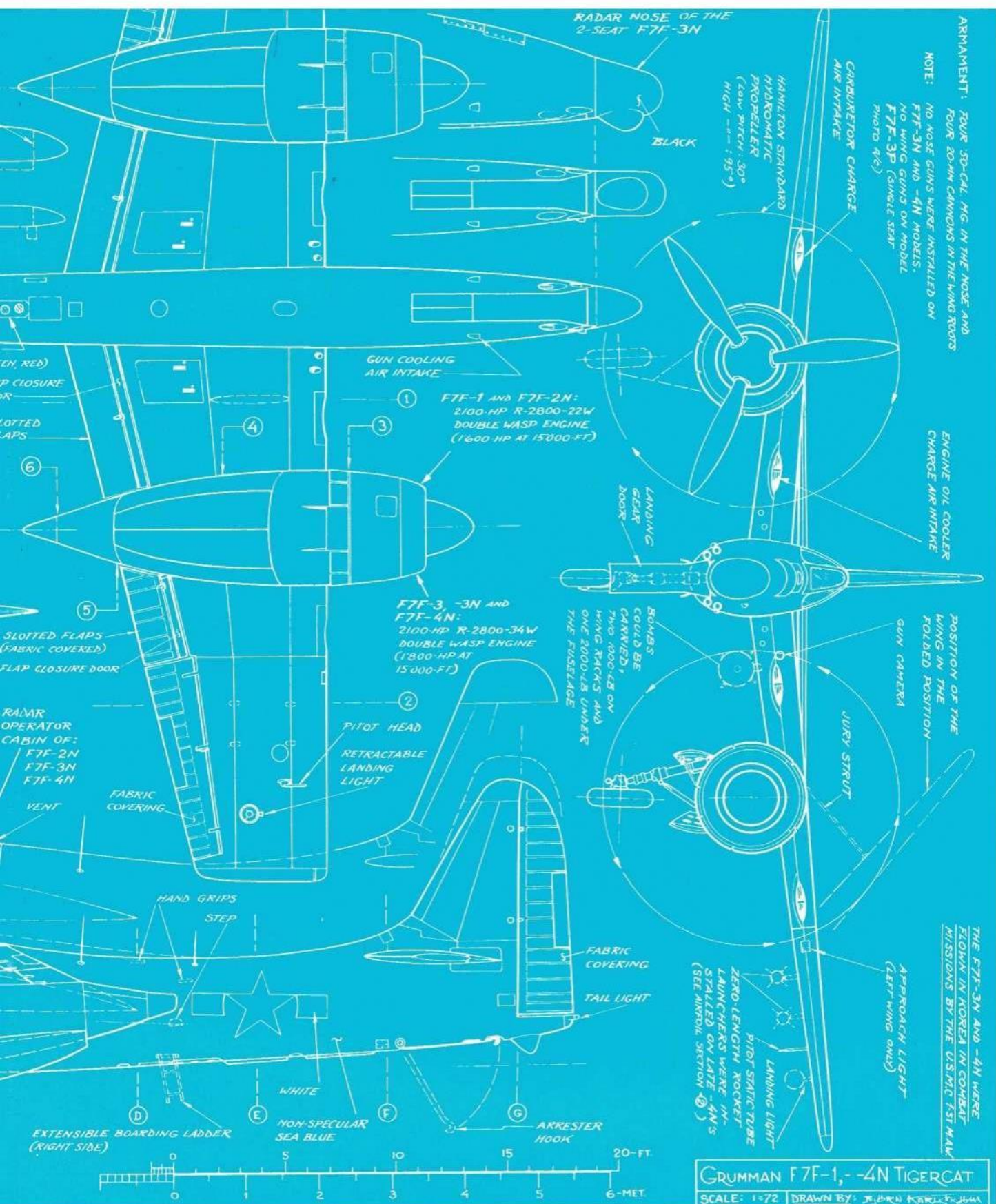
Snub-nosed fuselage of the "5F" was a distinctive feature which provided its pilot with unexcelled over-nose visibility. But nose was lengthened for early 1942 testing.



The formidable F7F-1 was already under development fully two years before the Navy gave up on the Skyrocket. In substantial production by VJ Day, it also was built as a night-fighter.

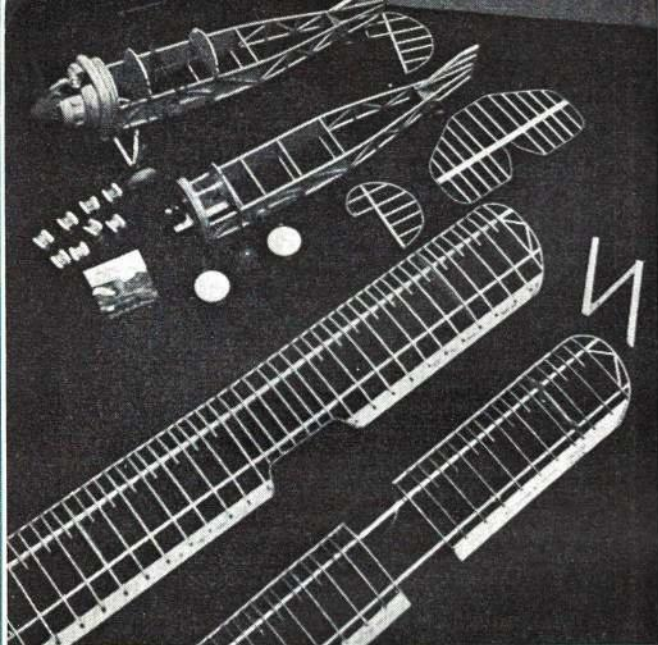


Grumman F7F-1-4N Tigercat



THE F7F-3N AND -4N WERE FLOWN IN KOREA IN COMBAT MISSIONS BY THE U.S. MC F31 MAW

Grumman, a long-time Navy favorite for no-fooling production of military aircraft, got off to a stubborn development of twin-engine carrier fighters with the wild Skyrocket. (It flew on April Fool's Day, 1940.) The Tigercat, which was the direct descendant, displayed little hereditary resemblance. It did manage to get into post-war combat operation in the Korean affair.



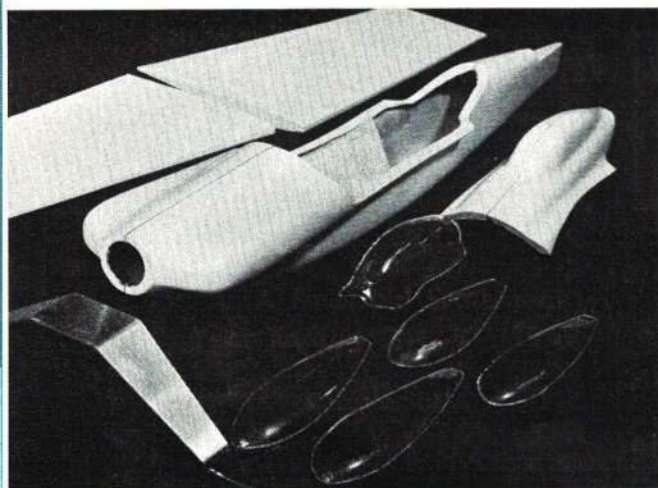
Citoxe Models/Travel Air 4000-B. First of a new line of scale kits from Golden Age era, **Travel Air** uses authentic built-up construction throughout, highest grade materials. Can be assembled for display, free-flight, or lite-weight R/C. 33" span, recommended power, 049 for free-flight, 099 for R/C. Coming next: **Pittairn Mailwing**. \$19.95 postpaid. **Citoxe Model Airplanes**, 109 Matty Ave., Mattydale, New York 13211.



NEW PRODUCTS CHECK LIST

Write the manufacturers for more data; tell them, "I saw it in *American Aircraft Modeler*."

FRANK PIERCE

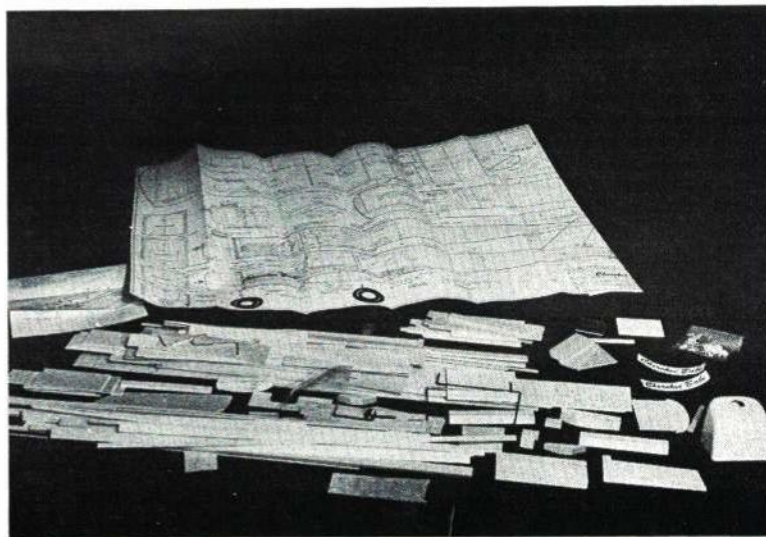


K & K Fiberglass Co./El Bandito. New pylon racer fiberglass fuselage, clear formed canopy, steel landing-gear struts and formed wheel pants. **'Bandito'** recommended for 40 engine, weighs 5 lbs. with 46" span. Foam core wings also available. \$49. Also available from **K & K Industries**, 901 Camden Ave., Campbell, Calif. 95008.

Sterling Models/Schweizer Sailplane. 8' 2½" wingspan, model can be flown single-channel through full-house with optional power-pod launching. Extensive use of plywood and pre-fabbed parts throughout, model uses special Eiffel 400 airfoil for best soaring qualities. \$23.95. **Sterling Models**, Belfield Ave. and Wister St., Philadelphia, Pa. 19144.

VK Model Aircraft Co./Cherokee Babe. Hi-performance multi-channel R/C operation possible with 53" wingspan **Babe**. Recommended for 35 engine for most applications, model grosses only 3½ lbs. Built-up balsa fuselage, heat-resistant cowl, formed canopy. Not for beginners. \$26.95. **VK Model Aircraft Co.**, 12072 Main Rd., Akron, N. Y. 14001.

K. J. Miller Corporation/Paint spraying kit. For home and hobby use, complete kit provides pressure spray gun, siphon gun, shading brush, two extra nozzles for painting flexibility. Includes 110-volt piston-type compressor and 12' air hose to provide 20 to 25-lbs. pressure. \$56.90. **K. J. Miller Corporation**, 8846 W. 47th St., Brookfield, Ill. 60513.





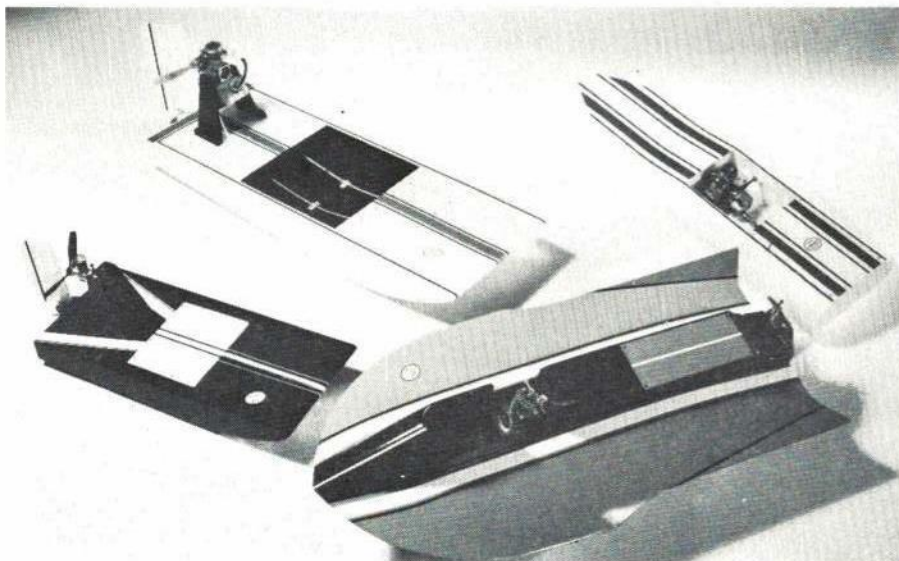
Marine Model Co., Inc./New catalog. For military and marine hobbyists. 128-page catalog includes precision ship models, figureheads, field pieces, scrimshaw, etc. 75 cents from **Marine Model Company, Inc.**, Dept. AL, Halesite, L. I., New York 11743.



Hobby People/New catalog. New, 96 pages all types of hobby merchandise. Gas and rubber models, R/C equipment, engines, car and ship models, tools, HO train gear, science equipment. **Hobby People**, 130 E. 33rd St., Los Angeles, Calif. 90011.

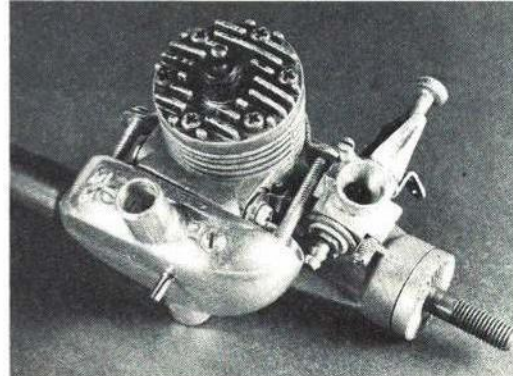


Dremel Mfg. Co./Motor-speed control. For precision use of hand drill, speed control is a must. New solid-state unit provides continuous speed control for brush-type and shaded-pole motors. Three-wire grounding, circuit breaker, max current 5 amps. For either 110- or 220-volt supplies. **Dremel Manufacturing Co.**, Box 518, Racine, Wis. 53401.



Dumas Products, Inc./New boat kits. From left to right: Li'l Swamp Buggy, Swamp Buggy, Drag'n Fly, SKdaddle. All feature birch plywood. Use optional R/C and 049

power on Li'l Swamp Buggy, 19's on others. \$5.95, \$14.95, \$15.95, \$21.95, respectively. **Dumas Products Inc.**, Box 6093, Tucson, Ariz. 85716.



Tatone Products/Exhaust manifold. Available for 09-19, 29-35, and 45-65 engines, multiple outlets provide for installation of tail pipe in either upright, inverted, or tail-end position. Allows best positioning of pipe even with small cowling or scale design. \$3.95, \$4.50, and \$4.95, respectively. **Tatone Products**, 4719 Mission St., San Francisco, Calif. 94112.



O. S. Max / 50 R/C engine. Uses low-expansion alloy piston and special alloy rings, new Max designed specifically for R/C. Features coupled carburetor and exhaust-port throttle for optimum smoothness and transition over speed range. Normal rpm range, 2- to 13,000. Ball-bearing construction. Available in 50 or 58 size. \$36.98. **World Engines**, 8960 Rossash Ave., Cincinnati, Ohio 45236.



MRC Enya / New 35 engine. Model 5224, designed especially for stunt and control line flying. Standard, \$17.50. Ball-bearing engine, \$22.50. **Model Rectifier Corporation**, 2500 Woodbridge Ave., Edison, N. J. 08817.

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PLANES JUST FOR FUN!

Easy to build, easy to maintain, and low in cost and upkeep, this new breed is fine for beginners. AND more and more of the big plane fliers are joining in on the fun so they can keep their hands in--or teach their youngsters.

To help the Fun Plane along, Ace is offering two plans now. More later. These are full size with enough details to allow almost anyone with just a bit of experience to build and fly. They are designed specifically for radio gear of no more than 3 ounces--and here is where the new Commander R/O Baby Twin pack comes in. Just right and proven dependability!

Rudder-Only does allow you much more than simple steering--you can do loops, spirals, Split S, and many more. You can gain or lose altitude simply by widening or tightening your turn.

DICK'S DREAM

This 34" job is designed by Owen Kampen. Named for the late Dick Adams who developed the magnetic actuators. Essentially this is a scaled down Whiz Kid, but has a few features especially for this size plane. Easy construction. Plans are full size.

No. 13K29--Dick's Dream Plans \$1.00

CITABRIA

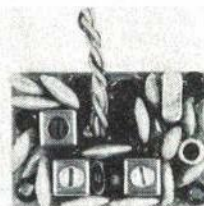
This semi scale is a design by Roman Bukolt. Has 34" span and features simple slab construction. Another eye catcher at the Toledo Conference. Full size.

No. 13K30--Citabria Plans \$1.00

CAMOUFLAGE SHEEN

Camouflage Sheen was discovered and developed by scale modeler Bud Atkinson. Dave Platt, Maxey Hester and other modelers have picked it up as THE way of giving their models that dull camouflage finish. It is ideal for dull black anti-glare shading, wheel wells, dull scale props and other finishing uses.

No. 24L56--Camouflage Sheen, 4 oz. \$1.50
No. 24L57--Camouflage Sheen, 12 oz. 3.95



NEW! NEW! NEW! NEW! NEW! NEW! COMMANDER DE GEM RECEIVER

The designers of the fabulous Commander DE Receiver have miniaturized and weight has been reduced! The new Commander DE Gem Receiver measures only 1 1/16" x 1 1/2" x 1/2". Weight of the bare receiver is approximately .5 ounce.

This is superhet equipment, and uses the same high grade components as the proven regular Commander DE. As a matter of fact, some of the exact same components, such as IF cans and RMC capacitors, are used in the mini version, simply because they have proven themselves and are not finicky as far as tolerance or temperature is concerned. This does not allow as great a shrinkage, but it does make for dependability.

The new Commander DE Gem is double ended for output into a dual actuator. However, it may be converted quite easily to single ended operation to feed into an actuator of the Bentert type.

Operation is on 2.4 volts with phenomenal range. May be used with 3 volts.

No. 12K2--Commander DE Gem Rx \$31.50

NOTE: The Standard Commander DE and SE receivers are furnished in the Commander Pack ages. The GEM is offered separately at the present time.

RAND PRICE REDUCTION

Since the time we acquired the Rand Manufacturing facilities, we have run a very careful cost analysis of the actuators and GG pack and Dual pack. In view of lower overhead and economy effected because of continuing mass production, we are happy to announce the reduction in price of a number of these units. The savings are not as a result of any short cut. The same high quality as always.

When so many other prices are rising, it is with pleasure that we announce the following reductions:

No. 14K127--HR1, formerly \$14.95, now only \$11.00
No. 14K128--HR2, formerly \$18.95, now only \$14.00
No. 14K126--LR3, formerly \$19.95, now only \$15.00
No. 15G40--GG Pak, formerly \$39.50, now only \$33.50
No. 15G46--Dual Pak, formerly \$75.00, now only \$60.00

(All units shipped since February 2, 1970, have been invoiced at the foregoing prices)

DEVCON!

No. 24L143--5 Minute Epoxy \$1.25
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DOW CORNING SILASTIC RTV 732

General purpose silicone rubber adhesive and sealant needs no catalyst or heat. Reacts with moisture in air and vulcanizes in 24 hours at 77 degrees F and 50% relative humidity. Moisture resistant and heat stable. Tack free under one hour. Two ounce tube. White.

No. 24L15--Dow Corning Silastic, 2 oz. 1.50

We Have The PULSE of R/C!

**PROVEN RELIABILITY! IN PRODUCTION NOW! LIGHT WEIGHT SYSTEMS!
VERSATILITY FOR SMALL PLANES; POWERFUL ENOUGH FOR LARGE JOBS!**

The reception of our Commander R/O series could only be called fantastic—from California to New York, from Texas to Michigan, from Colorado to Illinois, from Mexico to Maine, from Oregon to Florida—there are satisfied users everywhere. AND the list is growing!

Acceptance is from beginners—BUT a lot of it is coming from the digital pros as well! One of them writes: "I never realized how much fun simple R/O flying could be until I bought one for my daughter—now it looks like I'll need another for her!" . . . "No long trips to flying fields—just short jaunts to the neighboring areas; and my fuel bills are low" . . . "I am 16 and just completed my 10th successful flight with a Whiz Kid, Commander R/O equipped. Great!!" . . . From a California dealer: "One of my customers has sold his 'X' brand digital and all his big equipment. He's sold on R/O fun flying!" From Carl Goldberg: "Just a word to let you know how much I've enjoyed flying your Ace Commander Rudder-Only Stomper in our Ranger 42. . . And so it goes!"

A number of clubs are talking about Rudder-Only or SAC (Single Axis Controlled) contests for next year!

The Commander series of Packages from Rudder, to Ghost, to Fast Pulse are all designed around Transmitters engineered by Don Dickerson.

son. Each is designed for its specific function.

The airborne packs of the Commander systems are built around the Commander Superhet. Used as a DE unit in the R/O packs, it has been redesigned for a 3.6 volt input and Single Ended (SE) output for the Ghost and Fast Pack. Thousands of these receivers are proven in the field.

The Commander Series is completely wired, tested and guaranteed. It will not be available in kit form immediately. Transmitter battery, 9 volt of the M1603 or equivalent, is required.

Recommended chargers for the nickel cadmium battery packs used in the airborne units are shown at right.

A Commander package can be your doorway to fun—whether you are a novice wanting to get into Radio Control; or an old hand wanting a change of pace.

COMMANDER GEM IS AVAILABLE FOR R/O PACKAGES

You can get the new Gem receiver with any of our Rudder Only packages if the size is of importance to you. Simply order by catalog number, specify GEM, and add \$5.00 to the package cost.

NOW! NEW COMMANDER R/O BABY TWIN

We can honestly say that this combo is one our customers demanded; we kept getting occasional orders for our R/O Baby, but with the twin actuator. The demand increased and we investigated—these were going in some of the small jobs which required light weight, but needed the extra power provided by the Twin Baby actuator.

Our new Commander R/O Baby Twin has about 50-75% more power with only a .4 increase in weight—total airborne weight is LESS than 2.9 oz! Uses the outstanding Dickerson-designed transmitter, (uses M-1603 dry battery) with the regular Commander DE receiver, and 225 ma 2.4 volt nickel cadmiums—for dependable performance every time. Current drain is the same as the Regular Commander Baby. Completely wired and tested and guaranteed.

With some of the newer 32 to 42" plane designs appearing in the model magazines, this package fills the gap between our Baby and Standard.

Available on all CB frequencies except 27.255.

No. 10G15T—R/O Commander Baby Twin \$72.95

For charger use No. 34K4

You can convert your new Commander series Rudder Only System (Blue-Grey vinyl case only) to either of the two systems shown above. This means as you gain experience you can step up without obsoleting your original investment.

NEW HANDBOOK-CATALOG For the Fun Flyer and Tinkerer

Our NEW Handbook-Catalog is bigger and better than ever. We specialize in equipment for the Beginner, Sunday and Fun Flyer. More items for the do-it-yourselfer; more products from most major manufacturers, in addition to many Ace exclusives. Greatly enlarged HANDBOOK section. Last year this was called "bible for R/C." "A MUST" by R/C editors. Price is just \$1.00 POST-PAID. This is completely refundable on your first order! And that order also puts you on our mailing list for our newsletters and R/C Data Service—claimed the world over. You can't lose—send your buck on a round trip today. It could be the best dollar you ever spent!

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COMMANDER CHARGERS

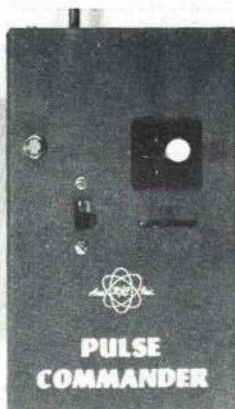
Now chargers of four different kinds as required by the Commander series of airborne units. Baby—25 ma at 2.4 v; S—Standard and Stomper—50 ma at 2.4 v; GG—60 ma at 3.6 v; FP—100 ma at 3.6 v. Assembled.

No. 34K4—Commander Baby Charger \$4.95
No. 34K5—Commander S* Charger 4.95
No. 34K6—Commander GG Charger 4.95
No. 34K7—Commander FP Charger 4.95
* Standard or Stomper

VARI CHARGER

If you want a more universal type of charger for your nickel cadmium battery supplies the Vari-Charger has much to recommend it. It features a high quality transformer and will charge up to 5 or more cells in series with up to 150 milliamp current. Charging rate is adjustable from 20 to 150 mils, with easy-to-use chart.

No. 34K21—Ace Vari Charger Assembled 9.95
No. 34K22—Ace Vari Charger Kit 7.95



COMMANDER R/O PULSE PACKS Ideal for Beginners and Sport Flyers

RUDDER ONLY PULSE IS: LIGHTEST—2.5 oz. for Baby * SIMPLEST—only one moving part, noise free * VERSATILE—arrange to suit * EASY to install * LOW COST to operate and maintain * GREAT for Beginners—CHALLENGING to the pros * FUN!

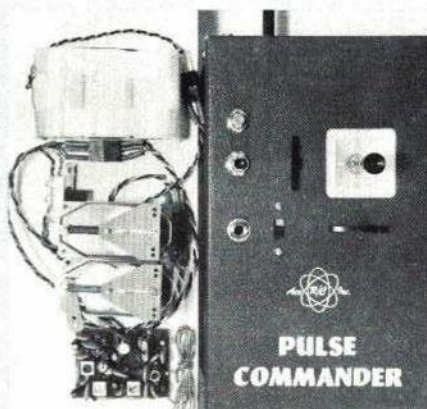
The R/O Packs feature the Dickerson transmitter described above with the Rand single axis stick, and the Commander DE 2.4 volt superhet receiver. Has an Adams actuator of the size of your choice, depending upon your aircraft, with nickel cadmium batteries wired with an on and off switch. AND each pack will save you \$10.00 if you bought the individual items separately.

The R/O Baby is for .010 to .020 jobs, has two 225 MA nickel cadmiums, and the regular Baby Adams actuator. The airborne weight is 2.5 oz.

The R/O Standard uses the LV single Adams actuator for more power for .049 to .07 size. Uses larger capacity nickel cads. Airborne weight is 4.5 oz.

The R/O Stomper used the LV Twin Adams actuator for up to .15 or can be boosted for use with .19. Airborne weight is 4.9 oz. (Charging equipment extra)

No. 10G15—Commander R/O Baby \$69.95
No. 10G16—Commander R/O Standard 71.95
No. 10G17—Commander R/O Stomper 74.95
All 27 MHZ, except 27.255. Specify.



COMMANDER FAST PULSE PACK Retains Elevator During Motor Signal

The system here is an electronic decoded one which allows a much faster pulse rate and rudder and elevator just quiver. You have FULL control of elevator response on motor command—An Ace EXCLUSIVE! Up to .29.

Receiver is new Commander SE, Rand Dual Pak, with 1 amp 3.6 V nickel cads. (Charging equipment extra)

No. 10G19—Fast Pulse Commander \$139.00
All 27 MHZ, except 27.255. Specify

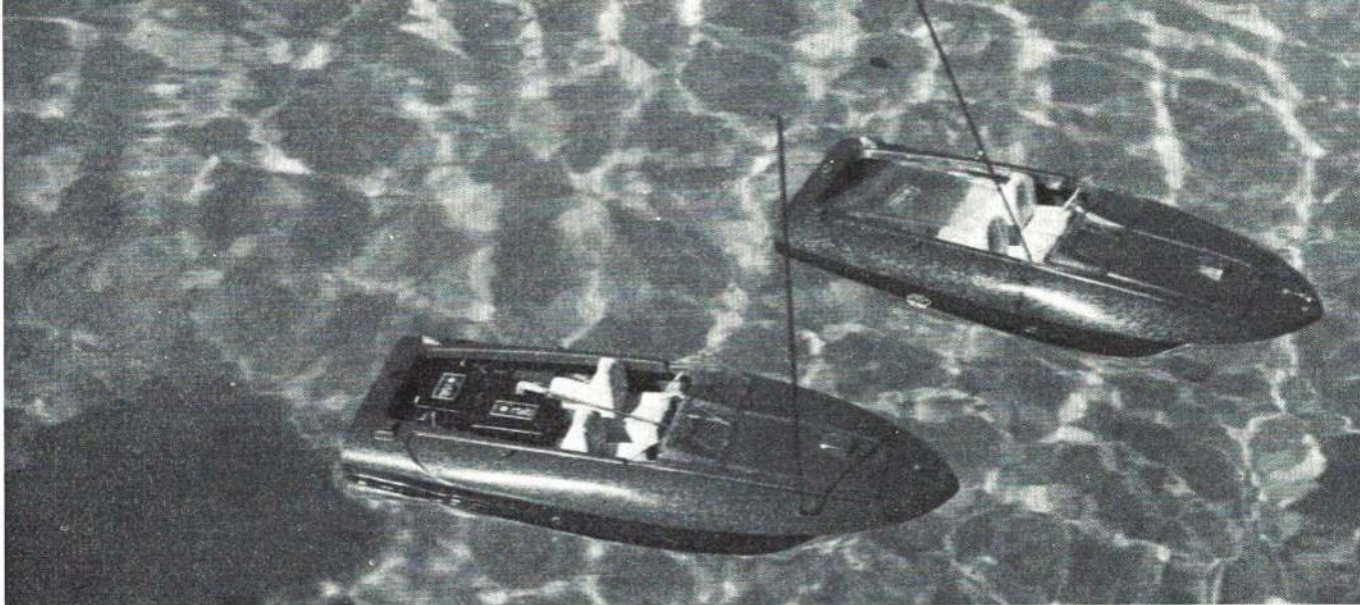
No. 10E116—R/O Factory Conversion to Ghost System above \$45.00

No. 10E117—R/O Factory Conversion to Fast Pulse System \$75.00

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R/C the Sea Bee

For real fun, it takes about an hour to put two servos in a Cox 049 ready-to-run boat.

GEORGE SIPOSS

THE Cox Sea Bee ready-to-float model boat is a simple, inexpensive project, ideal for beginners. A two-channel proportional radio set is used for control.

To start construction break off the serrated plastic part which stabilizes the tiller of the rudder. The rudder must turn freely. Next, cement a piece of plastic to the two parallel ribs on the floor just in front of where the serrated plastic was located. This serves as a mounting platform for the steering servo.

Drill a $\frac{1}{16}$ -in. hole in the throttle arm. Bend the bottom of the arm slightly so that it will not hang up on the serrated edge which makes manual adjustments permanent. The throttle arm also should move freely.

Now drill a small hole on the right (starboard) deck and insert a bicycle spoke, with a spoke nut threaded on the outside, to a depth of $\frac{1}{4}$ inch. Pack the radio receiver in foam rubber and wrap in a cellophane bag. Hold this cushioned pack in

the forward compartment. Attach the antenna wire to the lower nut on the spoke with waterproof tape or rubber bands.

The battery is mounted under the deck with double-adhesive servo mounting tape. This tape is not recommended for "hard" applications, but the boat is sufficiently cushioned by the water to prevent vibration damage. Run the wires neatly under the decks.

Now mount the steering servo on the horizontal piece of plastic in the aft compartment so that the plastic fitting on the servo will engage the wire tiller. Make sure that the servo output is in the center when the rudder is centered. The throttle servo is mounted by means of double-backed tape on the seat as shown. A plastic clevis arm suitably bent connects the servo output to the drilled throttle arm.

Cover all parts of the radio with plastic material to prevent damage by water splashing. This will not make the radio completely watertight but carefully done it will do.

Let the engine idle slowly when the boat is put in the water. Let it purr quietly and use the rudder to steer the boat. Only after all trim and familiarization procedures are completed should speed be increased. Slow down gradually after speed runs to prevent a stern wave from flooding the craft.

The beginner should start the engine and complete the break-in and needle-valve adjustments before commencing the radio installation. Wash the inside of the boat with rubbing alcohol (isopropyl alcohol) so that the adhesive tape will stick to the plastic.

Advanced modelers should make completely watertight compartments for all radio gear. Extra flotation should also be installed for running on rough water. Additional fuel tanks, a "driver," and other details greatly enhance the looks.

Keep the boat near the shore for the first few runs and carefully time them so that later, as when attempting speed runs on open water, the boat will not run out of fuel in the middle of the lake.



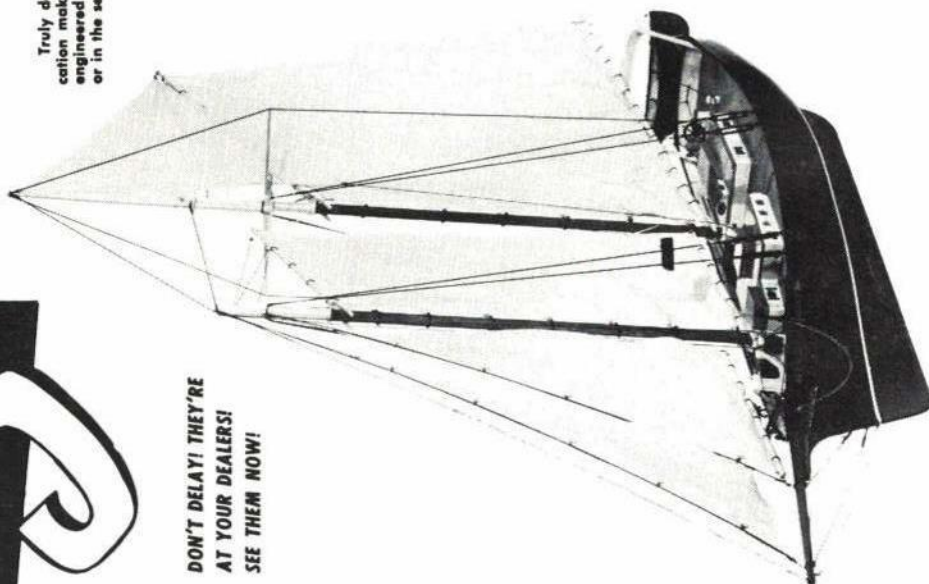
Supplies needed for R/C installation are shown. For well-protected arrangement put receiver and battery in seats.

Starting is simple; just pull on the recoil starter, then close hatch. Being quite fast on racing fuel, multiple boat racing is a real ball.

3 TERRIFIC NEW! MODELS

DON'T DELAY! THEY'RE
AT YOUR DEALERS!
SEE THEM NOW!

Truly deluxe beauties! Complete prefabrication makes them a cinch to build. Brilliantly engineered for "top" performance in the air or in the sea!



SAILING SCHOONER EMMA C. BERRY

KIT B-21
Length 49 1/2" Beam 10 3/4" Height 40"

OPERATES RUDDER-ONLY ON
SINGLE CHANNEL OR FULL
HOUSE WITH SAILS & RUDDER

A remarkably realistic operating scale model of the classic sailing Schooner, Emma C. Berry. A true classic in every sense, the full size vessel is now berthed at Mystic Harbor, Conn. A fine sailing model, it can be operated with rudder-only, or full house R/C which operates the sails in conjunction with the rudder... and by the way you can even launch... and retrieve the Dory by R/C... how about that!

Accurate die-cut parts make assembly relatively easy for most anyone. Outstanding Kit features are: One piece printed & die cut Birch Plywood Deck • Tapered Spars-Booms, etc. • Miniature Rope in scale size & color • Fine quality Sail Cloth • Molded plastic Water Cocks & Dory • Dozens of exquisitely detailed Cast Metal Fittings as well as Hardware and special metal fittings for rigging • Black & Brass Chain • Simple step by step Plans showing all phases of construction and operation • Magnificent in the water or on mantle.

\$34.95

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If no dealer available, direct orders accepted—with 10% additional charge for handling and shipping. (60c minimum in U.S., \$1.25 minimum outside U.S.)
☐ Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories, etc. 10c enclosed.
☐ "Secrets of Model Airplane Building," including design, construction, covering, finishing, flying, adjusting, control systems, etc. 25c enclosed.
☐ "Secrets of Control Line and Carrier Flying," including preflight, soloing, stunting, Carrier rules and regulations. Carrier flying hints and control line installation instructions. 25c enclosed.

Name _____ City _____ State _____ Zip _____
Address _____

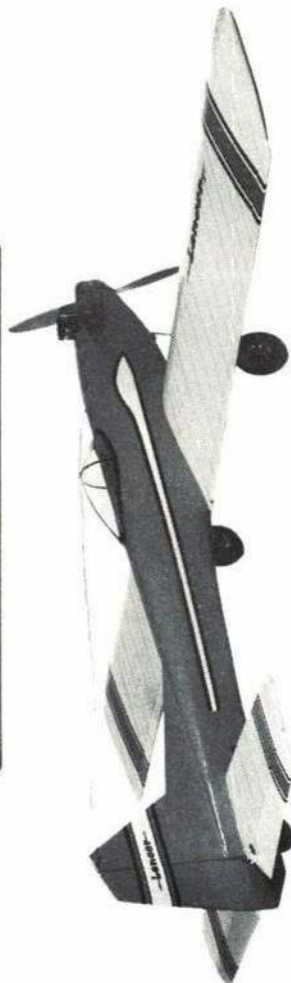


SCHWEIZER SGS 1-34 SAILPLANE

KIT FS-26 Span 8 ft. 2 1/2" in. Area 615 Sq. in. Wgt. 2 1/2 lbs. (less R/C) Scale 2 in. = 1 ft.

CAN BE FLOWN WITH SINGLE CHANNEL THRU FULL HOUSE R/C
Includes many special Nylon R/C fittings highlighted by NEW AILERON LINKAGE FITTINGS • Crystal Clear Canopy • Molded plastic Pod Fitting • Turned Nose Cone • Scale Decals • Simple yet complete step by step instructions • Full length of 100" DETACHABLE WING PANELS FOR EASY TRANSPORTATION.
• Equipped with a modified Eifel 400 special soaring airfoil, the magnificent silent flight performance must be seen to be appreciated. Optional power pod included • Beautifully prefabricated with many quality materials • Full length of 100" ported Birch structural Plywood — All cleanly and accurately die cut • Hardware

\$23.95



LANCER Advanced R/C Stunt Trainer

Available in Canada

KIT FS-25 — Span 53 1/2" in. Area 525 sq. in. Wgt. 3 1/2 lbs. (less R/C) Engine .35 to .51
ASSEMBLES QUICKLY AND EASILY. SUPERBLY RESPONSIVE IN FLIGHT

Years of flight testing and engineering have produced this classic beauty. Superior performance and maneuverability are the hallmarks of the expert, it is a smooth steady flyer in the hands of the new-comer. Design features remarkably simple and positive "table-top" war-free construction • Kit contents highlight: • Full length one piece die cut Fuselage Sides

EASILY FITS INTO TRUNK OF CAR FULLY ASSEMBLED

\$24.95





HOBBY PEOPLE

These prices good until June 20, 1970.

EVERYTHING AT DISCOUNT PRICES



R/C NOBELER

by Top Flite

The brand new R/C plane that includes many innovations such as mechanically coupled flaps and elevators. For full house raps. Span 51". Wt. 4 1/2-5 lbs. Power .35 to .45.



Reg.

\$29.95

SALE \$17.97

SCHWEIZER SGS 1-34

R/C SAILPLANE

This new Sterling Kit is prefabbed with many fine features. Has modified Eiffel 400 special soaring airfoil. Optional power pod included. Span 8 ft. 2 1/2 in. Area .615 sq. in. Scale 2" = 1 ft.



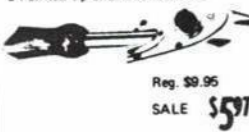
Reg. \$23.95

SALE \$14.87

T.F. MONOKOTE

SEALING IRON with Teflon coating

• Especially designed for Monokote covering
• Lightweight • Thermostatically controlled
• Pointed tip and rounded sides



Reg. \$9.95

SALE \$5.97

EMMA C. BERRY

SAILING SCOOTER

by Sterling
Spectacularly beautiful realistic operating scale model. Hardware and fittings. Many fine features to turn out to 1st. Operates rudder only or full house w/sails.



SALE \$22.88

Reg. \$34.95

TORPEDO .40 R/C

"SERIES 70F" w/front rotor. This exciting new engine has been designed exclusively for pattern flying. It features a shallow hemispherical head machined from a solid aluminum stock and a Perry carburetor.



Reg. \$35.00

AD SPECIAL

\$22.97

FLEA FLI + 10

A very complete kit from Midwest Wingspan 47"



For .19 to .23 Engine

REG. \$24.95

\$17.99

JENSONS DAS UGLY STIK

This fine kit is extremely quick and easy to build. All parts are machine cut and/or sanded to exact size and shape. Hardware included. 60" wingspan. 45-.61 engines. Reg. \$34.95



SALE \$26.99

GRAUPNER KWIK FLI MK III

Engines 45 to 61

One of the Highest Quality Kits on the Market Today!



Reg. \$49.95

SALE \$36.87

LOWEST PRICES EVER ON NEW RADIO CONTROL SETS

4CH. ASSEMBLED CONTOLAIRE WITH 2 SERVOS

Here is an excellent chance for you to get started in radio control. The purchase of this set means that someone can start flying rudder and elevator or aileron and elevator immediately; or if you like use the extra servo for throttle. When ready the purchase of 2 more servos will give you a complete 4 CH. set.

SET INCLUDES:

- All new components.
- 4CH. M.A.N. Contolaire factory assembled transmitter—no nickel cadmium, no meter dual stick. 27 mhz.
- 4CH. M.A.N. Contolaire factory assembled receiver and two assembled S4-A min. servos.
- Nickel cadmium airborne battery—with harness, charger and servo trays.

SPECIAL

While they last

\$147.50

	Retail	Sale
Contolaire 4 (4 servos) assembled 27 mhz	\$300.00	\$199.00
M.A.N. 4CH. Semi-Kit (4 servos) Deluxe	\$239.98	\$170.00
M.A.N. 4CH. Full Kit (4 servos) Deluxe	\$214.98	\$155.00

(ALL ABOVE NEW BLUE MAX SERIES)

Nationally known 5CH. set—Complete while they last \$265.00

SEND AND ASK SPECIFICALLY FOR OUR NEW MAILER—LOWEST PRICES EVER ON 1970 RADIO CONTROL SETS:

VECO 61 R/C

The new VECO 61 is better than ever with the incorporation of the Perry carburetor. Single ring and aluminum piston are just the start of the great features.



Reg. \$60.00

SALE \$38.76

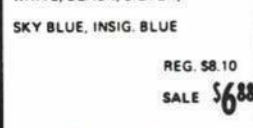
SUPER MONOKOTE

26 in. x 6 feet

RED, ORANGE, YELLOW,

WHITE, BLACK, SILVER,

SKY BLUE, INSIG. BLUE



REG. \$8.10

SALE \$6.88

SR. FALCON

by Carl Goldberg
60" span, .35-.45 power. This popular kit is deluxe which includes all the fittings. Simple sound attractive plane for beginner or expert. Reg. \$34.95



FALCON 56

Reg. \$18.95

SALE \$12.99

\$23.94

FOX 35



Reg. \$16.95

SALE \$11.87

DUMB BUGGY



soft pneumatic tires
recoil starter — lots of fun
Reg. \$20.00

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FLITE STREAK



TOP FLITE

42" Reg. \$5.95

SALE \$4.76

Jr. Flite Streak 31"

Reg. \$3.95

SALE \$2.99

Streak Trainer 33"

Reg. \$6.95

SALE \$5.27

MCCOY 35

Custom Stunt	Reg. \$11.95	Sale \$8.88
19 Custom	Reg. \$9.95	Sale \$8.99
29 Custom	Reg. 10.95	Sale 7.76
40 Custom	Reg. 12.95	Sale 9.99
29 R/C	Reg. 15.95	Sale 13.76
35 R/C	Reg. 16.95	Sale 14.88
40 R/C	Reg. 17.95	Sale 15.99

RINGMASTER



Eng. .35 power

List \$5.95

Sale \$3.99

BABY RINGMASTER

Wingspan 21" —

Eng. .049 power

Sale \$2.37

RINGMASTER JR.

Wingspan 30" —

Sale \$3.27

SUPER RINGMASTER

Sale \$7.99

ACCESSORIES

T-pins in bulk	reg. \$1.50 —	99c
#64 Rubber Bands	reg. \$1.25 —	97c
4-way Wrench	reg. \$1.00 —	76c
AMA Prop Nut	reg. \$1.00 —	67c
1/4" or 5/16"		

TESTOR SKYHAWK SET



Big 44" Wingspan powered by .049. Just take out of box and fly.

Reg. \$99.95

Complete R/C Package Radio Plane, Engine, Ni-Cad Pak, Controls.



SALE \$69.99

TESTORS SKYHAWK



READY-TO-FLY

The Testors Skyhawk plane has proven its fine flying qualities. Ideal for beginners this plane is made of Hi-impact styrene ... almost unbreakable. Big 44" wingspan and 27" fuselage for .049. It's

truly a ready to fly airplane that assembles fast ... nothing to build. All you have to do is add the radio and engine. Complete with one piece foam wing and one piece foam stabilizer molded engine cowl and tires. Could be made for full house by a more experienced modeler.

Reg. 20.00

ONLY

\$14.99

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California residents, please add 5% State Sales Tax.

JUNE 1970

MODEL AVIATION

Official magazine

A.M.A. NEWS



Academy of Model Aeronautics • 1239 Vermont Avenue N.W., Washington, DC 20005

INTERESTED IN JOINING A.M.A.? Over 27,000 did in 1969. Membership details may be had by requesting FREE BROCHURE from above address.

How AMA Dumped the Deficit

Last year's spectacular membership growth (27,271 members in 1969 vs 25,761 in 1968) at the new dues rate produced the income needed to finally wipe out the deficit which has plagued AMA for the past ten years. We not only got rid of the whopping deficit carried over from 1968 (accumulated in former years), but we came out \$2,494 in the black.

At one time, back in 1965, the deficit had risen to almost \$19,000. Through austerity operations and Dump the Deficit campaigns it was cut down to about \$17,000 in 1967, and in 1968 it was whittled to about \$15,000. But not until last year, by significantly increasing the dues income, while maintaining essentially the same operation, was the deficit wiped out altogether.

Credit Where Credit Is Due

AMA's currently solid financial position is largely due to the vision and confidence of AMA's executive officers of earlier years. Their foresight and imagination is responsible for where we are today.

The turnabout started in 1963 when an emergency-created AMA Finance Committee, faced with bankruptcy of the organization, put through a dues increase for 1964. It served to "hold the fort" until longer range plans could be developed to get AMA out of the red. Members of that '63 committee were **John Worth**, **Carl Wheeley**, **Maurice Teter**, **Walt Good**, **Bob Hatshek** and **Maynard Hill**.

Maynard Hill, AMA president in 1964, kept the rein on operations during his term while plans were laid for the future. He also took a calculated risk toward that future by initiating AMA's first professional public relations program. There wasn't much money involved, but Hill got **George Wells** to work part time for AMA. As a modeler and a PR man, George had the background to be of tremendous help to AMA as was proved by later events.

The 1965 Executive Council, under AMA President **Howard E. Johnson**, approved a program developed by Wells to establish a new chartered club program. This program has since become the backbone of AMA's membership structure. At the same time, the council initiated action to establish a new magazine arrangement—one that would put the AMA publication in a newsstand magazine, to gain regular exposure to thousands of potential new members. The '65 council members under Johnson were **Bob Hatshek** (sec'y.-treas.), **John Ross** (Dist. I), **Carl Schmaedig** (II), **Don Cameron** (III), **Bob Ward** (IV), **Dean Wright** (V), **Pete Sotich** (VI), **Dick Kowalski** (VII), **Maurice Teter** (VIII), **C. O. Wright** (IX), **John Pond** (X), **Dave Monnastes** (XI) and **John Worth** (executive director).

In 1966 the AMA Executive Council approved the finalized magazine arrangement we have today, with dramatic results. Since

the initiation of the magazine contract, AMA membership reversed a two year decline and climbed steadily. AMA gained 1,200 members in 1966, 5,000 more in 1967, 3,000 more in 1968, almost 2,000 more in 1969, and we're 2,000 ahead of last year's rate right now! Besides the carryover council members from '65, the 1966 council members included **Cliff Telford** (IV), **Bill Weaver** (VI), **Dick Black** (VII), **Pete Peters** (VIII) and **Bob Stalick** (XI).

In 1968 the Executive Council under AMA President **Cliff Weirick** continued to lay bold plans for the future by rejecting a "hold the line" dues increase and voting, instead, for a major boost which would enable the organization to break out of its old financial chains. Council members involved in this difficult decision-making



Howard E. Johnson
AMA President 1965-1966



John Worth
AMA President 1963-Jan. 1964



Cliff Weirick
AMA President 1967-1968



Maynard Hill
AMA President Feb.-Dec. 1964



John Patton
AMA President Currently in Office

were Earl Witt (sec'y.-treas.), Cliff Piper (Dist. I), Art Schroeder (II), Eva Biddle (III), Cliff Telford (IV), Jim Kirkland (V), Bill Weaver (VI), Jack Josaitis (VII), Pete Peters (VIII), Stan Chilton (IX), John Pond (X), Bob Stalick (XI) and John Worth (executive director).

Weirick made another significant contribution during his term. At a time when some people were thinking that a new organization was needed, he promoted a theme which said, in effect, "quit griping about the old AMA, and let's build a new, bigger and better one out of what we already have." He backed this up by campaigning personally throughout California to build a strong western chartered club network.

Bold leadership under difficult conditions was the pattern for the 60's. It took imagination, dedication and just plain guts to bring AMA through a much troubled era. The people responsible, mostly volunteer elected officers, deserve our thanks.

Nats, Model Aviation Magazine

The National Model Airplane Championship income/expense figures show an apparently heavy loss as they do usually. But the Nats expenses include slightly over \$11,500 in HQ salaries, much more than the over \$8,000 loss indicated. Actually, this is slightly better than recent years when the Nats either broke even or had a slight loss (when HQ salaries were subtracted from the expense total). This gain relative to former years was due to increased late entry fees and a very high entry.

Note the relationship between Member-

AMA Budget Estimate — 1970

Income:

Individual Memberships	
23,000 @ \$10.00	\$230,000
600 @ 5.00 (J/S w/mag)	3,000
6,000 @ 2.00 (J/S wo/mag)	12,000
Contest Sanctions	3,000
NAR Insurance	3,000
Mailing & Misc. Services	1,500
FAI Stamp Sales	1,400
Club Charter Fees	10,000
Non-Charter Meet Fees	800
Competition News Subs.	7,000
Total Income	\$271,700

Expenses:

Salaries & Payroll Taxes	\$105,000
Rent	7,000
Telephone	2,000
Postage	15,000
Office Supplies, etc.	10,000
Public Relations Fee	6,000
Other	6,000
General Insurance	1,600
Legal & Audit	1,200
Membership Insurance	18,000
Membership Supplies, etc.	16,000
Model Aviation	70,000
NAA Affiliation Fee	2,000
FAI Expenses	3,000
Rule Books	4,000
Total Expenses	\$266,800

**Excess of Estimated Receipts
Over Estimated Expenses**
(Nats not included — planned
for break-even operation.)

\$ 4,900

ship and Magazine; these two usually need to be looked at together to get a true picture. The magazine allocation of 35 cents per issue, per member, provided a reserve which covered all expenses and left a \$6200 surplus. This excess, if transferred to membership services would wipe out the \$4400 loss in that area and leave about \$1800 to spare. In 1968 the magazine income allocation was too low, and the result was a surplus for membership services which more than covered the magazine deficit. Both, therefore, need to be considered together to know whether there's a real loss or gain situation.

Note that the 35 cent magazine allocation (per issue, per member) includes, beyond the purchase cost of 25 cents each, the cost of postage, share of HQ overhead for copy preparation and materials used in copy preparation.

Budget for 1970

We're in the best financial shape of many years — and just in time. The current inflationary trends across the country are drastically increasing the cost of operation. If AMA merely keeps operating as it has been for the past year it will cost several thousand dollars more than in 1969 — for rent, printing, salaries, postage, supplies, services, etc. As a result, the lack of a 1969 deficit will not mean that the spending controls of the past will be lifted. They'll be eased a little but still maintained as a brake — to keep us in the black. The 1970 budget shows that out of a quarter million dollars income, the prediction is for only a relatively small surplus at year end — less than

AMA Financial Statement Year Ending Dec. 31, 1969

Balance Sheet

Assets:

Current Assets:	
Cash/Checking Account	\$ 71,288.09
Petty Cash	50.00
Cash/Savings Accounts	86,125.60
Accounts Receivable (owed us):	
Nats Trophy Sponsorship	1,120.00
Misc. Accts. Receivable	530.85
National Assn. of Rocketry	450.00
Advances/Employees	609.16
Deferred Exp. (paid in advance):	
Prepaid Insurance & Expenses	18,819.76
Supplies Inventory	3,256.19
Fixed Assets:	
Furniture and Equipment	19,673.64
Less: Depreciation Reserve	(8,201.72)
Total Assets	\$193,721.57

Liabilities and Net Worth

Current Liabilities:	
Accounts Payable (we owe)	\$ 6,955.16
Deferred Income (service due):	
Membership Dues/1970	154,143.00
Other	12,818.70
Program Entry Fees in trust for team travel within U. S.):	
Free Flight	10,320.65
Radio Control	1,197.61
Indoor	1,379.95
Control Line	545.50
Scale, General	98.00
Other Funds:	
FCC Frequency Fund	187.00
Scholarship Fund	3,582.00
Net Worth:	
Deficit: From Dec. 31, 1968	(15,479.47)
Gain — 12 months	17,973.47
Total Liabilities/Net Worth	\$193,721.57

Expense Statement

Operating Expenses — by Department

Nationals	\$ 35,059.12
Membership	92,112.47
Magazine	85,256.02
Supply and Service	5,238.89
FAI Programs	14,443.77
Contest Administration	9,834.76
Officer Services	3,487.81
General Administration	22,027.07
Total — All Departments	\$267,459.91

Operating Expenses — Detail

Salaries & Payroll Taxes	\$104,107.75
Rent	4,585.00
Telephone	1,870.92
Postage, general	13,477.72
Office supplies	8,426.02
Public Relations, general	5,337.23
Travel/Trade Shows	1,739.97
Meetings	1,370.76
Insurance, general	1,614.12
Depreciation	1,539.86
Legal and audit	1,153.95
Membership supplies	15,058.64
Rule books	2,430.88
Insurance, membership	17,708.00
Cost of supplies sold	2,737.96
Magazine, purchase	57,478.00
Postage	5,381.09
FAI: RC Team expenses	542.17
FF Team expenses	714.75
Records (NAA fees)	247.41
Franchise fee	2,054.90
Miscellaneous	1,049.78
Uncollectible Accounts	228.75
Nats: Hobby Shop	3,301.78
Trophies	4,433.51
Officials' fees	3,850.00
Officials' travel	402.77
Staff travel	538.83
Supplies	2,561.68
Miscellaneous	1,515.71
Total	\$267,459.91

Income Statement

Operating Income — by Department

Nationals	\$ 26,802.70
Membership	86,125.04
Magazine	91,498.51
Supply and Service	4,000.25
FAI Programs	23,324.25
Contest Administration	13,248.00
Officer Services	6,450.00
General Administration	32,250.00
Total — All Departments	\$283,698.75

Operating Income — Detail

Dues/27,271 members	\$215,010.00
Sanctions (AMA, FAI meets)	2,498.00
Sanctions (FAI records)	416.00
FAI Stamp sales	1,377.25
NAR: Membership processing	5,625.00
Insurance	1,800.00
Supply & Serv./Subscriptions	4,000.25
Mailing services & serv. chgs.	6,964.55
Club Charter fees	11,350.75
Non-Charter meet fees	976.00
Junior programs	82.00
Comp. News subscriptions	6,766.25
FAI Trophy Admin. — CL (net)	30.00
Nats: Sponsorship	6,800.00
Hobby Shop	4,879.21
Entry fees	13,471.83
Concessions	1,286.60
Miscellaneous	365.06

Total Operating Income	\$283,698.75
Less: Operating Expense	267,459.91
Operating Gain	\$ 16,238.84
Appropriation, Scholarship Fund (10 cents/adult member)	(2,055.00)
Other Income:	
Life Memberships	\$ 1,500.00
Contributions/booster fund	473.60
Interest/savings account	1,816.03

Net Gain — 12 months, 1969 **\$ 17,973.47**

Respectfully submitted,
John Worth, Executive Director

3% of income.

The 1970 income budget is based on a modest increase in membership—29,600 as compared with about 2,000 less in '69. Indications are that we should make this. At the time this was written more than 22,500 modelers had signed up as 1970 AMA members, and past history indicates that at least 7,000 more by the end of September could be expected. AMA could top 30,000 if the three years growth rate continues without letup; but the budget takes a more conservative estimate, to help hold optimism in check.

Clean Slate

Elimination of the deficit is a major milestone in AMA's 34 year old history. It enables the books to be closed on the past and a new start in the seventies with a clean slate. It's a great way to begin a new decade!



Photo by Ken Curtis

AMA'er Ken Curtis organized a D.C. area "Collect together" last February in Rockville, Md.; over 200 vintage engines displayed. Russ Gardner, L, admires Robert Bryant's display.

AMA News Bits

Glenview Permanent Nats Site?

That's the current plan, according to a letter from the Navy command at Pensacola, Fla. Reason is that the Navy is faced with the closing of several naval air stations in the near future. Olathe, Kans., is already set for closing, and rumor has it that Los Alamitos, Calif., and Willow Grove, Pa., may also be on the list.

On that premise the Navy has assigned Glenview, near Chicago, to be the Nats site for at least the next few years to come. No doubt AMA'ers on both coasts will be unhappy at this news, but the bright outlook is that, despite the severe economic setbacks being suffered by the Navy and other government agencies, the Nats program is considered worthy of continuation. We're lucky to still have the Navy with us at all.

For a while it looked like the permanent Nats site might be in Florida, but it was decided by the Navy that the Chicago area offered the best compromise in being located closer to the greatest mass of people likely to come to the Nats.

Snow Bank Saves Crash Damage

The Newsletter of the AMA chartered DCRC Club tells of a hard to believe but true story of an event that happened at the DCRC West Flying Field (Fairchild-Hiller facility at Gaithersburg, Md.). Duane Lundahl was maneuvering his beautiful white and orange A-Ray around when suddenly he groaned, "Oh, no!" As the crowd looked up they saw that the wing and fuselage had detached themselves, and the fuselage dove into the valley out of sight! After the customary moment of silence was observed, Duane set off for the valley with a drooped spine. "A few minutes later," the Newsletter said, "he was back, wreathed in smiles! He

had recovered the fuselage from a snow-bank with only enough shock damage to loosen up the servos—otherwise, he would have been back in the air in a few minutes with the application of rubber bands."

Just goes to show—there are times when snow is appreciated, even by a model flyer.

FF Models of the Year

An interesting and worthwhile addition to the publication of papers for the 1970 FF Symposium will be the selection of, and information about, ten free flight "models of the year". The idea is the brainchild of Sympto Editor George Xenakis, Houston, Tex. The symposium is organized by the AMA affiliated National Free Flight Society.

One each of the ten selected models of the year will be in the categories of 1/2A or A FF Gas, B or C FF Gas, Wakefield, FAI Power, A-2 Towline, HL Glider, Indoor Rubber, Flying Scale, Coupe D'Hiver, and one selected from the categories of Rocket, Payload, Cargo, Helicopter, A-1 Glider or Unlimited Rubber.

Naming of the models and designers will be by committees which will consider technical development background, success of the model, esoteric factors and any other appropriate criteria. It is expected that three-views of the selected models will be published as part of the Symposium papers, together with descriptive information from the designers.

The FF Symposium will be presented during the 1970 National Model Airplane Championships at Glenview Naval Air Station near Chicago, Ill., July 27-August 2.

The "Boo" RC Safety Plan

An article in a recent issue of *Flying Scale News & Views* not only extolls the virtues of scale drawings printed in the British *Aero*

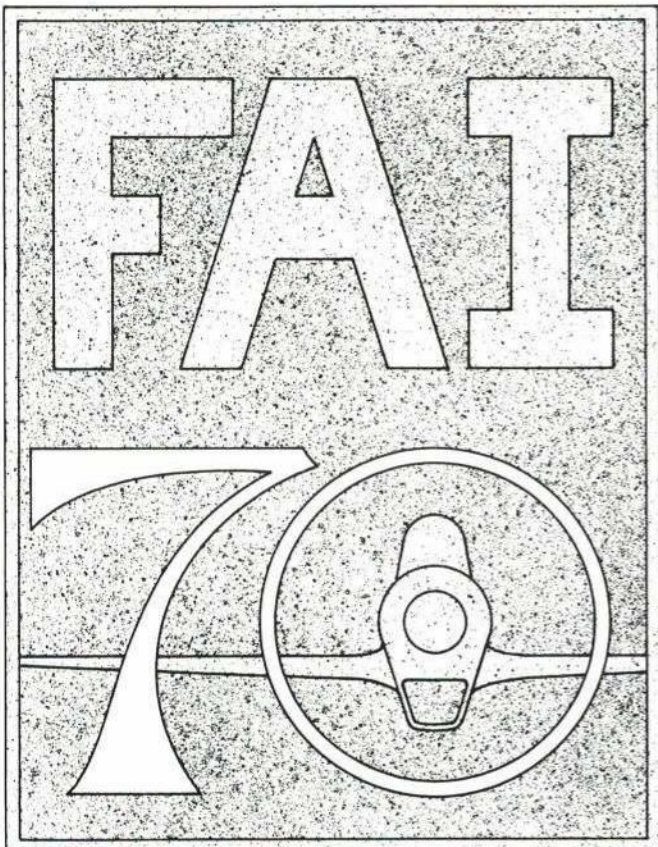


Photo by Steve Coffman

Winners of Detroit CL Combat contest last September (L to R): Steve Kott, Wayne, Mich., 5th; Clair Shoemaker, Detroit, 4th; Jim Morway, Hazel Park, Mich., 3rd; Dan Hay, Plymouth, Mich., 2nd; Charles Ashcraft, Walton, Ky., 1st. Shoemaker, Morway and Hay are members of the newly formed Detroit Combat Team, a group seen in force at many Mich. meets.

Support your 1970 FAI Control Line Team! Come on, all you control-liners, here's your chance to show your support for your representatives at the 1970 FAI Control Line World Championships. In contrast to our other team programs which have greater participation, the travel fund for CL teams is very low. As a result our CL modelers pay a large part of their own expenses to attend this meet. To help offset this expense we are selling the shirt pocket patches illustrated at left. They are fully embroidered, measure 3 x 4 inches, and are gold colored on a light blue background. They tell AMA and your fellow modelers that you supported the FAI '70 Control Line Team. They may be obtained for \$1.00 each from AMA HQ, 1239 Vermont Ave., N.W., Wash., D. C. 20005. Buy a bunch and sell them to the rest of the gang—saves postage. Chartered Clubs and hobby shops—buy 'em by the dozens! Let's go FAI '70! Laird "Doc" Jackson, 1970 CL Team Manager

Modeller magazine, but it also recalls a bit of RC safety advice that the latter magazine printed a while ago — to deal with the dangerous flyer by a boozing campaign. Whenever anyone flies his model dangerously, whether it be with respect to the public or other model flyers, particularly the show-off, it was suggested that he be subjected to catcalls and booing by all other model flyers present. One good boo is worth a pile of insurance coverage, the author said.

FSN&V is published by the **AMA chartered North American Rockwell Flightmasters**, Fernando Ramos, editor.

Fellowship Scores Highest

In tabulating questionnaires circulated among members of the **AMA chartered Western Ohio Radio Kontrol Society**, Dayton, it was found that the one item that most members liked was the fellowship, through club membership, of others with the same interest. Second in popularity was the flying facility of the WORKS.

On the negative side, the leading dislike was the fact that a small percentage of members do the majority of the work. Interestingly enough, most all stated a willingness to help share the load — looks like we may see a change for the better here.

This information came from an editorial in the club's monthly *Worksheet*. **Gene Drake** is editor as well as president of the club.

SHARKS to Build Runway

A runway 40 feet by 250 feet is to be constructed at the flying field of the **AMA chartered Shreveport Area Radio Kontrol Society** (La.). The runway will be made from ready mixed concrete, with club members doing the finishing under experienced supervision. "Get your old clothes ready," said **J. D. Alexander**, editor of *Sharks Sparks*.

To finance this major effort, each Senior club member has been assessed \$25, and new members henceforth will pay a \$25 initiation fee.

RC in Buick Brochure

You've probably seen the picture of RC models with Buick cars in the company's 1970 brochure — good subliminal advertising for modelers who may be in the auto market (and for auto buyers who may be looking for good recreation).

AMA District VII Vice-President Jack Josaitis has passed on word that **Jim Northmore** (former AMA RC Contest Board member) not only produced the photos, but he also supplied his own models for the shots.

Get the Most from Club Dues

In a recent newsletter of the **AMA chartered Model Club of East Tennessee** (Kingsport) club President **Gary Paar** outlined ten ways that each club member could be sure he is getting the most for his club dollar. Read them and take heed for they each apply to most all model airplane clubs. Paar said:

1. **Be a decision maker!** Your vote at club meetings is *not* meaningless. We often have important issues to decide. Problems arising in our search for a new flying site are prime examples.

2. **Be an objector!** Make your objections heard. If you dislike the direction in which a club project is headed, bring it up at the club meeting. If you wait until you can discuss it at the field or until you run into someone on the street, it may be too late.

3. **Be a contributor!** Your comments on issues, your new projects, your suggestions for beginners (or even for the "pros"), your good humor, your presence — all increase the benefits of meeting attendance for everyone. Remember — when you miss a meeting, you've missed a chance to get unexpected help which could mean a saved airplane or a saved dollar.

4. **Be noticed!** Don't be a "paper member". Let everyone know you're a member.

5. **Be a volunteer!** Don't let the same old bunch do everything. Come to the meetings and volunteer for a committee working on something that interests you.

6. **Be greedy!** Approximately six door prizes are given away at each meeting. Check with someone who has won one.

7. **Be entertained!** Good programs are scheduled. Some are pure entertainment, some are educational, all are interesting.

8. **Be hungry!** You may miss some good chow. Don't miss a meeting and find out later that you've missed the biggest and best club feed of the year.

9. **Be responsible!** All members of a democratic institution have to take part in order to achieve success. Share the load. That way no one is overworked.

10. **Be educated!** Come and see how meetings should properly (?) be conducted. Remember, you may be president next year.

Ultra Mini-Gliders

Can you believe 1½" maximum wingspan? That was the size specified for the mini-glider event of the **AMA chartered Dallas Aeromodelers Assn.**, Texas. **Rick Merryman** had a ¾" wingspan glider that did fine until a re-glued rudder caused stability problems. First place winners in three age brackets were **Jimmy Clem** (12 and under), **Dave Doss** (13 through 16) and **Jim Clem** (17 and over). Prizes were provided by **Johnny Clemens**.

Roughen Surface for Good Glueing

Philip Johnson laments that he put together his "Little Stick" (separately silk and dope-finished fuselage, stab and fin) without any special attention to the bonding of doped areas. Several good, uneventful flights were made, but on one flight the prop loosened and came off in mid-air. That must have caused enough vibration to weaken the bond between the fuselage and stab, for on the next flight the stab parted company. Up elevator has little effect under these circumstances!

During the post mortem Johnson found out that the glue he had used wouldn't stick well to a doped finish. On the repair job he cut off the silk, roughened the wood, and



Photo by Hugh Langevin

Upper L: The Toledo RC Conference last Feb. was a great occasion for awarding the FAI World Record certificate to Bill Bertrand by Dave Henshaw, L, president of the Model Aeronautics Assn. of Canada, and John Patton, R, AMA president. Bertrand's 220-mile powered RC flight was made in Canada. Lower L: Danny Bartley holds B Proto Speed model while dad, John, bolts on exhaust extension to Supertigre. This model, named "Aquarius," is similar to one described in May AMA News, set 143.37 mph record for John Bartley and Bill Garner in January. Above: Tension is evident as Ed Dolby and son wait for thermal with fully wound Wakefield at 1968 Bong Team Finals. Below: Indoor Scale PT-19 by Rolf Gregory, Potomac, Md., said to fly well, but doesn't like to circle.

Photo by John Thornhill



More on 1970 FF Rules

Tuned pipe still out. To settle once and for all whether the tuned pipe engine would be allowed this year for FAI class Free Flight Power models, AMA President John Patton agreed to let a vote of the Free Flight Contest Board determine whether the 1970 ban imposed by him should be continued or be rescinded. On this key question, six CB members voted to rescind the ban, while five voted to continue it in force. Normal CB procedures require a majority of at least seven to four to effect a change; thus, the ban continues unaltered.

No RC in FF. The 1969 AMA rule book was not very clear as to whether free flight mod-

els could employ such radio control as engine shutoff or dethermalizer. A late year Free Flight Contest Board interpretation is that no RC whatsoever may be used for free flight models. A statement to this effect appears in the 1970 rule book.

Two models allowed for FF Gas. Revised AMA rules for 1970 permit entry and use of two models in the Unlimited Rubber and Rocket-Powered categories for contests and records (reported in March "AMA News", page 47). Inadvertently not reported is the fact that 1970 rules also permit two models in the Free Flight Gas category. We regret the omission.

used epoxy. "I've since found out that it's a good idea to rough up any wood surface before glueing, especially if it's a joint requiring a lot of strength," he said.

Our thanks to **Tri-Valley R/C News**, published by the **AMA chartered Tri-Valley RC Club** of South Bend, Ind., for this bit of good advice.

Paper Collection Earns Club Money

Andy Adams, a member of the **AMA chartered Lake Erie Gas Model Club**, Parma, Ohio, suggested that members bring old newspapers to club meetings for him to truck away and sell in the club's behalf. According to the club's *Newsletter*, edited by **Richard Woodward**, Andy estimates that this venture could result in an income of about \$100 for the year.

Help Us, Please

Most of the photographs that have appeared in the "AMA News" section have been contributed by AMA members. This is great, and reader response indicates that

they have been appreciated. But the fact of the matter is that we need more photos than we currently are receiving (maybe the winter weather caused a sharp drop in picture taking) and we need them on a continuing basis.

There are no super-duper requirements for the photos. Ordinary snapshot prints, black-and-white or color, are fine, including those developed in the camera. As for subject, all types are wanted: control line, radio control, free flight, indoor—sport or contest.

Send photos (which cannot be returned) to **Picture Editor**, AMA HQ, 1239 Vermont Ave., N. W., Washington, D. C. 20005. Include a description for captions and the photographer's name. No payment possible for contributions, but full credit is assured.

FF Winter Bowl Thrives in Chill

Twenty-five flyers from Ohio, Indiana, Michigan and Illinois braved temperatures which hovered at 32 degrees to fly in the **Winter Bowl Small Meet** at Marysville, Ohio,

last February. The turnout, not big by summer standards, was amazing considering that it rained all night before the meet, and there was a forecast of 90% chance of rain for the day. But despite coolness, lady luck was with Contest Director **Floyd Miller** and the sponsoring **AMA chartered Central Ohio FF Club**. It did snow briefly before the start of the meet, but the rain held off until it was over. There wasn't any sunshine (solid fog with 600-foot visibility), but there was no wind, and absolutely no thermal activity!

In the three events held, first place winners were **Charlie Sotich**, Chicago, FF Rocket Power; **Martin Richardson**, Dayton, Coupe D'Hiver; and **Norm Getzlaff**, Cleveland, HL Glider.

RC — Be Sure Engine's Going

Writing in *Glow Plug*, bulletin of the **AMA chartered Middle Tennessee RC Society**, Nashville, **Shell Portnoy** relates a heart-breaking story that winds up with some good advice.

Seems that **Bob Reuthers** had just finished his "Soul Fli", 21 coats of finish and all, and was out test flying one beautiful morning. All went well for the first two flights even with the slightly tail heavy balance—engine idle was just a little fast for a good landing sink rate.

Then came the fatal third flight. Everything was okay for most of the flight, then Bob lines her up for landing. "We're just about down now," narrates Portnoy, "oh, oh, the wind died, and with that fast idle it appears that we will overshoot the runway. Yep, the aircraft is now past the landing strip, sinking very slowly, altitude three feet; Bob elects to go around again; he cautiously feeds in throttle to avoid loading up, now up elevator—the engine didn't respond, the aircraft snap rolls and right into the dirt for a heart-breaking crash."

The fatal error was the up elevator. "Bob took it for granted that the engine would respond, but unfortunately it didn't. Had he

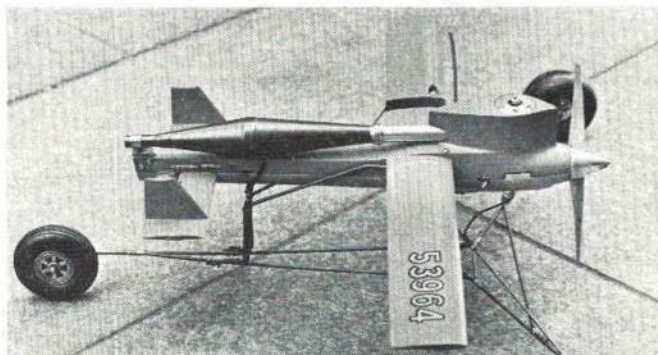


Photo by Charlie & Mike Fitzpatrick

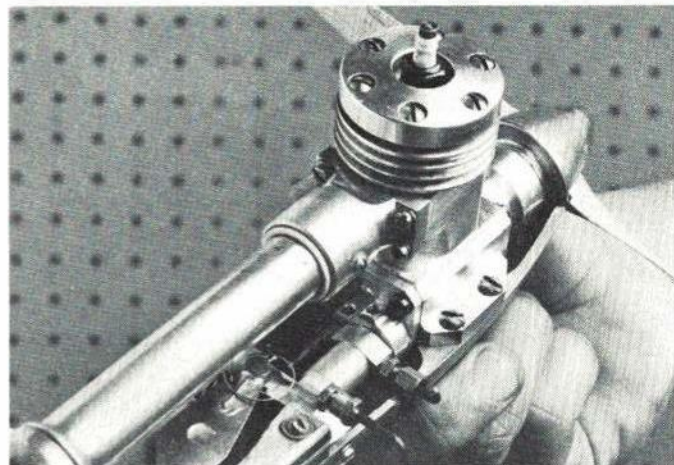


Photo by Charlie & Mike Fitzpatrick

Above and Upper L: This original design .029 cu. in. engine and tuned pipe by Charlie and Mike Fitzpatrick, New York City, is said to employ untimed crankcase pressure, an original design centrifugal fuel switch and a "supercast" iron lapped piston. The twin rudder model shown, by Charlie and Mike, is reported to have been clocked unofficially at 184 mph—single control line, Top Flite 7"D x 10 1/2"P Speed prop. **Left:** Photograph of Marine Corps Captain Russell Cedoz (over which is superimposed an earlier photograph taken when he was a youngster) lends credence to his boyhood reminiscing. With interest kindled by his dad, Capt. Cedoz began model flying when he was about 13. He quickly outgrew the simple starter models and advanced to Control Line Stunt and Scale. And he was successful, too, winning important prizes in the National Model Airplane Championships as well as the now defunct Plymouth International Model Plane Championships. Capt. Cedoz presently is a Naval Air Observer for the Marine Corps at New River, Jacksonville, N. C. Though not modeling now, he says Radio Control will be for him when he starts again.



U. S. Marine Corps photo

maintained level flight, the aircraft would have settled down for an easy grass landing, or if the engine did respond, Bob could have pointed the nose up after the engine increased the air speed."

The moral of the story: be sure there's sufficient airspeed before using elevator control.

FF Club Flies Indoor at Meetings

A trial program of indoor flying brought out 23 members for a club meeting on a rainy evening, and it proved to be so popular that, during the business portion, it was decided to make it a regular affair. The club is the **AMA chartered Thermal Thumbers** (Calif.), a group devoted primarily to indoor and outdoor rubber model and glider activities.

Two categories of indoor rubber-powered flying are planned for future meetings — the first is for models up to 8" span, and the second is for Easy B models.

Utah Club Speaker Talks about Woods

Members of the **Utah State Aeromodelers** were treated to an interesting talk and discussion about the properties of woods used in the construction of both model and full size airplanes. The lecturer was **Harold Cole** of the **McBeath Hardwood Co.**, a distributor of specialty woods, including balsa in block form.

On the subject of balsa, his coverage was very thorough according to the club's paper, *The Dope Bucket*. It included the growing locations and climate needed, the difficulties in harvesting the logs, the primitive methods that still must be used due to the locations and scattered nature of timber stands, the process of cutting up the logs, drying under controlled conditions, finish sawing and sanding, and the difficulties of marketing the final product. All this "made us more aware of how hard it is to get a good grade of wood at a price we can afford," said the **USA** newsletter.

Also very interesting was the discussion of the manufacturing of plywood and the uses to which it has been put in aircraft construction, especially during WW II when metals were scarce. Used as examples were the **British Mosquito** bomber and the huge flying boat built by **Howard Hughes**.

RC Pylon Show for Pay?

Could be. The *Flypaper* of the **AMA chartered Milwaukee Flying Electrons** (Wisc.) says that **Aero Park** may be interested in setting up an **RC Pylon** race course with the possibility of charging spectators admission

Why Contests?

Most of us start out with model airplanes first as an observer — we see someone else enjoying his sport, and we figure this is something we would like to do. Then we get our feet wet with a model of our very own and, forbidding any outright failures, we are usually content with fun flying for some time. What is there in contest flying? Read what was said in the *Mile Hi Newsletter* (**R. J. Ulanoski**, editor) of the **AMA chartered Mile Hi RC Club** last year. It doesn't have all the answers, but it might just tempt you.

Why have a contest? Why attend a contest? Why botch up a day of sport flying? Why compete? Why spend money for prizes? Why officiate?

These are common questions — and they are logical ones to be put forth by those who have never participated. And to be truthful, the only way they can be answered is for everyone to try on a few.

To compete is man's nature. Every day we compete in our jobs and activities. It only follows to compete in our hobbies. And we do! Without ever entering a contest — we are competing. We are always finding a way to build a better model, or to fly one better. And we measure our progress against others. A contest is no different — only more formal and with prizes. There is never any shame or embarrassment to be associated with losing a ship or a place. It only tells us where we need to improve ourselves. But there is pride associated with competing. It provides the necessary inducement to really work at improving our modeling.

to watch. Likely the club would share in the proceeds if the idea goes forward.

Spoofs World Affairs

Sharks Sparks, newsletter of the **AMA chartered Shreveport Area Radio Control Society** (La.), recently conjured up a roving correspondent whose make-believe job was to tour European air shows to promote "Fly-berger Digi-Glitch" proportional radio gear. Correspondent "Gloplug" really had his problems in France and Egypt. At Paris he unfortunately had a bright gold-painted model which was impounded by customs agents (luckily he didn't have any gold teeth), and at the Egyptian Nats, his choice

When we go up to the field to fly — wouldn't it be just as easy to practice some maneuvers for a contest pattern, rather than just flying aimlessly around? There is nothing wrong with fun flying, and that is what a contest is supposed to represent — a refined and practiced bunch of fun maneuvers. Why not three consecutive loops instead of just one? Or three rolls instead of just one? One of the things I have always enjoyed in a contest is meeting new friends. And that is one of the best ways to meet new people in your hobby. People from outside of your own club. You'll find that in a short time you have friends from all over the country. And if you are having a problem you'll never get more help than from the people you meet at a contest. Or from people you don't even know! The guy that answers your question very easily could be the designer of the plane or the engine. And in every contest I've ever entered or attended there has always been at least one plane, event or flight that has made the whole time worthwhile.

And if you can't enter that contest — your help in running the event is always appreciated by the flyers. Of course there will be things to go wrong — that's Murphy's Law. But the great majority will be happy with the events, and that one "thank you" makes all your work worthwhile. While doing something for others you can learn one heck of a lot yourself. Seeing how the "top boys" fly can be a real treat. And it can show you what to look for in your own flying.

I realize that this falls short of saying "why", but, as I said, you have to be involved in a few before the answers begin falling in line. And who knows who will take home the prize — just because he flew each time.

of model was again bad — an **F4 Phantom** which was promptly shot down.

At the **Italian Nats** in sunny **Napoli**, correspondent **Gloplug** blundered through marvelously, and he was somewhat surprised at being awarded first place in scale. "My float mounted scale model of the **Machhi-Castoldi 97** crashed on takeoff in **Naples harbor** — this being my only flight. The Italian judges lean heavily towards true to life scale flights, and I was informed that the original **Machhi-Castoldi 97** reacted in the exact same manner when fitted with floats."

Gloplug signed off by seeking suggestions for scale at **Tel-Aviv**. The only scale model he had left was a **MIG 21**!



Photo by John Thornhill

The **John Thornhill** kids enjoy flying their **FF Oily Bird**. With prop on backwards, a whole tank run will let model stay in school yard.



Submitted by Jerry Farr

Above: Members of the **Key City Prop Twisters**, **Abilene, Tex.**, took club honors and 10 trophies at 1969 **West Texas Championships** at **Odessa**. Right: **Edwin Wilson** gives pre-flight **CL** instruction to **Philip Broyles**, age 9, important for successful powered flight later, says **Wilson**. This is a project of the **East End Boys' Club**, **Louisville, Ky.**, sponsored by the **Downtown Optimist Club**.



Submitted by Edwin Wilson

AMA News Extra

1970 NATIONAL MODEL AIRPLANE CHAMPIONSHIPS, Glenview Naval Air Station, Ill.

Official Dates: Monday, July 27, through Sunday, August 2

The details contained in May's "AMA News Extra" have been confirmed. Use of the air station for RC Pylon Form. I & II Qualifying on Monday and Tuesday allows adoption of the full event schedule proposed by the Nats Executive Committee and confirmed by the AMA Executive Council. Only major detail still hanging fire at press time was the confirmation of the Indoor flying site. IF the site is of sufficient size and is available for both Monday and Tuesday flying, it is expected that Stick, Cabin, Paper Stick, HL Glider and Scale events would be flown. Other important Nats details:

Monday and Tuesday, for most entrants, will be devoted to in-person registration (for those pre-entered by mail; on Monday only, late entries will be permitted for those not entered in advance by mail. Also on Monday only, adding events will be provided for as will the signing up for Navy berthing and meals. The only flying events will be Indoor and RC Pylon I and II Qualifications.

Barracks type berthing is severely limited at Glenview this year, requiring a system of priority to be employed, with highest priority being given to earliest receipt of Nats entry form--only those registering by 2 pm Monday will have priorities honored. Also, plans are being made to set up a tent city with several hundred cots--this berthing will also be by priority.

Wednesday through Sunday. Free Flight, Control Line and Radio Control events will be flown from 8 am to 5 pm each day, except for a half day on Sunday due to an afternoon model air show followed by a full-scale air show. For those pre-entered by mail, registration continues through Saturday. Transmitter processing, for Class A and B Pattern entrants only, takes place Friday evening--flying of the events to be on Sunday.

Special RC Information. Class A Pattern and Class B Pattern are additions to the schedule this year; will be flown on Sunday only, using the full pattern for each and as many rounds as time permits. Instead of Class C, Class D (FAI maneuvers) will be flown--in two stages, Qualifying and Finals, from Wednesday thru Saturday. Qualifying flights will use the following shortened pattern:

- | | | |
|--------------|--------------------|-------------------------|
| 1. Takeoff | 4. Cuban Eight | 7. Horizontal Eight |
| 2. Figure M | 5. Four Point Roll | 8. Rectangular Approach |
| 3. Slow Roll | 6. Top Hat | 9. Landing |

The top 20 qualifiers will be eligible to compete in the Finals, using the full Class D Pattern.

The Pylon Racing program will be similar to that used in 1969, with the 20 top qualifiers in each of Form. I and Form. II advancing to a Finals later in the week, on Friday and Saturday afternoons.

Special FF Information. Coupe D'Hiver is a new official Nats event this year, to be flown in two age classes: Jr.-Sr. combined, and Open. FF events will be flown with a 3-minute max limit (except Coupe and HL Glider which will use a 2-minute max as per current rules). Engine runs for AMA Gas events will be 13 seconds ROG, 10 seconds HL. Flyoffs retain the same max flight limits--engine runs (including FAI Power) are reduced 2 seconds for each extra flight, but not less than 5 seconds will be required. FAI FF events will be scored for 5 flights, no rounds.

Special CL Information. Control Line Scale Racing (Goodyear) is a new official Nats event this year. It will be flown in two age classes: Jr.-Sr. combined, and Open. In Navy Carrier, as for last year, contestants who enter the Profile Class are not permitted to enter Class I or Class II. CL $\frac{1}{2}$ A Profile Proto entrants (Juniors only) are not permitted to enter $\frac{1}{2}$ A Proto. All three AMA age classes are combined for Jet Speed this year.

Special Scale Information. Outdoor FF, CL and RC Scale models will be scale-judged before flying this year, necessitating early turn-in of models. All of the scale classes will be judged by AMA rules this year. Flying of FF Scale models will be for a half day, in the morning on Thursday. RC Scale will be flown from two lines on Friday and Saturday on a shared-time basis with Pattern Finalists. Shared-time is a new concept designed to make more efficient use of the time available. In the morning, scale will have exclusive use of about half of the radio frequencies, while Pattern Finalists are using the remaining frequencies. Halfway through the day's flying session, Scale and Pattern will swap groups of frequencies.

Entry Information. The advance (by mail) basic entry fee is \$10.00 for Open age flyers, \$2.00 for Juniors and Seniors. Just as in 1969, the basic entry fee for an advance entrant who, for some reason, is unable to attend will be credited toward the 1971 AMA membership fee. The late basic entry fee (Monday only) is \$25.00. To qualify for the advance basic fee, entries must be postmarked by midnight June 22, 1970; otherwise, entries must be submitted late, in person, at the Nats, on July 27 only. Entry forms are now available. Send stamped, self-addressed envelope (with 6¢ postage for each form desired--10¢ each if Air Mail return is requested) to: AMA HQ, 1239 VERMONT AVE., N.W., WASHINGTON, D.C. 20005.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

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Which officers live in your district? Select correct address when writing officers.

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Bold type below indicates Chairman of Contest Board.

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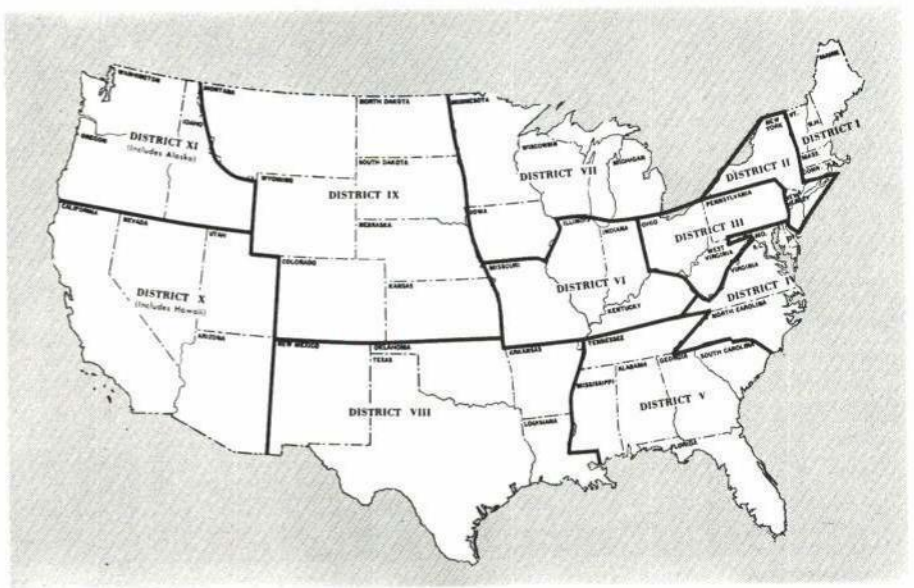
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Over 150 AMA members serve as volunteers on various committees which determine operating policies of Academy activities — many are listed here. Members are invited to communicate their comments, suggestions, proposals, or complaints by writing to the appropriate committee at any time. Note that the Executive Council and Associate Vice Presidents represent area interests for general AMA policy matters. Wherever district numbers are shown, write to the nearest address for your area. It is recommended that a copy of any correspondence be sent also to AMA Headquarters.

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**Fly Safely!
Follow AMA Rules**

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

May 2-3 — Atlanta, Ga. (AA) 5th Greater Atlanta RC Meet. Site: Club flying site. R. Roberts, Jr. CD, 2443 Woodside Way, Chamblee, Ga. 30041.

May 2-3 — Taft, Calif. (AAA) West Coast FF Championships. Site: Gardner Field. B. Fallon CD, 2667 71st St., Sacramento, Calif. 95817. Sponsor: Capitol Condors & Oakland Cloud Dusters.

May 2-3 — Greensboro, N. C. (AA) 1st Annual Greensboro RC Meet. Site: Greensboro Radio Modelers flying site. B. Johnson CD, 4139 Sheridan Rd., Greensboro, N. C. 27405. Sponsor: Greensboro Radio Modelers Club.

May 2-3 — Dallas, Texas (AA) Dallas RC Meet. Site: North Lake Park. R. Brown CD, 930 Vinecrest Ln., Richards, Texas 75080.

May 3 — Hicksville, N. Y. (AA) LIAMAC & PAASC Indoor Contest. Site: Cantiague Park. W. Dunwoody CD, 985 Ft. Salonga Rd., Northport, N. Y. 11768.

May 3 — Hadley, Mass. (AA) Hampshire Showdown RC Air Races. Site: 1/2 Mile N. of Coolidge Bridge. J. Papageorge CD, 104 Rock Hill Rd., Hadley, Mass. 01035. Sponsor: Hampshire County Radio Controllers.

May 3 — Council Bluffs, Iowa (AA) Mid-Western Spring CL Warm-up. Site: Iowa School for the Deaf. J. Dreier CD, 1918 Avenue R, Council Bluffs, Iowa 51501. Sponsor: Balsa Busters.

May 3 — Dallas, Texas (AA) CMC Spring FF Annual Meet. Site: Preston Rd., N. C. Hornbeck CD, 3506 Duchess Trail, Dallas, Tex. 75229. Sponsor: Cliff Cloud Climbers of Dallas.

May 3 — Wichita, Kans. (AA) 3rd Annual Wichitahawks Spring FF & CL Rally. Site: Wichita Modelers Council Field. J. Mason CD, 2214 So. Pinecrest, Wichita, Kans. 67218. Sponsor: Wichitahawks MAC.

May 9-10 — Amarillo, Tex. ARKS Spring Fly for Fun. Site: Club Field. B. Irwin CD, 3302 Lewis Ln., Amarillo, Tex. 79109. Sponsor: Amarillo Radio Control Society.

May 9-10 — Monroe, N. C. (AA) N. C. Championship RC Scale Contest. Site: Monroe RC Club Airfield. V. Helms CD, 800 Tyvola Rd., Charlotte, N. C. 28210.

May 10 — Wilmington, Del. Delaware RC Soaring Glider Meet. Site: Old Dupont Airport-Rt. 48 & 141. G. Geissinger CD, 1033 First Ave., Media, Pa. 19603. Sponsor: Delaware RC Club.

May 10 — Richmond, Va. (AA) Brainbusters Annual FF Spring Meet. Site: Curles Neck Dairy. A. VanDover CD, 112 Tillerson Dr., Newport News, Va. 23602. Sponsor: Brainbusters MAC.

May 16-17 — San Antonio, Tex. (AA) 2nd Annual Alamo Regional RC Contest. Site: Hurt Airport. G. Aldrich CD, 3219 Shady Springs, San Antonio, Tex. 78230. Sponsor: Alamo RC Society.

May 16-17 — Tulsa, Okla. (AA) Spring FF, CL & RC Rally. Site: Tulsa Glue Dobbers Field. W. Salnikov CD, Rt. No. 1, Box 130-C, Coveta, Okla. 74429. Sponsor: Tulsa Glue Dobbers, Inc.

May 16-17 — Jacksonville, Fla. (AAA) FF, CL & RC Rebel Rally. Site: White House Field. H. Pierce Jr. CD, 208 W. Forsyth St., Jacksonville, Fla. 32202.

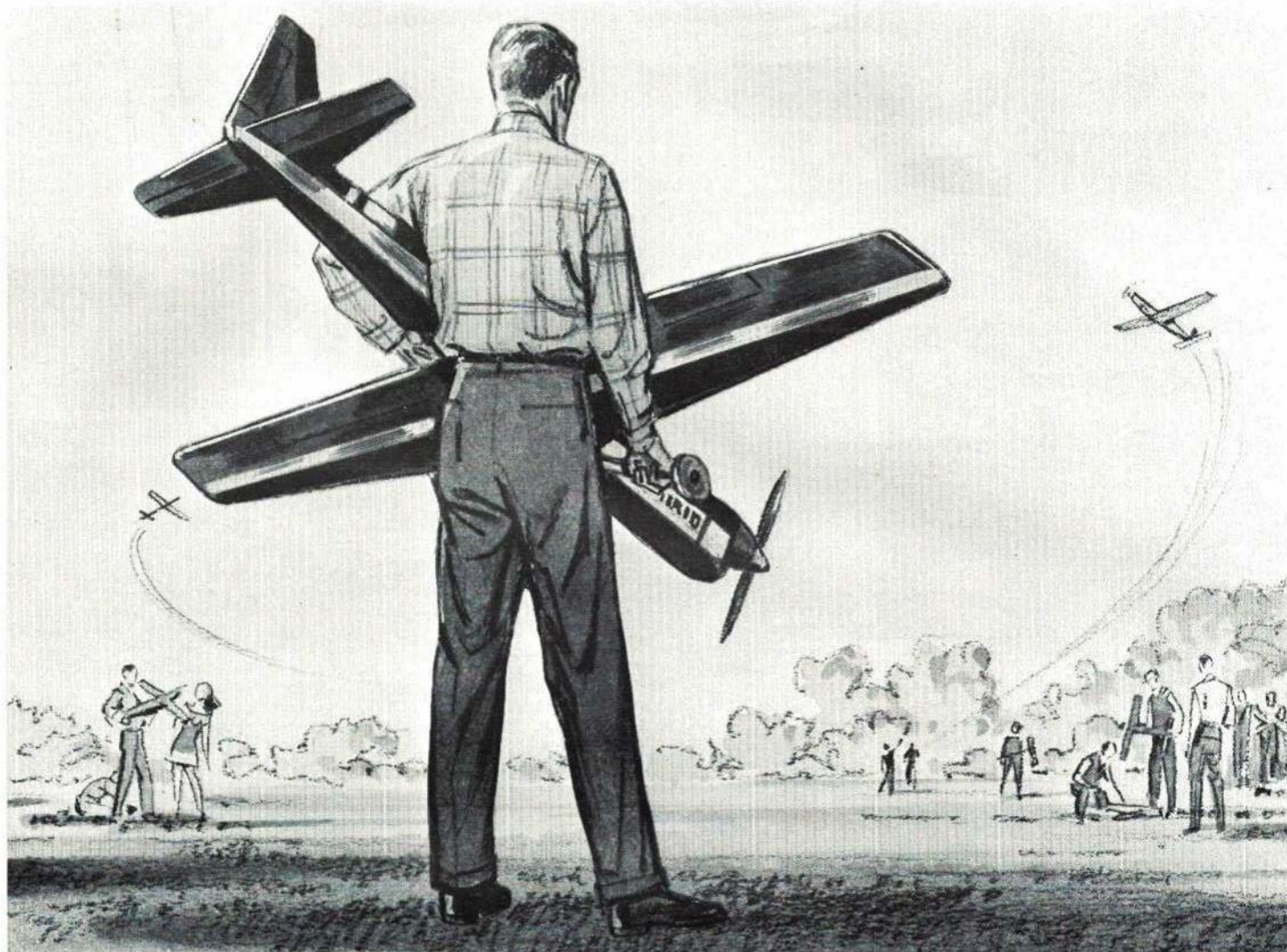
May 17 — Denver, Colo. (AA) 8th Annual Model Museum Spring FF Old Timer Meet. Site: East Colfax Air Park. T. Dannels CD, 1265 Yates St., Denver, Colo. 80204. Sponsor: Model Museum Flying Club.

May 17 — Tucson, Ariz. (AA) Cholla Choppers Spring CL Invitational Meet. Site: Rodeo Park — So. 6th Ave. & Irv. Rd. T. Snow CD, 909 E. Ellis, Tucson, Ariz. 85719. Sponsor: Cholla Choppers.

May 17 — Downers Grove, Ill. (AA) 4th Annual CL AA Meet. Site: Park at 39th & Fairview Ave. R. Phillips CD, 4431 Stonewall Ave., Downers Grove, Ill. 60515. Sponsor: Treetown Modelers, Inc.

May 17 — Taft, Calif. (AA) SCAMPS 4th FF Old

Continued on page 86



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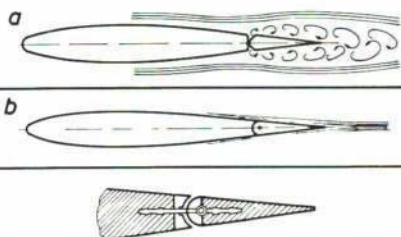
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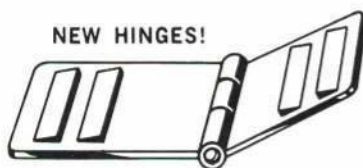
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Digit Migit

Continued from page 29

sive oscilloscope, even with unshielded leads.

The range is excellent. For the purchaser's guidance, the range with the stub antenna provided (which protrudes flush with the back of the case, through a grommet) is about 2.5 ft., much further than with other arrangements of this type. This is indicative of a flight range of several thousand feet. The servo is one of the fastest made: about 45 degrees in 0.6 sec., or less, but with a thrust of about three lbs. Servo output is rotary only.

The total weight of the airborne unit is seven ozs., including the four pencils. The Digit Migit is not quite small enough for a Schoolboy but just right for everything from a multitude of beginners' .049-powered planes to the largest practical rudder-only ships. (In my opinion, a .15- to .19-powered model is the practical and safe maximum for rudder only, unless it is one of the older, slow-flying cabin models. With today's potent engines and clean models, more control than just rudder is required on larger models.)

The system was flight-tested in a Gold-berg Ranger 42 rigged for strip ailerons instead of rudder. With this arrangement, be sure to rig for proper aileron direction of travel. Servos are normally set up to give proper direction automatically when mounted in a well cut in the wing, not when the servo is below the wing in the cabin. For a right turn, the right aileron must go up, the left down, and vice versa. The Digit Migit performed flawlessly during flight tests. A number of flights were made with satisfactory results once the model was properly trimmed.

Techniques of trimming such a model to fly with the Digit Migit are important to beginners. A single-channel system permits control of the turning of the model only. There is no throttle and no elevator. (World Engines does sell a "kick-up" elevator or two-position throttle servo separately, but it is not covered in this review.) Thus, trim must be achieved for pitch (nose up/nose down) by adjusting for proper balance (CG), engine thrust line, and elevator incidence.

First, balance the model at the CG location recommended by the designer (or kit manufacturer) by adding weight to the nose or tail or positioning the equipment where practical. Next, hand glide the model over tall grass, adjusting the elevator position for a clean glide (no mushing nose up and no nosing down sharply).

Now the hard part: for initial flights put in a few degrees more downthrust than shown on the model plans by shimmying the engine mounting. Use only enough fuel for a 10- to 15-sec. engine run at most. Launch the model into the wind. If it dives or settles to the ground under power, take out the extra downthrust a little at a time until the model climbs gradually under power. Ideally it should continue to climb in a circle to a height of 200 to 300 ft., then glide smoothly to a landing. With experience, engine run can be increased and, if enough power is available, more downthrust taken out to increase climb angle. However, never trim to the point at which the model is "hanging" on the prop and subject to excessive wind drift.

Colonel Bob's

Hobby Shop
Will Move May 1st 1970
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The Digit Migit meets the great need for a good, inexpensive system for the beginner and modelers requiring a single-channel system. Performance of the unit tested was excellent. The dry cells it uses will provide plenty of flying time, perhaps half a summer of weekend flying. Check the voltage after each flying session, before putting the system up for the next flying session, always with the system operating and after at least ten minutes operation.

I do feel that the "semi-brick" configuration should be extended to provide protection for the receiver components now located in the open. This and other systems tested have shown extreme durability, but additional cover would not increase overall size or weight and might save a repair bill. In addition, the switch used could be a somewhat more rugged design. Wiring and sleeving to the switch should be done more firmly. While no problem arose with the switch in the unit tested, a better design seems worthwhile.

Waco YKC-S

Continued from page 35

The leading wing (top wing for Waco) should have a slightly greater angle of attack than the trailing wing. This allows the leading wing to increase lift slightly more than the trailing wing as speed increases. When the model gets into a dive, this little extra lift ahead of the center of gravity will pull the model up and out of the dive.

Also, it is common to have a biplane model come out on the tailheavy side. To correct, add ballast to the nose or shift some of the R/C equipment forward to properly balance the model.

The Waco YKC-S was manufactured by the Waco Aircraft Co., Troy, Ohio, in 1934. It was a four- to five-place cabin biplane with span of 33 ft. 3 in., length of 25 ft. 3 in., top speed of 140 mph, and cruising speed of 125 mph, and gross weight of 3000 lbs. The Y stands for the Jacobs L-4 radial engine of 225 hp, while the KC refers to the wing and airframe type. The S either refers to the aircraft being straightwing or is a modification symbol. The YKC-S was the fourth in a series of twelve cabin biplane designs by Waco from 1931 to 1942.

The plan for the model was enlarged from a 3-view in *Flying for 1936* by the Aeronautical Chamber of Commerce of America, Inc. For additional reference, see the April, 1969, *Sport Flying*, which features Waco aircraft.

Construction: The model utilizes standard balsa construction and should be easy to build from the plan without much explanation. By being careful with material selection, a strong and rugged model can be built

Continued on page 68



SYMPOSIUM '70 MAY 16-17, 1970

WASHINGTON, D.C. AREA

Theme:

CONTEST MANAGEMENT & PATTERN JUDGING

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Wing span: 51 inches
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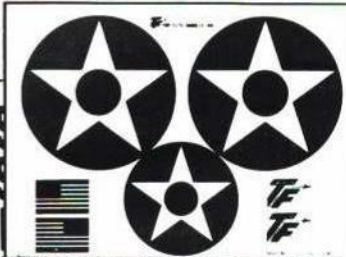
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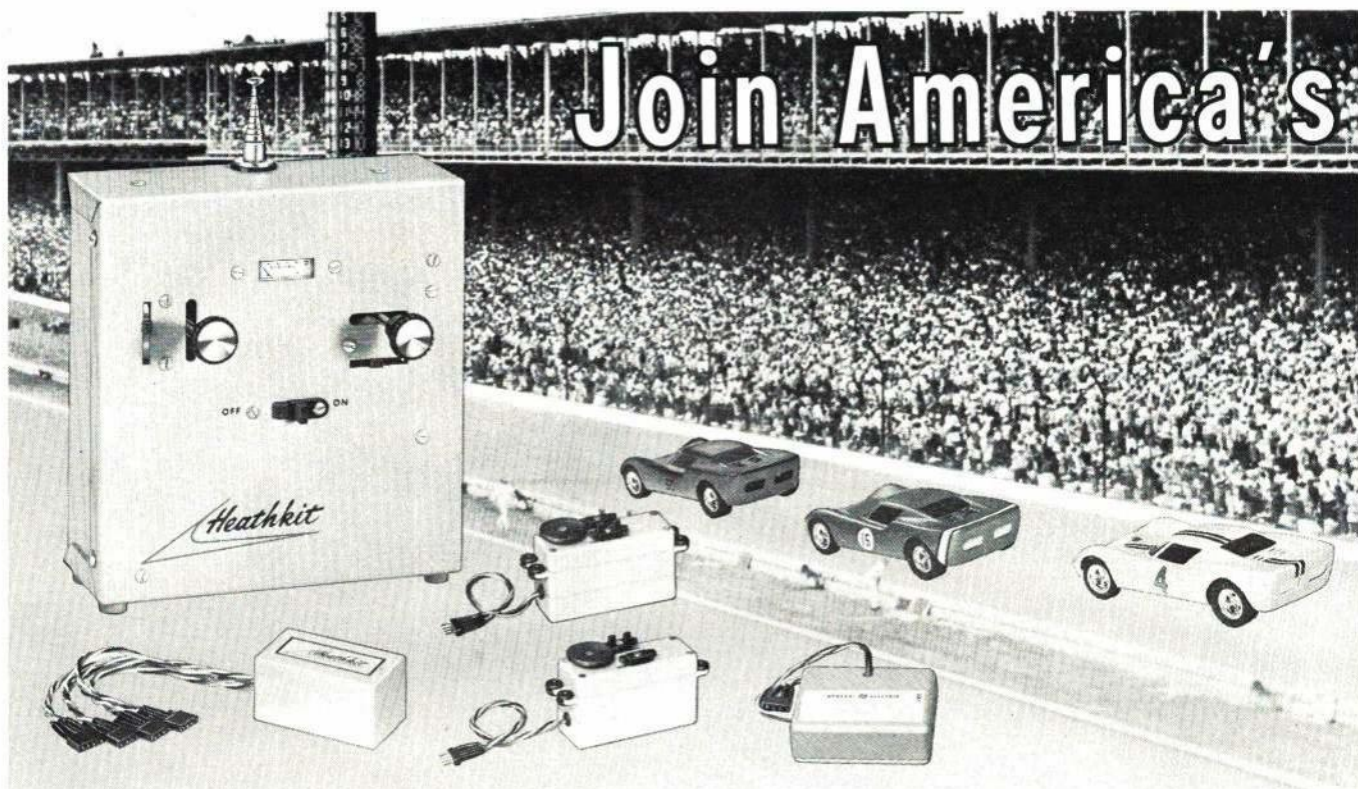
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Kit GDA-57-2, receiver only, specify freq., 1 lb. **\$34.95***

Kit GDA-19-3, receiver battery pack only, 1 lb. **\$9.95***

Kit GDA-19-4, one servo only, 1 lb. **\$21.50***

GD-57 SPECIFICATIONS — TRANSMITTER — Controls: 3 channels; 2 with trim, on-off switch. **Power Supply:** Internal 9.6 volt nickel-cadmium battery. **Dimensions:** 6 $\frac{3}{8}$ " H x 6 $\frac{1}{2}$ " W x 2-1/16" D. **Net Weight:** 2 lbs. with battery. **RECEIVER — Dimensions:** 1 $\frac{1}{2}$ " W x 1 $\frac{1}{2}$ " D x 2 $\frac{3}{8}$ " L. **Net receiver weight:** 2 oz. **RECEIVER BATTERY — Type:** Rechargeable nickel-cadmium. **Voltage:** +2.4 V and +4.8 V outputs. **Current rating:** 500 mA hours. **Dimensions:** 5/8" H x 2 $\frac{1}{2}$ " W x 2 $\frac{3}{8}$ " D. **Net weight:** 3.9 oz. **SERVO — Thrust:** 3 lbs. minimum. **Transit time for 5/8" travel:** 0.7 seconds. **Linear output travel:** 5/8" end-to-end. **Rotary output travel:** Over 100° rotation (end-to-end). **Temperature range:** 0° to +160° F. **Mechanical output:** (1) rotary arm, (1) rotary wheel, (2) linear arms. **Position accuracy:** $\pm 0.5\%$. **Dimensions:** 1 $\frac{3}{4}$ " H x 1 $\frac{1}{2}$ " W x 3-1/16" L. **Net weight:** 2.5 oz. **GENERAL SPECIFICATIONS — RF Carrier frequency:** Crystal controlled on 27, 53 or 72 MHz bands (see list below). **Frequency stability:** Within $\pm 0.005\%$ on 27 MHz, $\pm 0.002\%$ on 53 and 72 MHz bands. **Temperature:** 0° to +160° F. **Complete airborne system weight:** 12 oz. (1 receiver, 1 receiver battery, 1 switch & 2 servos). **Total operating time:** 4 hours minimum (with batteries fully charged). **Frequency available:** 27 MHz: (11 meters) — 26.995, 27.045, 27.095, 27.145 & 27.195. 53 MHz (6 meters) — 53.100, 53.200, 53.300, 53.400 & 53.500. 72 MHz (4 meters) — 72.080, 72.240, 72.400, 72.960 & 75.640. (NOTE: An amateur radio operator's license is required for 6 meter operations. Class C Citizen's band license required for 27 and 72 MHz.)

Heathkit GD-19 5-Channel Proportional R/C System ... Only \$219.95* Complete With 4 Servos



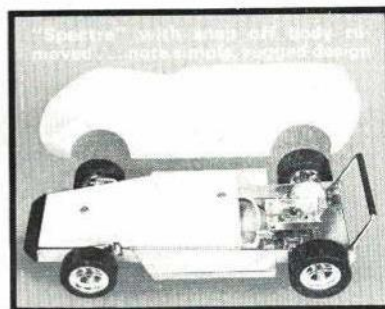
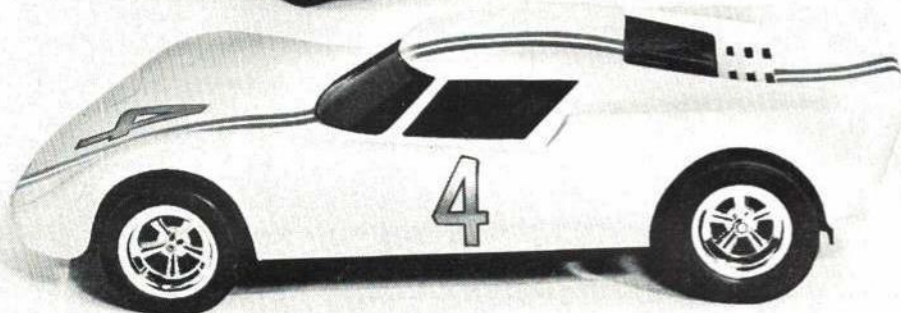
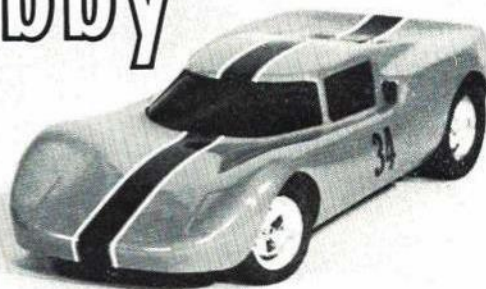
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Join The Most Exciting Hobby In America... building and racing radio-controlled Grand Prix cars. Feel the tense excitement as a dozen cars slam into the "s" turns of a Le Mans or Riverside styled course... the gripping near-panic as you thread your car through the pack around the tight turns and hills of a Mille Miglia or Watkins Glen course... the surge of excitement at racing your car at scale speeds up to 200 mph. Thousands of experienced R/C modelers and novices alike share this kind of thrill-packed experience and you can too... with the new Heathkit "Spectre" radio-controlled car.

Designed To Win! The new Heathkit R/C car is a newcomer to the market, but it is no stranger on a race course. The "Spectre" has been extensively tested and refined under actual race conditions, and can be credited with starting the trend toward "sidewinder" designs. In a recent Midwest meet, a "Spectre" prototype running the Heath GD-57 R/C System and GDA-101-1 Veco .19 engine took four out of five 1st places... the only top spot it missed was a "standing still" event, the Con-course, because it didn't have a finished body on it.

On The Move, Nothing Can Touch It. The design of the "Spectre" is unique among R/C cars. The one piece chrome plated steel chassis gives the car a true frame, resulting in tracking and handling like a real Grand Prix machine. Adjustable caster and toe-in allow you to trim the car for optimum performance. Specially formulated rubber wheels and inde-

pendent front suspension give the "Spectre" traction to take curves at speeds that would put other cars off the track. The 5.5:1 gearing has been selected to provide maximum torque at all speeds.

A Simple, Common-Sense Design. The new "Spectre" will not only outperform all other R/C cars on the market... it will outlast them as well. Simple, common-sense design is evident throughout... a virtually indestructible high-impact plastic body that snaps on instead of bolting on... simple coil springs for suspension in place of fragile piano wire "A" arms or torsion bars... a dirtproof, oilproof box inside the car to protect your R/C gear... tires that actually lock onto the "mag"-type wheels... husky, straightforward gear design instead of a fragile shift-able transmission... locking hardware used throughout to insure that the car stays together. The design is simple... reliable... and it works — better than any other R/C car made.

The Only Truly Complete Car Kit Available. The "Spectre" includes everything you need for a complete car except the engine and R/C gear... body, chassis, wheels & tires, fuel tank & tubing, radio equipment case & protective foam, gears, axles, servo linkages & mounting tape, all hardware, decals, numbers and a comprehensive manual. The famous Heathkit manual makes assembly foolproof with its giant foldout pictorials and clear, plain English instructions.

Get On The Track With A Winner... the new Heathkit "Spectre". Order yours now.

Kit GD-101, R/C car only, 8 lbs. \$49.95*

Assembled GDA-101-1, Veco .19 R/C engine, 1 lb. \$19.95*

GD-101 SPECIFICATIONS — GENERAL — Chassis: 16 gauge chrome plated steel. Body: GT-Sports, 1/8 scale, high-impact plastic. Drive: Gear driven, live rear axle. Gear ratio: 5.5:1. Clutch: 1" centrifugal type, adjustable. Brake: Neoprene-cork shoe. Suspension: Front coil spring. Front tire: 3" x 1.125". Rear tire: 3.250" x 1.375". Weight: 6 lbs. 6 oz. (approximately) without radio equipment. Engine Requirement: .15 to .23 cubic inches (2.5 to 3.5 cubic centimeters) displacement, R/C throttle glow plug model airplane engine. Fuel tank capacity: 4 ounces. Approximate running time (1 tank of fuel): 15 to 30 minutes, depending on average running speed. Speed: 0 to 25 mph. (0 to 200 mph scale). **CAR DIMENSIONS —** Wheelbase: 12". Track (front): 7 1/4". Track (rear): 7 1/4". Length: 19 3/4". Height (body): 5". Width (body): 8 3/4". Ground clearance: 8 3/4".



NEW

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Zip _____

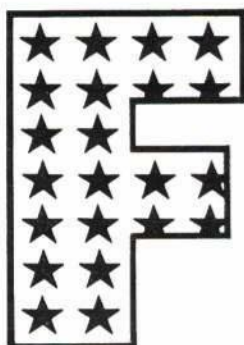
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Prices & specifications subject to change without notice.

GX-207



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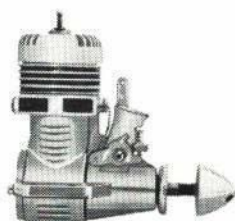


FOX 36x RC

Bore _____ .800
Stroke _____ .715
Wt. _____ 8 1/2 oz.

\$19.95

Peter Chinn, independent engine tester, reports: "We can think of few engines that so successfully combine ease of handling, reliability, a performance range adaptable to a wide variety of requirements and all for a price that is low by any standards." (Model Airplane News, April 1970)



FOX 15x RC

Bore _____ .590
Stroke _____ .540
Wt. _____ 4 1/2 oz.

\$14.95

NEW - Rotary Type Exhaust Valve.
NEW - Finned Crankcase.

We believe the Fox 15 RC is the only 15 size engine featuring a controlled fuel flow at idle. This means you can make touch and go's - prolonged dives - spins, etc. at idle without danger of the engine flooding out. The Fox carburetor is different - and better, we believe. Try it!



MFG. CO. 5305 TOWSON AVE.
FORT SMITH, ARK. 72901 A C 501 646-1656

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So stable it flies hands off!

EASY TO BUILD—TO FLY—TO AFFORD!

You can enjoy actually flying in the craft you build when it's a Bensen, world's most popular homebuilt aircraft. Fly low and slow or high and fast. Store it in your garage, go aloft when you like. So stable it flies hands off! The famed Bensen is your logical move up from models. It is designed by aeronautical engineers for building with ordinary hobbyshop tools at no more cost than a V-control job. Gyroglider is same craft as the record-holding Gyrocopter but without the engine (add later). Wheels interchange with floats. Lowest cost flying, practically no maintenance. Easy-to-read construction plans with flying instructions, also factory prepared parts and kits, are ready when you are. MAKE YOUR FIRST MOVE NOW: Send \$2 for 3-View Drawings, photo, specs of the Gyroglider, or \$3 for Gyrocopter info.



2-PLACE GLIDER



POWERED COPTER

SEND \$2 or \$3
BENSEN AIRCRAFT CORP., Dept. AAM-60
Raleigh-Durham Airport, Raleigh, N. C. 27604
NAME _____
ADDRESS _____

without exceeding the weight of the original model. Excess weight will cut down on the flight performance.

Fuselage: Build two fuselage sides on the plan, join together with crosspieces to form a box-type frame to which are added the formers, firewall, landing gear, etc. The bottom part of the cowl is built solidly onto the fuselage. Keep the fuselage structure square and straight and the wing alignment later on will be easy. For a longer flight time than is supplied by the engine's tank, make provision for a larger fuel tank. Mount the actuator (or escapement) solidly on a plywood bracket. The battery was held down into foam rubber on its mounting board by a rubber band. The receiver was simply wrapped in a big piece of foam rubber and stuffed into the front of the fuselage.

Wings: Use the full-size wing rib pattern to cut the required number of wing ribs. Build the wing panels on the plan, let dry. Trim bottom of main spar. Block up to dihedral angle and build center section. Add 1/32-in. sheet to leading edge after wings are finished. Add cabin fairing structure to top wing while wing and fuselage are mated. Cut, bend, and epoxy in place the whisker wires for N strut attachment.

Chances are good that after the wings are covered and doped, there will be a slight washout noticeable. (The tips will have less angle of attack than the root.) If this washout is in the neighborhood of 1/8 in. and equal for all tips, leave it in as this seems to increase flight stability.

Tail: Both stabilizer and fin are made on the plan in standard manner. Sew on the rudder so that free hinge action occurs. After the tail is assembled on the fuselage, set the actuator arm and rudder at neutral and glue threads in rudder horn.

Covering: The clear-doped colored silk covering on the original is worth the extra effort that silk requires, but Silspan or the newer plastic-film covering may be used instead.

For those who may wish to try covering with silk, here are the basics. (1) Put two coats of clear dope on all surfaces to be in contact with the covering. Sand lightly when dry. (2) Cut a piece of silk 1/2 in. larger all around than the area to be covered. (3) Lay silk on structure and water-spray until soaked. (4) Use fingers to work out wrinkles or sagging. (5) Flow-on clear dope with brush to perimeter of structure through wet silk. (6) Let dry and trim excess silk. (7) Brush on clear dope but avoid trying to fill the pores on the first coat. At least three or four coats will be necessary to close the pores, five or six for a good finish.

Color and detail: The early Waco cabin biplanes had the wings and horizontal tail light-colored (orange, yellow, white), while the fuselage, vertical tail, landing gear, and struts were dark (green, blue, black). Some, however, were painted to the owner's preference of a single color such as red, orange, or black, with only a fuselage trim stripe of contrasting color.

The aileron and flying surfaces should be outlined with a 1/16-in. black line. Addition of registration numerals increases the realism. Certain structural details as well as a wealth of small details have been omitted from our model for practical reasons.

Flying: Don't rush off to the flying field before the model has been properly balanced.

Continued on page 72

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FOR .049-15
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FLYER

.049: RUDDER
ONLY OR F/F

.09-10
GALLOPING
GHOST

\$8.95

MOLDED
ENGINE COWL

SEMI-SCALE
TRAINER &
SPORT
FLYER

FORMED LANDING GEAR

*D.H. BEAVER

DECALS

45" SPAN — FOR
.049-15 ENGINES
MOLDED FOAM
WING (REPLACE-
MENT WING: \$3.50)

ENGINES:
RUDDER ONLY OR F/F: .049
GALLOPING GHOST: .09-10
FULL PROPORTIONAL: .10-15

\$9.95

SIG "AAA" BALSA — NEW PRICE LIST

SHEETS STRIPS BLOCKS

36" LENGTHS	36" LENGTHS	3" LENGTHS
1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	
19 x 3 20c	1/16 x 3 3c	
20 x 3 20c	1/16 x 3 3c	

NEW BALSA ADDITIONS

SHEETS — 36" LENGTHS

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	
19 x 3 20c	1/16 x 3 3c	
20 x 3 20c	1/16 x 3 3c	

SIG SPRUCE

36" LENGTHS 48" LENGTHS

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	
19 x 3 20c	1/16 x 3 3c	
20 x 3 20c	1/16 x 3 3c	

BIRCH PLYWOOD

FINEST GRADE 24" LENGTHS

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	
19 x 3 20c	1/16 x 3 3c	
20 x 3 20c	1/16 x 3 3c	

SIG BASS WOOD

18" LENGTHS SHEETS

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	

SIG BIRCH DOWELS

12" LENGTHS 36" LENGTHS

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	

SIG DECAL PROOFER

MAKES ALL DECALS REEL-PROOF & DURABLE (ONLY ONE COAT REQ.)

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	

SIG MODEL PINS

MAKES ALL DECALS REEL-PROOF & DURABLE (ONLY ONE COAT REQ.)

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	

SIG RUBBER BANDS

MAKES ALL DECALS REEL-PROOF & DURABLE (ONLY ONE COAT REQ.)

1/32 x 3 20c	1/16 x 3 3c	1/4 x 3 6c
1/16 x 3 20c	1/16 x 3 3c	1/2 x 3 12c
1/8 x 3 20c	1/16 x 3 3c	3/4 x 3 18c
1/4 x 3 20c	1/16 x 3 3c	1 x 3 16c
3/8 x 3 20c	1/16 x 3 3c	1 1/2 x 3 22c
1/2 x 3 20c	1/16 x 3 3c	2 x 3 36c
3/4 x 3 20c	1/16 x 3 3c	
1 x 3 20c	1/16 x 3 3c	
1 1/2 x 3 20c	1/16 x 3 3c	
2 x 3 20c	1/16 x 3 3c	
3 x 3 20c	1/16 x 3 3c	
4 x 3 20c	1/16 x 3 3c	
5 x 3 20c	1/16 x 3 3c	
6 x 3 20c	1/16 x 3 3c	
7 x 3 20c	1/16 x 3 3c	
8 x 3 20c	1/16 x 3 3c	
9 x 3 20c	1/16 x 3 3c	
10 x 3 20c	1/16 x 3 3c	
11 x 3 20c	1/16 x 3 3c	
12 x 3 20c	1/16 x 3 3c	
13 x 3 20c	1/16 x 3 3c	
14 x 3 20c	1/16 x 3 3c	
15 x 3 20c	1/16 x 3 3c	
16 x 3 20c	1/16 x 3 3c	
17 x 3 20c	1/16 x 3 3c	
18 x 3 20c	1/16 x 3 3c	

SIG AIROLAC

NEW HIGH-GLOSS CELLULOSE ACETATE BUTYRATE DOPES FEATURING TRIPLE-GROUND PIGMENTS FOR AN ULTRA-SMOOTH, GLASS-LIKE FINISH. IT'S FAST-DRYING & LEVELING. TANK-RESISTANT & FAD-PROOF. AVAILABLE IN 15 COLORS:

SUDDEN SERVICE PLANS

Full-Size Plans — Shipped First Class Mail Within 48 Hours — No Extra Charge

No. 0101, Undone I — R/C Pattern plane for 60 engine for new maneuvers and lightweight equipment. Wing span 59". **\$3.50**

No. 0102, Skyvan — Semi-scale twin 049-powered STOL transport. Simple construction, all-balsa. For C/L **\$1.50**

No. 1191, Scimitar — Unusual-looking R/C stunter. High-speed maneuvers, clean tracking, 60 engines. Low-tail Rivets look. By Joe Foster. **\$3**

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No. 1193, Mig 21d — 40-powered C/L version of Russian fighter is fast, stable flyer. By Roland Baltes. **\$2.50**

No. 1194, 1937 Gas Model — Half-size 049 copy of great old-timer. Has durability and easy-to-fly characteristics. Frank Ehling. **\$2**

No. 1091, Halberstadt — Nearly scale R/C WW I fighter with semi-symmetrical 6' wings. 60-powered. Two-sheets. **\$4**

No. 1093, Hootie II — Record-holding rat-racer developed over years of competition. 40 engine. **\$1.25**

No. 0791, Pusher Galore — Bill Hannan's all-sheet, rubber pusher for Tenderfoot. Looks like supersonic transport. **\$7.5**

No. 0894, Voltswagon — Trainer and stunter by Marsh for electric tether flying with slot-car motors. Plans for the pylon included. Great club activity. **\$1.50**

No. 0794, Skimmer Airboat — Sled-type fun watercraft by Paul Hook. 09 engine, R/C rudder, throttle. **\$2**

No. 0991, Flashby 1 — Rakish-looking all-balsa ROG by Wayne Brown. For the Tenderfoot. Tricycle gear. **\$1**

No. 0992, Fouga Cyclone — Scale model of jet-assisted French sailplane, by Nick Zirolli. Gains altitude easily on 09 engine. A two-piece 7-ft wing. For R/C. **\$3.50**

No. 0993, La Jollita — Profile 15-powered Goodyear C/L racer by James Kloth, fast, groovy. On mild fuel and engine does 85 mph. **\$1.25**

No. 0891, Jungster — Realistic R/C stunter by Leake with swept midwing. 60 powered. Smooth maneuvers. Two sheets. **\$3.50**

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No. 0893, Martin Mo-1 — Rare WW-1 era monoplane, carrier fighter ideal for Class 1 Carrier. Ailerons keep lines tight at low speed. By Reeves. **\$1.50**

No. 1181, Junkers D-1 — Joe Tschirgi 1918 fighter, proportions for perfect R/C scale. 45 engine. Low-wing has 500 sq. in. **\$3.50**

No. 1182, FAI Pussy Cat — On this FF, Earl Thompson used high thrust-line, rear fin, clean lines to hurdle climb/transition gap. Hot 15. **\$3.50**

No. 1281, Strato-Streak '68 — Frank Heeb's 1/4 F/F updated version of hottest gas model of 1941 era. Simple pylon, 275 sq. in. **\$1.50**

No. 1282, Sky Mite — Small R/C multi by Hibbard has performance of larger craft. Foam and fiberglass. Span 52". Weight with 4-channel gear, 4 lbs. 19 to 35 engines. **\$2.25**

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No. 0391, El Cochino — Bob Morse conventional-design stunter. 57" low-wing. Can be extended 6" as R/C trainer. **\$2.50**

No. 0491, Emeraude — Duke Crow reduced famous home-built to R/C size (65"). 40 to 60, does stunt pattern. Gentle. Two sheets. **\$3.75**

No. 0492, Biceps — Don Yearout's show Control-Line bipe spectacular performer. 60-powered, flies slow, maneuverable. Two sheets. **\$4**

No. 0591, Small Fry Special — Mottin's C/L trainer for Tenderfoot. Easy to build. An .049. **\$7.5**

No. 0592, Messerschmitt Bf. 109E — R/C, semi-scale by Munninghoff. Mean look of efficient fighter. Two sheets. **\$3.75**

No. 0593, Manta — Howard Kuhn's Boost Glider for model rockets easy to build from sheet. A winner. **\$7.5**

No. 0691, Jr. Sky Squire — R/C sport-trainer by Jess Krieser, .09 to .19. From Galloping Ghost to multi-digital proportional. Span 48" (416 sq. in.); 3 lbs. **\$2.50**

No. 0692, 1/4 Sky Squire — Small version famous Sky Squire. 1 ch. rudder-only, or rudder, elevator and motor on Galloping Ghost. Only 22-28 oz. **\$2**

No. 0693, Mustang — Rabe's great near-scale C/L stunt. Flies pattern with ease. S.T. .40. Over 57". **\$2**

No. 0792, Rivets — Speedy, responsive R/C. Owen Kampen design for .020. Adams Baby Actuator, rudder-only. **\$1.75**

No. 0793, Atom — Mottin's Advanced Training Model for C/L. Sheet balsa. Easy flyer. .15 or .19; convert later to larger sizes. **\$2**

No. 1183, Corrigan — James Wilson's unique 1/4 C/L stunt model. Flies tail first! Stable like big stunt ships. Easy to build, 23". **\$1.75**

No. A693, Sweeper — Windy Urtnowsky's giant, C/L stunter, 78" span. 60 up front. Many trim adjustment features. **\$2.75**

No. A695, Lady Maxley — Brian Donn's A/2 Nordic towline. Davis 3 foil. Ritz construction. **\$1.50**

No. A697, Dwarf Dip III — Easy to fly, rubber Coupe de Hiver by Charles Stotich a winner! For small fields. Warp-resistant. **\$1.50**

No. A691, E A A Biplane — Nick Zirolli's scale R/C uses .40 engine, full-house gear. 38" wings, semi-symmetrical foil, box-and-stringer fuselage. Two sheets. **\$2.50**

No. A692, Miracle Worker — John Blum's C/L trainer. Combat, carrier, stunt. Easy-to-build profile. 35 engine. **\$1.50**

No. A694, Montana Duster — R/C Class-C stunter by Simon Dreese, semi-scale appearance. Foam wings, simplified assembly in 6 hrs. Two sheets. **\$3.50**

No. 1291, Demon Delta — Fast, mild-stunting C/L for 35-45. Looks like modern fighter. Attract attention for demonstrations. By Jerry Farr. **\$2.50**

No. 1292, Dolphin II — Czechoslovakian R/C for pusher, 09-15 mounted at rear under T-tail. Rudder/motor, good slope soarer. **\$1.75**

No. 1293, A/Wonder — Simple all-balsa A-1 towliner by Bob Stalick. Ideal for beginners at towline events. **\$1.50**

No. 0201, Cardboard Cutie — Inexpensive all cardboard C/L for Tenderfoot, 049. Two sheets. **\$1.25**

No. 0202, Push-Air — For Brown's tiny CO₂ engine. Simple F/F by Ehling. Like Curtiss-Wright Jr. **\$7.5**

No. 0203, Ole Tiger — Bob Morse's swift Formula I R/C of Bob Downey's famous racer. K&B 40. **\$3.50**

No. 0204, Classical Gas — Haight's C/L stunt for 35, for flyers graduating from profiles. **\$2**

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No. 0403, Bonster — C/L Goodyear for club project with 35 engines. All balsa and plan has balsa cutting guides. By Williamson. **\$2.50**

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No. 0501, Classic — Contest F/F for 1/4 A to C engines. Build any size, photo reduce plan to suit. As supplied, plan is for C class. Good detail. **\$4.50**

No. 0502, Mod Pod — All-purpose model, F/F, R/C, or tether — glider or power. Fiberglass pod, arrow-shaft boom. **\$1.75**

No. 0503, Royal Marine — By Yui Oki of Japan, magnificent seaplane with 8' wing. Two 40's or one 60. Graceful lines; smooth flyer, handles easily on water. Two huge plan sheets, every part shown in detail. **\$8.00**

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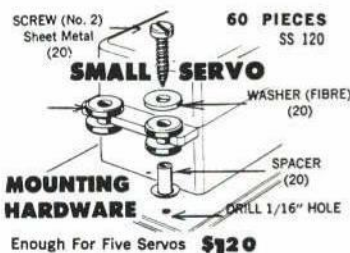
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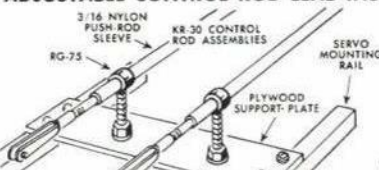
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NEWS BULLETIN

A scholarship stipend valued at \$1500 will be awarded the winner of the first Boeing Management Association Model Aeronautics contest which will be held in Seattle, Washington, June 20 and 21, 1970.

The contest, which follows closely behind the Spokane Internats meet to be held in Spokane, Washington, on June 12-13-14, is sanctioned by the Academy of Model Aeronautics.

Contestants, who must be less than 19 years old on July 1, 1970, will compete in 17 events ranging from free-flight model, helicopters to radio-controlled fixed wing aircraft. Entrants must be members of the Academy of Model Aeronautics or the National Association of Rocketry and must make and fly their own aircraft.

Free-flight events include 1/2 A Gas, unlimited rubber, hand-launched glider, tow-line glider, cargo and helicopter. Control line competition will include combined speed/record ratio, control line scale racing, stunt, Navy carrier, and 1/2 A profile proto speed. Specialty category events are indoor hand-launched glider, indoor easy "B", rocket quadrathlon, swift boost glide rocket, radio-controlled pattern, and design craftsmanship. The contestant's best score in four events will be combined to determine the winner. Trophies will be presented to runners-up.

Entrance information may be obtained by writing Boeing Association Model Aeronautics Contest, M/S 85-48, The Boeing Company, Seattle, Washington, 98124.

anced; the wings and tail checked for alignment, incidence, and warps; the radio system checked out (right is right, left is left); battery fully charged; and a calm day arrives. If you do so, the flight guarantee is void. If there is a soft, grassy area available, try a few test glides with the model. Some adjustment can be had by bending the stabilizer slightly. The first powered flights should be at reduced power or with prop on backwards. A stalling flight can be given first aid by using the rudder to turn the model out of a stall until the flight is completed, after which the necessary adjustments can be made.

Hand launching is advised, at least in the beginning. Once the glide is satisfactory, the powered flight can be adjusted by revisions to the engine thrustline. The original flew "right off the board" with only the addition of a few degrees downthrust.

Coupe de Challenge

Continued from page 32

The common motor sizes are six strands of six mm, six strands of five mm, and eight strands of four mm. The motor information chart gives lengths and turns, an all-around aid in power determination. Hand launching now permits experimenting with so-called marginal power models using motors perhaps 16 in. long which will take up to 700 turns. Although this may not turn out to be

an all-weather airplane, it can be interesting in the hands of the right person. A word of caution: check the rear peg location because many come out under the wing. If this is the case, try using the hatch opening on the bottom, but then use a hatch cover to keep out the dirt.

Although White and Dolby use carved props, Wasser uses a simple sheet prop, as do many others. There are several ways to make these. One is to make a hardwood template to which the wet sheet blades are strapped until dry. Wasser makes his this way from a piece of 2 x 4" with a true 12-in. pitch. His blades are three layers of 1/32-in. balsa glued with Jifbond. One-eighth-in. sheet also can be used this way, as can two sheets of 1/16 in. An alternate way is to use a bottle, with no smaller than a 4-in. diameter, as a form. Tape the wet blades at a skew angle of 15 degrees. This instant prop form works well but may require a bit of trial and error until the right sizes of bottle and angle are achieved. Although these three models use two-bladed props, they are not universal. Fudo Takagi uses a one-blade prop quite effectively.

These models are inexpensive. The average hank of rubber will yield at least 40 Coupe motors. For sport flying this will last a whole season. Contest work is a bit more demanding for, in competition, all the stops are pulled out to get that little extra performance.

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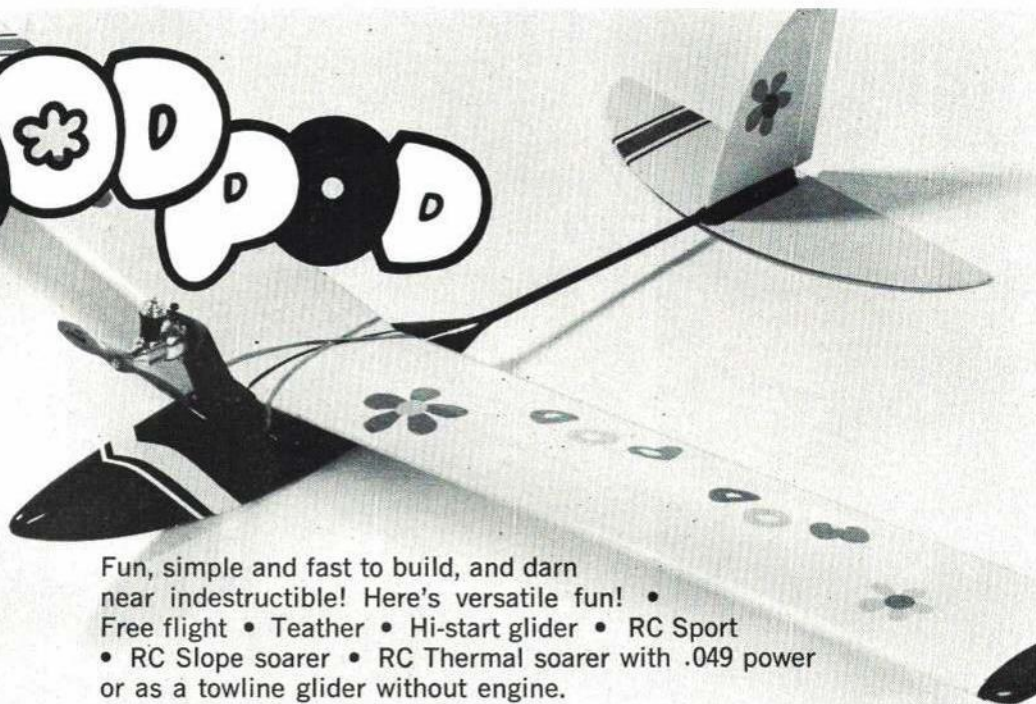
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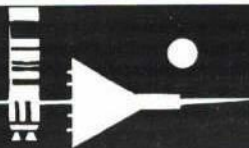
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Getting Started in R/C

Continued from page 43
tion as each control stick is moved.

Again, the digital modulator could control the oscillator only, the PA only, or both. A few very early digital transmitters did produce a string of audio tone pulses, but this was felt to be needlessly complex and expensive, so the present modulation methods were developed.

As may be seen, if we take each section of the transmitter separately and find out what it does, the overall result is much easier to understand than if we just contemplate the miracle that allows us (usually!) to move our model controls in exact step with our movement of a little lever at the transmitter.

India Ink is Magic

Continued from page 23
react with any known finish.

Ink Application Operations

(1) Apply a thin covering of talcum with a duster rag to an area of the model's surface; (2) position plastic straight edge on the surface with the aid of masking tape; (3) using a single stroke of the pen (more than one stroke could widen the line and make it

unusually outstanding) construct the desired line. (4) After the ink has dried, dust excess talcum from the surface with a clean, dry cloth. (5) Spray a thin coat of clear sealer over the completed lines for protection against smudging.

Inked lines may be used to detail sheet metal panel joints, simulated rivets, access and inspection panels, and hatches. Other special applications are airbrush highlighting to simulate engine exhaust and freehand pen work (as in cartoons).

Once you have seen the results of this simple technique, I believe you will be "hooked," and other models you own will seem strangely unfinished.

Flower Power

Continued from page 21

The wing is built with the lower rear

sheeting flat on the board. A length of 1/8" TE is just right to elevate the lower front spar to the correct position. The ailerons can be built right in the wing at the same time and then cut out. If done this way slant the aileron leading edge in reverse. When the aileron is cut out, it is merely turned over and transferred to the opposite panel. Result—instant washout, no pain, no strain. The aileron control horns are from the Midwest accessory pack with the flanges cut off. The rib at the root end of the aileron is cut out to nest the modified control horn and the two small sheet-metal type screws must enter into the 1/16" ply rib doubler.

The aileron servo mount is a quickie and convenient for the KPS-9 servo. It allows the servo to be installed or removed easily, and it does not project above the surface of the wing. Two narrow strips of G Pad are

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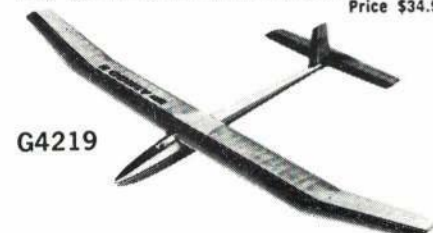
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placed below the servo for vertical support. The packing around the receiver will hold it down. Be sure the hardwood blocks hold the grommets snug without excessive compression. Also, there must be no end play.

I used Celastic cloth for doubler strength in the radio compartment. It can be installed after the basic structure is completed, and, if cut a little oversize, can be pressed into the corners for fillet strength. The inside tube of Nyrod was used to guide nylon-covered steel cable for nose gear and throttle control. These Nyrod tubes are installed before the Celastic. Rand Swing-in keepers were used at both ends of the nylon-covered steel cables. Just bend a sharp right angle in the cable and attach the keeper. Adjustments can be made by merely straightening the cable and re-bending at the corrected length.

Nyroids were used for rudder and elevator. If care is taken to align all holes in the bulkheads, a length of 1/8" music wire may be inserted to maintain alignment while the glue sets. The result is smooth-working Nyroids. The smooth Quick Link shafts are easily anchored in the Nyrod ends by nicking with wire cutters, dipping in carbolic acid (liquid phenol) and inserting into the Nyrod. Do not disturb overnight. This allows the softened nylon to set.

The ship is quite economical to build. I used 2 3/4" Banner wheels which are neat and have less drag in the grass.

The entire model was sealed with clear dope and covered with Shrink-Tite. The covering was then sealed with a minimum amount of clear dope — just enough to close the weave in the open areas on the wing. After that, three coats of polyurethane enam-

el (available at most any paint store) were brushed on and wet-sanded (with no mercy) between coats. One final spray coat and it was done except for trim. Do not attempt to trim with dope unless a crinkle finish is desired. Polyurethane enamel fills surprisingly well. After four coats, two of which almost have been sanded away, the little jewel will look like a fine piece of china — and that is no exaggeration. By the way, this stuff is totally fuel-proof. Thinning and cleanup are done with turpentine. The enamel part of this project can be done for less than \$2.50.

Be sure all control surfaces are aligned and that all linkages have minimum free play with no bind. The CG should be as indicated and deviation should be forward — definitely not to the rear. If trim corrections are needed during the first flight, attempt to correct these conditions so very little control surface deflection is trimmed in for straight level flight. This is necessary on almost any ship to obtain smooth performance at all speeds.

I am just a Sunday flier, but this ship has been wrung out in just about all maneuvers possible. It should do well in any pattern event, and on a small budget too.

You Can Fly Carrier

Continued from page 28

tin MO design was shown in *American Aircraft Modeler* and this issue contains my contribution to carrier design.

Control systems for Navy Carrier models are almost exclusively J. Roberts bellcranks made by Sturdi-Built. The rest are usually homemade modifications of this design. Electric throttle systems have been used. However, the Roberts bellcrank works best and is the simplest. This three-line bellcrank uses a counterbalance principle in which the third or throttle line pivots the bellcrank about its mounting so that elevator position stays the same when the third line is moved, but an extra arm moves to operate the throttle device on the engine. Centrifugal force (the pull of the model) returns the throttle to high speed when tension is



Following demonstration of rockets at Cox R & D area at Marine Corps Helicopter Station at Santa Ana, Ben H. Garrett, center, director of marketing for L. M. Cox, Mfg., presents mounted sets to Col. Kenneth E. Huntington, left, Station C.O., and Santa Ana mayor Lorin Grisct. Awards recognized contributions to safety in model rocketry.

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relaxed on the third line. In this system the wind drag of the throttle line is balanced by the drag of the elevator control lines. If a separate throttle bellcrank system is used it must be balanced with a heavy spring, or line drag will give low throttle. This results in a stiff control which can be avoided by using the Roberts system.

Engines used in Class II are the big McCoy 60 with a variety of throttles, as well as the Rossi 60. Most of the R/C 60's are not designed for the high revs necessary to reach top speeds. Class II models remain rather costly ships because of their need for these expensive and hard-to-find engines and their equally expensive throttles.

Less costly and complex are the large number of good R/C 40's and 35's available. The Supertigre 40's, both front and rear valve, are commonly used in Class I. K&B and OS both make 40's designed for R/C

Goodyear that also are real performers. Any other good 35 or 40 with a throttle is fine for a start in Class I. Ability to rev up is most important in an engine but low idling is vital too.

Seven laps of low speed are required. The engine must have the ability to just turn over and be able to change speed at command to meet flight situations. R/C engines generally are designed to lug with larger prop and are not ported for maximum revs. They do give excellent slow speeds thanks to modern throttle designs.

Props used vary with engine and model, but it's best to begin with a 10-8 for the 60 and a 9-8 for the 40. Nylon props are suitable for practice on a 40 because wood props are normally broken in any good arrested landing. Stopping the engine by breaking the prop on a good landing assures that the model will sit on the deck where it hits.

Most flyers use wood props for this reason. They also are truer running and more efficient.

It is best to learn on a rugged carrier trainer. Any of the profile stunt jobs, such as Shoestring, Flite Streak, or Ringmaster can be adapted to carrier by equipping them with a three-line throttle system and a landing hook. Even better are the smaller profiles, such as Sterling's Sky Shark which was designed for this job or the Top Flite Streak Trainer, an all-balsa profile. The larger stunt profiles qualify for AMA profile class but the two smaller ones do not. They must fly in Class I or II if used in competition. A profile can be flown in Class I or II but it earns no scale points, which is a 100-point handicap. Scale judging is modified in that minimum requirements are set and the model is either scale or not, all or nothing. Profiles obviously do not meet the

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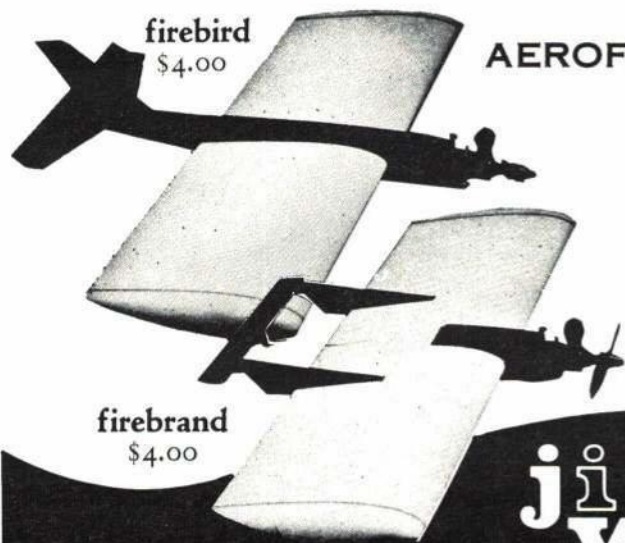
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minimum so they have to fly in the regular
classes at a disadvantage.

The new profile class requires a model of
300 sq.-in. area and an engine of 36 or smaller
with sleeve bearings and a factory throttle.
These standards are quite restrictive
but the larger profile stunt models will qual-
ify with the right engine. This class was de-
signed for beginners, but already the planes
are quite sophisticated. Good engines to
meet the requirements are not easily avail-
able. The best trainers are still the smaller
profiles as represented by the Sky Shark
and the Streak Trainer kits. Both are the
right size and rugged.

The model can be given a Navy paint
job, complete with insignia and decoration.
There is no end to the types of trim that
can be used. Many of the real Navy air-
craft are highly individual. If the model has
those Navy colors, the pilot will feel like a
real jet jockey heading for the deck with
glow plug-powered profile.

The control mechanism in these models
is quite different and needs close study.
As described earlier, the J. Roberts bell-
crank is best for obtaining additional throt-
tle control, so the model is built around it.
Normal lead-ins of music wire or braided
cable fasten to the elevator portion of the
bellcrank, and a third lead-out is fastened
to the throttle arm. This lead must be po-
sitioned between the elevator leads at the
wing tip so that pull on this line will not
cause the ship to nose in. A pushrod runs
from the elevator portion of the bellcrank
to the elevator horn in normal U-control
manner.

The throttle is operated by the pushrod
from the throttle portion of the bellcrank.
This pushrod must run as straight as possi-
ble because bends will result in flexing and
lost control motion. The bellcrank moves
the throttle rod only 1/8 in., therefore proper
leverage on the motor throttle arm must be
used so this movement takes the engine
from full to low throttle. For positive action
all pushrods should be stiff enough to resist
bending.

An arresting hook is needed for landing.
Most hooks are released when the throttle
is first moved to low speed, which allows
flaps to be tied in. The hook should be rather
strong and heavy enough to drop into po-
sition. Rubber bands pull it down and
hold it there. Above all, the hook must be
mounted firmly to the body. To make the
hook, wrap a piece of 1/8 in. music wire
around and solder it to a piece of brass
tube. This rides over a No. 6 bolt mounted

through plywood reinforcements on the
side of the profile body. A small rubber
band pulls the hook down and a wood
screw acts as a stop. To release the hook,
a piece of music wire is brought back from
the throttle pushrod as shown and makes
a loop on the hook to catch this wire. When
the throttle is moved to low, the hook-
release wire slides out of the hook loop
and the rubber band pulls the hook into
position.

Flaps are a real help in getting a good
low speed. They change the airfoil section
over part of the wing which results in an
increase in lift. This allows lower flying
speeds with the same weight plane. The
advantage is obvious for a carrier ship. The
flaps can be pulled down by a link from
the hook to an elevator horn fastened to the
flaps.

Although these mechanisms are really
simple, the number of pieces seems to scare
off the too timid. Hopefully, these explana-
tions, photos and sketches illustrate the
purpose of all these pieces and how they
can be used in building a system that is
simple, tough, and reliable. More elaborate
linkages are shown in some kits, but doing
the job is what counts, so the simpler the
system the better.

Friendship from Bonanza

Continued from page 25

The wings can now be installed and the
horizontal stab comes last. The props,
wheels, tires and doors are then attached.
The side windows with a tape backing are
installed while the side doors are off. Using
the proper windows for the correct side,
insert the tape/plastic glass from the rear
door. Using a piece of coat hanger shaped to
press the tape from the outside, tamp the
tape around glass areas to get a good bond.
If done correctly, the windows will again
fit right into position and will give a profes-
sional look.

Exhaust stains on the nacelles can be du-
plicated by rubbing a soft lead pencil just
behind the port. With a brisk movement of
the finger, pull the graphite toward the rear.
A little practice will perfect this modeling
trick. This model of the F-27 had square-
tipped props. Using a pair of toe-nail clip-
pers square the props about 1/8 in. from the
end.

This completes a most attractive model.
If you haven't built an airliner before, this
Bonanza beauty will take the honored place
in your collection.

R/C BOB MORSE

Specialist Correspondent
PYLON RACING

Finishing Dividends: Our last column discussed an item which contributes to winning races, "calling" a race. Article after article is written about hopping up engines, proper fuel mixes and tailoring propellers to fit a particular engine-airplane combo. "Calling" a race can be every bit as important as a million rpm engine. This month another seldom-mentioned aspect of racing, the time handicap, will be considered.

A little extra care in finishing a ship pays handsome dividends in the final race standings. An example of how the modeler penalizes himself: his ship scores 12 points in scale judging; the number one ship earns 16. He's down four seconds even before the starting lineup. Worse yet, when in a heat with 16, 15 and 13 handicap ships, he'll start last and be down eight seconds. That's a lot of time to make up in ten laps.

But a couple of extra evenings spent adding some attractive pin stripes and doing some extra polishing might have moved the model into the winner's circle. . . .

Radial Engine Mount: Recently, the excellent carburetor developed by Bob Siegelkoff and Elk Electronics for the K&B and Supertigre racing 40's was mentioned here. They've done it again with a radial engine mount, machined entirely from heavy-wall 6061T6 aluminum tubing and including a threaded firewall backplate for mounting. It is priced at \$10.95 from Elk Electronics, P. O. Box 239, Milpitas, Calif. 95035. . . .

Tiger Tales: Last fall, your correspondent and Bob Francis staged a demonstration Formula 1 race at the Northern California FAI Scale Meet. On the last turn before landing, we illustrated with extreme clarity how two objects can occupy the same space at the same instant! As a result, the prototype Ole Tiger, which appeared in a recent AAM, and the Francis Products prototype, Shoestring, were no more. Two more Ole Tigers are now finished and perform every bit as well as the prototype. We can relax now, having two Tigers ready to go for the coming season. . . .

Foster's Back: Joe Foster, the number one NMPRA exhibition pilot, is back to the active competition ranks after more than a year's sabbatical. Joe enjoyed his vacation, and now has two ships ready, a Fosterized Ole Tiger and a new design, the Schu-Schus-Nik (I think). The finish line is going to heat up a little this year! . . .

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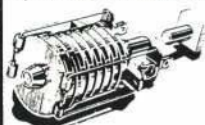
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California R/C Associations' annual meeting was coordinating competition dates for all phases of California R/C. The recent decision to compress the point racing season from last year's seven months to five months in 1970 is playing havoc with the racing schedules proposed by the various sponsoring clubs. There just aren't enough weekends in five months to accommodate all the racing sanctions desired by these clubs.

This is an indication of the tremendous growth being enjoyed by Formula racing and typical throughout the country. Several flyers are planning to compete in San Marcos, near San Diego, and again in Spokane, Washington, 1500 miles to the north. Then back to San Marcos again. Talk about a "hobby!"

Siposs on R/C

Continued from page 37

2855 Velasco Lane, Costa Mesa, Calif. 92626.

Comments: R/C car racing is indeed a great sport which costs no more than other hobbies of serious nature, which is easy to pursue (any good parking lot can be a Grand Prix track) and which gets rid of frustrations in a hurry. Good cars can be built for relatively little money (about the cost of a pair of skis) and only two-channel radio has to be used.

Please keep your letters coming. I need construction hints, pictures and inked drawings, as well as volunteers to serve as area reps. If you have any questions that simply cannot wait, write to ROAR, enclosing a stamped self-addressed envelope. See you at the track!

Lowe on R/C

Continued from page 36

judged from a distance of 25 ft. Flight points are awarded for ten maneuvers, scoring a maximum of 100 points for flying. There are

many other possibilities of variations of scale and flying emphases. . . .

Beware the Hillers: A warning to all you "old fogies": watch out for a pair of youngsters from Chicago who are really on the move in competition flying. Jim and Bill Hiller are all of 12 and 13 years old, respectively, and fly everything from scale to Formula I pylon. Not only that, they usually end up placing or winning! The climax of their 1969 season came when Jim Hiller won the Grand Champion award at the Tangerine Internats in Orlando, Fla. Jim and Bill also placed first and second in Class C Novice in the same contest. Interest, practice and a reasonable amount of natural ability are required, as well as a measure of dedication and interest on the part of parents. Hats off to Mom and Pop Hiller and to all parents who recognize this hobby as an outstanding challenge to youth. . . .

Movies Available: For chairmen of club activities and individuals who like R/C movies, Robert Graham of Platteville, Wis. 53818 (P. O. Box 22; telephone, 606-348-2374) has a series of six films, which run about 15 minutes each. Emphasizing the humorous side of R/C modeling should make them great for club meetings. Films may be rented for a fee, either singly or at a reduced rate for several, if ordered at one time. Write Robert Graham for particulars. . . .

Super Club: The membership roster of the Los Angeles Valley Flyers reads like a "Who's Who" of the hobby. Among them are nationally-known Richard Sonheim and Bob Smith, club officers; Larry Leonard, winner of both pattern and pylon events at the Willow Grove Nats; Joe Bridi, scale delegate to the Internats; and Whit Stockwell, R/C's junior champion. Whit showed the experts how it was done by walking away with the Grand National Championship in pylon racing last year.

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The list continues with engine man, Clarence Lee; Jack Stafford, producer of beautiful kits; Woody Woodward and Frank Capan, whose scale offerings have been published in the model magazines. Others are Bob Palmer, an old-time U-controller turned R/C'er, who produces beautiful fiberglass fuselages; pattern flyers, Jim Oddino and Bill Salkowski; Nate Rambo, designer of the one-and-only "Polish Kwik Fli"; and Bob Upton, hard-working contest director and judge at the Nats. Newest members are Bill Northrop, now representing Micro Avionics, and Don Dewey. . . .

Help for the Novice: We understand that Orbit is marketing their new equipment with a buddy system built in. Basically this interconnects two transmitters and permits either to control the aircraft by switching from one to the other. A real help in the training of fledgling flyers, it permits a close approach to the pilot-instructor arrangement with dual controls in full-scale aircraft. In a training session it can prevent the mad scramble for the transmitter when the student is about to make kindling out of his pride and joy! Controilaire of World Engines is also working on a similar arrangement. . . .

Gimmicks and Gadgets: How many times have you looked frantically for something to mix epoxy glue on while busily fabricating your latest creation? A continuous problem for me, every scrap of wood, plastic, paper, etc., in my shop has been rendered useless by gobs of unused mixed epoxy. Wayne King (Eureka, Calif.) has solved this problem by thumbtacking plastic sandwich bags to his workbench. Callie Stallings (Goldsboro, N. C.) uses the plastic backs of recloseable cold-cut packages. Since this tray affair has depth it is able to hold up to four ozs. at a time.

Bill Seelinger (Summerville, W. Va.) came up with a solution to the problem of bending that hard brass tubing. He simply heats it with a torch and then quenches the tubing in water to anneal the material. It then bends easily. He then reheats it and allows it to cool in air. This retempers and hardens the material.

Bill solves the problem of wrinkling or sagging MonoKote by reheating any wrinkle and then running a cool, wet rag over the surface. He claims that the wrinkles will not return if this technique is used. I presume the sudden cooling retains the tautness created by the heat; whereas slow cooling in air would allow the material to slowly relax and loosen. This process may work with any heat-shrinkable covering materials.

For those with Citizen-Ship or other rigs which use a shorting plug instead of a conventional switch for turning the receiver on and off here's a tip. To prevent loss of the plug when not in use, attach it to the aircraft with a short piece of fishline leader. Richard Valentine (San Antonio, Tex.) has a better idea. He installs a second unwired socket on the aircraft in some suitable conspicuous location but remote from the active one. When the plug is not in use it goes into the unwired socket.

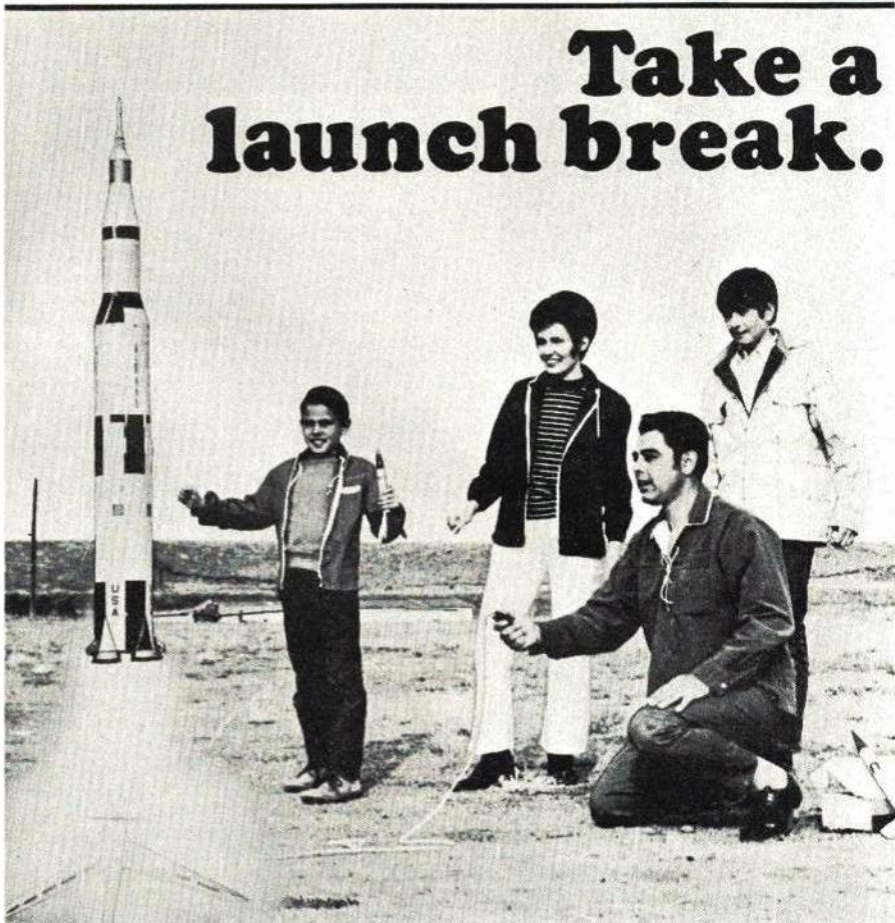
McEntee on R/C

Continued from page 36

ing to set a record in Canada to obtain prior approval and supervision by MAAC officials. . . .

Zephyr Arrives: Now R/C glider pilots have a publication exclusively their own. First issue of the *Zephyr* has been published by Dale Willoughby (14695 Candada Pl., Tustin, Calif. 92680). As will all issues, the initial one (Jan.-Feb. 1970) included a full-sized glider plan for the Bowlius Baby Albatross. The full-sized single-placer was popular back in 1939, and 17 of them were said still to be flying in 1968! The model is 1/8 scale, and a reasonably close copy of the

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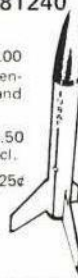
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original. The single plan sheet is 35 x 47", has full-sized drawings of both wing halves and all other components. Also in this issue are reports on World Record glider flying, proposed rules of the Tustin Model Club for R/C glider flying, many shorter items, pictures and drawings relating to the subject. *Zephyr* costs \$3 an issue with the plans, \$1 without, from the above address. It will come out every other month; annual subscription is \$15 (with plans). . . .

Model Glider 3-Views: Radio Control Manual No. 3, published by Model & Allied Publications, Inc., England, publishers of *Aeromodeller* and *Radio Control Models & Electronics*, presents eight constructional 3-views of model gliders from various countries. Construction details and dimensions on each are adequate for an experienced builder to follow; the designs include scale types and originals, even a tailless model. As in the *MAP Aeromodeller Annual*, this volume abounds with constructional 3-views. Also included are several articles on R/C Competition, R/C Scale, instant covering materials, and research with R/C models. The manual, which costs about \$1.80 in England, no doubt will be sold in the U.S. (try Polk's Modelcraft Hobbies). . . .

Real Basket Case: A sad reminder of the carnage at the DC/RC-Cumberland RCC glider record trials in northwestern Maryland last fall (see this space, April 1970 AAM) comes from Stew Vance, editor of the DC/RC Newsletter and a fellow sufferer that bitter weekend. This writer lost a Cirrus in the severe turbulence (actually, it had not quite recovered from being flipped inverted, when nearby woods intervened!). The fuselage ended up in three large pieces — and several smaller ones — but the wings were not in too bad shape. For the trek down the mountain we stuffed the remains in a basket along with transmitter and other sundries. Stew, who commented that was

a true "basket case," took the shot here. The Cirrus fuselage is not really all that fragile; it had been made brittle by use of the wrong finishing material (and the 34° temperature certainly didn't help matters!). Moral — follow Graupner instructions on finishing and, above all, don't use dope!

McCullough on R/C

Continued from page 36

(3) Hold the nose in the air for at least 20 sec. to make certain an engine will not cut out.

(4) Vibration is bad on a twin. Wooden props should be used. Operation of the radio gear must be carefully checked at full throttle just before takeoff.

(5) If, in spite of precautions, even slight motor malfunction occurs on the takeoff run, do not attempt liftoff. No matter how stable the model may be, if a motor sags just after liftoff, while the nose is up, you are in trouble.

(6) On the first flight, as soon as sufficient altitude is gained, find out the stalling characteristics and how well the model glides with engines in low throttle.

(7) As soon as a few flights have been accomplished and you are used to landings, fill one tank half full and go up high to find out what it will do with one motor. Some types will spin but idle the engine to recover. Practice single-engine flight at various degrees of throttle and trim.

FAI rules restrict multi-engine scales to .61 cu. in. total displacement and 11 lbs. weight. This is a very difficult specification to meet and some prototypes are impossible. Lehman favors an increase in allowed size to achieve lighter wing loadings, wings of greater efficiency and more realistic flight; a view that will find considerable support. Increases in weight and displacement al-

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Sunliner 365—Harry Murphy designed this FF with plenty of wing area to tame the hot .049 and .051 engines. He built it light yet strong for high performance.

Papa Taca IX—highly efficient design by Walt Perkins. Retractable landing gear cuts down on the frontal area; adds speed and laps. Lightweight too for acceleration.

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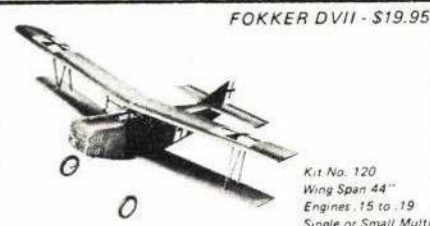
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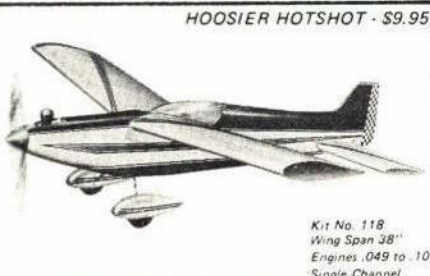
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lowed under AMA rules has not resulted in unsafe scale models. In fact, the most unsafe are still the small, high-wing-loading "bombs," well under the old limits. . . .

Highly Irregular: Scalars wanting an enlarged 3-view have found the photocopy services now widely available to be a convenient method. But beware—the paper these places commonly use has flaws. A 7 x 10" magazine plan when doubled can turn out to actually measure 14 1/4 x 20" and change even more later, depending upon the humidity. This can play havoc with model accuracy when the judge starts comparing it to dimensions of the prototype.

Better quality paper that will not vary so much is available. The best, if most expensive, way to accuracy is to have the job done on sheet film, which has high dimen-

sional stability. . . .

Books for Scale Modelers: *Fighting Colours*, Michael J. Bowyer (Patrick Stevens, Ltd., London, 192 pp.). The subtitle of this invaluable volume, "RAF Fighter Camouflage and Markings 1937-1969," tells the story. Historical background text is illustrated by many drawings and photos showing insignia, camouflage patterns, colors, unit badges, marking codes, etc., for all major fighter types, including U.S.-built aircraft in British service. Emphasis is on the WW II period. A companion effort, *Bombing Colours*, is in preparation. . . .

Scale Data Sources: One of the most important collections of photos useful for scale purposes is held by the National Archives and Records Service (General Services Administration, Washington, D. C. 20408). They

have particularly fine Navy coverage (anything before 1964) and can also supply Air Force and civilian photographs. Many instrument panel, cockpit, landing gear and other detail shots are available.

Unlike the service photo centers, the Archives provide a skilled and helpful free preliminary search service, although at a slightly higher cost per photo, the basic charge being \$1.25 per 8 x 10" glossy. Describe the type and approximate number of prints required. Be specific, for several hundred different views can be furnished on some types! They will send a report sheet listing photo numbers and a description of the subject matter pictured in each one. Check those you wish to buy and return the order form with payment by check or money order. The search form will be returned with the photographs.

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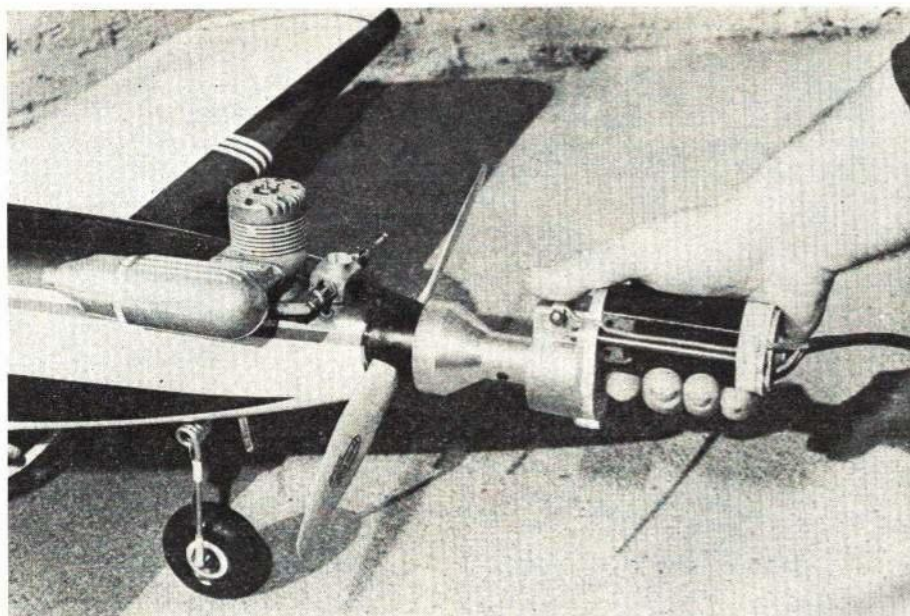
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companies whose ads appear in this magazine. The poop sheets (especially Ocutura's newsletter) are very informative. They will also answer questions on hardware availability. Other kits are available, but these three will get you off to a good start.

Send further questions to us, and we will get the needed answers. See you next month with the details on the upcoming 1970 Internats to be held here in Buffalo on July 16, 17 and 18.

Marks on R/C

Continued from page 37

Control Modes: M. G. "Jerry" Huben, submitted a simple approach to a problem which could help you decide on control modes. Jerry says: "I have been wanting a new small set and have been intrigued by the single-stick setup but wasn't really sure how I would like switching from the two-stick style. My present set is a two stick with ailerons and elevator on the right hand stick.

"The solution was easy. I took a piece of broomstick, cut, drilled, whittled and taped it as shown in Fig. 2. The shank of the control stick is wrapped with tape to equal the diameter of the knob. The large "single" stick fits snugly but can be slipped off quickly in a panic. Of course there is no "rudder" but you can twist the knob to simulate. After an hour or so of flying, I was sold on single-stick. Try it if you're wondering!"...

Questions: I should like to leave you with a few provocative questions for your response in the coming weeks. (1) What is your feeling on the application of failsafe to digital sets in a manner much less complex than in our older digital sets? Have you any ideas? (2) Would someone with access to a wind tunnel like to make an investigation of the theory of coupled flaps and elevators? (3) Has anyone measured the yaw moments generated by strip ailerons versus conventional?

More next month. I have lots of answers, it's the questions I don't know.

Blum on C/L

Continued from page 41

ing, will build to a level of perfection with which he is satisfied. Tom polled the entrants at the FAI Finals in St. Louis last Labor Day and found that the majority of these top stunt flyers favored the elimination of appearance points. Considering the "supposed" stunt-judging problem over MonoKote at the 1969 Nats, this proposal does offer food for thought. More on the proposal next month!...

Past Records: While reviewing past Nats Carrier models and scores I noted an earlier

Moynihan on R/C

Continued from page 37

mail \$7.50 for yearly dues to President Bill LeFeber, 6328 East 52nd St., Indianapolis, Ind. 46226. A membership card, decal and a set of rules and regulations will be sent. This will answer many other questions automatically. Bill will be glad to clue in new members on local people to contact.

Next, those near a boat club should join it. Nothing beats taking advantage of the help and experience of seasoned R/Cers. The IMPBA is devoted largely to power boats. Almost every major city has a club. Real hotbeds of activity are Detroit, Buffalo, Chicago, Seattle, Miami, Washington, San Diego, Los Angeles. For those interested in scale, join up to compete, but also drop a line to Glenn Staubitz, 48 Freeman St., Buffalo, N. Y. 14215. Sail and yachting types should join too, and may write Ray Hottinger, 206 Elmwood Dr., Colorado Springs, Colo. 80907. Ray has been organizing R/C yachting on a national level.

A mimeographed list of information, drawing, equipment and data sources is being prepared. To obtain one, send a stamped self-addressed envelope to Jim Moynihan, 123 Evergreen Dr., Tonawanda, N. Y. 14150. Available at cost are some inch-to-the-foot drawings, 4-view with sections. These are detailed and accurate. Drawings of the High Riser hull in outline and detailed scale, but not construction drawings, also can be ordered. These items are offered only as aids to those who want them. . . .

More Answers: To answer another frequent question, beginners should start with a kit. Many good ones are available. We recommend Ocutura, Dumas or G.E.M. These proven winners of good quality have much boating experience built into them. If local hobby stores don't carry them, write to the

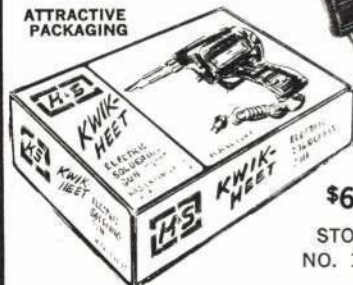
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(Feb. 1955) Guardian plan, was printed by Dave Domizi. He was the first to make over 400 points in Nats Carrier Competition, in 1954. This record set the Guardian pace. First place in each age group at the 1955 Nats, at Los Alamitos, went to Guardians, two of them built from magazine plans. Highest score was 391.93 by R. M. Post of Fresno, Calif., who took a first in Open, with a Guardian using a McCoy Redhead 29. An E-Z-Just handle, modified for electrical contacts, facilitated the electrical throttle setup.

A phenomenal development at the 1956 Nats was the J. Roberts Flight Control System (now produced by Sturdi-Built Models, Route 2, Box 218, Meridian, Idaho). It permitted throttle control from the handle, which is mated to the special bellcrank. Various adaptations in linkage arrangements then allowed operation of other controls such as flaps, ailerons, etc. This Flight Control is now standard Carrier equipment.

Winners in 1955 and 1956, for the most part, were Guardians, F-8-F, F-4-F, T-28, and originals, with Fox 59 and 35 and K&B 35 engines. Scores fell off 30 to 60 points from 1955 to 1956. Still, the over-400 flight of the 1954 Nats held. (For reference see the July 1961 AAM article by Cal Smith.)...

Dual-Needle Throttle: Ray Willman (many times Nats winner from Normandy, Mo.) recently discussed his dual-needle throttle setup. A similar arrangement appeared commercially at one time, but this one was developed by Ray and Jim Wilson (Hazelwood, Mo.). The back view shows the relation of the two needles in the high-speed position while the top view indicates the slow-speed position. The engine (K&B 40), equipped with an exhaust slide, is actuated by a pushrod from a Roberts bellcrank. The throttle lever-arm is moved and, in turn, moves the rotating barrel. The limit-stop (peg), attached to the sliding-barrel, protrudes through the stationary and rotating barrels. Hence, as the rotating-barrel is moved, the angled slot changes position and forces the sliding-barrel to move. This action moves the right-hand needle (see back view) toward and/or away from the inner end of the spray bar. The left needle can be adjusted for high-speed; then, for slow-speed, when the exhaust slide is closed, the right needle can be adjusted to further regulate the fuel from the spray bar.

Ray finds this system effective, but it can give trouble during flight if all working parts are not closely fitted for smooth operation. ...

Covering Leadouts: An anonymous modeler suggests the following method for covering around leadouts. Eyelets are inserted over the leadouts, prior to bending end-loops, and positioned in the wing. When ready to cover and finish, pull eyelets out to the end of the leads from the wingtip and reinstall when finishing job is completed. The tip cutout assures trouble-free reinstallation by reducing the opening for the eyelet. ...

Panhellenic Contest: P. Cologeracos, Athens, Greece, reports on the Panhellenic Aeromodeling Contest held at Tatoi (military airport near Athens), November, 1969. Organized by the Aeromodeling Club of Athens, this eighth annual event offered U/C stunt, R/C stunt and certain F/F categories, plus two extra R/C events. (Not a large list of events—perhaps we could learn something from this!)...

Newsletters: A nice letter and newsletter from Dick Hall (604 Box St., Athens, Ala. 35611) relates the formation of the Model Airplane Club of Huntsville (MACH). Those living in that area who are looking for a club may contact Jim Perdue (203B Cloverleaf Dr., Athens, Ala. 35611). Sounds like a determined group with hard, but obtainable, goals. I'm proud to say that I have just received honorary membership in MACH.

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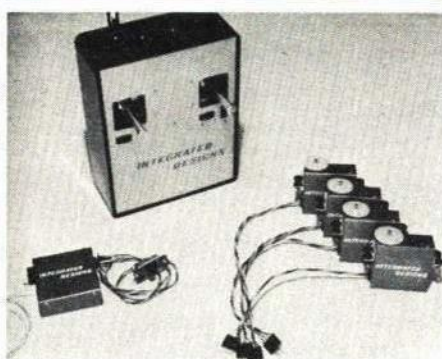
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Broadhurst on F/F

Continued from page 39

fore each contest I now clean my timers and oil 'em with WD No. 40 which sells for about 90 cents a can at most auto parts supply firms. It comes in spray cans. Simply wind up the "squeaky clean" timer, start it running. Then spray the timer's insides — gears and all. The lubricant almost immediately quiets the squeaks and converts the timer into a smooth-running machine. . . .

Seelig Timers: Doug Galbreath (Davis, Calif.) tells me he has sold somewhere between 300 and 400 Seelig (German-made) timers since 1966. Wow! Who's using 'em? Power fliers are, for sure, but some modelers must be putting them in their AMA Gas jobs. Seelig puts out four different timers. The regular FAI combo job (fuel shut-off, auto-rudder, auto-stab, dethermalizer) sells for \$14.50. The DT only timers come in the manual type for Wakefield and the spring-loaded type for Nordic. They sell for \$7.50. And the Seelig ½-A Minicombo costs \$11.50. It takes time to get them. Doug's address is 707 Second St., Davis, Calif. 95616. To my knowledge, Doug is the only source in the U. S. for these timers. They're really well-made, but they must be kept clean! . . .

Construction Tips: Using contact cement is a great way to adhere sheet balsa to a wing. The end result is not only neat but also super strong. On my Eros wings, for instance, I sheet the first 2½ in. of the top-side behind the leading edge with 1/16 in. stock. After cutting and fitting the sheeting to the area to be covered, I pin it lightly in place, turn the wing over and trace lightly on the sheet with a pencil wherever the sheeting touches the ribs, leading edge and spars. Then I apply the contact cement to both the sheeting and the wing and let dry

for 15 min. The final step is critical. Be sure to place the sheeting in the correct position. Once the two cemented surfaces touch it is almost impossible to pull them apart without tearing wood.

Contact cement (I use Weldwood) is great, too, for making sanding blocks. They can be made in minutes to fit almost any sanding need. I cut a block of balsa to fit the contour of an undercambered wing, adhere sandpaper to the block, and, presto! — in a few minutes of careful sanding I have a uniform undercamber. Contact cement comes in both tubes and cans. It resists water, oils, and greases as well as many chemicals. . . .

Three for three: Three times the National Free Flight Society has sponsored the unofficial Coupe d'Hiver event at the Nats, and three times Bill Vanderbeek, 22, has won the event with the same model, his "My Coupe." Twice Bill won as a Senior. Bill won the Dick Black Trophy for his 1969 Open victory at Willow Grove. A modeler since he was 8 years old, Bill is president of Santa Clara's famed "900 Club." . . .

FAI Power Record: Earl Thompson had a fabulous record in FAI Power during the 1969 contest season. Earl maxed out in four out of five Power events with his Pussycat design. He's a member of the Oakland Cloud Dusters.

Mooney on F/F

Continued from page 39

won by the best flyer. The system is quick and everybody was happy with it.

Among the more interesting models seen at the Orbiters' contest was Dick Castle's P-51 with retractable gear. Wrisley's ultra-light scale model of Beardmore's ultra-light Wee Bee floated around just under the lights. Walt Mooney's Fokker F II, with no dihedral and almost without a vertical tail, made successful flights in about two out of three attempts. Other flights ended in tailspins when the Fokker stalled. Takagi's Miles M-18 made high-speed racing circles 3 in. off the floor and still flew almost thirty sec.

Peanut Scale Rules: Dave Stott, the shoulder behind the wheel of the Connecticut Flying Aces Club, sent a copy of the Official Peanut scale rules, which are as follows:

- (1) Open to any scale model of no more than 13-in. wingspan.
- (2) Total of three flights, hand-launched, to be used in addition to construction and workmanship points to determine winner. Fly-off to break any tie.
- (3) Unlimited attempts to gain three official flights. Any flight of five seconds or more is automatically official.
- (4) Construction, general: use of condenser paper instead of Jap tissue — minus 10 points; no microfilm allowed.

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Workmanship: Color — reasonable effort to use tissue and/or dope to simulate realistic coloring for type modeled — plus 3 pts. Marking — civil registration and striping or military insignia, serial numbers, and squadron markings — plus 3 pts. Details — struts, cowl, cylinders, pilot, rigging, armament, windshields, steps, and control surface outlines, plus any unmentioned outstanding details for the type modeled, shall be scored thus: Stark, minus 3 pts.; Lax, zero pts.; Good, plus 3 pts.; Great, plus 6 pts. Planes that had retractable landing gear may be built with the gear represented in the up position.

Meuser on F/F

Continued from page 38

meter can be mounted on some solid support, but for outdoor flying the only practical place to put it is on the winder. Such a setup appeared in one of Frank Zaic's old Model Aeronautics Yearbooks. The one shown here is a bit different. It has proved to be easy to build and use. The dimensions work fine for 16 strands of ¼-in. Pirelli, and it can be scaled up or down for other motor sizes. It must be calibrated by intentionally breaking a few motors and marking the needle position at which breakage occurs....

Super-Solder: Those who have had a solder joint pop loose at exactly the wrong time will value a solder that is several times as strong as ordinary lead-tin solder, yet can be applied with a soldering iron. Called Stay-Brite, it comes in a bubble package with flux for under two dollars. An additional advantage is its use for two-stage assemblies. It is a tin-silver alloy that melts at a somewhat higher temperature than lead-tin solder. If the first joint is made with Stay-Brite, the second one can be done with regular solder without melting the first one. Do not let the Stay-Brite mix with regular solder, because the resulting mixture will not have the strength of Stay-Brite. The soldering iron must be cleaned thoroughly when switching from one solder to another. A similar product is sold under the name Allstate 430. Many hobby shops carry it, as may hardware stores....

Keep the Tail Light: This is what experts admonish. The result is a lively, buoyant, responsive model, quick to recover when upset, and sensitive to the slightest whisp of thermal activity. The principle applies to everything from the lowly hand-launched glider to the regal C-Gas model, but the Nordic towline glider flyers seem to be particularly paranoid about it. They fret and fuss to save a gram on the stabilizer, but their efforts are often nullified by the way they mishandle the placement of nose weight and ballast.

One handed-down recipe calls for adding the ballast at the center of gravity (CG) to bring the model up to the required weight. More recent instructions call for distributing the ballast throughout the nose, making the nose length whatever is required to balance at the desired CG. Both recipes can be greatly improved upon.

The purpose of a light tail is to minimize the polar moment of inertia (PMI), a long-haired name for a simple concept. To understand PMI, take a side-view drawing of the model and cut it up into a thousand pieces. (I mean in your imagination — put down that Zona saw!) Measure the straight-line distance from the CG to the center of each piece. Multiply the weight of each piece by the square of its distance from the CG (that's

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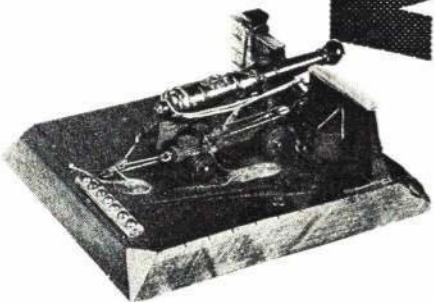
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weight X distance X distance). Add them all up, and the result is the PMI of that particular model. Such a calculation actually is not necessary, but it is a useful concept to have in mind when trying to minimize the PMI. It indicates immediately, for example, that a gram added to the tail increases the PMI four times as much as a gram added to the middle of the tail boom.

The PMI can be minimized by applying the following recipe: make not only the tail but the entire model as light as possible. Concentrate all of the ballast required to bring the model up to the required weight, including the DT timer, in the nose. The nose weight and the ballast are one. Placement of the weight must be adjusted for balance at the proper point. As an alternative use the wing position as the last step in the construction. If the wing is pylon-mounted the pylon can be made longer than necessary initially, then trimmed to size when the wing position is decided.

Model plane builders are not the only ones concerned with making the PMI small — sailboaters and race-car designers are too, and for very similar reasons.

Tenny on F/F

Continued from page 39

for "FF Instructor List."

To learn more about indoor models or to have specific questions answered, drop a line to the instructor nearest you. If you think your name should be on the list as an instructor, volunteer to Roger J. Schroeder, 4111 W. 98th St., Overland Park, Kan. 66207.

NIMAS also has available a small assortment of materials helpful to indoor neophytes. These materials can be obtained by sending requests to Bud Tenny, Box 545, Richardson, Tex. 75080. Please be specific about information desired; indoor modeling is a pretty large subject!

Minimum Weight Models: Every few years, someone designs a beginner event for indoor. The first was indoor Paper Stick, about 20 years ago. Easy B was another attempt, and now along comes another concept: models with a minimum weight. These models have been proposed in two sizes: an FAI size (65 cm span) to weigh the same as a U.S. nickel, and the Pennyplane. The Pennyplane, featured in the February contest of the Chicago Aeronuts, is basically an Easy B with minimum weight equal to a U.S. penny.

The basic premise of the minimum weight concept is that beginners are more likely to feel competitive if everyone's model has to weigh about the same. By the same reasoning, Paper Stick and Easy B have been unsatisfactory as beginner events because experienced builders build successful models much lighter than those of the beginners. However, this argument does not allow for

the fact that experienced people will usually win over novices whether the game is model airplanes or tiddlywinks. Thus, any "beginner" event must be set up so only beginners fly it! Even so, the concept of minimum weight does seem to have merit and deserves a good trial.

Contest Calendar

Continued from page 62

Timer Texaco Annual. Site: Gardner Field. S. Taibi CD, 4339 Conquista Ave., Lakewood, Calif. 90713. Sponsor: SCAMPS Old Timers Club.

May 17 — Hastings, Minn. (AA) MMAC Spring FF Meet. Site: Webers Air-strip. D. Monson CD, 131 W. Wentworth, W. St. Paul, Minn. 55118. Sponsor: Minneapolis Model Aero Club.

May 17 — Dayton, Oh. (AA) Dayton Buzzin' Buzzards 1000 Lap CL Rat Race. Site: Municipal Flying Circles. J. Martin CD, 551 Aberdeen, Dayton, Oh. 45419. Sponsor: Dayton Buzzin' Buzzards.

May 17 — Creve Couer, Mo. Spirits Fly for Fun. Site: Spirits Field. R. Williams CD, 4060 Bondurante Dr., Bridgeton, Mo. 63044. Sponsor: Spirits of St. Louis RC Club.

May 17 — W. Suffield, Conn. (A) Nor-East RC Air Races. Site: Peterson Farms. G. Sawm CD, 6 Audrey Ln., Thompsonville, Conn. 06082. Sponsor: Northern Conn. Radio Control Club.

May 17 — Denver, Colo. Jefco RC Spec. Aerobatic Events. Rules available from CD. Site: Jefco Field. D. Johnson CD, 12604 W. Virginia Ave., Denver, Colo. 80228. Sponsor: Jefco RC Club.

May 23 — Fayetteville, Ark. Fayetteville Aeromodellers RC Fly for Fun. Site: Younkun Flying Service. R. Hall CD, 1830 Old Wire Rd., Fayetteville, Ark. 72701. Sponsor: Fayetteville Aeromodellers.

May 23-24 — Huntsville, Ala. (AA) Rocket City RC 10th Annual Meet. Site: Old Huntsville Airport. C. Schofield CD, 2709 Briarwood Dr., S.E., Huntsville, Ala. 35801.

May 23-24 — Chicago, Ill. (AA) 8th Annual Season Opener RC Meet. Site: Kikapoo Woods. D. Foley CD, 4329 So. Spaulding, Chicago, Ill. 60632. Sponsor: Radio Control Club of Chicago.

May 23-24 — Sumter, S.C. (A) 1970 Iris Festival RC Invitational Meet. Site: County Airport. R. Thompson CD, P. O. Box 621, Sumter, S.C. 29150. Sponsor: Sumter Model Airplane Club.

May 23-24 — Lafayette, La. (AA) 2nd Annual CL & RC Model Aviation Day. Site: Ovey Comeaux High School. C. Castaing CD, P. O. Box 788, New Iberia, La. 70560. Sponsor: Acadian RC Club.

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May 24—Warminster, Pa. (AA) Golden Eagles 5th Annual FF "Early Bird" Meet. Site: Johnson NAS. J. Kutkunn CD, 517 Georgetown Rd., Wallingford, Pa. 19086. Sponsor: Golden Eagles MAC.

May 24—Urbana, Ill. (AA) Midwest CL Racing Championships. Site: Illini Airport. J. Fasimpaur CD, 310 E. Benham St., Tolono, Ill. 61880. Sponsor: C-U Aeronauts.

May 24—Troy, N.Y. (AAA) 2nd Annual North Eastern N.Y. State CL Invitational. Site: Hudson Valley Community College. R. Monroe CD, 9 Winter St., Troy, N.Y. 12180. Sponsor: Flying Knights MAC.

May 24—Tullahoma, Tenn. (AA) Coffee Airfoilers 6th Annual FF Old Timers Meet. Site: Model Field. C. Tuthill CD, 101 Westwood Dr., Tullahoma, Tenn. 37388. Sponsor: Coffee Airfoilers Model Airplane Club.

May 30—Union, N.Y. (AA) 16th Annual Union Model Airplane CL Invitational. Site: Morrison Field. F. DeCicco CD, 53 Broadview Ave., Maplewood, N.Y. 07040.

May 30-31—Baton Rouge, La. (AA) Baton Rouge RC Club 9th Annual Meet. Site: Klempeter Field. L. Boutwell CD, 1739 Oak St., Baton Rouge, La. 70815.

May 30-31—Dallas, Tex. (AA) Dallas RC Pylon League Meet. Site: North Lake Park. R. Straw CD, 506 Salem Dr., Richardson, Tex. 75080. Sponsor: Dallas Radio Control Club.

May 30-31—South Bend, Ind. (AA) Tri-Valley RC Multi Meet. Site: Club Field. J. Hoffer CD, 1312 Brummitt Ln., South Bend, Ind. 46615. Sponsor: Tri-Valley Radio Control Club.

May 30-31—Schenectady, N.Y. (AA) Empire State RC Championships. Site: Air National Guard Base. A. Sattler CD, 1837 7th Ave., Schenectady, N.Y. 12307. Sponsor: Thundervolts Radio Control Club, Inc.

May 30-31—Clarksdale, Miss. (AAA) Clarksdale Climbers 10th Annual FF & RC Meet. Site: Fletcher Field. Mrs. G. Pickel CD, 1631 Steen Dr., Clarksdale, Miss. 38614.

May 31—Chardon, Oh. (AA) CRC "500" RC Pylon Races. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Oh. 44132.

May 31—Tacoma, Wash. (AA) Mt. Rainier All RC Pylon Contest. Site: Mt. Rainier RC Society Field. B. Gale CD, 811 9th Ave., S.W., Puyallup, Wash. 98371. Sponsor: Mt. Rainier RC Society.

May 31—Fresno, Calif. (AA) Fresno's Monthly FF Contest. Site: Near Kerman. Calif. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

May 31—Lockport, N.Y. (AA) United RC Pylon Racing Circuit Meet. Site: Niagara County Model Airport. H. DeBolt CD, 3833 Harlem Rd., Buffalo, N.Y. 14215.

June 6-7—Oklahoma City, Okla. (AA) TORKS 10th American RC Annual Meet. Site: To be announced. C. Brownlee CD, 3033 Rolling Stone Rd., Oklahoma City, Okla. 73120.

June 6-7—Spencerport, N.Y. (AA) Eleventh Annual N.Y. State RC Championships. Site: Salmon Creek Park. T. Salvemini, Sr. CD, 6 Valley Ln., Avon, N.Y. 14414. Sponsor: Radio Control Club of Rochester, Inc.

June 6-7—Lincoln, Neb. (AA) Lincoln Sky Knights 11th Annual RC Meet. Site: Old Lincoln Air Base. W. Johnston CD, 531 Wedgewood Dr., Lincoln, Neb. 68510.

June 6-7—Valley Park, Mo. (AAA) Greater St. Louis Modeling Association's FF, CL & RC Meet. Site: Buder Park Model Field. J. Blum CD, 2417 Glen Pl., Granite City, Ill. 62040.

June 6-7—Columbia, Md. DC/RC—RC Thermal Soaring Meet. Site: DC/RC Flying Site. G. Maroney CD, 3107 McComas Ave., Kensington, Md. 20795. Sponsor: District of Columbia Radio Control Club, Inc.

June 6-7—Nashville, Tenn. (AAA) 7th Annual RC Midlands Championships. Site: Percy Warner Park. B. Reuther CD, 216 Vaughns Gap Rd., Nashville, Tenn. 37205. Sponsor: Middle Tennessee Radio Control Society.

June 7—Mankato, Minn. (AAA) Mankato Modelers Regional CL Meet. Site: Old Municipal Airport. J. Cattyssee CD, 806 Center St., No. Mankato, Minn. 56001.

June 7—Pittstown, N.J. R.V./R.C. 3rd Annual RC Novice Meet. Site: Location to be announced. A. Schroeder CD, 18 Spencer Rd., Glen Ridge, N.J. 07028. Sponsor: Rockaway Valley Radio Control Club.

June 7—Pontiac, Mich. (AA) Pontiac Open CL Contest. Site: Jaycee Park. H. Hackett CD, 3780 S. Shimmions Circle, Pontiac, Mich. 48057.

June 7—Mentor, Oh. MARCS 1/4 Midget RC Pylon Race. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Oh. 44132.

June 7—Colorado Springs, Colo. Pikes Peak Fun Fly. Site: Pikes Peak RC Club Field. B. Hayhurst CD, 1219 Oswego, Colorado Springs, Colo. 80904. Sponsor: Pikes Peak RC Club.

June 7—Bristol, Conn. (AA) Hornet's Model Classic CL Meet. Site: Elmwood School. J. Scott, Jr. CD, 265 Witches Rock Rd., Bristol, Conn. 06010. Sponsor: Hornet's Model Airplane Club.

June 12-13-14—Asheville, N.C. (AA) 16th RCNC Invitational Meet. Site: Old Asheville-Hendersonville Airport. V. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210.

June 13—Saginaw, Mich. (AA) Tri-City RC Trophy Race. Site: SVRCC Flying Field-2240 Lone Rd. G. Gill CD, 2020 Lone Rd., Freeland, Mich. 48623. Sponsor: Saginaw Valley RC Club.

June 13-14—Pensacola, Fla. (AAA) Fiesta Five Flags FF & RC Model Championships. Site: Corry Field. FF: 8A. T. McLaughlin CD, 4140 Fern Ct., Pine Glades, Pensacola, Fla. 32503.

June 13-14—High Point, N.C. (AA) High Point CL Model Airplane Meet. Site: Spinners Flying Field. L. Undersood, Sr. CD, 1507 Whitehall St., High Point, N.C. 27262.

June 13-14—Houston, Tex. (AA) Houston RC Club Contest. Site: Houston RC Field. L. King CD, 3303 Ripplebrook, Houston, Tex. 77045. Sponsor: Houston Radio Control Club.

June 13-14—Spokane, Wash. (AAA) Spokane Internats FF, CL & RC Meet. Site: Spokane Int'l Airport. R. Hepker CD, Wash. Air National Guard, Spokane Int'l Airport, Spokane, Wash. 99219.

June 13-14—Kansas City, Mo. (AA) KRCRC Annual Meet. Site: Lake Jacomo. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64137. Sponsor: Kansas City Radio Control Assn.

June 14—Endicott, N.Y. (AA) 5th Annual Northeast RC Pylon Racing Championships. Site: Tri-Cities Airport. R. Noll CD, 96 Pine Knoll Rd., Endicott, N.Y. 13760. Sponsor: Aeroguidance Society, Inc.

June 14—Dayton, Oh. (AA) Buzzards Spring CL Fly-In. Site: Municipal Flying Circles. J. Martin CD, 551 Aberdeen, Dayton, Oh. 45419. Sponsor: Dayton Buzzin' Buzzards.

June 14—Council Bluffs, Iowa (AAA) 7th Annual Midwestern CL Model Airplane Meet. Site: Iowa School for the Deaf. D. Hutcheson CD, 317 Spencer, Council Bluffs, Iowa 51501. Sponsor: Balsa Busters.

June 20-21—Dallas, Tex. (AA) Sun & Fun FF Rally. Site: Preston Rd. N. B. Chenaault CD, 5906 Jim Miller Rd., Dallas, Tex. 75228. Sponsor: Cliff Cloud Climbers of Dallas.

June 20-21—Denver, Colo. (AA) 12th Annual Mile Hi RC Contest. Site: Lowry AFB. H. Geller CD, 6920 E. Exposition, Denver, Colo. 80222. Sponsor: Mile Hi Radio Control Club.

June 20-21—Dayton, Ohio (AAA) Wright Brothers Memorial 8th Annual RC Meet. Site: Wright Patterson A.F. Base. D. Lowe CD, 5936 Clar-von Dr., Dayton, Ohio 45430. Sponsor: Western Ohio Radio Control Society.

June 20-21—Oilville, Va. (AA) R.A.R.C. 10th Annual RC Meet. Site: Oilville Field. F. Gregg CD, 12709 Richmond St., Chester, Va. 23831. Sponsor: Richmond Area Radio Control Club.

June 20-21—San Jose, Calif. Wavemasters Annual RC Contest. Site: Wavemasters Field. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif. 95123. Sponsor: San Jose Wavemasters RC Club, Inc.

June 20-21—Davenport, Iowa (AA) Davenport RC Society 2nd Annual RC Meet. Site: Scott County Park. W. Kroeger CD, 3820 Homestead, Davenport, Iowa 52802.

June 20-21—San Jose, Calif. (AA) Wavemasters Annual RC Contest. Site: Wavemasters Field. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif. 95123. Sponsor: San Jose Wavemasters RC Club.

June 20-21—San Jose, Calif. Wavemasters Annual RC Contest (FAI Team Selection). Site: Wavemasters Field. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif. 95123. Sponsor: San Jose Wavemasters Radio Control Club.

June 20-21—Ft. Worth, Tex. National Fun Fly Championships. Site: Thunderbird RC Field. B. Lut-

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ker CD, 6029 Walraven Circle, Ft. Worth, Tex. 76133.

June 21 — Westhampton, L.I., N. Y. (AA) Suffolk Falcon's "Early Flyers" RC Scale Meet. Site: County Rd. 31, North Side and adjacent to Suffolk A.F.B. Fence. D. McGovern CD, P.O. Drawer E, 140 Wagon Lane, W., Centereach, L.I., N. Y. 11720. Sponsor: Suffolk Falcons Club.

June 21 — Portville, N. Y. Olean MAC Fly for Fun RC Meet. Site: Rt. 305 South off Rt. 17, E. Evans CD, Box 87, N. Main, Richburg, N. Y. 14774. Sponsor: Olean Model Airplane Club.

June 21 — W. Suffield, Conn. (A) Nor-East RC Air Races. Site: Peterson Farms. B. Williams CD, 347 Southwick Rd., Westfield, Mass. 01085. Sponsor: Northern Conn. Radio Control Club.

June 21 — Salem, N. H. (AA) Salem Model Fair CL Meet. Site: Salem High School. R. Sherman CD, 408 River Rd., Tewksbury, Mass. 01876. Sponsor: Lawrence Air-Isotcrats.

June 21-28 — Des Moines, Iowa (AA) Des Moines Modelaires RC Scale & Pylon Rally. Site: Des Moines Model Field. J. Bonanno CD, 201 S.E. Rose, Des Moines, Iowa 50315. Sponsor: Des Moines Modelaires.

June 27-28 — Detroit, Mich. (AA) 18th Annual Great Lakes RC Championships. Site: 18 Mile & Mound Rds. H. Mottin CD, 2124 Common Rd., Warren, Mich. 48092. Sponsor: Radio Control Club of Detroit.

June 27-28 — Wichita, Kans. (AAA) Midwestern 10th Annual FF, CL & RC Championships. Site: Beech Field, J. Finley CD, 5217 E. Murdock, Wichita, Kans. 67208. Sponsor: Wichitahawks.

June 27-28 — Greenville-Spartanburg, S. C. (AAA) S. C. State RC Championships. Site: W.C.R.C. Flying Field. J. Nicholson CD, 105 Greenbriar Rd., Spartanburg, S. C. 29302. Sponsor: Western Carolina RC Club.

June 28 — Cook County, Ill. (AA) Skylarks 3rd Annual "A & B" w/scale RC Meet. Site: Forest Reserve. R. Swindell CD, 90 N. Wolf Rd., Wheeling, Ill. 60090. Sponsor: Skylarks RC of Illinois.

June 28 — Valley Park, Mo. "Spirits vs. Chasers Challenge meet. Site: Buder Park field. T. McGinnis CD, 7491 Amherst, University City, Mo. 63130. Sponsor: Spirit of St. Louis RC Club.

June 28 — Cahokia, Ill. (AA) McDonnell Spring FF Contest. Site: Parks Air College. N. Burgdorf CD, 9822 Whitcomb Ln., St. Louis, Mo. 63123. Sponsor: McDonnell FF Club.

June 28 — Hempstead, N. Y. (AA) Meroke 6th Annual RC Meet. Site: Mitchell Field. R. Geyer CD, 913 Washington St., Baldwin, N. Y. 11510. Sponsor: Meroke Radio Control Club.

June 28 — Fresno, Calif. (A) Fresno's Monthly FF Contest. Site: Near Kerman, Calif. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

June 28 — Muscatine, Iowa (AA) First Annual Skylarks CL Contest. Site: Muscatine Airport. F. Brewer CD, 706 Walnut St., Muscatine, Iowa 52761.

June 28 — Canton, Oh. (AA) Canton RC's 10th. Annual RC Pattern Contest. Site: Club Field. G. Villard CD, 3001 23rd. N.W. Canton, Oh. 44708.

June 28 — Rochester, N. Y. (AA) United RC Pylon Racing Circuit Meet. Site: Monroe County Model Airport. H. DeBolt CD, 3833 Harlem Rd., Buffalo,

N. Y. 14215. Sponsor: Radio Control Club of Rochester.

July 5 — Mentor, Oh. (AA) MARCS All RC Pylon Day. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave. Euclid, Oh. 44132.

July 11-12 — Oaks Corners, N. Y. Sky Rovers Fly for Fun RC Hobo Meet. Site: Club Field. H. Ford CD, 11 Stephens St., Clifton Springs, N. Y. 14432.

July 11-12 — Oklahoma City, Okla. (AAA) Sooner State Model Aviation FF & CL Championships. Site: North Western & Memorial Rd. F. Miller CD, 1900 Rolling Ridge, Bethany, Okla. 73008.

July 12 — Davenport, Iowa (AA) 13th Annual CL Model Airplane Meet. Site: Davenport Airport. R. Mairer CD, 3009 Westmar Dr., Bettendorf, Iowa 52722. Sponsor: Davenport Model Airplane Club.

July 12 — Hastings, Minn. (AA) MMAC Summer FF Meet. Site: Webers Airstrip. H. Langevin CD, 4854 Aldrich Ave., S. Minneapolis, Minn. 55407. Sponsor: Minneapolis Model Aero Club.

July 12 — Hadley, Mass. (AA) Hampshire Show-down RC Air Races. Site: 1/4 Mile N. of Coolidge Bridge. R. Barkowski CD, 32 Lyman St., Easthampton, Mass. 01027. Sponsor: Hampshire County Radio Controllers.

July 19 — W. Suffield, Conn. (A) Nor-East RC Air Races. Site: Peterson Farms. B. Williams CD, 347 Southwick Rd., Westfield, Mass. 01085. Sponsor: Northern Conn. Radio Control Club.

July 19 — Jamestown, N. Y. (AA) United RC Pylon Racing Circuit Meet. Site: Winch Rd., Lakewood. N. Y. H. DeBolt CD, 3833 Harlem Rd., Buffalo, N. Y. 14215.

July 26 — Fresno, Calif. (A) Fresno's Monthly FF Contest. Site: Near Kerman, Calif. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sfr "or" Fresno Gas Model Club.

July 27-Aug. 2 — Glenview Naval Air Station-near Chicago, Ill. (AAAA) National Model Airplane Championships Traditional Events.

WWI Matinee

Continued from page 19

than explosions are heard high over the field. The aerodrome gunners have opened up with anti-aircraft guns, and shells are bursting all over the sky.

The two aircraft draw closer and the battle is on. The crafty old Baron tries to get behind Sir Percy, but he is no stranger to air warfare and easily keeps out of range of the Baron's machine guns. Wingovers, dives and steep turns are executed by the flyers while shells burst with ear-shattering report all around them. At last Sir Percy pulls a steep wingover and finds himself right behind the red triplane. He lets fly with a hail of bullets and a stream of dark smoke

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pours from the doomed German machine. The Baron goes into a dive, still trailing smoke, and disappears behind some trees.

Sir Percy brings his aeroplane in for a smooth landing and is given a hero's welcome. He brings the little biplane right up to the fence, then shuts off the engine. On the horizon the German three-winger has loomed into view and also glides in safely to a rousing round of applause.

The visitors start drifting towards their cars and head for home. The little aeroplanes are carefully wheeled back into their hangars to await next Sunday and their chance to relive once more their moments in history. "Someday," laughs Cole Palen, "the skies will be black with World War I aeroplanes." The way he is rebuilding them and getting them back into the air, his boast may just become a reality!

On the Scene

Continued from page 12

19 engines converted from C/L combat types, flown by Don Lowe, Ed Sweeney, and John Elliot. Towing streamers, they chewed up the sky. In contrast, Dave Roblen flew his three-channel, 020 Littlest Esquire. Crowds at the 1/4 midget race track watched demonstrations on the oval course. Sunday was a repeat, but with a hilarious manufacturers' "Dune Buggy" race. It brought down the house.

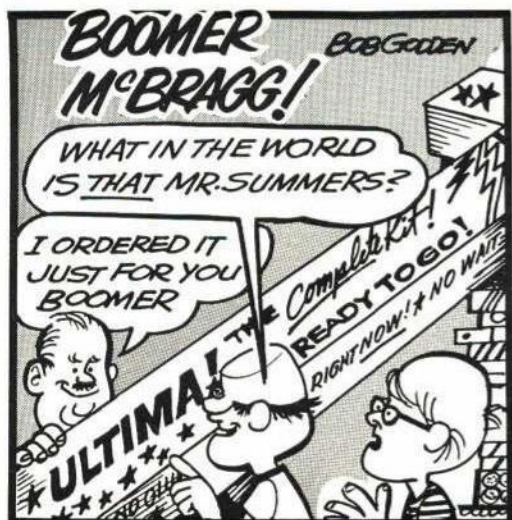
The swap shop did a thriving business, and the AMA raffle booth wound up with a thousand dollars for the frequency fund. The show closed with the presentation of trophies and awards.

STERLING'S EMMA C. BERRY

A special notice

The photograph of this fine sailing schooner kit in the Sterling advertisement on page 64 of the April issue was so poorly reproduced that we wish to apologize to old friend Eddie Manulkin, who takes great pride in the preparation of fine products. The appearance of the sails in this photo may have handicapped the reader in his assessment of this quality item — for which we wish we could make amends.

As to why these things happen, the advertising trade and magazines pass around negatives and materials to meet various deadlines and highly technical matters can cause printing slipups. Normally, original art is obtained in such an emergency but the correction in this case did not take place until the May issue. Eddie, we're sorry. And to the modeler, and the trade, do please see page 68 in the May issue for what this kit really looks like.



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Continued from page 45

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