american aircraft MODELER

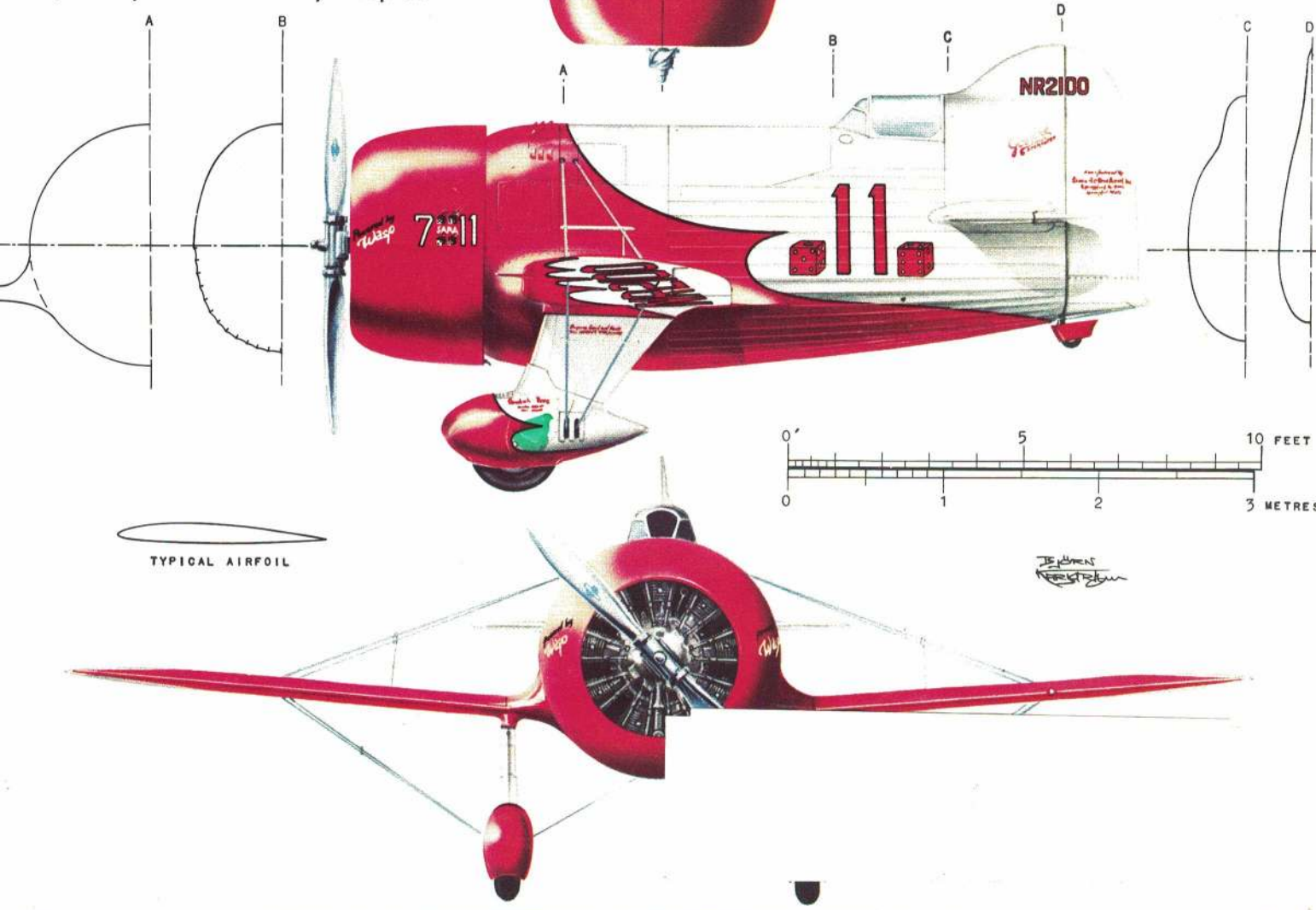
JANUARY 1969 60c 7/-

FULL-COLOR CENTERSPREAD
de Havilland DH-88 Comet

GEE BEE R-1

Supersportster 1932

750/800 h.p. Pratt & Whitney Wasp Sr.



TYPICAL AIRFOIL

O.S. ENGINES R/C SYSTEMS

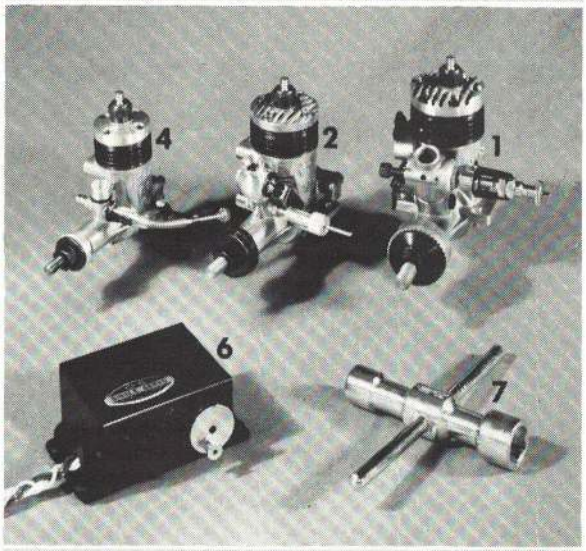
FOR SMALL R/C SMALL OS ENGINES

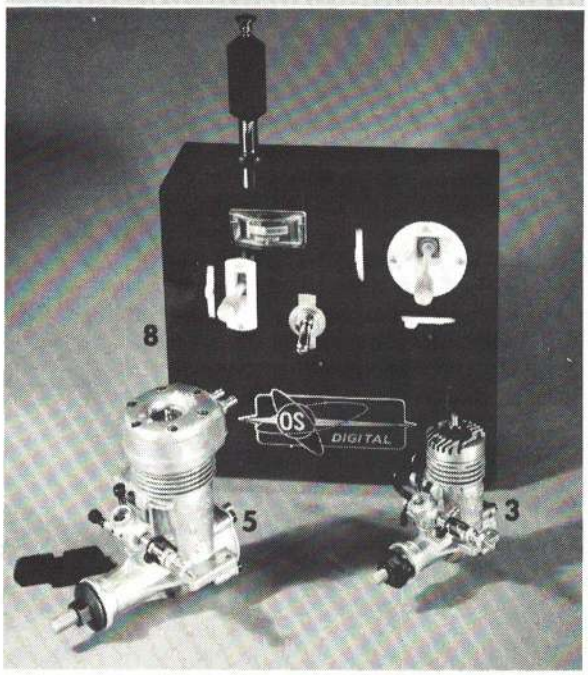
Mr. Ogawa of OS has been making engines since 1939. Some of the first engines he made looked like the old Denny Mite. The early post war years saw a rash of Diesels and a twin stacked 29 that at one time held an endurance record because of its extremely good fuel economy. Today OS builds a wide range of engines from the tiny .06 up to the Max 80 R/C. We will cover the merits of the larger engines in another ad some day but today we want to talk about the really strong suit of OS — his small, light, precision R/C engines. For the last two or three years these engines have been in such short supply that it was almost embarrassing for World Engines. In the last year, we have worked out an increased production agreement with OS which has finally paid off. We can actually say that in this point in time, we have a nice stock of small OS engines in stock. This includes the all time favorite, the Max 15 R/C — $15.98. This is a compact, light weight, little lapped 15 with a beautiful throttle. The 19 — not shown — is a little larger, not just a bored out 15. (2) This is the Pet .09 R/C. This engine runs well and has a throttle and sells for the very low price of $6.98. (3) the 10 R/C — $11.98 — is a higher quality engine than the economical Pet .09 and has a more sophisticated throttle with an exhaust wiper. The porting in the .10 is also substantially different than it is in the .09. (4) The Max .06 is the smallest engine that OS makes. Some day we hope to offer it with a throttle. $8.98.

WORLD ENGINES · OS'S R/C SERVICE CENTER

Note: For some of these numbers you will have to look in either picture. (5) The S-30 R/C Marine is complete with a water cooled head and a water chamber in the crankcase backplate. Complete with throttle $24.98. (6) This is OS tiny single channel servo. This comes as the S-103 for rudder — $13.98, as the S-104M — $12.98 — for motor control, and the S-101W — $11.98 — for Pulse. For information on the range of OS R/C products, please see the column at the right.

(7) This wrench fits the standard glow plug and also the prop nut on either the OS 15 or 19. 75¢. (8) OS 3 Channel Proportional. This even includes trimmable motor control. An exceptional value at $199.98. This equipment is serviced in Cincinnati by the Controlaire Division of World Engines, Inc.





WORLD ENGINES
8960 ROSSASH AVE. CINCINNATI, OHIO 45236

O.S ACCESSORIES

Space in this advertisement prohibits covering these accessories in any great detail. OS manufactures mufflers for the Max Series engines, from the 10 all the way through the Max H60 Series. All of these mufflers have R/C baffles in them ecept for the 60. Spinners — there are two small needle nose type. The smaller fits the 15-19 range and the larger fits the 29 to 58 range. The larger has the ¼-28 thread and can be used on other engines. They also make a new streamlined spinner that fits the ¼" prop shaft.

Max 10-19 R/C Muffler	$ 2.98
Max 30-58 R/C Muffler	3.98
Max 60 Muffler	6.98
Marine Universal — 09	1.00
Marine Universal — 15-19	1.25
Marine Universal — 29-40	1.75
Marine Universal — 50-58-60	1.95
OS AMA Prop Nut — ¼-28	.79
OS AMA Prop Nut — Max 15-19	.69

R/C Engineers from Controlaire have been working steadily with OS to try to build some interchangeability and compatibility to the two systems. Because of the difference in component that are available to OS in Japan, the systems are not identical but resemble each other in many ways and, therefore, our Service Engineers can fix most anything that is wrong with an OS set. The single stick 4 Channel Proportional should be of exceptional interest to the many single stick flyers about the nation. OS also makes the conventional 2 stick version in 4 channel. Their 3 channel gear is extremly popular as the price is very low for the quality that is inside. Also, single channel flyers do not overlook the single channel superhet combo that is ready to go for $49.98.

OS 4 Ch. 1 Stick	319.98
OS 4 Channel Propo	319.98
OS 3 Channel Propo	199.98
OS Tx Stick Kit	14.98
1 Channel Pixie S/Het Combo, Tx, Rx, Servo, Batt. Bx., Switch, Wired	49.98
1 Ch. Pixie Tx	19.98
1 Ch. Pixie Rx Regen.	13.98
1 Ch. Minjtron S/Het.	32.98
1 Ch. Rudder Servo S103	13.98
1 Ch. Motor Servo S104M	12.98
1 Ch. Pulse Servo S101W	11.98
OS 7 Pin Connector	1.29
OS 4 Pin Connector	.98
OS 50 Ohm Relay	2.98
OS 100 Ohm Relay	2.98
OS Propo Servo	30.00

PROPO TIME PAYMENT PLAN APPLICATIONS IN EVERY CATALOG

.75

An Exciting 1/72nd Scale Model Airplane Kit of the Renzan "Rita" Strategic Bomber!

Built by The Nakajima Aircraft Factory, the "Rita" was Japan's last-ditch attempt to develop a long range, land-based attack bomber. Success could have changed the course of the war. Only four were completed before Japan's surrender.

A "Super-Big" model (12½" long, 17¾" wingspan) with lots of plastic, each kit features moveable wheels, propellers, landing gear, guns and control surfaces, plus eight bombs and four highly-detailed crew figures. Both Japanese and USAF decal markings are included. This exciting kit retails for $3.00 everywhere!

THE AUTHENTIC KITS ARE ALWAYS FROM amt®

american aircraft MODELER

VOLUME 68, NUMBER 1 JANUARY 1969

COVER PHOTO: One of the most famous racing aircraft in history is the GeeBee R-1 Supersportster of 1932, depicted in full color by Bjorn Karlstrom. It had a 750/800 hp Pratt & Whitney Wasp Sr. engine.

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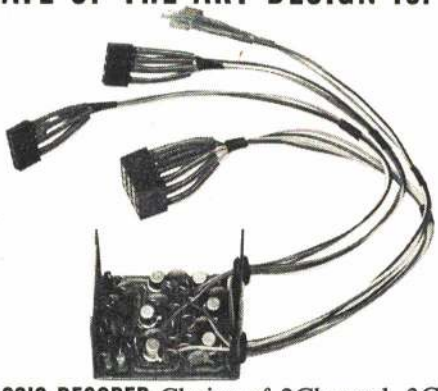
THE ROYAL "CLASSIC" DIGITAL KIT SYSTEM

STATE OF THE ART DESIGN for the Discriminating Modeler and Technician



CLASSIC DECODER Choice of 2Channel, 3Ch, 4Ch, 5Ch or 6Ch. Circuit Features: Reliability proven SCS shift logic pioneered by Ed Thompson with added temperature compensation / Stablized for operation from 140°F to 0°F / PC board is Military Grade epoxy glass (G-10 material) and all are drilled for 6 channels. Only the holes needed are used for less than 6 channels and easily converts at a later date to a higher number of channels. Decoder kits are offered with all connectors and switches or less connectors and switch.

Decoder Kits Below Include: Servo connectors, 4PDT Submin. slide switch, Plastic Switch Cover, Metal Switch Plate

2 Channel Decoder Kit	$16.95
3 Channel Decoder Kit	20.95
4 Channel Decoder Kit	25.95
5 Channel Decoder Kit	29.95
6 Channel Decoder Kit	33.95

Decoder Kits Below are less connectors and switches

2 Channel Decoder Kit	$13.95
3 Channel Decoder Kit	15.95
4 Channel Decoder Kit	18.95
5 Channel Decoder Kit	20.95
6 Channel Decoder iKt	22.95

Decoder Add A Channel Kit (less connector) 3.50

Factory Built Decoder with connectors only

2 Channel	$26.95	5 Channel	$44.95
3 Channel	32.95	6 Channel	49.95
4 Channel	39.95		

Four Servo I/C Block	$7.95
4 Pin Servo Connector	$ 1.50
Royal Three Pin Connector	$ .95
Royal Classic Dual Output Battery Charger Kit	$ 9.95
Royal Classic Dual Battery Charger, Factory Built	$11.95

CLASSIC AMPLIFIER FOR PS-3 ORBIT SERVO MECHANICS

(See Ed Thompson's Article this month) The Classic Amplifier, PS-3 Mechanics combination features: Dual linear rack output, wheel and rotary arm / Resolution .5% / Weight 2.0 oz. / Transit time .55 seconds / All Silicon Transistor servo amplifier / Single deck amplifier PC board / Average construction time one hour / Power enough to fly the largest and fastest multi ship, 4 lbs. min. / Small enough for the .09 powered full house ship.

Classic Servo Kit Complete (PS-3 Mechanics and 9 transistor amplifier)	$24.95
Classic Servo Amplifier Only (9 transistor for PS-3)	$11.95
PS-3 Servo Mechanics only Kit	$14.98

Featured NEXT Month (available now)

Classic Precision Servo Kit (Classic 11 transistor amplifier and PS-2 Servo mechanics)	$24.95
Precision Amplifier Only Kit (11 transistor)	$11.95
PS-2 Servo mechanics Only	$14.95
Classic PS-2 Servo Factory Built	$39.95
Classic PS-3 Servo Factory Built	$39.95
Servo Extension Cable 4 in. long	$ 2.75

ROYAL ELECTRONICS CORP.
2101 South Leyden Box 22204 • Denver, Colorado 80222

royal CLASSIC

STRAIGHT AND LEVEL

Why don't you design your own airplanes? Give your creative urge a break. Be an expert. Why be bored? Live!

WHEN did you design your last model airplane? Did you ever design an airplane? Do you know how? Or are lift and weight, thrust and drag mysterious factors you can't put together as a winning team? They really shouldn't be. Design is not a black art. If you know why a kite flies and how to rig and fly it, you can create your own successful free-flight design. If you can do that, other types hold no terrors.

But why design anything when ready-to-fly creations in all categories — from hand-launched glider to fully equipped radio-control jobs — can be bought over the counter? Why indeed! Perhaps only because you call yourself a model builder. We hobbyists proudly proclaim ourselves "in." We are hip. We know what it is all about. Nuts! Though there is a recognizable place for ready-to-fly products — and they do fill a genuine need, you simply are not a modeler unless you can build your own. And, no matter how good a craftsman you may be, you are only half a man if you can't design a flyable crate.

Designing is a challenge. Fun. It brings a rich reward. You'll never find out what it is that keeps some guys going on happily for years, unless you have a fling at putting your thoughts on paper, then transforming lines into three-dimensions of wood and paper, dope and silk, foam and fiberglass or, maybe just a simple flimsy of some kind.

No course in aerodynamics is necessary. You don't have to start from scratch. You need no heavy tomes — though simple books on things like the theory of flight, and elementary aerodynamics may be found at the library or purchased from people like Aero Publishers. If you must know what the air molecules say to each other, then more power to you. There is no excuse to be unenlightened.

Basic research is not required. After all these years of development in hundreds, if not thousands, of scientific fields, the useful facts and principles are all around us. For anything you wish to design dozens, if not hundreds, of similar models have already been published in plan form. Proportions, sizes, areas, are demonstrated. Check enough of them and you are wise to the permissible range of variations. The purist may demand formulae, but the whole rule-of-thumb field now is only a practical expression of mathematical statements. So determine your own requirements from the free evidence, and lend to them your own tastes and expression. When you are done, you'll get the biggest lift imaginable — especially when you dare that first flight! If you have a winner, you are living. The hobby will have new zest. Future adventures will beckon. You say you couldn't be bothered with all that fuss and work? You're chicken!

Does making plans frighten you? For shame! Anybody can make a plan. It is nice to have a drawing board, a T-square, and a couple of hefty triangles. French curves come in handy, too. But you don't always need them. Compass? Use a convenient can top, bottle, can. Or stick a pin in the board, and tie a string to it and the pencil and swing an arc. Dividers? Use a scrap of paper. So something is this long — mark it with a pencil jot. Then measure off the distance, three, four, ten, what-the-heck number of times to reach the scale you wish. Curves? Just pin a long strip of balsa over the drawing. Bend it this way and that until your eyes light up. Or lightly freehand in, with sweeping, fast repetitive strokes, a rough curve you want to see, then pin down your wood strip marker. Heck, a wing, with spars and ribs, is no harder than drawing a fence — any child can do that. Why can't you?

At model supply prices these days, French curves and triangles are nothing to scream about. They last a lifetime anyway. Even a set of draftsman's tools is relatively inexpensive. For bulkheads, try sketching in the largest one, with a horizontal straight line at the widest spot, and another vertical for the centerline. Then draw in the smallest bulkhead, over the other. Measure off heights and widths of those in between, and rough them out. A cheap French curve will pinpoint the lines. So you'll have to fiddle the first time you try it. Tough!

Maybe the big shots have you buffaloed. Shucks, more of these guys put on a brave front than you can shake a stick at. Practically all of them copy each other, or slip through the old model mags in the dark of night. And that's all we are suggesting you do. Live it up. Time's a-wasting.

* * * *

To airplane people, the model rocketry field is "different." How different, your editor had not realized until he attended last summer's rocketry nationals — NARAM-10 — at Wallops Island. Significantly, the really big difference is in the industrial area, not with the modelers themselves (or are they mod-rocks?), or even with the models — eh, rockets. For after the first fleeting impressions, we found ourselves strangely at home. This, being an invitational affair, was not exactly a jam session. It was quiet (no gas engines!), leisurely, but kinda half-familiar. We found ourselves discussing with one of the younger boost-glider experts the techniques of spotting wing warps — which really matter on anything that goes up like a rocket. And, one of our old airplane buddies, well-known from our own past Nats, won a first at NARAM-10 — Bryant Thompson take a bow.

Even the chats with manufacturers were the same, but what they told us about the industry and the way they do business, shook us to the soles of our feet. To be-

Continued on page 69

What's New
FOR MODEL BUILDERS

Edge-It Prevents damage to Leading & Trailing edge of Wing..... No. LT-1 **59¢**

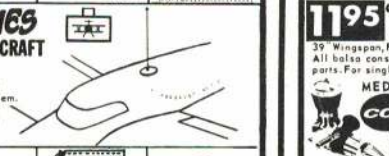
Inspect-It No. IC-1 Large No. IC-2 Small **59¢** EACH

Fair-It Push Rod Fairing No. F-1 Lg. No. F-2 Med. No. F-3 Sm. **59¢** EACH

Aerogloss SPRAY Dope Reg. 69¢ each **5 FOR 2.19**
Your Choice of Color
Metallic Blue.....
Metallic Green.....
Stinson Green.....
Sapphire Blue.....
White.....

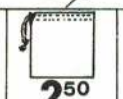
Protect-It Plates No. PT-1 Control horn and Switch Plates.... **59¢**

GOODIES BY MORE-CRAFT
Anten-Away Retractable vertical R C Antenna System. **2.00**



45¢ a Pair
Large or small. (Specify)
Pair of Nylon Control Horns. R-8. Royal products.

24 Assorted **29¢**
Eyelet Assortment 1 1/16" to 5 32" Long & Short



2.50
Jimmy Bags by Rand #1022 Fits all size Transmitters

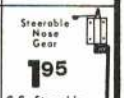
35¢ a Foot
Surgical Tubing by R/C Craft

MOUNTING TAPE

79¢ Yard
Qwik Mount Servo Tape 36" long 1½" wide double adhesive.

98¢
Socket Head Bolts 6-32x1" by Du-bro with wrench and blind nuts. Set of 4

1.49
Tatone Hang-On Battery Connection Fits any size engine..Easy to use.. Just hang it on to the glow plug.



Steerable Nose Gear **1.95**
C.G. Steerable Nose Gear. G16N ..with arm and nylon mounting block.

20¢
Pre-tinned set of 4 Split Coupling Sleeves for .062 to .078 wire. #CS-20 by Du-bro.

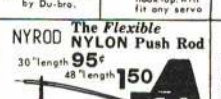
98¢ EA.
Rocket City Throttle-ese Fast & easy hook-up. Will fit any servo

50¢
Nylon Tail Wheel Bracket ETI by Top Flite

PEA LAMPS

Miniature Bulbs
3 Volt Clear(may be painted any color) **20¢** EA.

NYROD **The *Flexible* NYLON Push Rod**
30"length **95¢** 48"length **1.50**



Eliminates Unsightly wires. Push rod bending from high "G" loads. Ideal Mate for your Servo. Fuel Proof. Unbreakable, light weight.

SHRINK TITE COVERING MATERIAL

Regular	30"x 42"...	2.75	
Regular	36"x 60"...	4.25	
Super+	30"x 42"...	3.25	
Super+	36"x 60"...	5.25	
SPL 990 Box.	16oz.	32oz.	
	$2.75	$4.75	$7.25
SPL 1000 Thinner	8oz.	$2.50	
Catalyst	2oz.	1.00	

Grifhold Reg. $1.35

KNIFE KITS
No. 8-1 Heavy duty knife kit used for medium to heavy work. Set consists of No. 8 holder and 6 Razor sharp blades. This is a great kit for airplanes kit building and Model work.
SALE PRICED 98¢

Flair TOUCH DECALS

17"x22" Sheets
201-German Luftwaffe, WWII.....
301-U.S. Army Air Corps, WWII.
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402-AEF French, WWI.....
403-German Air Service, WWI....
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2.98 EA.

Official AMA Number Insignia Decals Your choice of Color- 17"x22" Sheet **AMA1 3.98** EA.
*Red, White edge *White, Black edge
*Black, White edge *Gold, Black edge

SNAP ON PLUG CONNECTOR Reg. 1.98 Sale **169**

R/C Craft SNAKES 36" **98¢** 24" **75¢**

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PARABOLIC SHAPE
2 Piece construction

1 3/8" Dia.....	79¢
1 5/8" Dia.....	89¢
2" Dia.....	$1.19
2¼" Dia.....	$1.29
2½" Dia.....	$1.59
2¾" Dia.....	$1.79

A.G. PLASTIC BALSA
39¢ EACH **3 FOR 87¢**

A.G. CEMENT (NEW FORMULA)
1 oz. 19¢ 5 for 69¢
1½ oz. 29¢ 5 for $1.00

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UNTIL YOU GET OUR LOW PRICE ON THE R/C EQUIPMENT YOU WANT

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Call or write for our PERSONAL Price Quotation; We stock all famous brands.

Phone (212) 675-8922

AHC AMERICA'S HOBBY CENTER
146 WEST 22nd STREET, N.Y., N.Y. 10011

R/C PRICE QUOTATION REQUEST

Description	List Price	AHC Discount Price

PRINT NAME AND ADDRESS IN MARGIN BELOW

RADIO CONTROL
FAMOUS BRANDS AT BIG SAVINGS

$15 R/C OUTFIT
SCHOOLMASTER $6.95
Order Combo R/C 13 TOP FLITE
11.95 VALUE $15.93
39" Wingspan, For .049 Engines
All balsa construction, Die cut parts. For single channel sets.
MEDALLION .049 COX $8.98
Medallion .049
RPM: 18,000
Wt. 1.2 Ounce

ASTRO Pee-Wee RELAYLESS
ALL TRANSISTORIZED
COMPLETE OUTFIT
SUPER DeLUXE VALUE

BRAND NEW "ASTRO" OUTFIT
RECEIVER: Super sensitive *3 Volt relayless *Wt. 1½oz. ¾"w 1"x 1¼"* Printed circuit *Tuning light indicator *Tuneable 26-28MC* Metal case
TRANSMITTER: Uses inexpensive pencells. *Compact size: Only 4 3/8"x 2 5/8"x 1 3/8" *Sealed no tuning necessary *Micro keying sw. *37" Collapseable antenna *Toggle switch.

R/C OUTFIT $24.88 BOTH TRANSMITTER & RECEIVER
LESS BATTERIES
SINGLE CHANNEL ALL ASSEMBLED READY-TO-OPERATE

$10 R/C OUTFIT
Order Combo R/C 2 JR. FALCON $5.95

VALUE $11.93
37" Wingspan, For .049 engine
Large tail moment for smooth flying. For single channel.
BABE BEE .049 COX $5.98
Babe Bee .049
RPM: 15,000
Wt. 1.5 Ounce

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

SAVE TESTORS **R/C system**
SIMPULSE 1 PROPORTIONAL PULSE
REG. $79.95 **59.88**

R/C digest Sale
R/C digest 1.00 Reg. $2.00

CONTROLAIRE 5 SINGLE CHANNEL RECEIVER RELAYLESS
7.98 KIT | **13.98** ASSEMBLED
3 volt fully transistorized receiver. Weighs 5/8 oz. Ideal for ¼A or ½A models.

SABRE Ready-To-Fly by Lanier 63" Span **49.95**

Name	Span	Engine	Price
Mustang	65"	45-60	39.95
Transit	65"	35-45	39.95
Bronco	65"	45-60	44.95
Pursuit	65"	45-60	44.95
Midget	65"	45-60	46.95
Comet	65"	45-60	44.95
Go Go	65"	45-60	44.95
T-Ball	65"	45-60	44.95

R/C SHOESTRING
For .19 to .40 Engine
54" Wingspan

CG MULTI CHAN. DeLuxe Kit **24.95**

Sterling CESSNA 180
48" Span

.09-.35 Engine **9.95**

TOP DAWG by Top Flite 39½" Wingspan

.049 to .15 Engine. or Multi Channel **12.95** Single

Your Choice **7.88** EACH
BIG 44" WINGSPAN POWERED BY .049 FLYING WT. 23 OZ
REG. $89.95
R/C Plane READY TO FLY **TESTOR**
Reg. $99.95
Length 16" Ready-to-run
R/C Mustang

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

SALE
ASTRO Pee Wee
COMPLETE R/C OUTFIT

Here's what you get!

ASTRO PEE WEE SET	
RECEIVER	40.00
TRANSMITTER	
BABE BEE .049 ENGINE	5.98
STERLING MINNIE MAMBO	5.95
AMTRON SN ESCAPEMENT	2.95
6 NYLON PROPELLER	.25
BATTERY BOX	.25
SWITCH	.25
HOOK-UP WIRE	.60
FOAM RUBBER	.25
ESCAPEMENT RUBBER	.25
R/C BOOK	.25

TOTAL VALUE $56.98
36.95
SAVE ALMOST $20.00

SPECIAL OFFER!
ALL-TRANSISTOR R/C OUTFIT
COMPLETE **ASSEMBLED** Ready-To-Operate
$47.95 Less Batteries
Verified $65.00

OPERATES ANY MODEL BOATS, CARS & PLANES From 1/4 A to the Largest

TRANSMITTER: Weighs only 12 oz. Measures 3¼ x 5½" x 1 7/8" No reduction of RF signal with modulation. Hi efficiency externally loaded Antenna. Printed circuit chassis
RECEIVER: Super hetrodyne relayless. Weighs 1 ounce and measures 2 1/8" x 1¼" x 7/8". Two pencells operate both the Rec. & escapement.

FREE OUTFIT Of Extra Cost With Radio Control Combination
R/C Solder * Guide to R/C Book
R/C Tuning Wand * 19" Hookup Wire
Foam Rubber (3"x 6") * Parts Boxes
R/C Hardware (nuts, bolts, etc.)
SINGLE CHANNEL

America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

AERO MASTER 48 Inch Wingspan for .45 to .61 Engines **38.95** by AMCO

½A SKYLANE 42" Wingspan For .049 Engine **8.95**

NAVIGATOR

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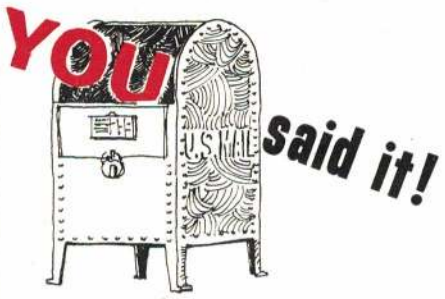


Got started in R/C!

My boys and I have finally dug up enough grit to go into R/C.

Now I've run across Howard McEntee's 13th article on "Getting Started in R/C" and sadly realize we've missed 12 articles.

How do we get either rewrites or copies of these 12 previous articles?

Gilbert J. DeLucia, Altamont, N. Y.

Don't fret Gil, you can get all 19 installments of this popular series, under one cover. See ad elsewhere in this issue for details of new book, Getting Started in R/C. It's the first of a new hobby library series. Ed.

Why Walker was great

Thanks for the great editorial on Jim Walker in the November issue.

As I view my past history in modeling and the age at which I really came on strong in the hobby, I can't help but add a thought to your many well-said words; namely that Jim Walker was one of our heroes. He was a real live hero doing the things that many of us young modelers yearned to do. You could talk with him and touch him and, if you were lucky, you might get to hold one of the Fireballs! And he answered questions about leadouts and center of gravity and making those funny stunt tanks out of balloons. And there was his station wagon — the goodies inside that were too much!

If you listened closely to him you did learn about that dual-point two-speed setup and the special micarta bellcrank and the insulated wires. So by adult standards he was a little corny, but he wasn't corny to us kids. He was all the things we wanted to be and in the effort to imitate him, many of us kids stayed off street corners and seriously built and flew model airplanes. And now, at age 36, I thank him. He helped me grow up and through a rough set of years in a boy's life. Yes, when I was a kid, Jim Walker was a hero. He's a bigger hero now, for I understand.

Enclosed is a picture of me with one of Jim's Saber Dance Fireballs about to be lowered into my arms. If memory serves me right, this is sometime in the late 40's. That makes me about 15 or 16 years old.

John Andrews, Streamwood, Ill.

Carl Goldberg — alive and kickin'

Sure enjoyed your editorial on the truly great Jim Walker. But I have to take exception to a paragraph near the end.

Despite any rumors to the contrary, I can assure you that Carl Goldberg is alive and well, and living in Chicago.

Carl Goldberg, Chicago, Ill.

Carl wrote that kinda tongue-in-cheek because he is a dear friend of your editor for many, many years! We did say in the Walker editorial that the greats were no longer with us. Carl is still great today, but we were thinking of the magnificent days when the Zipper, et al, were setting the world on fire. Carl still stands 10 feet tall. Ed.

A long, long road

In 1945, I was on my way home from Czechoslovakia. As a former member of Hitler's last "Tank-destroyer-brigade," hiding in forests and fields along the roads where the American Army rolled towards the East, I slept by day and walked by night. I had 200 miles to go. I was 14 years old, but had been a keen modeler since I was seven or eight. Searching the sides of the road for food, I was sometimes lucky. One day, I found a copy of *Air Trails*, the first time I saw literature about modeling from a foreign country. This was better than a can of beef, and I forgot about sleep and hunger. I read the drawings and spent the day trying to make heads or tails out of articles by a Mr. Grant. I would have given the "thousand-year-old empire" for a dictionary!

About a week later, I was home and started carving a solid Piper Cub out of pine from a plan in the same magazine. The original had given us a rough time as an artillery-spotter-plane.

Friends and I brought our tow-line-gliders out from the attics. We were informed by the Allied-Control-Commission that this was not allowed anymore and could draw a stiff fine or imprisonment. We were not even allowed to fly a kite, so we switched to solids and model boats.

When the Korean War started, things slackened off a bit. So we took our models to lonely farms and hills and enjoyed free-flight again. Many times, American modelers stationed with the occupation-forces, would join us. They were all buddies and did not squeal on us. We also built full-size gliders in attics, basements and barns. When Germany became "one" again, there were model-contests held all over and the full-size gliders were brought out. Around 2000 gliders were registered the following week.

When you meet a friend today who has disappeared from the flying field, he probably has some excuse such as the lousy mags, or the rules, poor management of the affiliation, etc. But the main reason, in my opinion, is that somehow we lost the challenge which used to draw all the youngsters into active modeling.

There is a whole generation of very able designers in our midst. Their names appear in each periodical. But they are pretty much in one age group. And in each of the recent years, we got the sad news we had lost another one. We know that no one is irreplaceable, but we are running out of this type of designer. These men did

not concentrate on only one kind of model. They were versatile in any branch of the hobby! They accumulated their knowledge when model mags had articles about designing, NACA reports, data on full-size, scale drawings and drawings or planes of a variety of models of which our youngsters never even heard of!

You have asked: "who shows the boys how to build, to cover and to fly?" I think that I am one of the few left who enjoy doing it. When I came to Dundas ten years ago, there was no modeler in sight, but lots of kids wanted to model. So I formed a club and we built ourselves a workshop to go with it. It's large enough to hold 25 boys with tables and lockers. We have developed our own line of beginners' models. We started out with a 12" HLG, a 24" all-balsa glider which the boys launched from a box-kite and sailwagon, then a 30" built-up towline glider. Boys who were interested in towline, built after this A/1 and A/2 contest gliders. Others started in sports-power. I have developed a whole series of sports-models for the 049 engines.

The boys can take their choice of a cabin-high-wing, low-wing, mid-wing or biplane. All are convertible to skis or floats. We also have four different fuselages as flying boats. Then there are four other ones built as pushers. For the same power range we have monoplane and biplane canards, also are pushers or flying boats. The deltas with pusher-engines are flown already, the ones with tractors are still on the building board. Variety is our motto!

So you can see that I do not only show the boys how to build and fly but encourage them to take direct part in designing and developing. And they love it! They get ideas of their own and that's the thing we must have again or our hobby will be degraded to the level of the ready-made slotcar-modeler.

We just like to build whatever we want and if there are no plans to be had, we make our own.

The members of our club and myself congratulate you on the fine work you are doing.

Wilfried Weisensee, Dundas Model Aircraft Club, Dundas-Ontario, Canada

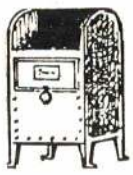
Happy Champion

Here is a photo of my 1947 model 7AC "Aeronca" Champion. It's a crop sprayer located near me. The plans were scaled up from drawings in your January 1968 issue, by Paul Matt.

The span is 77" and it weighed 12 lbs. ready-to-fly with the spraying-mechanism attached.

The Scale rules being what they are, flying points are very important. I placed second according to the AMA tabulations in Scale and Fidelity points, but I fell low on actual flying ability, and thus finished 16th. But I was happy with this, my first Scale model entry in competition.

Richard Hansen, Cozad, Neb.



YOU said it!

Likes centerspreads

Was quite pleased when I reached the centerspread of one of your recent issues. A full-color four-view of my favorite airplane! Bjorn Karlstrom is to be commended on his fine artwork. You, too, on your increasingly better magazine.

Richard W. Gleason, Fairbault, Minn.

One man's meat . . .

Must disagree with your correspondent (Oct. issue), who wants Karlstrom drawings in black and white. Bill Rossa, rather misses the point. These paintings are not intended for scaling to a model — plenty of drawings are available for this purpose. No, the paintings must continue, especially since the demise of "Profile Publications." They fill a need unobtainable elsewhere. I use mine as wall decorations in the workshop and they look good.

Dave Platt, Top Flite Models, Inc.
Chicago, Ill.

Colorful rebuttal

I wish to offer this letter as an answer to reader Bill Roosa, Oct. '68 issue.

As a dedicated scale-modeler, I have found there to be a disconcerting lack of accurate, easily acquired, interesting, high-quality color prints of any type of aircraft. It was with great pleasure that I "discovered" Mr. Karlstrom's talented portrayals at the local drugstore! In fact, since I don't "fly 'em," the centerspreads are the only reason for my purchase of A.A.M.

In order to satisfy Mr. Roosa, by all means continue your superlative black and white drawings. But you can maintain an excellent format, in my mind, only through the retention of the color centerspreads.

I only hope that I run out of wall space for the centerspreads before, long before, you discontinue the color centerspreads!

Jeffrey McDonald, Rockville, Conn.

Wants to help

Your recent editorials indicating a necessity to interest young people in aircraft modeling has motivated me to volunteer my services with our recreation department to encourage interest in the hobby. Oily Bird sounds like an ideal place to start.

I must confess that I too have become so involved in R/C modeling and tend to downgrade C/L and F/F and other forms of modeling. I now feel an obligation to help young people wherever I can.

Charles L. Salkowski, Hartford, Wis.

Ehling's masterpiece

Photo of my wife, Patty Jo, holding Frank Ehling's masterpiece — Oily Bird — in small field planes. Flies great.

John A. Thornhill, Mt. Rainier, Md.

Walla Walla Oily Bird

Enclosed is my personal check for one copy of the full-size plan for your Tenderfoot "Oily Bird" featured in the October issue.

This looks like a good fall project for my club, the Walla Walla Balsa Bugs.

E. M. Swedlund, Walla Walla, Wash.

Pretty, pretty, Oily Bird!

I really like the looks of the Oily Bird. My sister thinks free-flight is really neat. She never knew about free-flight until our family went to compete in the Nats. Please send me the plans of the Oily Bird, from the October issue. I would appreciate it if you would send me my plans as soon as you get my letter, so I can get started.

Mike Mollica, Fresna, Calif.

Where to get plans!

Please send me the plans for Oily Bird. I am an inexperienced modeler and hope I will be able to understand the plans. Also please enclose a list of other plans you publish. If there is any cost for the list, please bill me and I will send you the money.

Patrick DiSabia, Glen Ellyn, Ill.

Man, oh man, everybody wants an Oily Bird plan. You guys all can't be kids — or are you? The younger modeler's interest in this simple free flight plan, would warm the hearts of everybody who ever worried about the beginner problem. The kids are there — in swarms. As to other plans that Pat asks about, may we suggest the reader look over both Hobby Helpers and Sudden Plan Service ads. Ed.

More plastic models, please

Please start my subscription to A.A.M. immediately. I thought your August issue was excellent. Please carry more on plastic models and detailing when possible.

John Masterson, Ventura, Calif.

R/C race cars

Just purchased a copy of your March issue and it is truly an exceptional magazine. I have read practically everything in it, but one thing really caught my attention — a picture of a car on page 34. I looked for an article on it but I couldn't find one. I would appreciate it very much if you would send me an address to which I could write for information on the construction of the car.

I am also interested in the gear box, clutch and wheels, since I have never heard of or seen anything like them.

I am 16 and like to fly, and I own a Ringmaster and a Voodoo. I like to build and think this car would be a good challenge.

Stephen Paul, New Baden, Ill.

Complete information about parts and construction of the one-eighth scale racing cars may be had by writing RA/Car Developments, 522 West Central Park Avenue, Anaheim, Calif. 92802. Ed.

Wants Rubber

This is a fan letter to tell you I like you and your magazine. I have a small suggestion to make. Please include some small rubber-band powered (sticks and tissue) models. They are the only kind I can afford and have a place to fly.

J. Dallas, Syracuse, N. Y.

Conducted by *Sally Barry*

MINI-GLIDER

JOHN ZAIC

Give your trimming ideas a workout. Cut and try and experiment with these midgets before moving on to larger models.

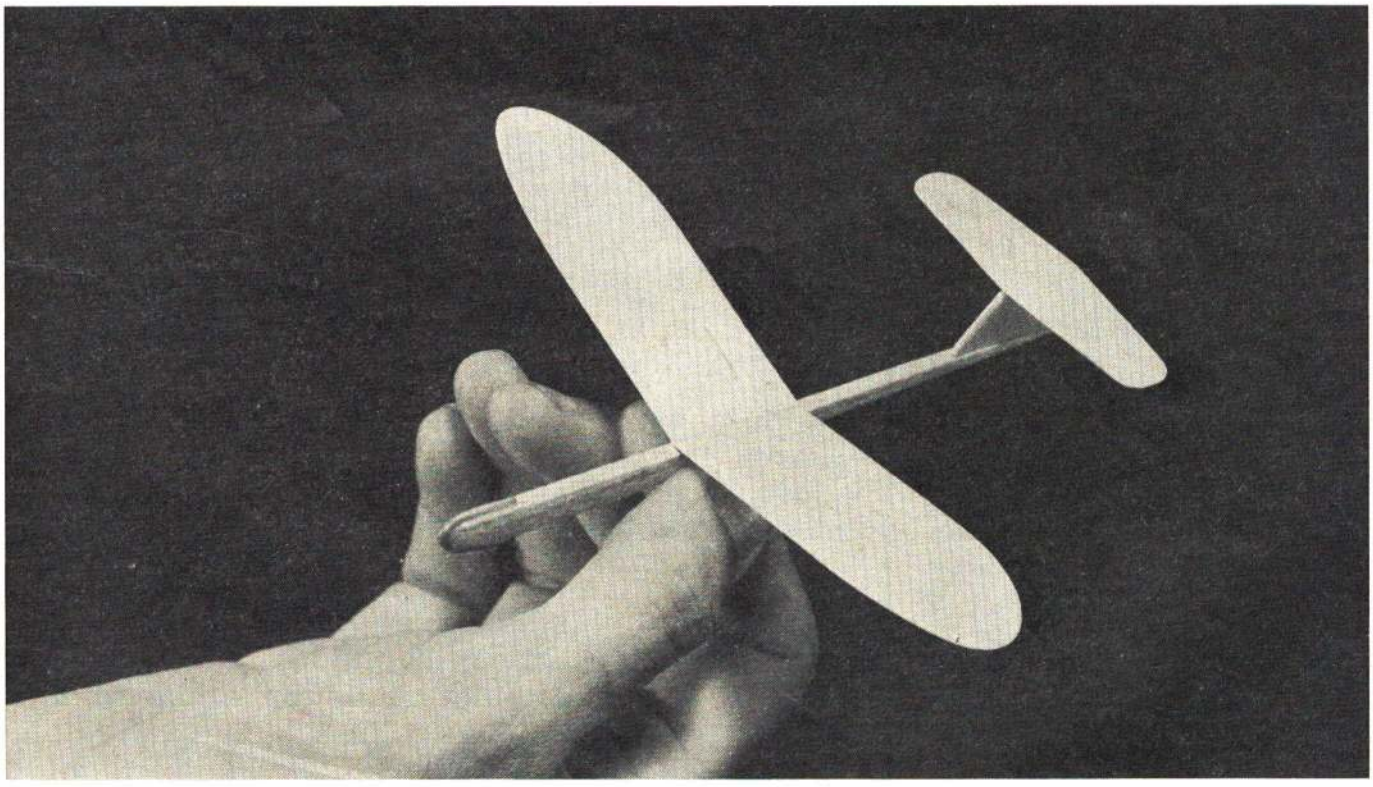
WITH this fun design, you can learn a lot about making a model fly O.K. Quite small, only 6″ in span, it can be quickly built. Since it will not glide straight if anything is out of alignment, you will discover mistakes to avoid when building models. It can be flown in very small areas. And, it is of interest to budget-tight model classes.

The fuselage is medium-weight ⅛″ sheet balsa. Two pieces of 1/16 sheet balsa can be cemented together if desired. Slice and sand to the approximate side-view profile shown on the drawing. The ⅛ thickness is maintained to the very end of the fuselage. Round off the bottom of the fuselage and the top portion that is ahead of the wing. A coat of cement is then rubbed all over the fuselage.

The wing is of lightweight balsa. If the simple, squared-off form is chosen, cut away the excess balsa at the tips to form the taper. Draw the centerline; use a postcard to help draw it square. With a razor blade, nick the leading and trailing edges where they meet the centerline. When the wing is to be cut in half, after the airfoil has been sanded in, these nicks will help relocate its center.

About a 4″-sq. of 6/0 fine grit sandpaper is used. To avoid its edges accidentally catching and slicing into the wood like a knife, hold one end of the sandpaper between the little and adjoining finger, and the opposite end between the thumb and forefinger. The sandpaper will curve across your fingers, and the fingertips will act as a soft pad. It is a bit clumsy at first, but you will get used to it. As an added precaution, bend back the edges of the sandpaper about ¼″ width, so they face up. Sandpaper held flat will certainly cut a gash into the work.

Lay the wing stock on cardboard. To get the airfoil shape, apply light pressure at the point shown on the drawing. You will



How big is a gnat? Check this Mini-Glider sitting atop a calloused thumb. Our less-than-a-handful, hand-launch glider flies O.K. with a bit of solder up front, some bits of masking tape on a wing tip for turn and that up-to-date, T-type of tail layout.

be sanding the wood and cardboard together. The airfoil shape will start coming in very easily. Don't rush. Stop often to check progress and to remove the wood dust that will start to pack up under the wing.

After the sanding is completed, cut the wing in half using the razor nicks that located its center. A piece of heavy cardboard may be used as a guide in cutting since it can bend over the airfoil, whereas a stiff, straight-edge can not. Use light cutting strokes. There are sometimes threads of very tough fibers running through the wood and a razor, or X-acto knife, will come to a sudden stop when it encounters them. Razor blades should be treated with great respect. They must never be picked up in a hurry, but always in a deliberate manner. Use of the X-acto knife may be better and safer.

Draw the dihedral template on a piece of paper. The drawing may seem a bit odd in that lines seem to be overdrawn in length. Well, you just overdraw the lines even more. Cut a piece of wood roughly, somewhat larger than needed for the template. Place it over the drawing, which now cannot be seen. However, the extended lines can be seen. Using them as guides, you can easily cut out the template. The rudder is done the same way, but be sure the grain is in the right direction. Putting pencil measurements on wood for the rudder is not easy, but it is easy to do so on a piece of paper.

Usually, small steel rulers are used as a guide for cutting balsa. However, they have a severe fault in that being so smooth, they may slide just as you are cutting. You can buy a cheap steel ruler and cement thin, fine sandpaper underneath it so it won't slip. You can also buy a very thin, cheap ruler and do the same for surfaces that are curved. Or you can substitute other material like plastic. If the wood to be cut is narrow, support the ruler with extra pieces of wood underneath it of the same thickness as the wood to be cut.

A piece of wood board which has one side straight, and one square edge not rounded off, is used to help make the dihedral-angle, center-wing joints. Improvise here on what you can get — drawing board, breadboard, etc. It may help to draw a line on the board so you can relocate the wing in case it shifts while you sand it. A postcard can be used here to help get the line square with the board's edge. The sanding block, about 1 x 4", can be anything that is smooth and to which you can cement a piece of 6/0 sandpaper. It must be thick enough to be rigid.

Place the sanding block against the board's straight edge. Lightly, place the wing half (its fresh-cut edge) against the sanding block. Check the wing line-up with your pencil mark. Hold the dihedral template on top of the wing half (see drawing). The template's backward-slanting edge should almost touch the sandpaper. Now start sanding with the block, pivoting it slowly towards the template's slanted edge. As you sand back and forth, it should feel as though the wing were not there. When the block lines up with the slant of the template, the job is finished. It takes about 10 seconds. Forcing the sanding will twist the wing out of your hand. Now, do the same with the other wing half. Check for a good joint by placing the wing halves butt to butt; raise the tips the correct amount as shown on the drawing. There should be no wobbling or large gaps in the joint.

The wing with the curved tips has its rounded outline shaped after the dihedral joints are made. Take one wing half and, estimating by eye, cut away what seems surplus until you have a rough outline. Place the other wing-half bottom against the bottom of the wing you have worked on, otherwise you may end up with either two right or left wing halves. On curved wing outlines one always has to be on the alert that both a right and a left wing half is made. Trace the outline you have just made with a pencil. Cut away the surplus. Put the two wing halves together — bottom to bottom — and sand to final outline shape.

Apply a coat of cement at, and around, the dihedral joints and immediately wipe it

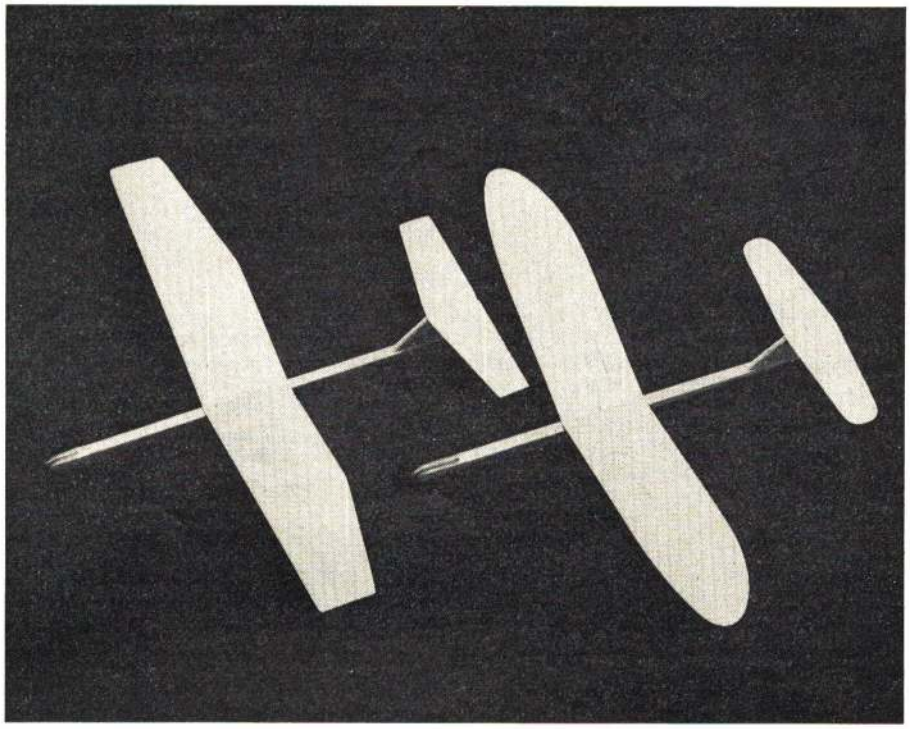
MATERIALS LIST

1 — 1/16 x 1 x 11" balsa sheet

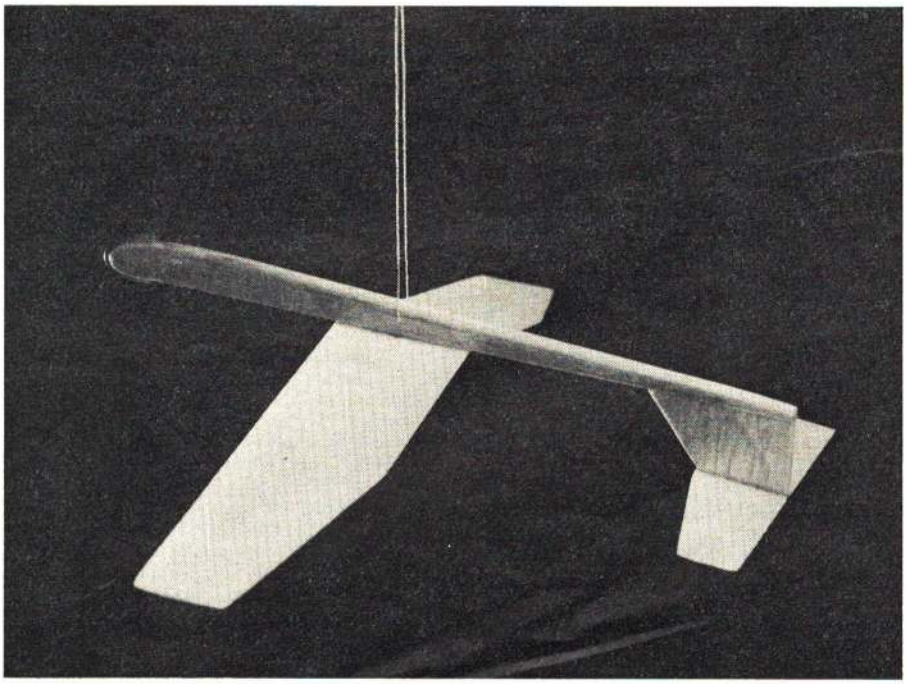
1 — 1/8 x 1/4 x 5" balsa strip

1 — 1" length of radio solder

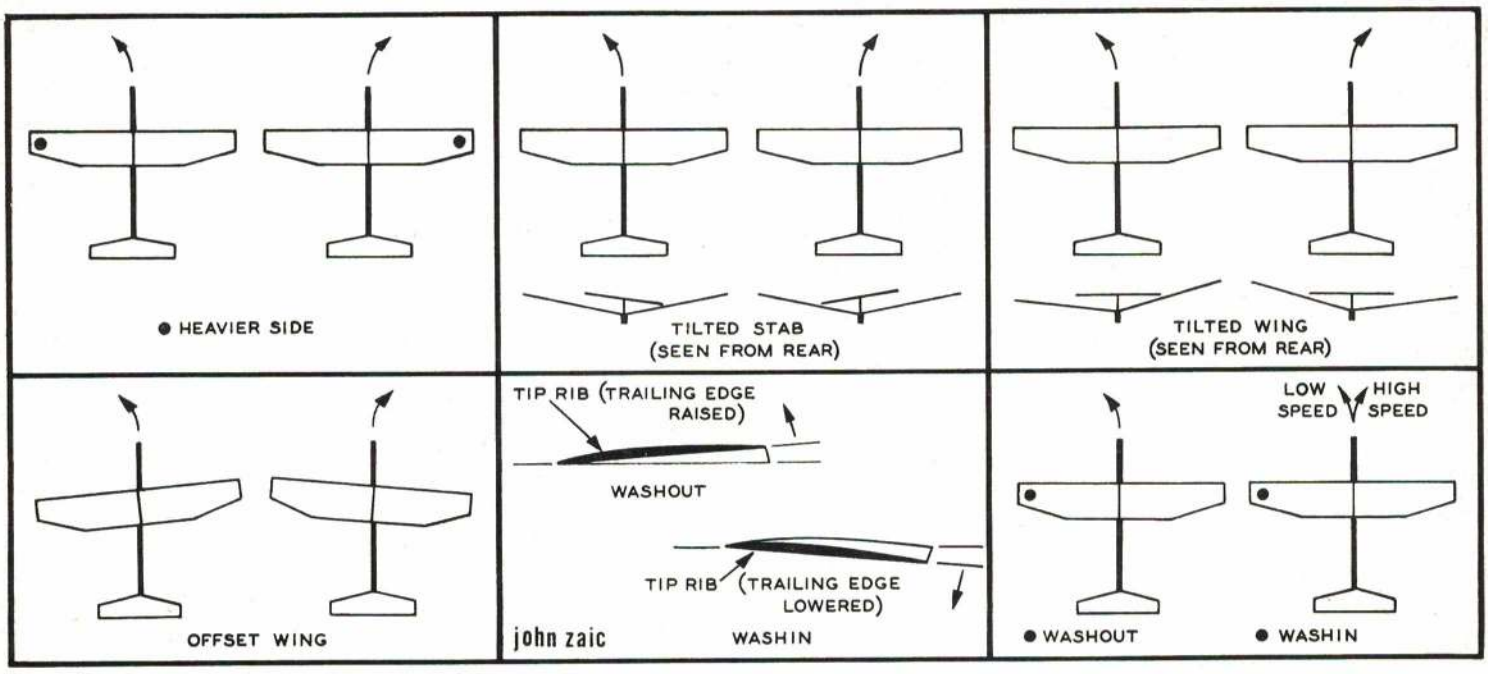
Miscellaneous: Ambroid or white glue, sandpaper, cardboard and masking tape for flight trim.



The full-size plan gives dimensions and layout for both versions of Mini-Glider. If in a hurry, pick the simplified outline at left. Both, though, are very easy to build.



Before a "flying" start, add nose weight to the model and find the approximate balance point. Suspend by thread so wing is out of the way. Works fine on other models, too.



off clean. This coat forces cement into the wood pores and cleans the dust away. It is called precementing and the wing halves will tack together much quicker with the final application of cement. To prevent sticking to the workbench, any kind of plastic film or waxed paper may be placed under the wing halves when they are being cemented together. Apply cement to one wing half and lay it on the plastic, then apply cement to the other half and join the two together. Use a little block, or something handy, to raise one wing tip to 1-¼" for the dihedral.

Apply downward pressure on the joint area to make sure the wings are held flat. Too much cement and no pressure will result in the wing having built-in twist. After the cement seems to have set, apply another thin coat and allow to dry well. Don't remove the supporting block. Many are surprised when they pick up a glider wing after the top cement has set, that it just folds in half! Here's what happens. The cement skins over — that is the outer surface dries and thickens first like paint in a can. This slows up the evaporation of the cement's solvents from the inside of the joint. Also the plastic film underneath the joint keeps air from reaching the cement and drying up the solvents. In some cases when waxed paper is used, the cement solvent even softens the wax, blends with it a little and takes even longer to dry. So, wait a couple of hours. When you do lift the wing, set it on edge. Apply a thin coat of cement to the joint bottom. After drying, apply a second coat. Now the joint should be solid.

Tube cement can be rather messy. I prefer to put it in a bottle and thin it down with acetone. A brush is used to apply it. There is not much holding power if you lay cement on dusty wood — so wipe off wood dust.

The rudder of 1/16 balsa is sanded down a bit in thickness. It's not streamlined; just lightly sand the leading and trailing edges round. Use the precementing system as described before, when putting it on the fuselage. Center it carefully. As the cement dries, keep checking the rudder to see that it is centered and not leaning over — it must be vertical. You can use the postcard for this. Remove it and reglue if it is not.

The stabilizer can be sanded to an airfoil shape like the wing. For the gliding tests, it is cemented very lightly only at the leading edge and trailing edge to the rudder. Be sure it is square with the rudder, and does not tilt down one way or the other.

The wing is also lightly and accurately cemented to the fuselage in the same way. Line it up with the stabilizer.

Radio solder is used to balance the model. Tie a thread to a pin. Stick the pin in the bottom of the fuselage 5/16" back from the leading edge of the wing. Prepare a length of solder about ¾" long. Bend it to a horseshoe shape and straddle it on the nose about ¼" from the tip. Suspend the model upside down. Remove or add solder until the fuselage is fairly level. It would be preferred that the model be slightly tail-heavy to begin with. In a small model the final balance is made with very little addition or subtraction of weights. Small pieces of masking tape can be used.

In gliding the plane for the final balance, observe if the model has any tendencies to turn and bank. Here, you may also practice how to glide the model. It should be thrown at the speed and angle at which it glides. The elbow should rise up as the hand goes forward. Otherwise you will get a sort of outside loop result in the model. You will learn this quickly enough. Ignore any turn in the beginning of the flight; it is at the very end, when the glider is on its own, that really counts.

If the model has a turn, check for any fault. Correct if possible. If it appears to have no faults, check if one wing half is heavier than the other. If so, start applying ⅛ squares of masking tape under the tip of the lighter wing. Keep gliding and adding tape. The model will start to turn less, then it will go straight as the weight is sufficiently increased. Finally it will turn the other way when too much weight is added. The center of gravity (balance point) should be on a line that is in the middle of the dihedral angle. If it is off to one side, it will yank the model off a straight-line flight. It is a powerful force, since it represents the weight of the entire model which is off center.

From now on refer to the small drawings showing flight adjustments. Adjust the model to glide straight, then tilt the stabilizer as shown in the drawing and observe the glide. You can remember this experiment by thinking that the "stab" is trying to level itself. In so doing the model is turning in the direction of the high side of the tilted stabilizer. Tilting the stab is common in free-flight to get a turn without using the rudder. The rudder is more powerful at higher speeds. Stabilizer tilt works well at all speeds. It may be used to oppose a bad turn.

The third test is to check if one wing is low. The model will glide with the wings level, so the glide turn would be in the direction or side of the low wing. This is because the model turns toward the high side of the stab which is tilted relative to the wing.

The fourth test involves offsetting the wing (one wing panel forward of the other). The model will glide in the direction the offset is pointing (the forward wingtip).

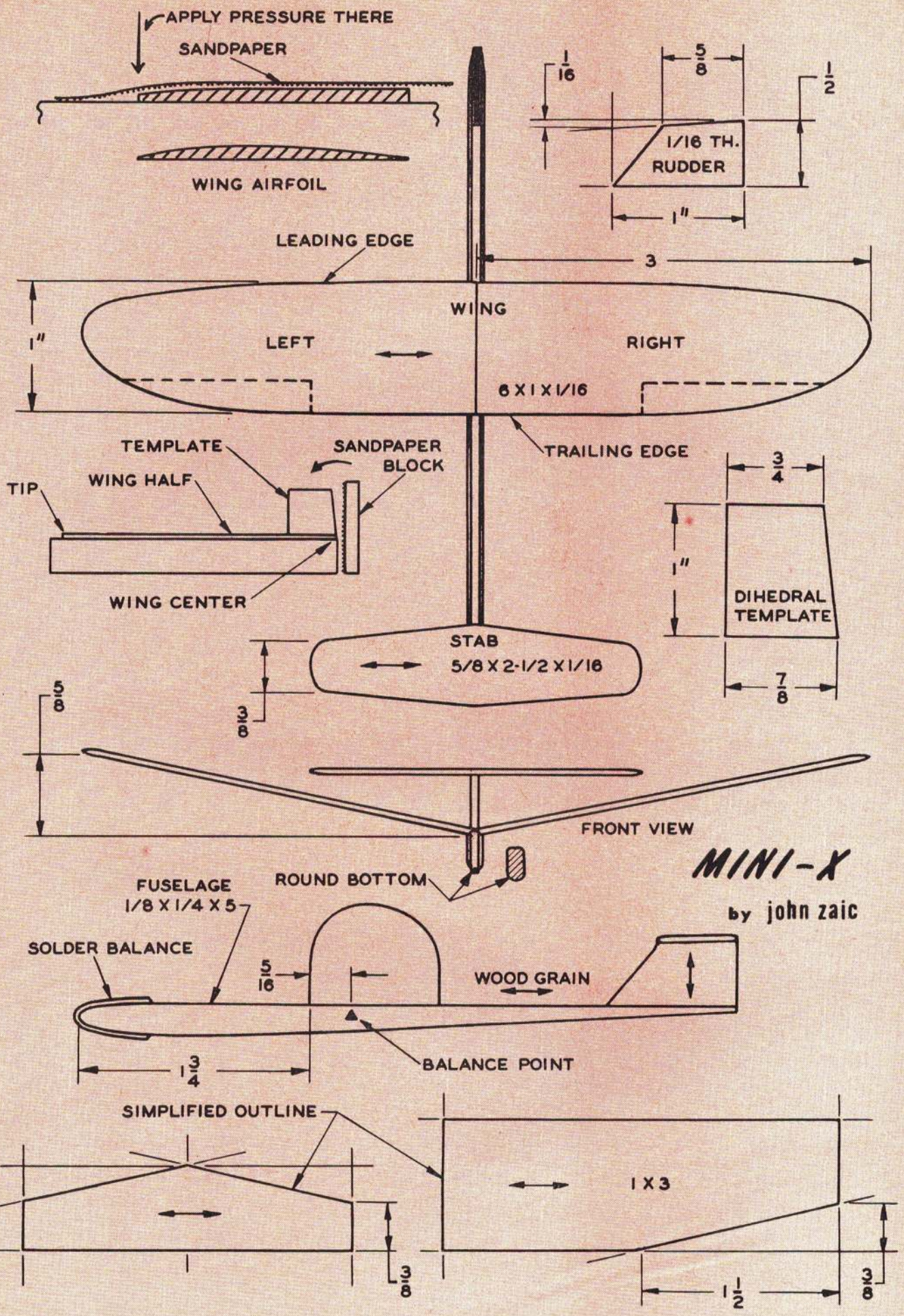
Additional tests involve washin and washout of the wings. Washout means that the wing near the tips is twisted and at less an angle of incidence than the center rib. It may be found in any portion of the area outboard of the center rib. Again, see the sketches.

Washin is the reverse. Any wing portion that has more angle than the center rib is said to have washin. It is possible for a wing half to be so badly warped that it may have both washout and washin!

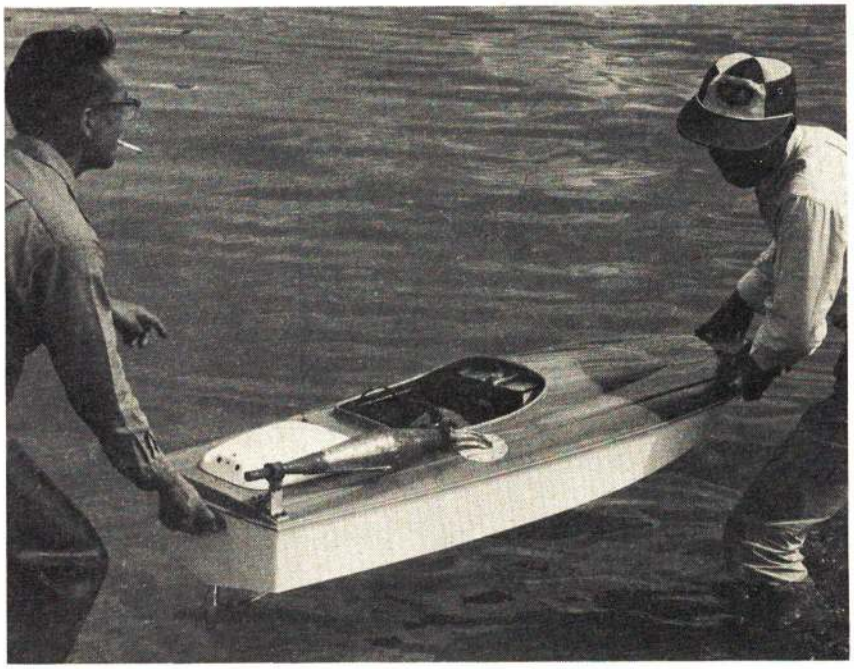
Ailerons were cut out of the wing (note dashed lines on plan) and recemented according to the tests performed. They control turn as on a real plane. Nail polish was used for cement.

These are the real headaches, and cause most of the problems for beginners. One cannot say positively what results will be in all cases. It depends on the amount of error, whether the model is a glider or a powered model, and on the aspect-ratio of the wing (width or chord in relation to span). So it pays to be fussy in having all things in proper alignment. Two errors may cancel themselves out, or, effects can even be doubled!

All of the conditions we've described have been depicted in the small illustrations. Don't let that mysterious bit about washin and washout throw you — the key is, experiment. Try some things on purpose, and see what happens. You can make the Mini-Glider do whatever you want it to do. You are the master!


APPLY PRESSURE THERE
SANDPAPER
WING AIRFOIL
1/16
5/8
1/2
1/16 TH.
RUDDER
1"
LEADING EDGE
3
WING
1"
LEFT
RIGHT
6 X 1 X 1/16
TRAILING EDGE
TEMPLATE
SANDPAPER
BLOCK
TIP
WING HALF
WING CENTER
3/4
1"
DIHEDRAL
TEMPLATE
7/8
STAB
5/8 X 2-1/2 X 1/16
3/8
5/8
FRONT VIEW
MINI-X
by john zaic
FUSELAGE
1/8 X 1/4 X 5
ROUND BOTTOM
SOLDER BALANCE
5/16
WOOD GRAIN
1 3/4
BALANCE POINT
SIMPLIFIED OUTLINE
1 X 3
3/8
1 1/2
3/8

model world
...on the international scene



R/C power boats big in Nippon

Left: Coming in at end of run, followed by chase craft, is large-class R/C power boat at recent Osaka contest. Engines are 50cc motor-cycle powerplants tuned by professional mechanics. Above: These boats used tuned exhaust pipes long before Wisniewski and other speed flyers. Takes two men to handle the brutes. Pix this page Ritsui Honda.

R/C seaplanes vie in Japanese competitions

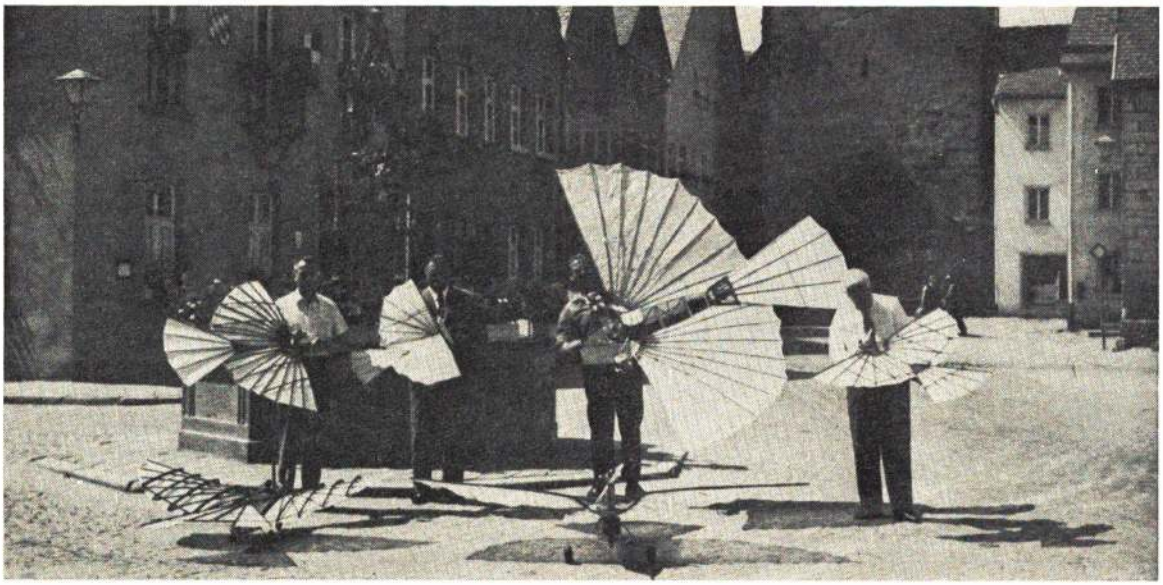
Hordes of impressive R/C seaplanes sparked recent Tokyo meet. Notable is an almost universal preference for FAI-style competition models. Beautiful workmanship and finishes abound. Techniques are advanced — on floats and clever water-rudder rigs.

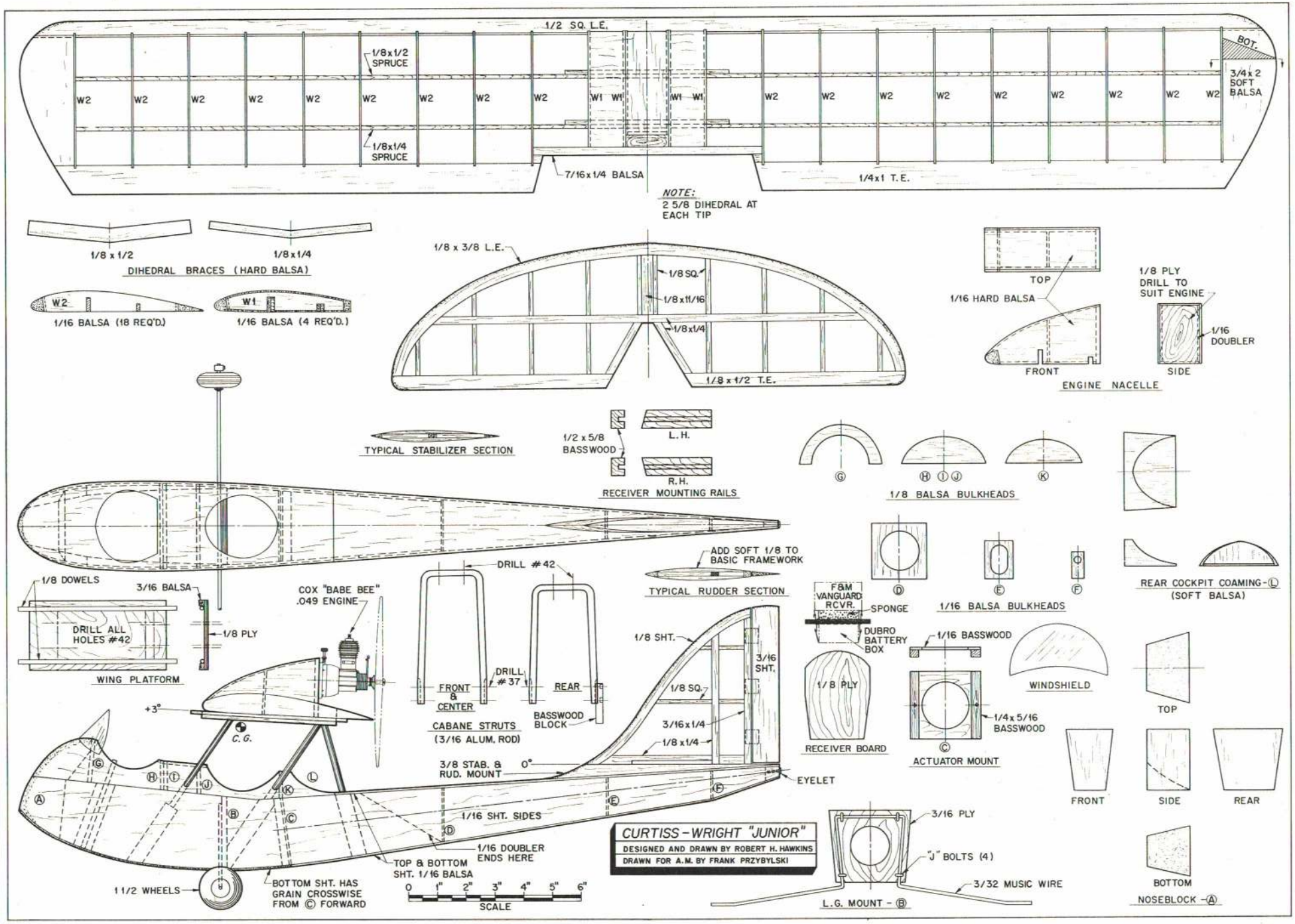
European Control-line Criterium in Czechoslovakia

Magnificent scale models marked European Criterium of control-line models, held last summer in Czechoslovakia. Otakar Saffek took these two shots especially for A.A.M. Left: Super-scale SE-5A by L. Davidovic. Right: Twin-engined Westland Whirlwind of WW II fame, built by Jan Kuzcilek. The longer one studies the photos, the more details that become apparent — note gear and canopy on the Whirlwind.

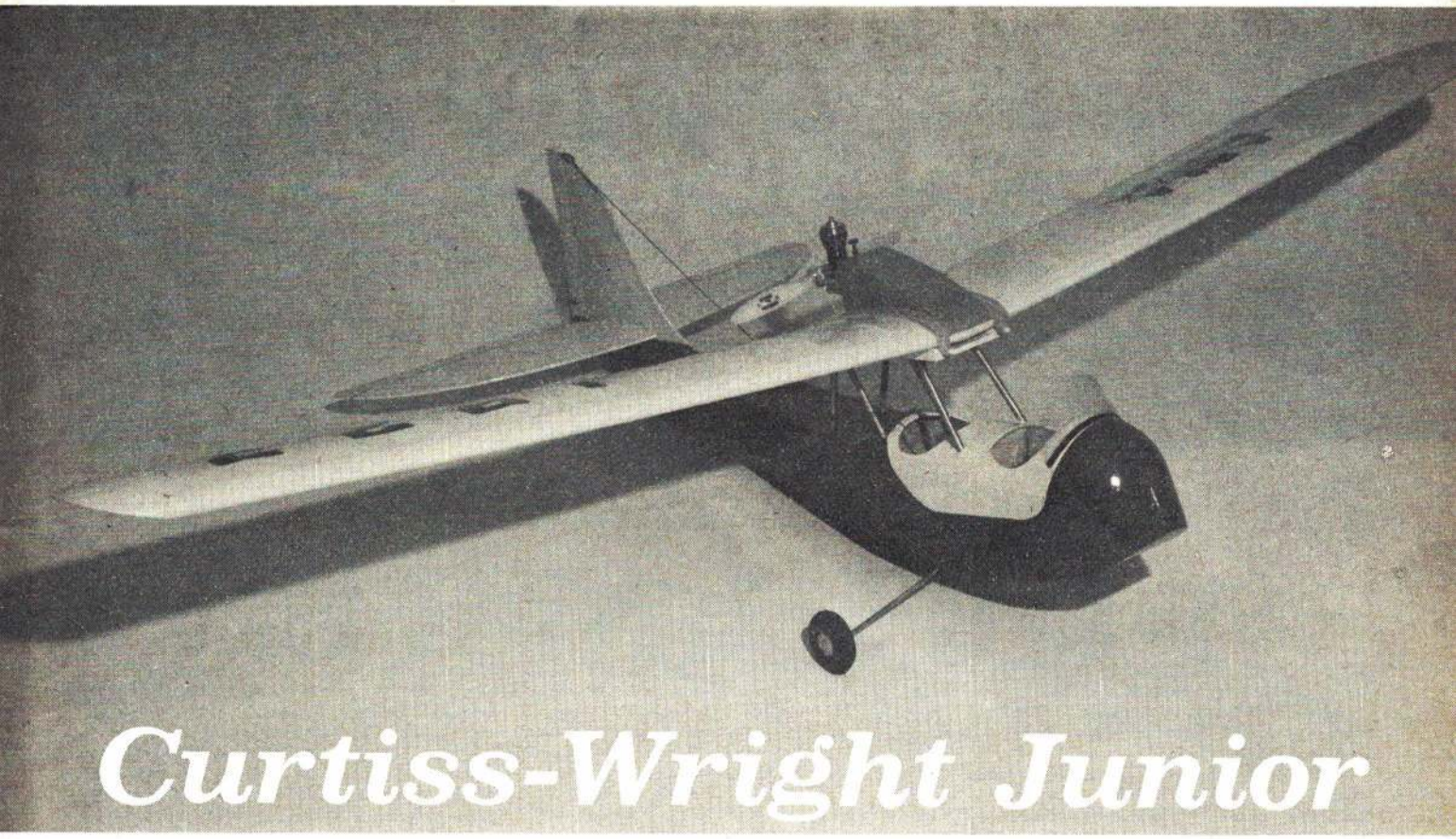
Whitehead scale models in Bavaria built for R/C test of 1901 plane's ability

Right: Skeleton of Whitehead #21 model was brought to William J. O'Dwyer — author of "Did Whitehead Fly Before the Wrights?" in November issue — during TV interview at Leutershausen, Bavaria, Whitehead's birth place. Man holding model gave up vacation to Italy to build, with Waldermar Leinert, in two weeks time, flyable R/C scale model. O'Dwyer is bald eagle, lower left. Stella Randolph, who provided historical pix for A.A.M.'s November issue feature, is at right. Below: Fleet of five Whitehead 21's built in 1966 to prove validity of Whitehead design, said to have flown in August, 1901, posed before city's Upper Gate Watch Tower. Large model is craft shown in skeleton form, picture on right. Interesting to scale modelers is fact that Whitehead replicas have proved remarkably stable when flown as radio-control craft. Accurate plans taken from authentic prints of Whitehead original, were rendered by Bjorn Karlstrom in November issue. From a modeler's point of view they are hard to fault.





FULL SIZE PLANS AVAILABLE — SEE PAGE 60



Curtiss-Wright Junior

Scale model of a great light plane of long ago is ideal subject for ½A radio flying on rudder only.

ROBERT H. HAWKINS

IN the late twenties and early thirties, the real romance of flying came from sitting in the breeze of an open-cockpit plane. One of those planes was the Curtiss-Wright Junior, a pusher airplane that was offered in two versions — first as a 40-hp landplane and second as a 60-hp amphibian. The landplane design lends itself well to becoming a sport-flying R/C ship of today. Let's look at the features which make it suitable for R/C flying:

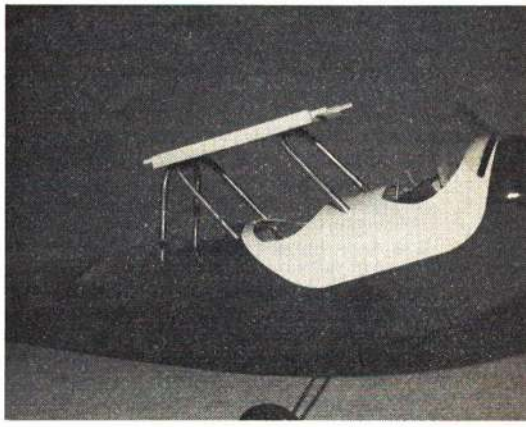
1) Two open cockpits; the front one to house the receiver and batteries and the rear one as the location for the magnetic actuator. 2) A high-wing design with sufficient dihedral to provide good, inherent stability. 3) A pusher-mounted engine which eliminates propeller breakage even in rough fields. 4) An upswept fuselage in the nose area and a landing-gear position that combine to prevent nosing over upon landing. 5) The receiver and battery box are well protected in the front cockpit. There's practically no chance of getting oil or fuel near them with the engine in its high, rear-mounted location. 6) And, besides, it's different from the usual R/C plane. It looks like a real airplane (at least to those of us old enough to have attended some of the pre-war Nationals meets).

One of the frustrating things that modelers sometimes find with some magazine or kit plans is the "let's leave it up to the builder" attitude regarding location and choice of accessories. Most of us would like to know what actuator, battery box, wheels, etc. the original builder used. We are listing the manufacturer of items we used in constructing this plane. Of course, many substitutions can be made.

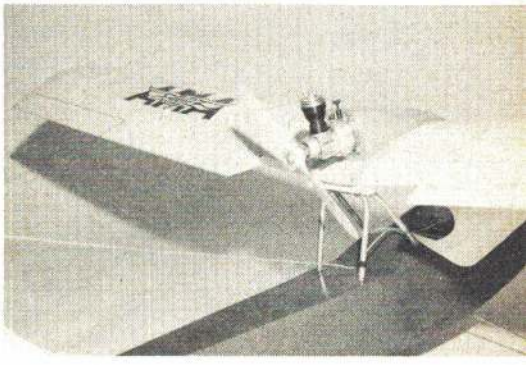
1) Engine used on prototype: Cox "Babe Bee"; 2) Displacement range: .049-.051; 3) R/C equipment used on prototype: F & M "Vanguard" receiver, F & M "GG-1" transmitter and Adams single magnetic actuator; 4) Types of alternate equipment: Any single channel equipment using escapement, magnetic actuators, or servos.

Much of the construction of this plane is straightforward and needs little explanation. Other items require some detailed explanation to make assembly as easy as possible. Let's start with the wing. The leading edge is made from ½ x ½" pre-cut L. E. stock and notched 3/32" deep by 1/16" wide for each rib, except where noted. Notching can be done quite easily, using an X-acto saw at each edge of the notches and then breaking out the center piece with a single-edge razor blade. Trailing edges are notched in the same manner. The wing spars are ⅛ x ¼ and ⅛ x ½ Sig spruce. Wing ribs can be cut from medium 1/16 thick balsa, but use R/C balsa for the ribs at the center dihedral joint and at the locations for mounting the engine nacelle.

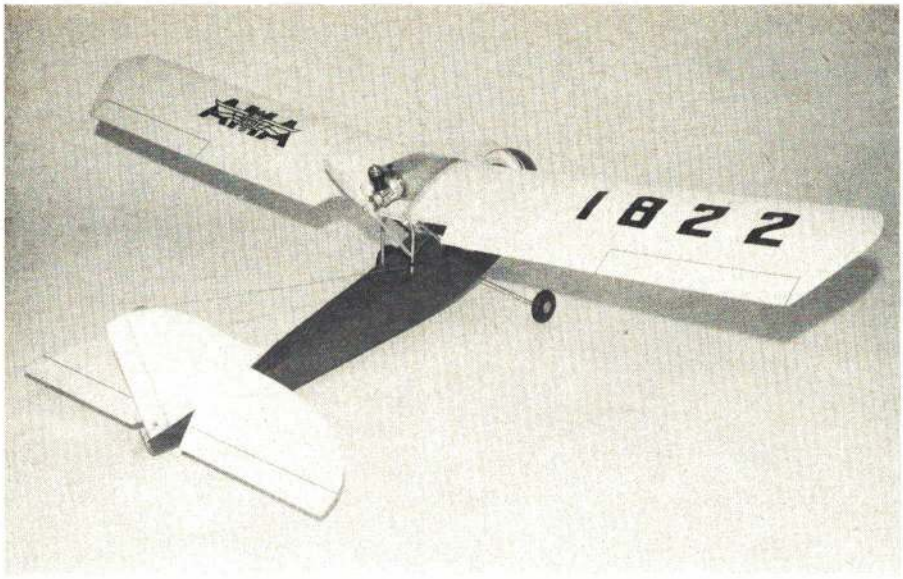
Build the wing, except for the ribs adjacent to the engine nacelle, and trim the leading edge, trailing edge and spars for proper dihedral angle. Assemble the dihedral joint, cementing all dihedral braces in place. Now, with the bottom of each wingtip rib raised 2⅛ above the workbench surface, install the nacelle ribs with the engine nacelle sides in a *vertical* position. Cement the ⅛ plywood firewall in place after installing four 3-48 blind mounting nuts on the rear surface and put on the 1/16 hard R/C balsa pieces on the top of the



Wing platform is attached to aluminum cabane struts with 2-56 machine screws. Upswept nose is handy for grass-field landings.



With pusher engine, antenna must be fastened to lower, right-hand, rear cabane strut. Clockwise engine starter spring.



Large wing and stabilizer provide good stability and fairly slow flying speed. High mounted thrust-line with a low center of drag gives excellent wind penetration.

nacelle. When this assembly is dry, plank the upper and lower surface of the center-section of the wing with medium hard 1/16 balsa. Add soft balsa wingtip blocks and sand to shape.

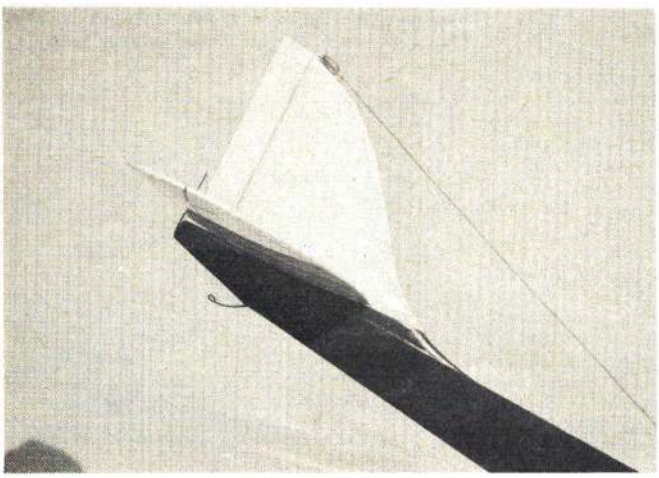
Next, build the stabilizer and fin. The construction used is similar to that used by Earl Stahl on many of his well-remembered rubber-powered designs of the late thirties and early forties. It's simple and provides an easy way to get a streamlined section for both the stabilizer and fin. Use soft 1/8 square strips on top and bottom of the completed framework and sand them to the shape shown in the typical cross section. The only caution here is to use *hard* balsa for the spar in the main framework of the stabilizer and a *hard* balsa rear spar in the fin. The hinges for the movable rudder fasten to the rear spar of the fin, so strength and rigidity are needed. After the two assemblies are completed and sanded, cover them with wet Silkspan. Give them two coats of clear butyrate dope and assemble the fin into the 3/8 wide slot in the upper surface of the stabilizer. Trim the paper from between the two center ribs of the stabilizer to form these slots, top and bottom. As mentioned, the fin fits into the top and the 3/8 thick hard balsa stabilizer and fin mount fits into the bottom.

Begin the fuselage by cutting the sides and doublers from "B"-grained, medium-hard 1/16 balsa. Glue the doublers in place, with white glue, being sure that you make one right-handed side and one left-handed side. Install the magnetic actuator mount "C" at the position and angle shown. The angle causes the centerline of the actuator to be parallel to the path of the torque rod. At the same time you install the magnetic actuator mount, also cement in place the tail-block wedge with the bearing for the torque rod. Next, install the remaining bulkheads between the escapement mount and the tail. Put the bottom and top 1/16 balsa sheets on the tail section of the fuselage before attempting to pull the front fuselage pieces together. When the rear section of the fuselage is assembled including the stab and fin mount and completely dry, cement the shaped balsa noseblock in place on one side. After it dries, bend the two fuselage sides uniformly and cement the noseblock to the other side. Wrapping the entire nose with 10-12 loops of 1/4 Pirelli rubber or large #64 rubber bands holds this assembly properly in place until the cement is absolutely dry. Let it stand overnight to be sure. All cement joints should be pre-cemented and allowed to dry before assembly of parts is attempted in the fuselage. The 3/16 thick 5-ply plywood landing gear mount is next to be assembled. Fasten the 3/32 diameter steel wire landing gear onto the plywood mount with "J" bolts *before* cementing the mount inside the fuselage. Install the magnetic actuator and the torque rod at this time. Be sure to do it at this stage of construction; otherwise, you will not be able later to reach the actuator mounting screws because the cabane strut mounts and 3/16 plywood landing gear mount will be in the way of a screwdriver when they are installed later.

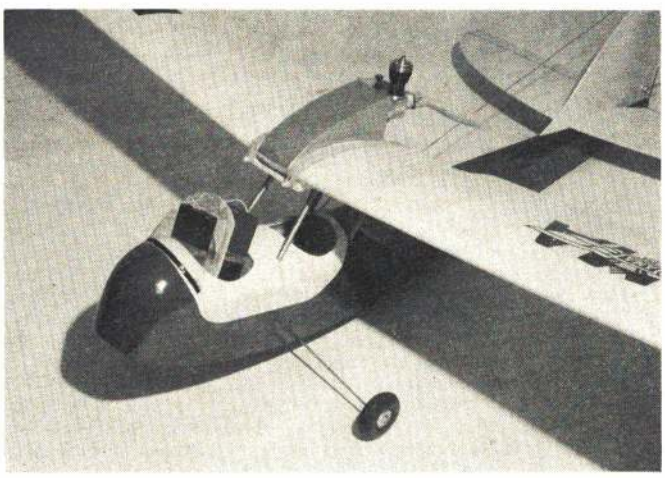
Now the cabane struts are installed. These are formed from 3/16 diameter uncoated aluminum welding rod. A Handi-Bender wire-bender was used to form all angles. Grind or file flats on the ends of the struts where they fasten to the 1/4 x 1/2 basswood blocks. Also grind flat surfaces at the proper angles at the top center where the wing platform is to be fastened. Drill each strut as shown on the drawing after the flat surfaces are filed on them. Counterbore the basswood strips so the 3-48 nuts will be slightly below the surface when tightened. Screw the aluminum struts to the basswood strips with 3-48 1/2" round-head machine screws. Clip off the protruding threaded portion of the machine screws and grind flush with the surface of the basswood blocks. Retighten and fill the counterbores with epoxy cement. Precement the proper locations inside the fuselage and the outside surface of each cabane strut block. Cement the cabane strut blocks in place, being certain that the three struts meet in a longitudinal straight line which is 3 degrees positive with respect to the upper surface of the stab and fin mount. Check it this way: With the fuselage resting on the landing gear wire, block up the rear of the fuselage until the stab and fin mount are 3 degrees negative. Then, use a carpenter's level to determine zero for the line joining the three cabane struts. When the struts are properly aligned, let them dry in place overnight. Mount the 1/8 plywood wing mount to the top of the struts using 2-56 x 3/8 round-head machine screws. Since the method of attaching the wing rubber bands allows a knock-off arrangement, this wing mount can quite easily absorb the shocks of hard landings.

Build two rails to hold the receiver mounting board. These should be of very hard balsa or even basswood, because they must withstand the entire forward force generated by the receiver and batteries in the event of a hard landing. The rails taper toward the bottom of the fuselage and should be carefully fitted to the sides of

Continued on page 66



Large fin area and rudder-control surface allow positive directional control power-on or power-off. Uses streamlined tail surfaces.



Receiver and batteries are easy to service on removable slide in forward cockpit. Magnetic actuator fits in rear cockpit.

Navy's first true Carrierbased fighter.

Boeing F3B-1

This tough little fighter finally scuttled the predominance of Curtiss in the Navy fighter field.

PAUL R. MATT

THE year 1928 was a milestone in the annals of U. S. Naval air power. During that year the two aircraft carriers, U.S.S. Lexington and U.S.S. Saratoga, joined the fleet on active duty. Although the superstructures of these ships were constructed over battle-cruiser hulls, their flight decks of 888 feet were unprecedented at the time, and their normal complement of 80 to 85 aircraft was unheard of. They were the super carriers of their day. No longer was Naval Air restricted to a dozen or so short ranged planes operating from the narrow and confined 542-foot deck of the first and, at the time, only carrier — the U.S.S. Langley.

To meet the increasing needs of taking aviation to sea, new aircraft were ordered, new squadrons formed and new tactics explored. The air fleet was outgrowing its initial role, that of being merely the eyes-of-the-fleet. With carriers operating as an integral part of the fleet, aviation units became both an offensive as well as a defensive weapon.

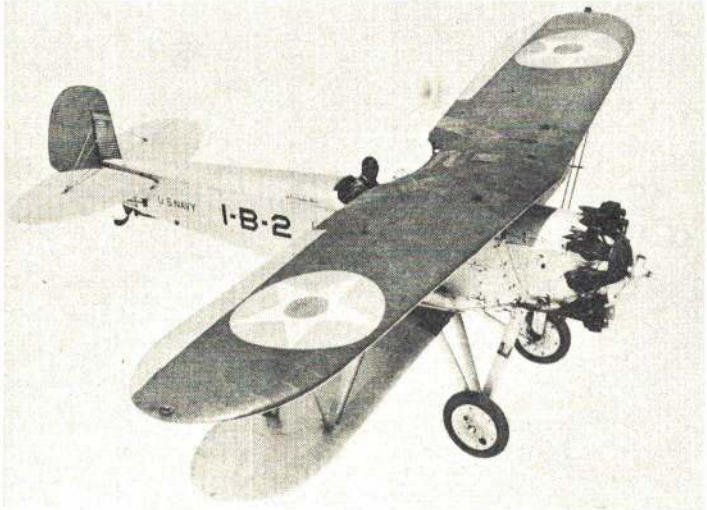
During the mid-1920's, Boeing and Curtiss held sway in the Navy-fighter category. Boeing with a succession of FBs (FB-1 through FB-5) and Curtiss with the F6C Hawk series. All employed water-cooled inline engines. The advent of the air-cooled radial, however shed new hope for the future of all aircraft at sea. The radial, void of heavy and cumbersome plumbing and radiators, was lighter in weight and provided a better power to weight ratio. Tests proved these engines more reliable, easier to maintain, and required less room for storage. They were far more resistant to salt water corrosion. For the first time, inverted flight for extended periods proved practical. As far as the Navy was concerned, this was the engine of the future.

It was only a matter of time for the air-cooled engine to become the Navy's standard powerplant. Quite naturally, the fighter was one of the prime types to incorporate this new installation. Vying for new contracts, Boeing and Curtiss immediately undertook a redesign of their proven water-cooled fighters to accept the new radials.

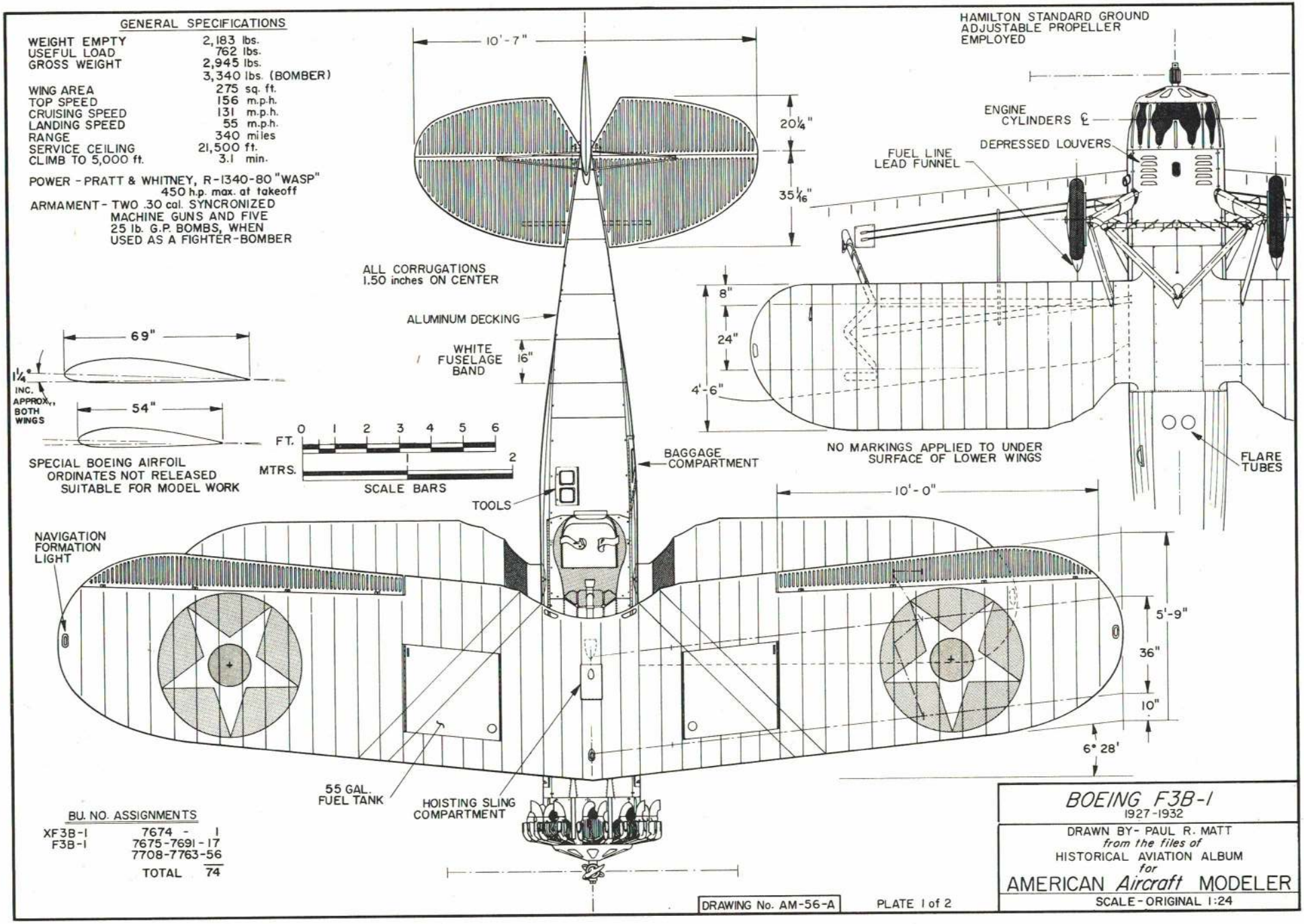
In October 1926, Admiral Joseph M. Reeves ordered a concentration of battle squadrons at San Diego. The plan was to explore new tactics, have a free exchange of ideas and a general airing of views. The men knew the carriers were on their way. The build up was underway. They knew also that new planes were well along in the final stages of development. These aircraft would make all previous machines obsolete.

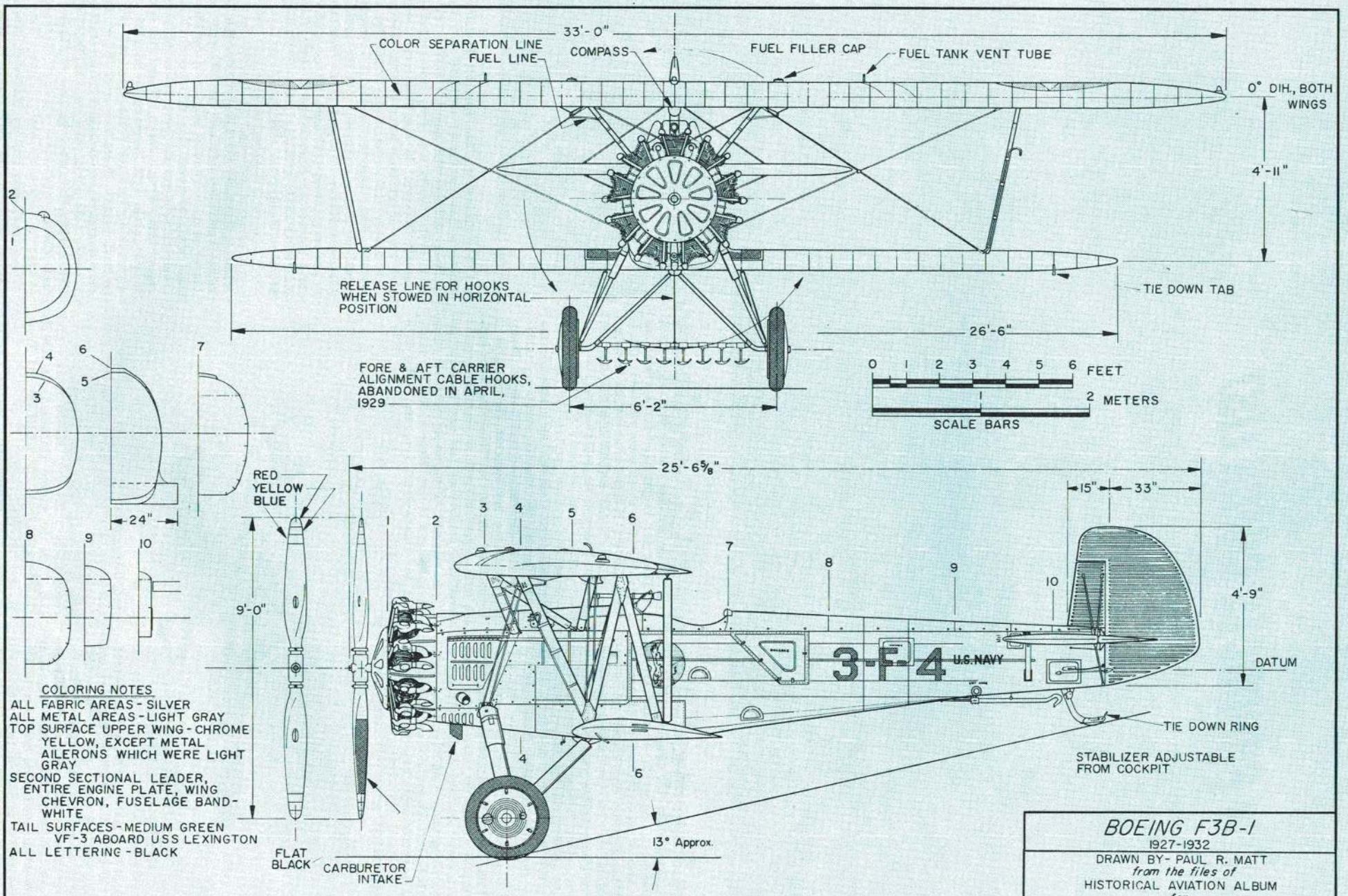
Curtiss had installed the first production P & W Wasp engine in an F6C Hawk. It was flown to San Diego to demonstrate the new combination and give the pilots a taste

Continued on page 61



New Navy fighter series was developed for the also-new P&W Wasp air-cooled, radial engine — more reliable and lighter than the liquid-cooled powerplants. Bigger aircraft carriers meant the airplane could become a tactical and strategic weapon, not just eyes-of-the-fleet. F3B top 156 mph, landed at 50 mph.


GENERAL SPECIFICATIONS
WEIGHT EMPTY 2,183 lbs.
USEFUL LOAD 762 lbs.
GROSS WEIGHT 2,945 lbs.
3,340 lbs. (BOMBER)
WING AREA 275 sq. ft.
TOP SPEED 156 m.p.h.
CRUISING SPEED 131 m.p.h.
LANDING SPEED 55 m.p.h.
RANGE 340 miles
SERVICE CEILING 21,500 ft.
CLIMB TO 5,000 ft. 3.1 min.
POWER - PRATT & WHITNEY, R-1340-80 "WASP" 450 h.p. max. at takeoff
ARMAMENT - TWO .30 cal. SYNCRONIZED MACHINE GUNS AND FIVE 25 lb. G.P. BOMBS, WHEN USED AS A FIGHTER-BOMBER
10'-7"
20¼"
35 1/16"
ALL CORRUGATIONS 1.50 inches ON CENTER
ALUMINUM DECKING
WHITE FUSELAGE BAND
16"
HAMILTON STANDARD GROUND ADJUSTABLE PROPELLER EMPLOYED
ENGINE CYLINDERS ℄
DEPRESSED LOUVERS
FUEL LINE LEAD FUNNEL
8"
24"
4'-6"
69"
54"
1¼° INC. APPROX., BOTH WINGS
SPECIAL BOEING AIRFOIL ORDINATES NOT RELEASED SUITABLE FOR MODEL WORK
0 1 2 3 4 5 6 FT.
MTRS. 2
SCALE BARS
BAGGAGE COMPARTMENT
TOOLS
NO MARKINGS APPLIED TO UNDER SURFACE OF LOWER WINGS
FLARE TUBES
10'-0"
NAVIGATION FORMATION LIGHT
5'-9"
36"
10"
6° 28'
55 GAL. FUEL TANK
HOISTING SLING COMPARTMENT
BU. NO. ASSIGNMENTS
XF3B-1 7674 - 1
F3B-1 7675-7691 - 17
7708-7763-56
TOTAL 74
BOEING F3B-1
1927-1932
DRAWN BY- PAUL R. MATT
from the files of
HISTORICAL AVIATION ALBUM
for
AMERICAN Aircraft MODELER
SCALE - ORIGINAL 1:24
DRAWING No. AM-56-A
PLATE 1 of 2



COLORING NOTES

ALL FABRIC AREAS - SILVER
ALL METAL AREAS - LIGHT GRAY
TOP SURFACE UPPER WING - CHROME YELLOW, EXCEPT METAL AILERONS WHICH WERE LIGHT GRAY
SECOND SECTIONAL LEADER, ENTIRE ENGINE PLATE, WING CHEVRON, FUSELAGE BAND - WHITE
TAIL SURFACES - MEDIUM GREEN VF-3 ABOARD USS LEXINGTON
ALL LETTERING - BLACK

BOEING F3B-1

1927-1932

DRAWN BY- PAUL R. MATT
from the files of
HISTORICAL AVIATION ALBUM
for
AMERICAN Aircraft MODELER

SCALE - ORIGINAL 1:24

DRAWING No. AM-56-A

PLATE 2 of 2

NEW PRODUCTS CHECK LIST

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

Fliteglas Laminates, Inc./Curtiss P-40F. Fiberglass and foam, that's what this R/C scale model is made of. Fuselage is glass; wing and stab are foam cored. And many other detail parts — canopy, exhaust stacks, wheel fairings, etc.—are of vacuum-formed plastic. There's a hardware pack, complete with landing gear, too. Span is 58" and length 46". Weight of the .60-powered ship will run six lbs. Kit price—$69.50. Catalog 25c. FLITEGLAS LAMINATES, INC., 1211 Thompson Ave., Santa Cruz, Calif. 95060.

Sturdi-Built Model Mfg./J. Roberts Bellcrank. This 3-line throttle control bellcrank has been improved. Throttle arm is heavier and of steel instead of aluminum. Base is heavier too and closer tolerances are maintained for smoother operation. They are guaranteed — you get a free replacement if a failure occurs. Price is $3.50 for an upright or suspended unit. Write: STURDI-BUILT MODEL MFG., Route 2, Box 218, Meridian, Idaho 83642.

K & S Eng./K & S Metal Center. You'll find their display racks at your hobby shop, hardware store, etc. In each there are 81 different sizes, shapes and kinds of metal for the hobbyist. There is brass, aluminum, copper, magnesium, tin and spring steel in tubes (round and square), angles, channels, rods, wire, flat stock and sheet shapes. Anything you might need for a project in a quantity and at a price you can afford. Look for the K & S Metal Center display. Info from: K & S ENGINEERING, 6917 W. 59th St., Chicago, Ill. 60638.

Heath Co./1969 Catalog. Available for the asking is the new Heathkit catalog. Over 300 kits are described in its 116 pages. There are kits for every interest, including R/C enthusiasts. Naturally, Heath's proportional R/C system, GD-47, is thoroughly covered. The variety of test and service kits should also be of interest. One of their new products is the "Boondocker," a compact and lightweight, 5 hp, trail bike with a 2-speed transmission and a welded, steel-tube frame. And it's in kit form; great for free-flight chasing! Write: HEATH COMPANY, Benton Harbor, Mich. 49022.

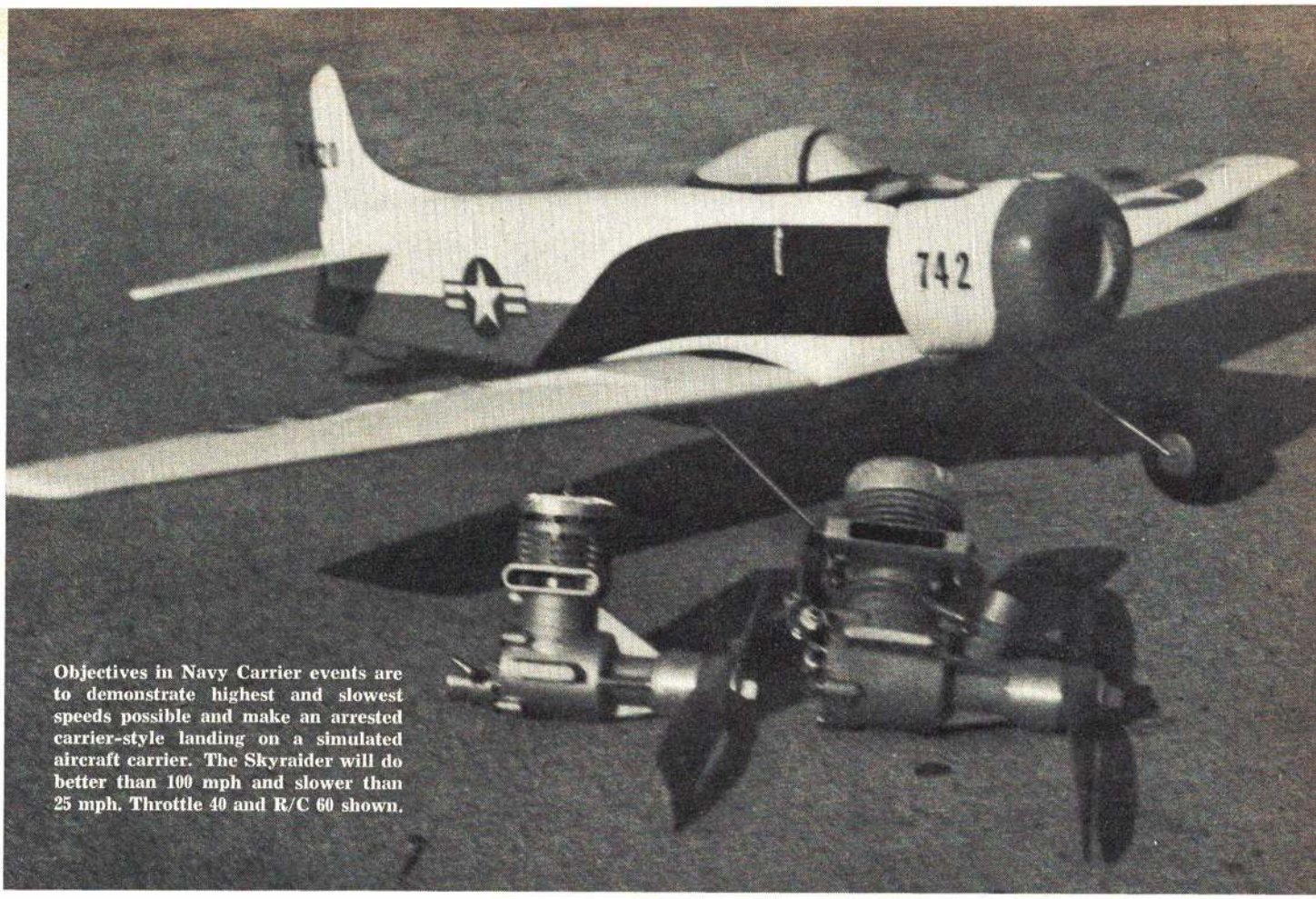
Airtrol/Cessna 150 R/C. A semi-scale model, for .09 to .15 size engines, that flys well with any kind of radio gear from rudder-only to multi. Galloping Ghost works out perfectly as the model was specifically designed for the Airtrol GL-100 system. Wing and stab are molded foam and need no finishing. Fuselage is high-impact plastic. All told, kit requires only about three hours to assemble. Parts are pre-cut and cement furnished. Span is 44"; weight, less engine and R/C gear, is 24 oz. Kit price-$15.95; ready-to-fly with the GL-100 system and O.S. Max .10 engine (installed) is $159.50. Query: AIRTROL OF ADRIAN, 845 Treat St., Adrian, Mich. 49221.

L. M. Cox Mfg. Co./Fuel 'N Tool Chest. Here's another new accessory by Cox and one that is complete with all of the small items needed to fly and maintain model aircraft. Black plastic case is 8½ x 6 x 4" and has a leather-grain finish. There's a sturdy catch and adhesive-backed initials so you can identify it as your own. In the case you will find a starting battery; glow plug clip and wires; can of glow fuel; D-shaped control line handle; Dacron flying lines; fuel strainer and filler tube and two sets of Cox wrenches to fit .020 and .049 engines. Chest, complete with tools, is only $5.98. Ask: L. M. COX MFG. CO., INC., P.O. Box 476, Santa Ana, Calif. 92702.

Kaybro Industries, Inc./Aircraft Jewelry. Kaybro's new series of aviation jewelry includes some of the popular WW II aircraft. (The series last year featured several WW I types.) In this new series, several are of general interest — there's an 1837 hot-air balloon and the USS Macon airship. Also there are styles in earrings, pendants, pins and charms for the ladies. All are available in a gold or silver finish. Prices range from $1.95 for a tie tac to $6.95 for a set of cuff links and a tie bar. Ask: KAYBRO INDUSTRIES, INC., 175 W. 13th St., New York, N. Y. 10011.

Midwest Products Co./Lil' T Glider Kit. A radio controlled glider, Lil' T can be launched by towline or high-start for thermal riding or flown as a slope soarer. Use single channel proportional or rudder-only equipment. Wing span is 74" and the area is 480 sq. in. Kit features a booklet on glider flying by Dale Willoughby and easy-to-read plans. There are even plans for an optional engine-pod and its installation. Kit price is $15.95. Write: MIDWEST PRODUCTS CO., 400 S. Indiana St., Hobart, Ind. 46342.

Conducted by Harry E. Harps



Objectives in Navy Carrier events are to demonstrate highest and slowest speeds possible and make an arrested carrier-style landing on a simulated aircraft carrier. The Skyraider will do better than 100 mph and slower than 25 mph. Throttle 40 and R/C 60 shown.

Skyraider for Navy Carrier

An expertly designed ship with interchangeable engines for Class I and II.

HOWARD MOTTIN

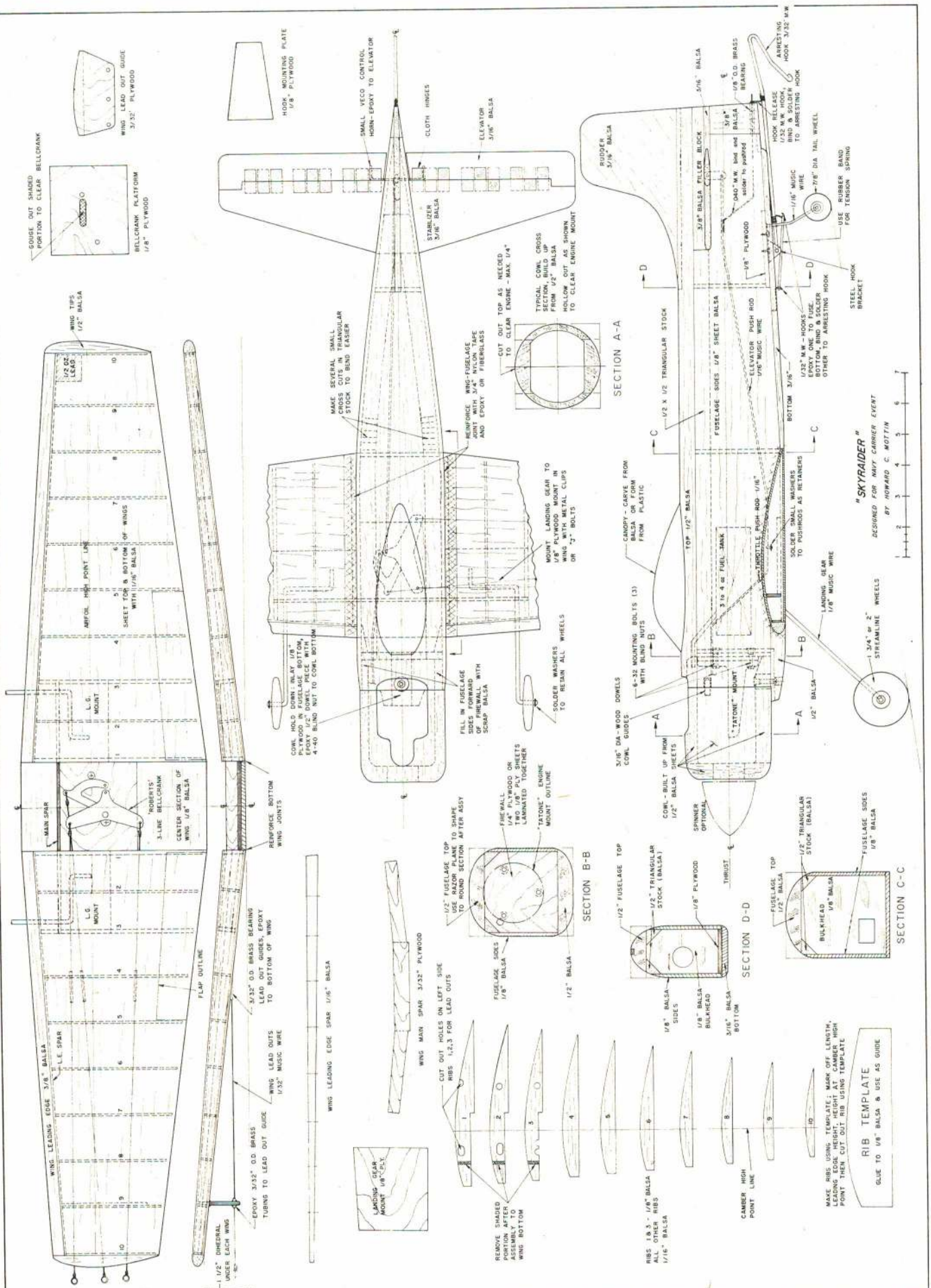
THE incomparable Douglas "Skyraider" has a record that will be hard to match by any other aircraft in military aviation history. Originally conceived in 1944, the Skyraider has had a life span that has extended over three wars. After being designed in June, 1944, the first prototype was flown on March 18, 1945. Twenty-five pre-production prototypes were ordered and built, beginning in July 1944, and were designated the XBT2D-1. The Skyraider originally had a huge propeller spinner and was known as the "Dauntless II." But only the number four prototype actually flew with the spinner. Following the first successful test flights of the then Dauntless II, a production order was placed for 548 BT2D-1 aircraft on April 18, 1945.

With V-J Day and the end of World War II, this initial production order was cut to 277 planes. The name was changed to Skyraider in February of 1946 and, in April, the Navy changed the letter designation from BT2D-1 to a day-attack aircraft designation of AD-1. Seven basic versions of the Skyraider have been produced. Although the primary mission of the Skyraider is the day-attack mode, other versions of the aircraft have also been produced; namely for radar countermeasure, early warning and night attack. With special modifications, various specialized versions were also made from the basic configuration. These were for antisubmarine warfare, ambulance, cargo, refueling tankers, and photographic missions. Beginning with the outbreak of the Korean War in 1950, the Skyraider saw combat action. The AD's served as the standard dive-bomber throughout the three years of the war and were operated from both carriers and land bases. The final version of the Skyraider, the AD-7, was put into production in 1955. When production was completed in March 1957, ending 12 years of Skyraider production at the Douglas El Segundo plant, a total of 3,180 planes have been built in seven versions and 28 subversions.

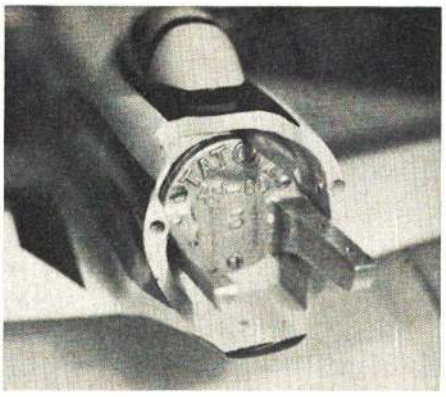
The Skyraider is an all-time Carrier favorite. It is in current military service and plenty of scale material is available.

But this was not the end of the line for the Skyraider. Beginning in 1960, surplus aircraft were delivered to the Republic of Vietnam Air Force, and were flown by Vietnamese pilots. One of the most notable was the former leader of South Vietnam, General Nguyen Cao Ky. In 1962, following a Department of Defense directive, the AD was again redesignated; the AD-5 to A-1E, the AD-6 to A-1H and the AD-7 to A-1J. Finally, in August 1964, following the Gulf of Tonkin incident, the US Navy entered the Vietnam War using the Skyraider. Although not as sophisticated or as fast as the modern jets, the Skyraider has proven itself a combat workhorse, and has made an enviable record in its 25-year history.

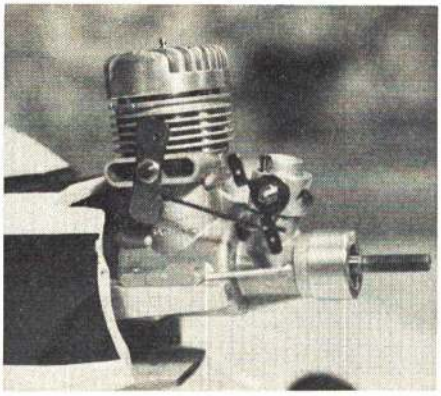
The Skyraider is also a natural subject for the AMA Navy Carrier event. The first Navy Carrier competition held at the 19th Nats, way back in 1950 at Dallas NAS, was won by a Skyraider model flown by Cal Smith. Although the basic Navy Carrier rules have not changed appreciably since that time, the models have somewhat. Instead of the large, slow, and heavy models of that era, the current top models are small, fast and light weight. Since there is an automatic limit on the low speed of the model, the only way to increase the point total is to increase the top speed. Low speed is limited by the stalling characteristics of the particular model. This is usually between 20 and 30 mph, depending on the wing and weather conditions. Top speed is determined by how much power can be crammed into that small package of balsa. But along with increased power, usually



FULL SIZE PLANS AVAILABLE — SEE PAGE 60



Author found that one size of Tatone mount would hold both engine sizes he planned to use. Engine area fuelproofed with epoxy.



For winning Class I performance engine must be light, powerful, and able to handle a short high-pitch prop at speed and at idle.

comes an increase in weight and a corresponding necessary increase in size to maintain a reasonable stall speed. So trade-offs and compromises must be made to achieve an optimum design that has both lightweight and maximum power.

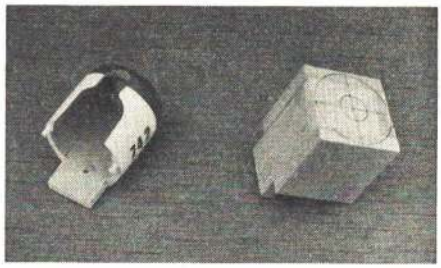
A further advantage is the abundance of available reference material. One of the most perplexing problems facing modelers wishing to participate in the Navy Carrier event is the lack of good reference material on most of the designs that would otherwise be suitable for this event. This is *not* the case with the Skyraider. Since this plane is operational, many photographs still appear. A visit to the local library will reveal many of them. A source available to every modeler is the "Profile Publication" No. 60 found at most hobby shops. This pamphlet contains both the three-view drawing and color pictures that are necessary for the scale bonus points. A more complete history on the Skyraider also is presented.

As the initial design characteristic, I decided that this Skyraider model would have the dual capability of being flown in either Class I or II Carrier events. So I made the compromise to design it around the R/C 60 rather than a racing 60, which is heavier and more powerful. The R/C 60 is about the same weight as a racing 40 with only a small decrease in size for the 40. By using a Tatone engine mount, a universal type of mounting arrangement can be had, enabling the quick interchange of engines. The model itself is sized around the 40 and, since the weight does not change much, almost identical flying characteristics are maintained.

Another compromise that was made was the use of a lifting (Clark Y type) airfoil as opposed to the semi-symmetrical type that is used on most planes in this event. I also decided against the use of flaps, although the outline is shown on the plans. I did not feel that the benefits gained from flaps would outweigh the complications involved in installing the "bird-nest" linkage system necessary to make them work. Those expert at building this type of craft always use their own system anyway. I felt that the use of a lifting airfoil would help to make up for the lack of flaps while the increase in drag at high speed would not be such a great detriment. A further advantage is the ease of constructing the wing using a flat-bottom airfoil. A "true" wing can be built on a flat surface without the use of a jig which is ordinarily necessary for the semi-symmetrical type.

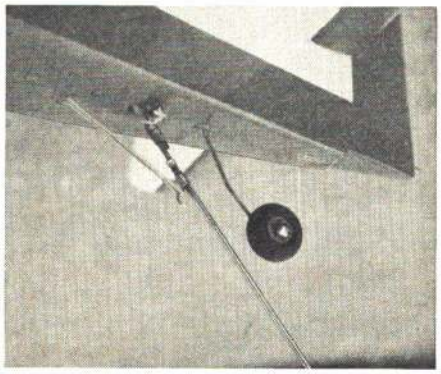
Thus, we have come to the outstanding characteristic of this model, its simplicity. An attempt was made to maintain a simplified construction technique as the primary design criteria. The Douglas Skyraider is a natural in this respect. The square-type fuselage cross section is about the easiest type there is to build. Instead of taking months to build, this plane can be put together in a matter of hours. Taking advantage of the new type "instant" covering materials, this plane could conceivably be built in a day's time.

Continued on page 70

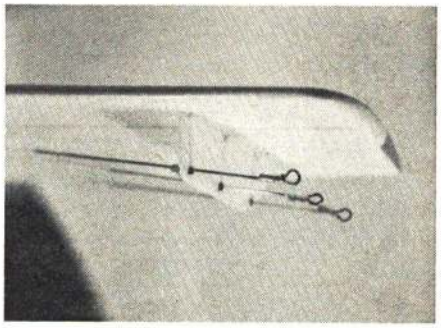


The cowl is hand-carved and lathe-turned from built-up balsa blocks. Because cowls take a beating in flying, make several.

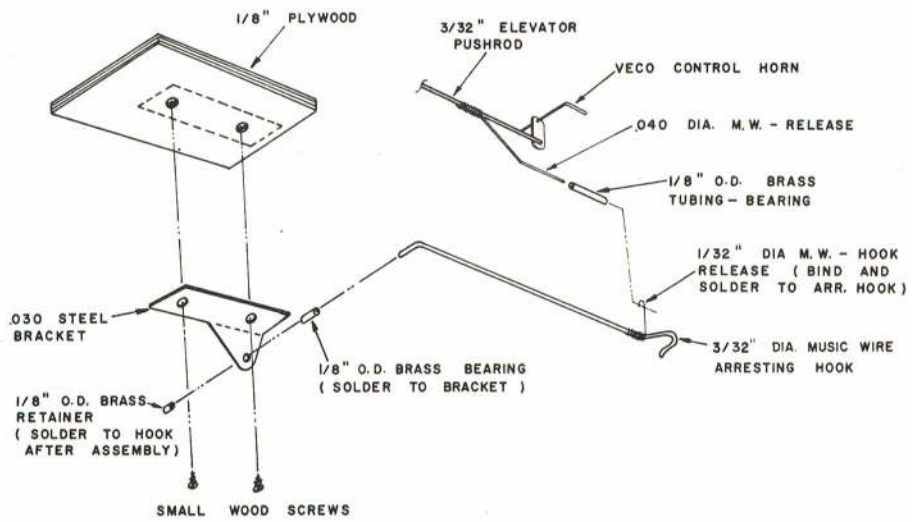
Externally attached landing gear is as stiff as practical and, being long-legged, it is removable for convenience and straightening.



Sturdy arrestor-hook installation will take unbelievably hard treatment. Spring-loaded down released by full-down elevator.



Clark Y flat-bottomed airfoil gives good slow flight without flaps gadgetry. Three-wire system for elevator and throttle.



ARRESTING HOOK ASSEMBLY

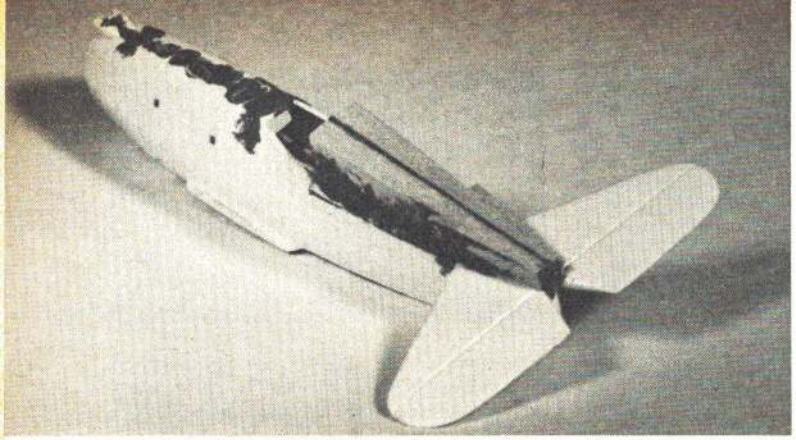


Fig. 1 — Cement the balsa turtleback in position. Make sure its centerline lines up with the spot-puttied seams on the fuselage.

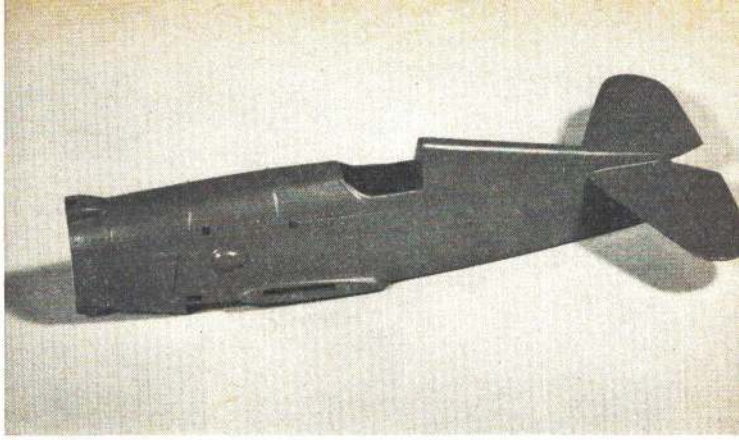
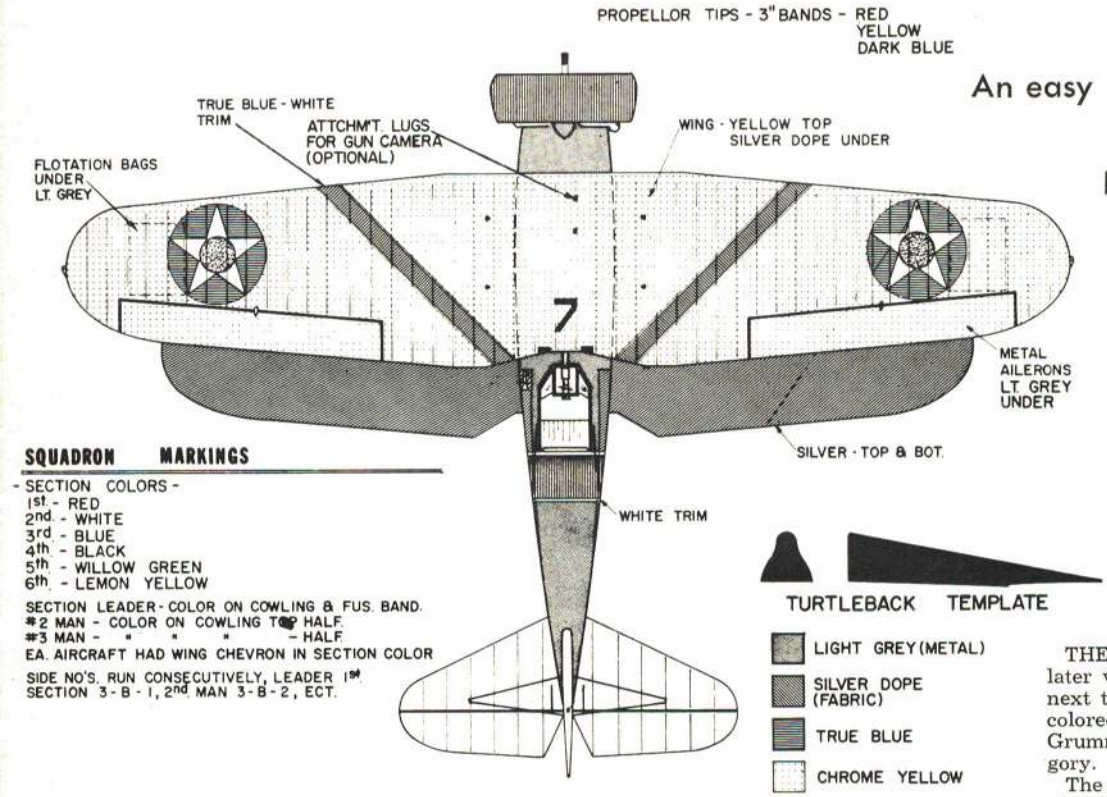
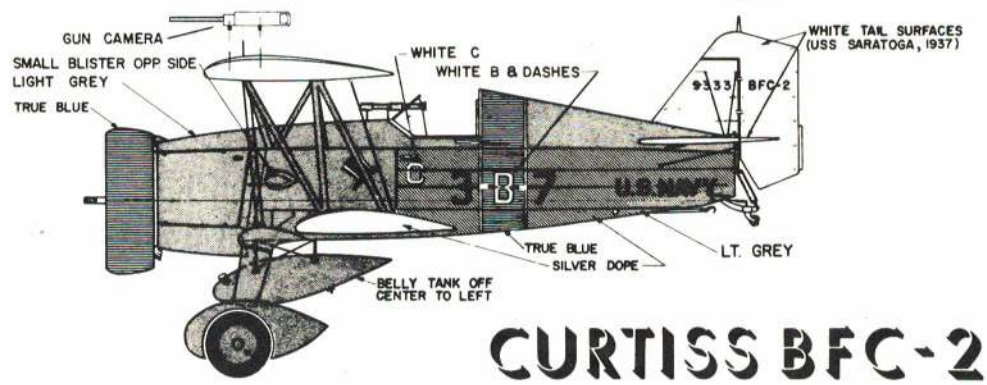


Fig. 2 — Carefully carve the turtleback to shape, checking with the drawing's template. Fair it in; sand smooth and add primer.

SCALE TECHNIQUES FOR THE PLASTIC MODELER

Curtiss BFC-2 Fighter-Bomber





CURTISS BFC-2

VB-3B SECTION 3 LEADER
LT.(jg) JOSEPH B. H. YOUNG

Drawn - DON GARRETT

SCALE 0 1 2 3 4 5 6

An easy conversion — change the Goshawk F11C-2 into a BFC-2. Instructions cover two different kits in two sizes!

JOHN N. TOWNSLEY

THE Curtiss Goshawk F11C-2 and the later version, the BFC-2 aircraft, were the next to the last of the series of brilliantly colored aircraft used by the Navy, the Grumman F3F's being the last in this category.

The first Goshawks (F11C-2's) were assigned to the USS Saratoga VF-1 Squadron in June 1933. This was the only squadron to use the F11C-2 aircraft, with the squadron designation changing to VB-2B, VB-3B, and VB-6. While on the Saratoga, and assigned VF-1, VB-2B, and VB-3B designators, the Goshawks carried the famous "High Hat" insignia.

Not long after the first F11C-2 aircraft were assigned, the Bureau of Aeronautics redesignated several types of aircraft. The Bureau was interested in dual-purpose fighters which could be used as dive bombers and the fighter aircraft then in existence seemed to be the most easily adapted to this purpose. The F11C-2, when converted to the role of fighter-bomber, was redesignated the BFC-2. Changes were made in the windshield and in the headrest;

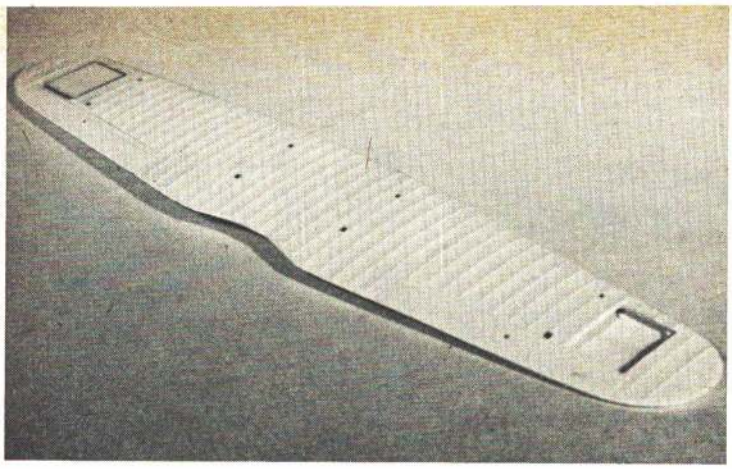


Fig. 3 — Cut out flotation bag panels with a jeweler's saw blade. Install smooth plastic sheet to simulate the metal panel covers.

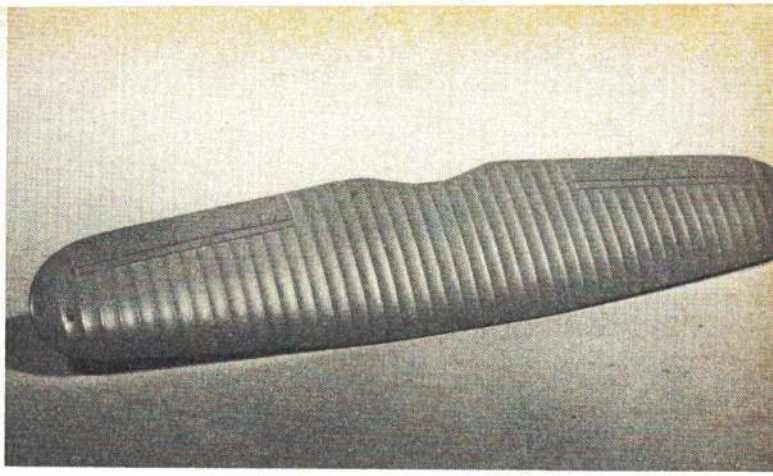


Fig. 4 — BFC-2's upper wing is primed and sanded; top gets coat of chrome yellow. Flotation panels are only visible on bottom.

the latter altered to accommodate a rubber life raft. The changes were made to facilitate the bombing role and to eliminate some of the pilot's discomfort; primarily, however, the aircraft retained the basic F11C-2 features. The last BFC-2's were withdrawn from the service in 1938.

The markings of the BFC-2 in the drawing are those of LT (jg) Joseph B. H. Young, Squadron VB-3B, Section Three Leader, on the USS Saratoga, 1937.

The F11C-2 can be converted to the BFC-2 from either of two kits, Lindberg's 1/48th scale F11C-2 Goshawk (Kit No. 460 — 79c) or the Monogram 1/72nd scale Goshawk F11C-2, (Kit No. P.A. 210 — 70c). The Monogram kit is virtually perfect; any fault-finding would be purely "nitpicking." Instructions will be given for converting both models, but the conversion photos are for the Lindberg kit as it is the one which requires the major changes to make it the BFC-2. The Lindberg kit is not new and has never been updated, which is a shame as it is a good kit and for a long time was the only one on the market. The castings were accurate and clean when it was first produced. In fact, they still are.

Specifications: Upper wing span: 31′ 6″, lower wing span: 26′ 0″, powerplant: 700 hp Wright R-1820-78, landing speed: 65 mph, fuel: 94-146 gals., weight, empty: 3,337 lbs. Armament: two .30 caliber synchronized Browning machine guns and one 500-lb. bomb which could be carried in place of the streamlined belly tank.

Color scheme: All metal surfaces such as cowling, paneling, turtleback, area around

Continued on page 56

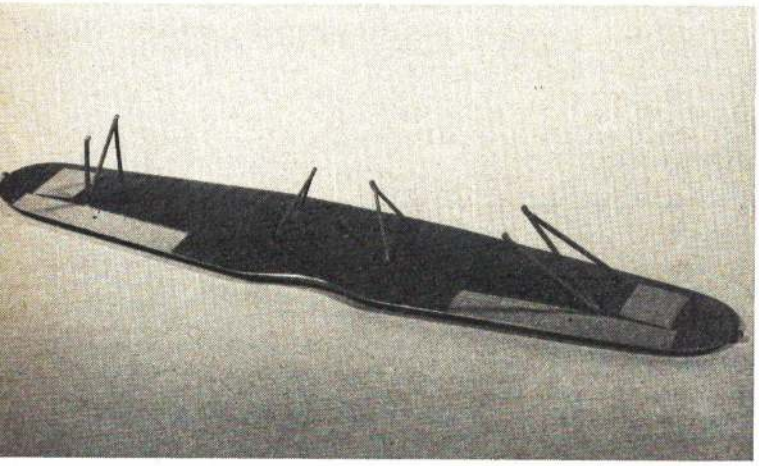


Fig. 5 — Undersurface of the top wing is sprayed light gray. Mask over ailerons and panels. All exposed parts finished in silver.

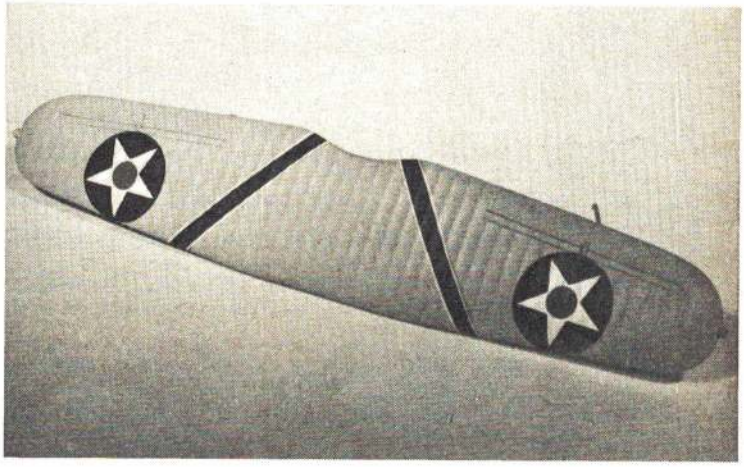


Fig. 6 — Mask and spray for the true blue, chevron trim. White separation lines can be painted on or cut from white decal sheet.

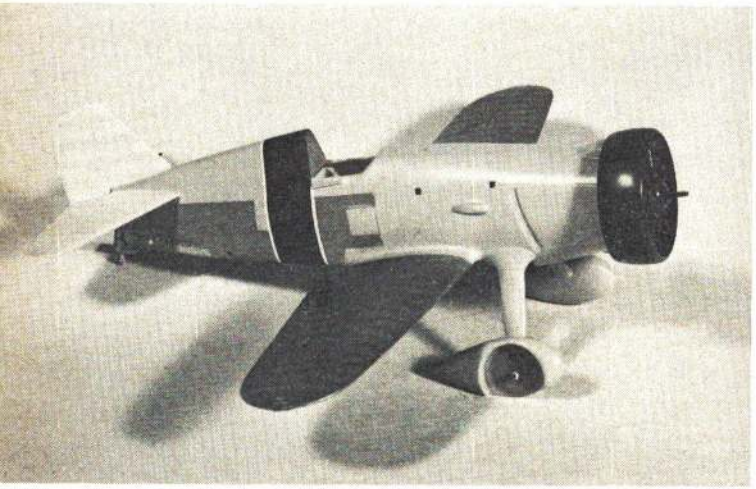


Fig. 7 — Completed fuselage, with tail and lower wings in place, is ready for the decal insignia and attachment of the upper wing.

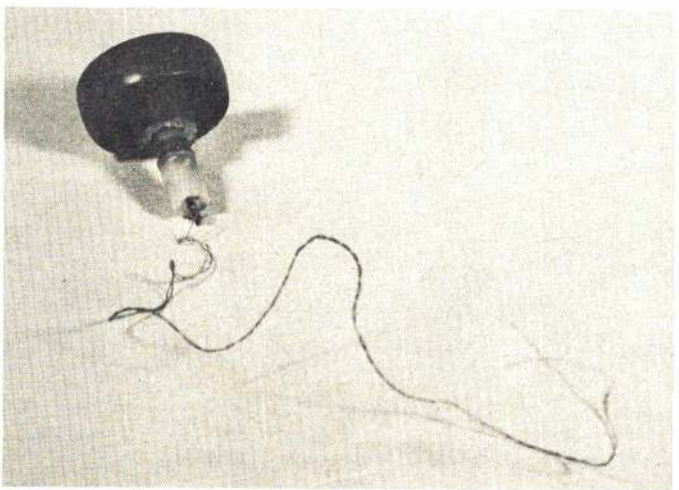
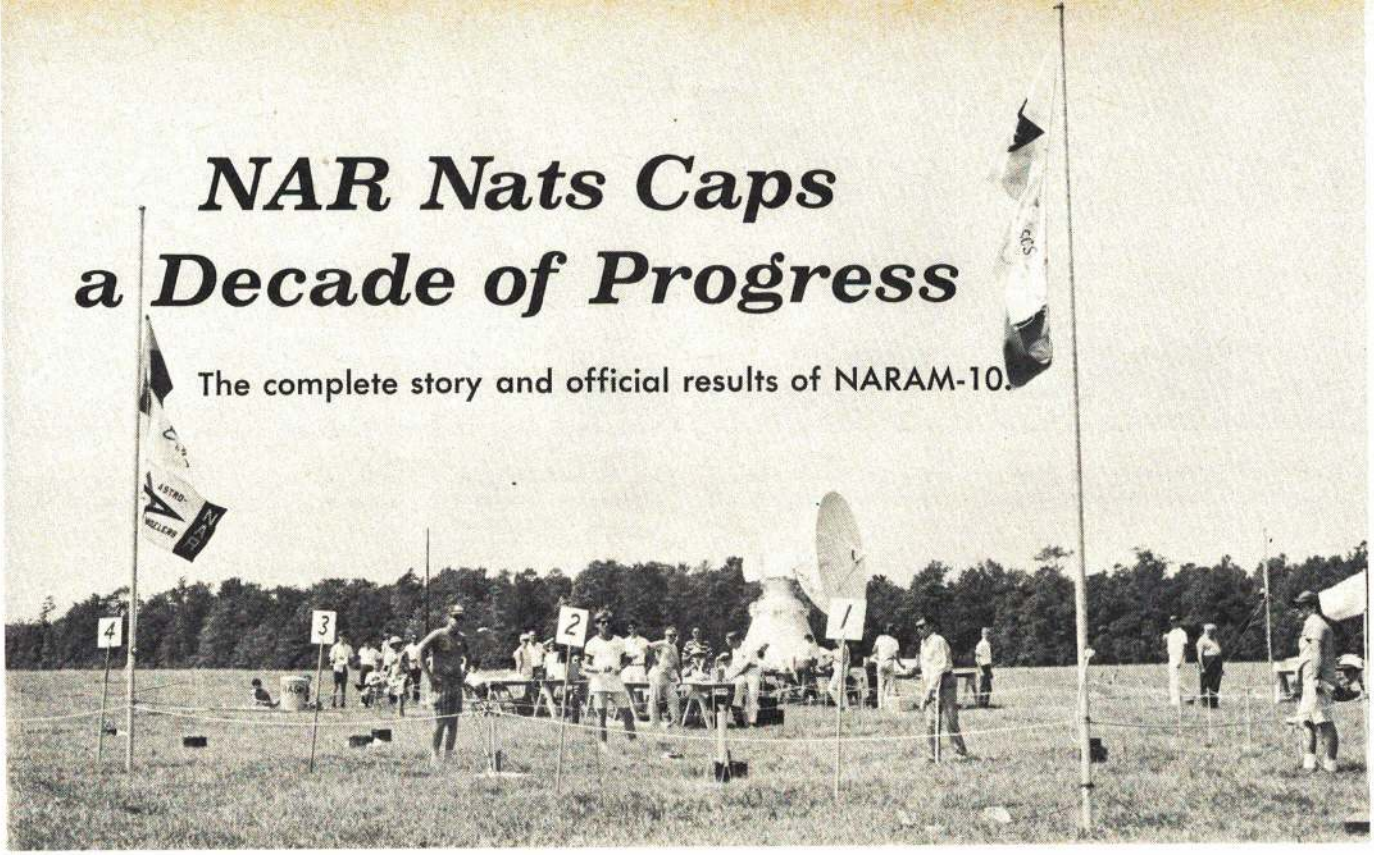


Fig. 8 — For a bit of realism, epoxy small electric motor inside cowl ring and fuselage. Hide away tiny batteries and a switch.

NAR Nats Caps a Decade of Progress

The complete story and official results of NARAM-10.



National Association of Rocketry Aeromodeling Meet No. 10 which culminated a decade of growth for model rocketry in the U. S., at Wallops Island, Va. (NASA Station) Aug. 19-23, was the scene of nine competition categories. A good number of rocketeers traveled great distance just to make the annual meet NAR sponsors with the courtesy of military and government installations.

Of the NAR sections represented, most likely the Y.M.C.A. Space Pioneers of New Canaan, Conn., went home the happiest of all. Their section was named "1968 National Champion NAR Section." This honor included a beautiful trophy that was accepted by NAR Junior Sven Englund from officials, and a pennant the section will fly on their flagpole until the next annual meet, NARAM-11.

Space Pioneers amassed a total 3615 points against their nearest competitor section and eventual runner-up, NARHAMS from

Continued on page 65

NARAM-10 NATIONAL STANDINGS — 1968

The top three winners in each event are being published with this issue for the information of NAR members and other rocketeers who should note the records established at NARAM-10.

SCALE EVENT

	NAR#	Section	Measurement
JUNIOR:			
1st Michael Poss	5702	Southland	824 pts.
2nd John Drake	7515	Space Pioneers	730 pts.
3rd Charles Duelfer	2580	Fairchester	726 pts.
LEADER:			
1st James Stevenson	11763	Mars	769 pts.
2nd Victor Ceicys	4221	None, Ohio	737 pts.
3rd Talley & Jeff Guill	1146 & 3130	Fairchester	634 pts.
SENIOR:			
1st Bryant Thompson	1202	None, Illinois	795 pts.
2nd G. Harry Stine	002	Space Pioneers	681 pts.
3rd Howard Kuhn	11628	Mars	624 pts.

SPARROW BOOST-GLIDE EVENT

JUNIOR:			
1st John Drake	7515	Space Pioneers	57 sec.
2nd Carl & Steve Kratzer	5568 & 5538	NARHAMS	53 sec.
3rd Mark Wargo	10371	Pascak Valley	50 sec.
LEADER:			
1st Philip Slaymaker	6432	NAR Orbiters	44 sec.
2nd James Stevenson	11763	Mars	41 sec.
3rd Irvin Buck & Paul Guercio	6158 & 6710	Star Spangled Banner	38 sec.
SENIOR:			
1st Jim Kukowski	4668	UFO	59 sec.
2nd Gerald Gregorek	9193	C.S.A.R.	51 sec.
3rd Howard Kuhn	11628	Mars	24 sec.

CLASS II SCALE ALTITUDE EVENT

JUNIOR:			
1st Michael Poss	5702	Southland	1190 pts.
2nd Jonathon Besson	8088	Space Pioneers	865 pts.
3rd Greg Scinto	5589	Fairchester	819 pts.
LEADER:			
1st Guill Team	(see above entry)		741 pts.
2nd Bruce Blackistone	6413	NARHAMS	704 pts.
3rd Victor Ceicys	4221	None	688 pts.
SENIOR:			
1st G. Harry Stine	(see above entry)		1087 pts.
2nd Howard Kuhn	(see above entry)		884 pts.
3rd B. Thompson	(see above entry)		785 pts.

EGG LOFTING EVENT

JUNIOR:			
1st Carl Guernsey	9925	NARGAS	373 m.
2nd Connie Stine	1300	Space Pioneers	325 m.
3rd Steve Glines	2696	Fairchester	247 m.
LEADER:			
1st Paul Conner	5787	NARHAMS	322 m.
2nd James Stevenson	11763	Mars	314 m.
3rd Gary Spriggs	6472	LaSalle	246 m.
SENIOR:			
1st Gerald & David Gregorek	9193 9204	C.S.A.R.	408 m.
2nd Howard Kuhn	(see above entry)		359 m.
3rd Dr. E. B. & Konr Beetch	3952 & 3953	Zenith	147 m.

OPEN SPOT LANDING EVENT

JUNIOR:			
1st Loren Fagen	9100	None, Iowa	16 ft.
2nd Sven Englund	8053	Space Pioneers	26 ft.
3rd Joe Baxter	7319	None, Ohio	28 ft.
LEADER:			
1st Charles Gordon	6948	NARHAMS	12 ft.
2nd J. Stevenson	(see above entry)		30 ft.
3rd John Belkewitch	2897	Pascak Valley	31 ft.
SENIOR:			
1st Jim & Judy Barrowman	7489 & 6883	NARHAMS	33 ft.
2nd G. Harry Stine	(see above entry)		57 ft.
3rd Jim Kukowski	(see above entry)		68 ft.

SPACE SYSTEMS EVENT

JUNIOR:			
1st Charles Duelfer	(see above entry)		587 pts.
2nd Mark Evans	9484	Apollo-NASA	469 pts.
3rd Jonathon Besson	(see above entry)		465 pts.
LEADER:			
1st Alan Malazia	4740	Fairchester	282 pts.
SENIOR:			
1st G. Harry Stine	(see above entry)		451 pts.
2nd B. Thompson	(see above entry)		263 pts.
3rd Karl Feldman	1136	Pascak Valley	158 pts.

SWIFT BOOST-GLIDE EVENT

JUNIOR:			
1st Andrew Elliott	7419	NARHAMS	101 sec.
2nd Mark Barkasay	5038	Cheshire	98 sec.
3rd Trip Barber	4322	None, N. C.	82 sec.
LEADER:			
1st B. Blackistone	(see above entry)		131 sec.
2nd P. Slaymaker	(see above entry)		94 sec.
3rd John Belkewitch	(see above entry)		79 sec.
SENIOR:			
1st Jim Kukowski	(see above entry)		94 sec.
2nd Dr. E. B. & Konr Beetch	(see above entry)		90 sec.
3rd Howard Kuhn	(see above entry)		68 sec.

CLASS I PARACHUTE DURATION EVENT

JUNIOR:			
1st Kevin Stumpe	9225	None, Iowa	253 sec.
2nd William Block	6881	Steel City	167 sec.
3rd David Gregorek	(see above entry)		143 sec.
LEADER:			
1st P. Slaymaker	(see above entry)		116 sec.
2nd Gary Spriggs	(see above entry)		74 sec.
3rd Alan Malazia	(see above entry)		61 sec.
SENIOR:			
1st B. Thompson	(see above entry)		177 sec.
2nd Gerald Gregorek	(see above entry)		128 sec.
3rd Jim Kukowski	(see above entry)		68 sec.

RESEARCH AND DEVELOPMENT EVENT

JUNIOR:		
1st Connie Stine	(see above entry)	
2nd Carl Guernsey	(see above entry)	
3rd John Drake	(see above entry)	
LEADER:		
1st Mark Mercer	5839	NARHAMS
2nd Robert Mullane	4157	Pascak Valley
3rd Guill Team	(see above entry)	
SENIOR:		
1st Gerald Gregorek	(see above entry)	
2nd Barrowman Team	(see above entry)	
3rd Frank Bittinger	5660	Spacers

INDIVIDUAL NATIONAL AND RESERVE CHAMPIONS

JUNIOR — Connie Stine	743 points
RESERVE — John Drake	670
LEADER — Robert Mullane	615
RESERVE — James Stevenson	578
SENIOR — G. Harry Stine	970
RESERVE — Howard Kuhn	518
TEAM — Barrowman Team	719
Guill Team	512
SECTION: — Space Pioneers	3615
NARHAMS	3080

SPORTSMANSHIP AWARD: Robert Forbes, Astro-Modelers, Kansas

Blue Ribbon Radio Control Equipment

Hallco 123SS Dual Pulse System

Unitized 2 + 1 proportional system from single channel is fully-matched, ready-to-install and fly.

FOR many years the perennial "tinkerers" in the field of radio control have pursued the use of pulse proportional control through the application of magnetic actuators, motorized rudder-only servos, go-around servos, and the familiar "Galloping Ghost" technique. The field of pulse proportional control has been enhanced significantly in recent years by the appearance of much better servos, good receivers capable of pulse application and noise rejection, and pulsers capable of interaction-free operation. There have been numerous individual units offered, but this has been followed more recently by packaged systems which include all components required in a matched set.

This latter approach has essentially removed the requirement for adjustment and permits the average flyer to buy and operate a system-engineered package which relies on time-proven techniques.

The Hallco 123 system falls in the last category discussed above. It is basically a growth system which permits the modeler to start with a simple Galloping Ghost unit and proceed to independent dual-proportional control without any loss of investment.

The Hallco 123 system may be obtained in any of the following configurations:

1) As a Galloping Ghost unit suitable for later addition of a tandem-mounted rate decoder and the elevator servo. This is the basic Hallco 123.

2) With the addition of the rate decoder and elevator servo, it becomes the 123TA, or

3) With the servos mounted side-by-side on a common board with all electronics, it is the 123SS model.

The latter system was reviewed. However, it is noted that operation of the 123TA would be identical.

The same transmitter is used with all three of the preceding models of the Hallco 123 system. The transmitter is designed to operate in the 27-MHz frequency band. A dual-rate pulser for low rate at a nominal 6 pulses per second (PPS) and high rate at a nominal 16 to 19 PPS provides for pulse operation of either the Galloping Ghost or rate decoded system. A slide switch is accessible through a slot in the transmitter back cover, for selection of the desired nominal rate. Potentiometer adjustments are provided for broad adjustment of high rate, low rate, and pulse width (rudder). A lever switch is mounted on the side of the transmitter for full signal on and full signal off to be used for motor control. The transmitter utilizes a 9V dry battery which is not rechargeable. It does not come with the system.

Mounting of the control stick and the motor control switch are unique on the Hallco transmitter in that they could be readily adopted for either right-handed or left-handed operation. A Bonner stick assembly is mounted near the top center of the transmitter face and, for those not familiar with such stick assemblies, the trim levers for rudder and elevator are an integral part of the stick assembly.

A clever plastic mask is attached to the face of the stick to limit stick travel in the normally troublesome full-up and full-rudder condition encountered in GG systems. The mount holes are slotted so, that the limitation may be reduced when flying the decoded systems.

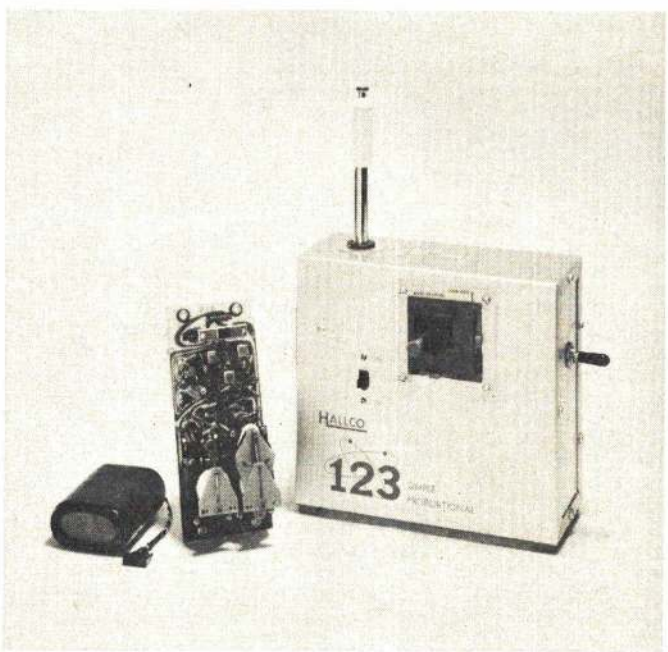
The motor control switch is mounted on the right-hand side of the transmitter. Normally, the transmitter is cradled in the left arm, the heel of the right hand is rested on the transmitter face and the right thumb and forefinger control the stick. The left fingers control the motor control switch. The back cover is a two-piece assembly with the motor control switch mounted on a separate side panel. This panel, and the motor control switch can be moved to the left side of the transmitter and the other part of the cover reversed to permit a left-hander to use the system naturally and comfortably.

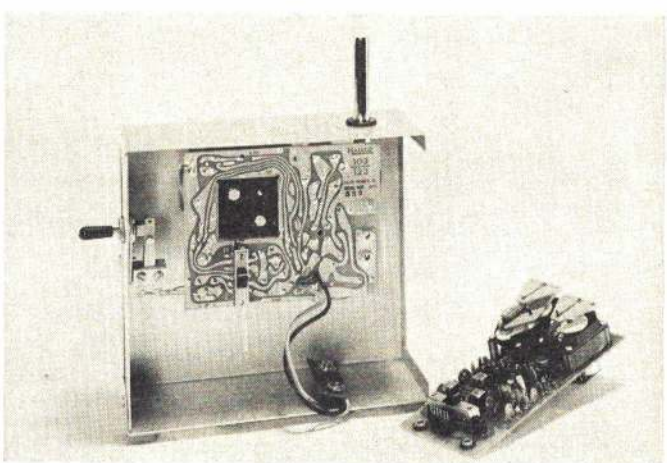
The airborne unit consists of a center-tapped 4.8 volt pack of one ampere hour rechargeable nickel-cadmium cells and 1/16" glass-epoxy printed-circuit board which contains all electronics, switches, plugs, and the servos. This latter is designed to be placed into the model and shock mounted by four grommeted mounting points or, after removing the grommets, mounted with servo mounting tape. (*Note:* 1/8" tape should be used, not the 1/16" tape because this is the shock mount for all the electronics.)

Construction of the receiver, servo amplifiers and rate decoder is open with a liberal application of a polyurethane coating material for vibration protection. This is a distinct departure from normal airborne pack construction but was definitely proven by our examination and flight tests to be as tough and crash resistant, if not more so, than separate, packaged units. The receiver is a superheterodyne, utilizes all silicon transistors and has a single tuned front end. The receiver differs from the normal single-channel receiver in that additional stages of amplification and tone filtering are provided for pulse detection and squaring which remove all trace of audio tone prior to the rudder servo driving stage, as verified by examination with an oscilloscope.

Complementary two-stage amplifiers using germanium driver transistors provide

Continued on page 72





For a pulse system with dithering servos the Hallco unit will handle fairly large planes and, unlike Galloping Ghost, the Dual Pulse system does not cause up-elevator in throttle changes.

Conventional circuitry is used throughout and quality is on par with multi digital rigs. Receiver has excellent noise rejection ability. Switchable-rate transmitter has strong power output.

Required type of launch is demonstrated by author. Planes designed for the Coupe d'Hiver event fit specifications on weight of rubber motor, fuselage cross-section area, and time of "max" flight. It is an international event now gaining popularity in U. S. — may soon be official AMA event.

Cutie Coupe

Step into competition or fly for fun with our Cutie. Straight lines and all-balsa surfaces keep it uncomplicated.

DAVE LINSTRUM

THE Coupe d' Hiver (say "koop dee vair") class is no newcomer on the contest rubber-model scene. The French originated CdH over 25 years ago and it has gained steadily in popularity. It is now flown by so many USA modelers that the AMA has just adopted it as a Provisional AMA Event.

The simple rules restrict only motor weight (10 grams), model weight (70 grams minimum), fuselage cross section (20 cm^2, about 3.1 sq. in.) and type of launch (one point ROG). Scoring is on endurance, with each flight having a "max" of 120 seconds. These uncomplicated rules (see 1968 AMA Rule Book for detailed rules) and the small field flying made possible by limited motor run are good reasons to try CdH for both AMA and club competition (it is a very popular postal contest event) as well as Sunday sport flying.

There are also good reasons for trying "Cutie Coupe" as your first CdH, perhaps even as your first advanced rubber model. It is very quick and simple to build, utilizing Jedelsky all-balsa flying surface construction and a simple box or tube fuselage. You may use a ready-carved Sig folding prop to overcome the biggest problem most beginners have — they can't carve props. The Sig folder is legal in AMA competition and is well worth the price it costs.

Cutie Coupe has been designed with straight outlines for simplicity, but these have been manipulated to give a rakish appearance (stylists might call it the SST Look) with more eye appeal than boxy designs. The general configuration and structural techniques have been well proven in many towline gliders built by the author, as well as two previous CdH: "Spirit" (designed by Jack Daniels of Chicago) and "Roma." The latter name I chose because, contrary to historical belief, it *was* built in a day! You can do the same with Cutie.

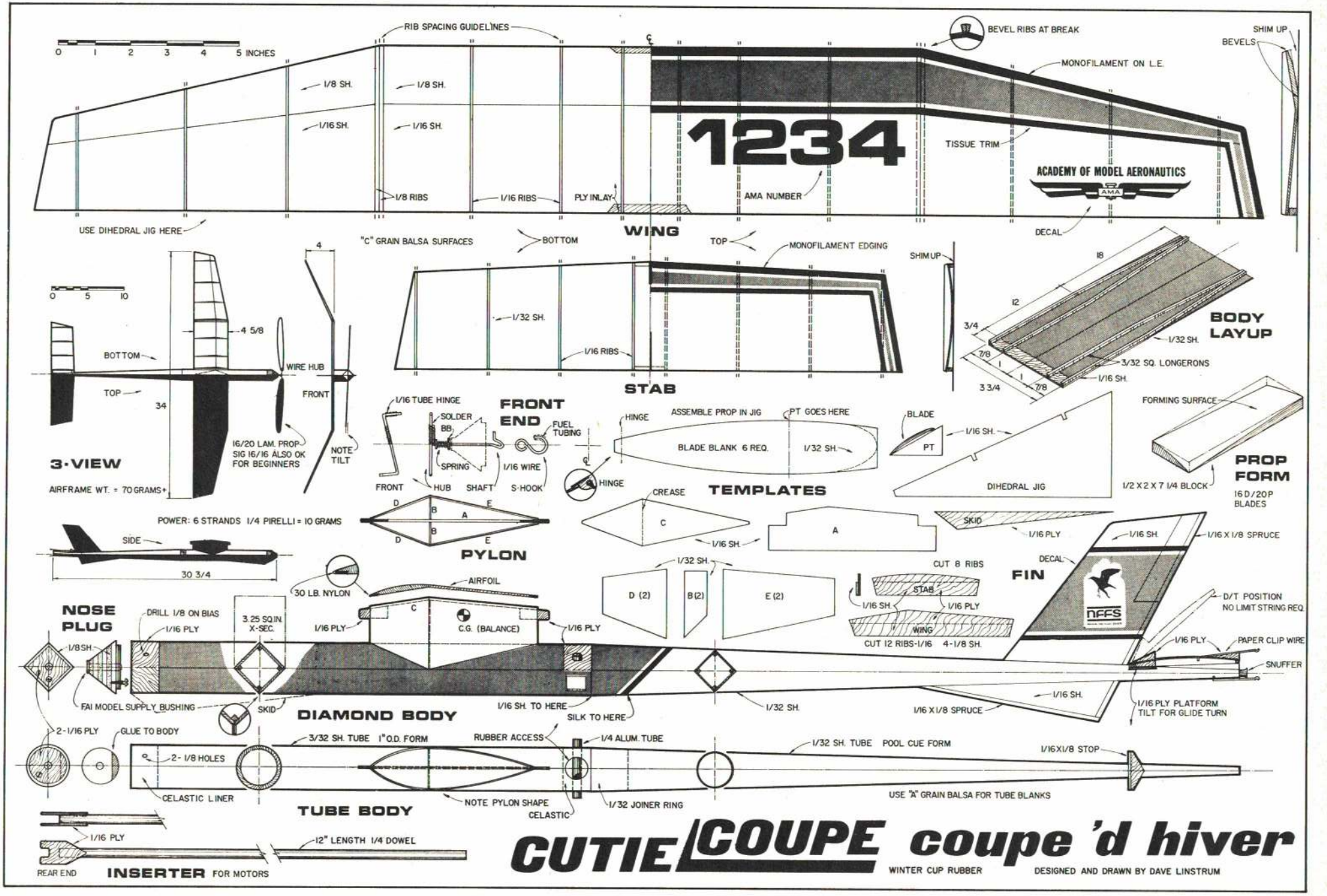
Fuselage: I feel that tube fuselages are by far the easiest to build, but many people have mental blocks about them, especially if forms are not available. Use a 1" diameter dowel or conduit to form the motor tube; a pool cue built up to proper diameter with masking tape rings spaced on 3" centers makes a fine boom form. Cut a tapered blank of 1/32" "A" grain balsa and soak it in hot water a minute, then wrap on form and bind in place with an Ace elastic bandage. Dry overnight, then glue the seam. By the way, I suggest you build the entire model with an aliphatic resin glue. SigBond and Titebond are both good.

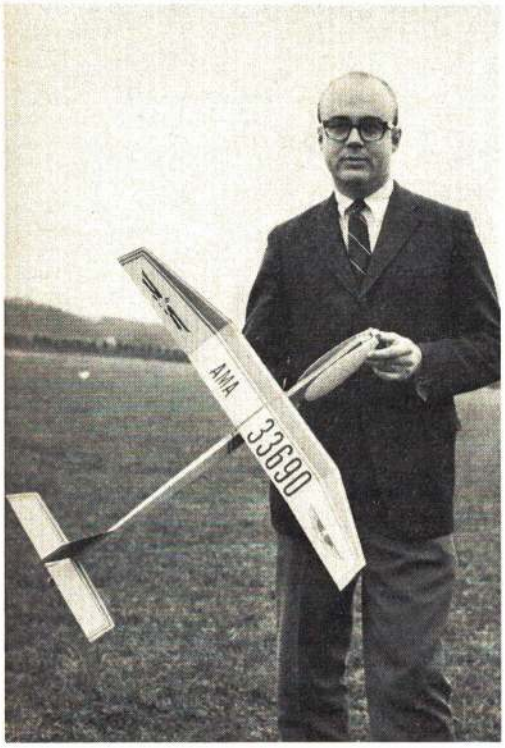
The motor tube is formed in a similar way with 3/32 balsa; it requires Celastic reinforcement at both ends, inside or outside, if you like. Cover motor tube with a single piece of silk; this prevents burst motors from splitting it along the grain. Slosh some thin dope inside motor tube to protect balsa against rubber lube. Join boom to motor tube with a 1/32 ring to double boom thickness at this stress point.

Build the pylon with a curved cross section and a long skirt on the side skin. Sand the complex curve joint between this and the motor tube by wrapping 3/0 sandpaper on the latter and sliding pylon back and forth until it fits. Do not glue pylon in place on either body until balance point of fuselage, with motor, prop, and stab installed, is determined. Then glue pylon on so that CG falls over this point. The diamond body takes more work but is very sturdy and unique in appearance, yet it is really only a box on edge. Cut four pieces 3¾" long from 1/16 sheet (3" width), one piece from 1/16 ply (¾") and six pieces from light 1/32 sheet (3"). Glue them all together in a ribbon and mark (I used a Pentel pen for all construction marks) lines along the center and ⅞" in from each edge. Taper the boom to 3/16 wide.

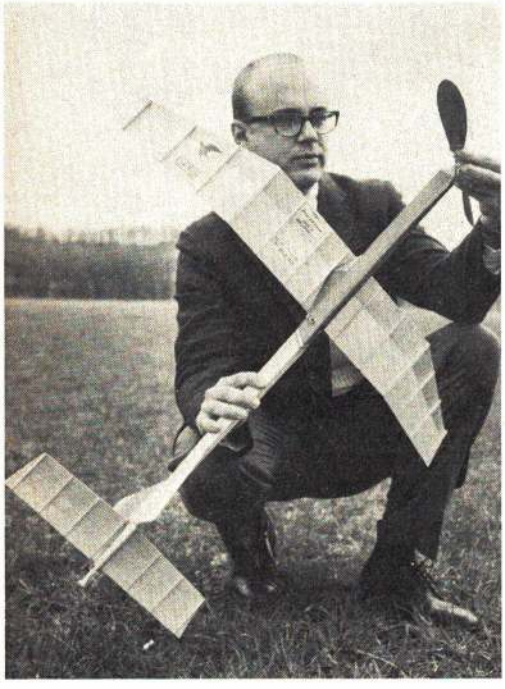
Glue 3/32 square hard balsa longerons to the sheet as shown on plan. When dry, cut apart on marked lines and trim the outer pieces to the edge of longerons. Lay one of the middle pieces down as the "bottom," glue the two outer pieces to it at 90 degrees,

FULL SIZE PLANS AVAILABLE — SEE PAGE 60





Colorful small-field flyer was decorated by doping colored tissue to the bare balsa. After rubber unwinds, propeller folds flat against fuselage.



Wing uses Jedelsky construction with no edges or spars. Although simple, it is durable and yields excellent glide with good wind penetration.

and cap it off with the other middle piece. When dry, carve off excess wood along boom and sand edges round. Fair the 1/16 into the 1/32 at the rear peg and remove balsa to inlay the two plywood rear peg mounts. Build the pylon right on the body by tack-gluing parts A and B to it. Glue other parts only to each other and then you can slice thru those tack points and remove a custom fitted pylon. Again, cover the motor tube with a single piece of silk, overlapping boom joint. This is the only "covering" on the entire model, although you may want to decorate with colored tissue as I did. This requires a lot of patience, however, and you can also get jazzy decoration with a few colored marking pens. Try drawing flowers on it for a "hippie" CdH.

Cut fin and subrudder from 1/16 sheet, edge with spruce, and glue directly to fuselage. Glue stab platform on with slight tilt; stab tilt cause gentle glide turn toward the high side. Coat the entire fuselage and fins with three coats of Sig Lite-Coat or Aerogloss. It is important to use low-shrink dope on this model, as regular dope might warp the flying surfaces, which you should build next.

Wing and stab: Cut the rear wing sheet from a single piece of 1/16 sheet (be sure to use "C" grain balsa, identifiable by its odd speckled appearance) and cut three leading edge pieces to fit of 1/8. Use the *inside* of bold outlines on plans as patterns. Glue the four pieces together after beveling the 1/8 along both edges as shown on plan in cross section near wingtip. You will also have to trim the tips at the dihedral joint to glue sheets at proper undercamber angle. Shim up both LE (leading edge) and TE (trailing edge) and build the wing upside down on the board by gluing in ribs at proper stations, which should have been marked on the balsa (use guidelines on plans). The rib template with its 1/16 doubler was designed to allow you to automatically cut proper shaped ribs while giving you something big enough to hold down. Just slide it along the edge of the balsa and slice off enough ribs. Build the stab upside down too, then add 3/32 sq. pieces at center and add the ply rubber hook and DT (dethermalizer) wire mount.

When wing is dry, flip it over and sand the top to a smooth airfoil. Then cut the wing apart between the 1/8 ribs and block the three sections up at an angle so you can sand the dihedral bevel. Do this by placing the rib next to a table edge and sanding along this vertical edge. Pretend you are beveling a joint for a hand-launch glider wing. Sand about 1/16 more off the rear of tips; this gives some tip washout which counteracts the washin that was built in due to tapered leading edge sheet. Washed-in tips will cause poor stall recovery. When bevels are a good match, glue wing together using jig to prop up tips to 4" above center section. You may want to add some ply reinforcement to center LE and TE, and you should glue some nylon monofilament along LE of wing and stab to prevent nicks and tears.

Give the wing a couple of coats of dope, but only one very light coat on that thin stab, please! Add your AMA number if you plan to fly in competition, and an address label too. This insures that finders know where to return wayward models. This model catches thermals easily and it is possible to lose it if you forget to light the DT fuse. Be sure your ship has an aluminum tubing snuffer which fits the fuse. When fuse burns through rubber band between rear hooks and allows stab to pop up to DT position due to tension on front stab hold down bands, it stalls the model out and it drops back to earth as if on a parachute. If you did not use a snuffer tube and the fuse drops while burning, Smokey the Bear will catch your Coupe and stomp on it!

Prop and front end: The rest of the model was easy; now comes what is usually the hard part. If you use a Sig ready-carved prop, all you have to make is a front end and nose plug. Make the latter from cross grain laminations of 1/8 sheet and add the ply that fits in the nose to prevent rotation of nose plug. On the tube body, a small piece of this must actually be removed from nose plug and glued to the body. This acts as a stop and a key to insure you always get the plug in the same way.

Install a 1/16 i.d. (inside diameter) aluminum bushing (available from FAI Model Supply — see ad in this magazine) in nose plug and then carve and sand plug to shape. Bend a shaft and s-hook from 1/16 music wire. Make sure the front loop of the s-hook is at least as big as shown on plans. It must fit the hook on your rubber winder and still allow clearance for an L-shaped piece of wire to go through the loop. You see, this model is wound up by winding the s-hook, then slipping the L-shaped wire through the two 1/8 holes in the body to secure the s-hook from flopping about after you remove the winder. You then attach the prop shaft to the s-hook and remove the securing wire before seating the nose plug. Winding without the prop insures against a broken motor wiping out your balsa fan.

If you selected the Sig prop, simply slip the shaft into bushing, add a ball bearing washer and tensioner spring (both from FAI Model Supply), and slip shaft through brass plates in prop hub. Bend an elbow in front of shaft and epoxy it well to hub, using a bent pin to secure it from rotating. Seat the nose plug and fold the prop against the body. For neatness, fold it flat against the sides of the diamond body. Or, if you are lazy or made a tube body, fold it with blades on sides and hub horizontal. Mark the location of the stub on rear of shaft when blades are folded, then install a screw in ply at this point. Screw it in until the stub will strike it when the tensioner spring is at full length. As the motor unwinds, this spring will decompress, pulling the shaft forward until the stub strikes the screw head. This stops the prop and air pressure will fold the blades.

You may want to stretch a rubber band between prop blades just beyond the hinge lines. This will snap the blades closed when prop stops spinning. It is definitely necessary on diamond-side flat fold, or lower blade will hang down and your bird will look like a crippled duck while gliding — and fly about that way too! The laminated blade, wire hub prop assembly is only for the more ambitious. Blades are wet laminated of three layers of 1/32 bound to the carved form. They are then sanded to airfoil and a sloppy hole drilled near hub for the hinge tube.

The wire hub is set plumb (vertical shaft) in a jig with pitch template PT (see plan) set at proper diameter; 1/16 i.d. brass tubing is slipped on the hub ends and this tubing is then epoxied into the sloppy hole in the blade while blade is pinned to PT. This insures equal pitch on both blades. Epoxy a music wire stop on the LE of blades to keep both blades tracking square with shaft. Use Perfect 1/2A wheel retainers to keep blades on hub. Dope and sand blades smooth, then balance on shaft. This should then be inserted into the bushing and hook bent behind nose plug.

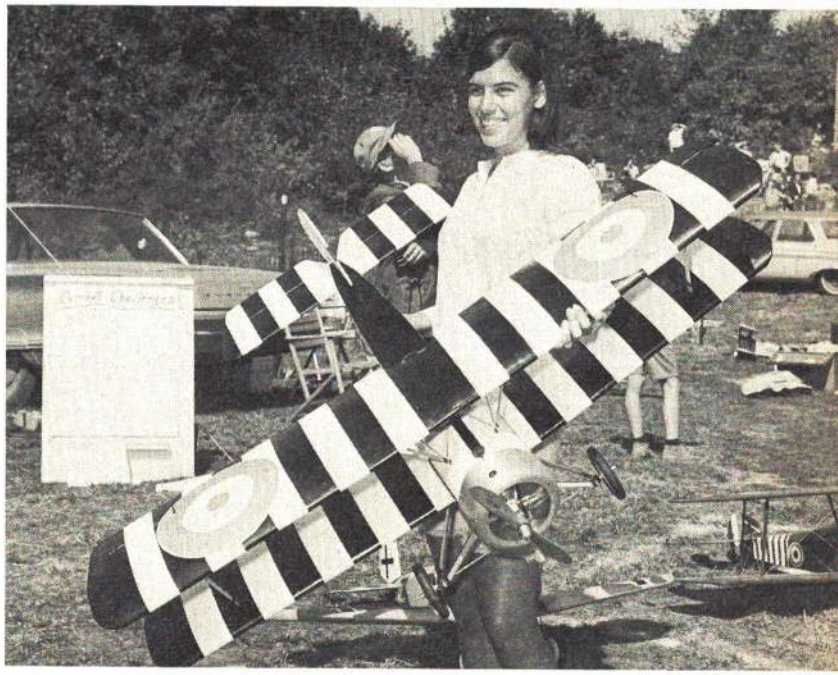
Rubber motor: Make up several motors from 1/4" Pirelli rubber looped around nails driven about 10 1/2" apart in your workbench. Make six strand motors and tie the loose ends in a square knot twice, to prevent slippage. Weigh the motor after it has been lightly lubed with Sig Rubber Lube or equal. It must not weigh more than 10 grams; if it does, use less rubber on the next one. These motors will be too short to fit between s-hook and rear peg, so you will have to stretch them to "broken-in" length. Simply stretch between an immovable object like a smooth doorknob and a

Continued on page 54

RADIO CONTROL WORLD

A ROUNDUP OF LATEST NEWS

CONDUCTED BY HOWARD MC ENTEE



Annual World War I model meet at Rhinebeck Aerodrome, N. Y. attracted an active crowd of flyers. Top: Hank Satterthwaite cranks up his S. T. 60-powered Fokker Eindecker. At its slow flying speed the reed control system is hardly noticeable. It is a nine-pounder with a wing span of six feet. Above: Leon Shulman entered this 7-pound Merco-powered Sopwith Pup, here displayed by daughter Irene. WW I offers wide choices.

Technical Matters

Fuel float valve: An idea for the FAI record flyers — or anyone who wants to keep a plane aloft longer than the largest present R/C fuel tanks allow — is offered by Tiny Harley (318 East Ave., N. Augusta, N. C. 29841). Tiny had installed a 15 engine on an Imperial 100 glider, with a pint fuel tank. He tried several fuel feed ideas but all gave trouble until the one shown here was evolved. With it the glider was kept aloft under engine power for two hours, but the pilot finally got tired and brought it down; throttle was cut back considerably after the plane was up, but when it landed there was still fuel in the tank.

The float valve is housed in a can 2″ dia. by 9/16″ thick, which originally housed 22 blank cartridges. Commercial parts used in the unit were obtained from a Lauson lawn-mower engine (float A, part # 630245; float pin B, 630254; needle and seat C, 630286). Total new cost about $2, lots less if you can scrounge used parts. To hold the needle seat firmly, a tire valve dust cap (remove rubber washer) is screwed on tightly before soldering the works to the can. There must be a hole in the cap for fuel inlet, and holes in the can for the vent and carburetor tubes, and for the float pivot

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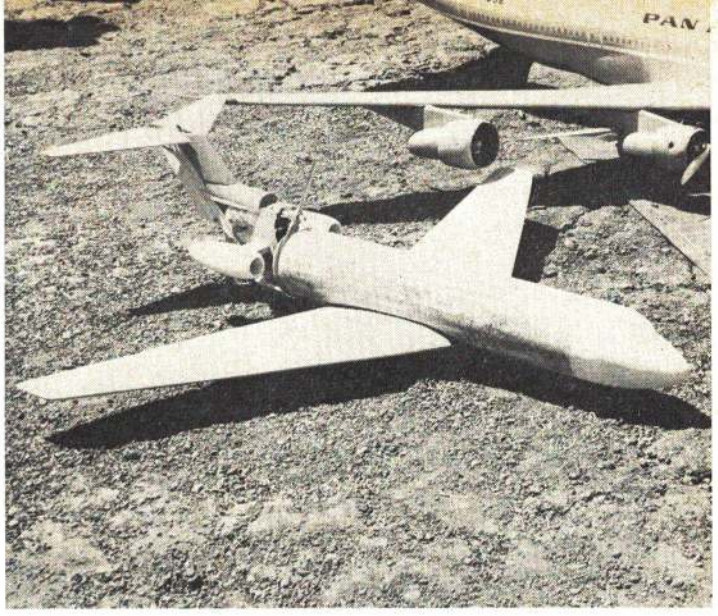
An editorial *'We urge all clubs to consider inaugurating a paper; even if it is single page, you'll find it worthwhile to your group.'*

HAVING just finished sorting out a huge stack of R/C club papers, the accumulation of some two years, we feel in the mood for some rambling notes on this subject. The stack was two feet high, and we found that more than one paper had been received from about 50 clubs, single copies from 22 more, plus another eight from assorted sources — AMA bulletins, the FAI Record reports and so on. An impressive heap of reading matter, particularly considering that we make it a practice to read each paper from start to finish!

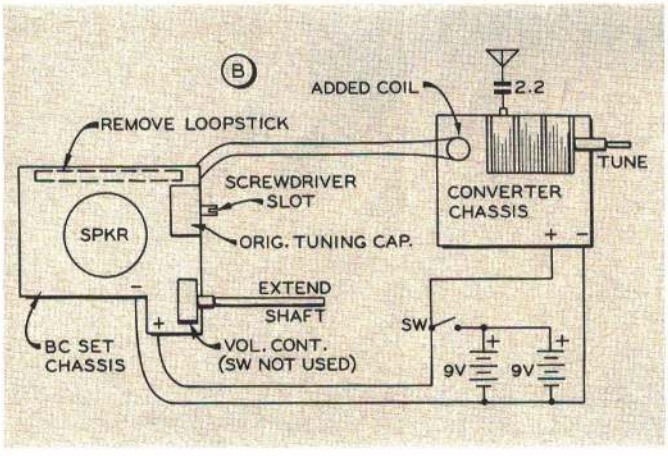
Few modelers ever stop to think of the man-hours needed to produce such a stack of papers — or even to put out just one of them, year in and year out! A few of the papers are one-man jobs; the editor gathers the news, types it, prints it, folds it, addresses it and mails it. For most of the clubs, this is just too much work. Most editors have all they can do to just gather the news and put it all into readable form. If they know how to type, fine. If not, someone else has to be conned into this task. (A bow here to wives, daughters and other family members who often assist in such work!) Then the "printer" takes over, to reproduce the material by any of a dozen or so different methods. If the club has a commercial printer on its roster, so much the better — and often the paper will be a very professional looking job. But most don't, and mimeo and other low-cost forms of reproduction are used. Often the club owns its own machine — and the printer also has to be an expert mechanic, doctor and psychologist for said machine, many of which are rather ancient to say the least. Then comes the job of collating the pages, possibly stuffing in envelopes, addressing, and finally mailing. These latter jobs are often handled by a small group, and turn out to be fine R/C bull sessions while the work is being completed.

While all the latter jobs are usually completed in an evening, the editor must spend many more hours on his end. You think all that news in each paper and those tech articles come to the editor unsolicitated? Don't you believe it; it's worse than pulling teeth to get *anything* in writing from most club members — or even anything verbally. Often the editor has to do

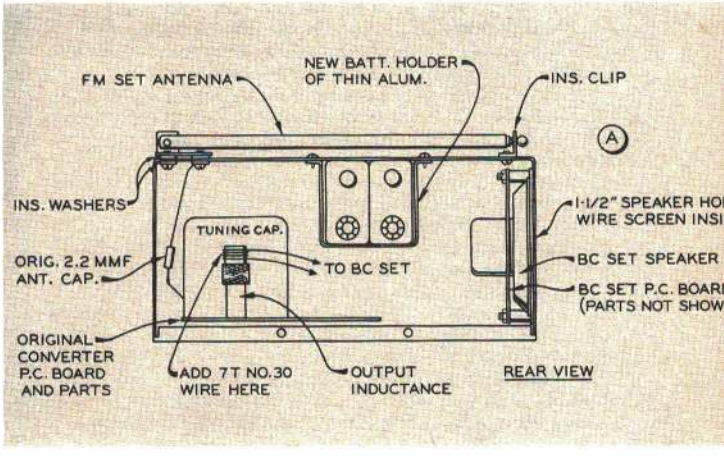
John Carlson having a good time with original wing-in-the-middle canard design. It appears to have aileron-only control. Although strut-mounted, forward "wing" is vulnerable in landings.



Interesting scale model of Boeing 727, beside Paul Sherlock's monster 747, has five-foot span. Engine installation has the prop passing through the rear fuselage. Carved foam with balsa skin.



Since there is no commercially available 50 MHz monitor at present, Howard McEntee devised this unit. It uses a 50-54 MHz ham-operator converter, broadcast-band receiver. Now see right . . .



Converter and 9-volt broadcast-band receiver fit into small metal box. Detected 50 MHz signal drives BC set's IF amplifier and audio section. Units coupled by few loops of wire on tuning coil.

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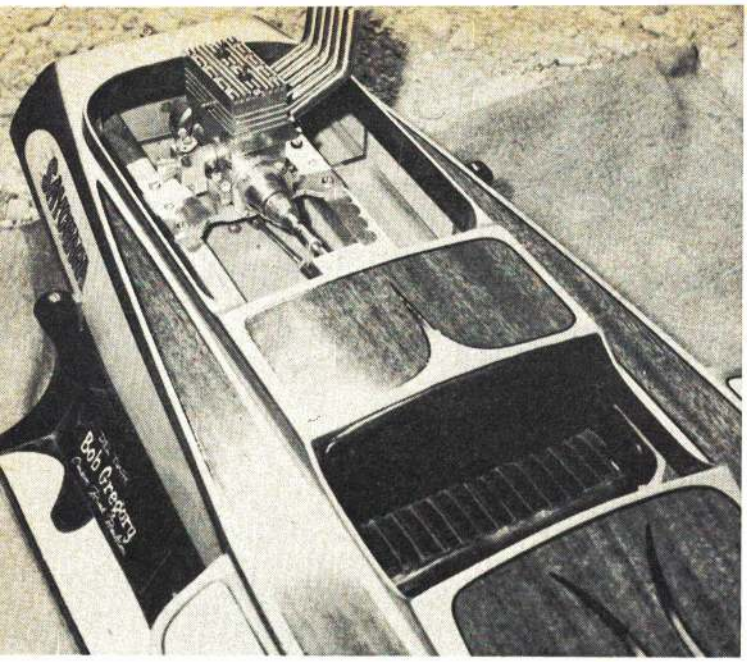
the whole blasted job — one reason why editors often don't last too long! How would each of YOU like to spend an entire weekend pounding a typewriter or scribbling longhand, while the rest of the gang is out at the field in beautiful weather. Or spending countless evenings the same way, unable to work on that new plane — or even make repairs on the old one? Do we exaggerate? Just ask *any* club paper editor!

Well then, why do they do it? Because they know that such a paper holds a club together. Many clubs are large enough that members fly in several different areas; a newsletter keeps all of them in touch, lets them know when meetings will be held, what meets and other R/C affairs to watch for, even offers bargain buys in used R/C equipment. Needless to say, it takes a really dedicated modeler to take on such a job, and to stick with it. But most of them will tell you they really get a lot out of it; many are in constant touch with other newsletter editors in many parts of the country — even in other countries. Their names — and that of the clubs — becomes familiar far and wide; and are often quoted in the model magazines. Don't think *that* isn't a real ego-booster!

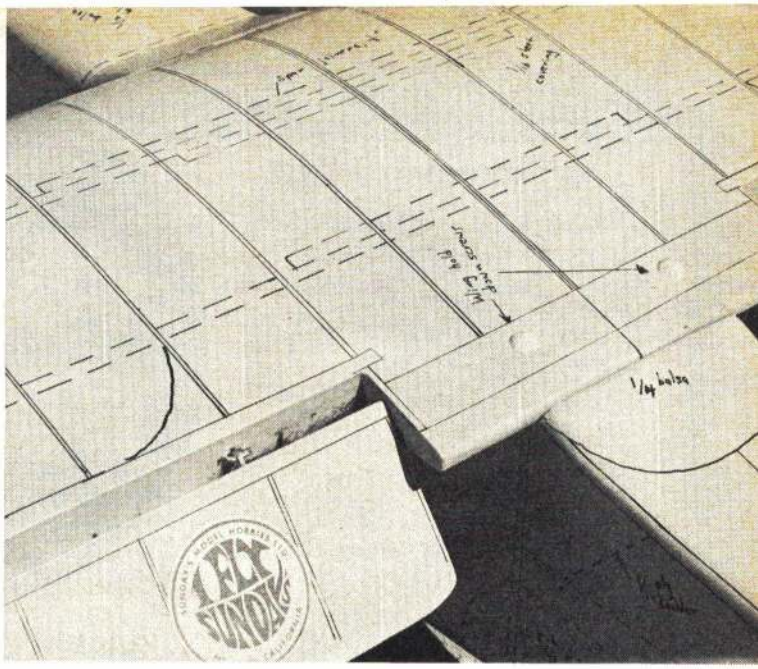
At risk of sticking our neck out, a little R/C newsletter history. As far as we recall, the DC/RC was one of the first clubs to put out a regular paper — it was one of the first all-R/C clubs in the country, too. We further believe the DC/RC Newsletter started late in 1956. Possibly around this same time the LARKS (also one of the very first all-R/C clubs) started putting out their newsletter. These were not the first model airplane club papers by any means. The free-flight and control-line clubs printed them for years earlier, right back from the end of WW II — and probably even prior to the war. But formal all-R/C clubs didn't start generally until around 1950, and the first regular newsletters quite a few years later. Some clubs have published a paper virtually every month since they started, the DC/RC among them. Another longtime club paper is the Printed Circuit of the NJRCC (North Jersey).

We urge all clubs to consider inaugurating a paper; even if it's just a single page (maybe just one side) you'll find it worthwhile to your group. And who knows, in a few years it might develop into one of "the great club papers!"

One last word — this one to the newsletter editors themselves; if your paper has any circulation outside of your own group and area (and most of them do so) pulleeze print on each issue your own name and address (or name and address of someone who can always be reached in the club) and the date of each issue. Postmarks sometimes are helpful, but often are unreadable; you have no idea how frustrating it is to spot an interesting item in a newsletter, but find it impossible to locate any name or address, or determine when the material was written!



Bob Gregory's scale Ski Boat is one of the most beautiful seen to date. Engine is home-made two-cylinder glow-plug type with unique wet-sleeve cooling system and multiple tuned stacks.



If you are looking for a unique paint scheme, you have one — right on your plans! This crazy scheme showed up at Pioneer R/C Club picnic. Decal refers to Sunday's Hobby Shop.

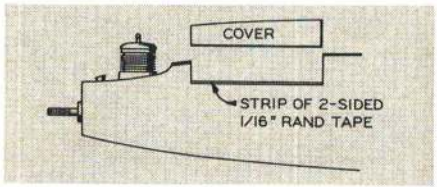
pin (latter soldered to both can body and cover). Put washers on the pin both sides to prevent float from rubbing on inside of can, and bend the lip on the float so it meets the needle valve spring properly. When satisfied that all is well, solder the cover in place. The complete assembly weighs about 1 oz., and, of course, is not intended for stunt planes — it has to be fed by gravity from a fuel tank located above it.

50 MHz monitor: A search of the market has failed to turn up any unit that could be used as it comes as a monitor for the 50 MHz ham band, so we have tried several ideas to make same from commercial components. One try is sketched here; while not the ultimate by any means, it does work and is not too much labor to build. Most important (and expensive) component is a little converter that is intended for use with auto radios, to tune the 50 MHz ham band.

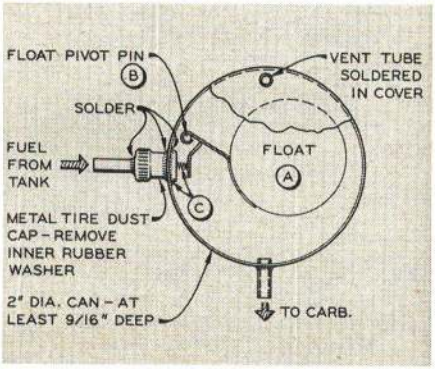
The unit we used is the Model 504, covers 50-54 MHz, cost about $30 from Herbert Salch & Co. (Woodboro, Tex. 78393), and the case measures $4\frac{3}{8} \times 3\frac{1}{4} \times 2\frac{5}{16}$" high. Since this unit was built, a new model, 504X, has replaced the one we used. It is exactly the same size, has some internal improvements and has an added switch and a front panel socket to hold a crystal; costs $32.95 less the crystal. You might still be able to get the older type from above concern, or possibly from ham supply houses that have a good second-hand stock. The crystal feature doesn't seem of too much use for monitor purposes. The 504 is just the front end of a receiver — you have to add the IF amplifier and the audio section to it. Our solution to this was to fit inside the case — there is a reasonable amount of extra room — the works out of one of the tiny broadcast-band receivers now available. Ours was a "Juliette" and cost all of $3 at a local discount center!

Care must be taken to get a set whose chassis and speaker will fit inside the case — measure things carefully. As sketch A shows (rear view depicted) the converter chassis and parts are all at one side of the case, leaving the other free to install the works of the tiny BC receiver. A 1½" dia. hole in the case side, covered inside with

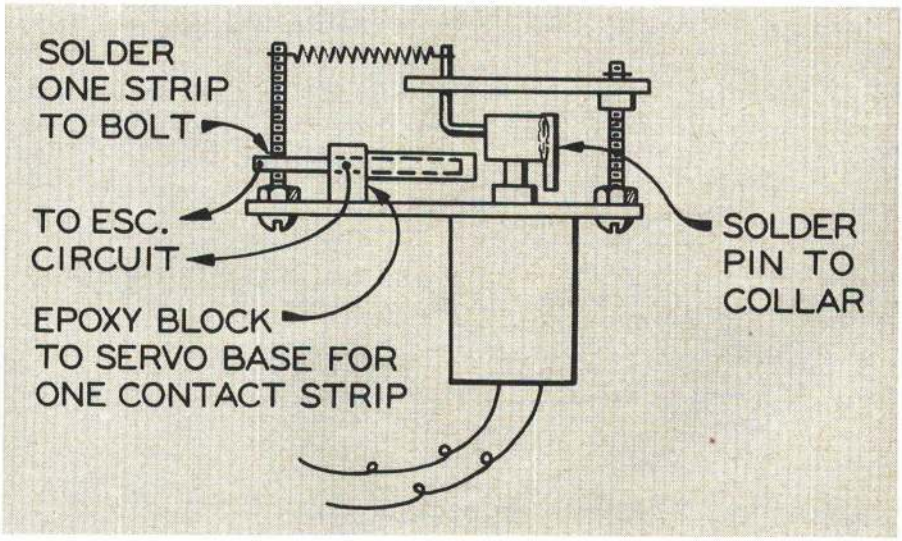
Continued on page 74



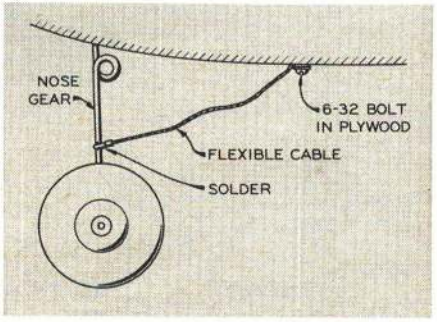
Vincent Tolomeo recommends using two-sided servo-mounting tape to attach hatch. Keeps fuel residue out of fuselage.



Lawn-mower parts make up this reliable fuel-float-valve assembly used by Tiny Harley on 15-powered Jetco Imperial 100.



Simpro I motor-control method by Tom Sanders triggers an escapement at 180 degrees rotation by closing a switch added to rudder servo. Also could offer trimmable MC.



Finding that nose gear was so far forward it would hit his prop on the rebound, Walt Watkins' son added a restraining cable.

TRY YOUR DEALER FIRST

Here Are Some of Our Aces

- **ALABAMA**

Alabama, Huntsville 35805
HUNTSVILLE HOBBY SHOP
2100 Triana Blvd.

- **ARIZONA**

Arizona, Phoenix 85012
WEBSTER'S HOBBY SHOP
521 E. Camelback Rd.

- **CALIFORNIA**

California, Burbank 91505
T & A HOBBY LOBBY
3512 West Victory

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COMMANDER DE SUPERHET RECEIVER

This is the first superhet receiver to be produced by Ace R/C! And it is a first in many respects: Small—measures only 1⅝ x 1¾ x ⅞"; Light-weight is about .6 ounce; Relayless-but double-ended (DE) with 1 amp transistors in output for hookup direct to dual coil actuators; Low voltage—works reliably at maximum range on just 2.4 volts; Versatile—works with most any transmitter of from 400 to 1400 hz; Pulses—exceptionally fast.

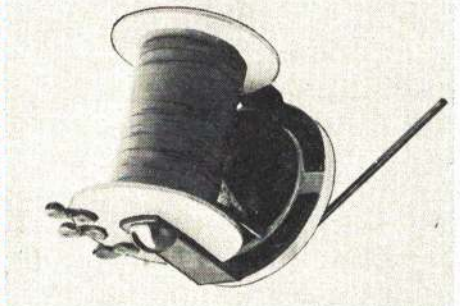
Manufactured by Ace exclusively under license agreements with designers — several circuit breakthroughs found only in this unit.

Works with only minor change on Dickerson Skyhawk GG Conversion kit. Uses highest grade miniature components—completely assembled, tested and guaranteed.

Not only is the Commander the smallest and lightest superhet available today—it is also the lowest priced at this special introductory offer.

No. 12K1—Commander DE SH RX
Assembled $26.50

(Available on 26.995, 27.095, 27.145 and 27.195 mHz. Be sure to specify.)



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Adams Baby Actuator—smallest dual coil made. Only ½ oz. Only..... $6.95

Other Adams Actuators in low voltage coils in both single and twin magnet assemblies in stock. LV Single $6.95. LV Twin $9.95. Improved!

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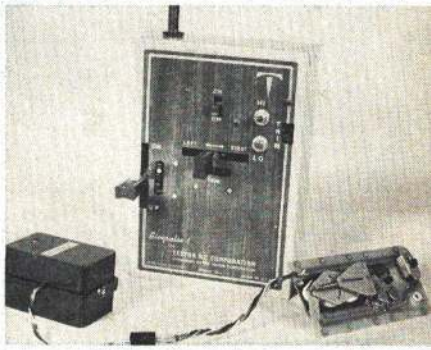
NEW!

DICKERSON—TESTOR CONVERSION KI



Although intended primarily to convert t Testor Skyhawk to GG operation for rudder a elevator (motor if desired), the kits below a among the most versatile ever offered.

The plane conversion kit will give GG for t Skyhawk, but also may be adapted for airplan up to .19 power! May also be used with almo any other type of receiver—relay or relayle

RECEIVER CONVERSION KIT

The Dickerson conversion kit for the Skyha receiver utilizes some of the components ready in the unit, but adds a switching deco to convert signals for a Rand LR3. Kit consi of PC board for housing switcher, LR3, swit and charging jack on a 2¾ x 4¼" deck. C tains all transistors and resistors. LR3, c nector, switch and charging jack are not s plied.

No. 15K53—Dickerson Skyhawk Rx Conversi Kit, $11.50

TRANSMITTER CONVERSION KIT

While foregoing may be used with any GG tra mitter, this kit makes the conversion of t Testor Simpulse Tx into a two stick GG tra mitter easy and simple. Only hand tools quired. Basic kit contains all pots, bracke extra stick assembly (SPST push switches motor available as extras.)

No. 11K5—Dickerson-Testor GG Tx Conversi Kit, $11.50

No. 30K3—SPST push switch for motor cont (2 required) each, $.45

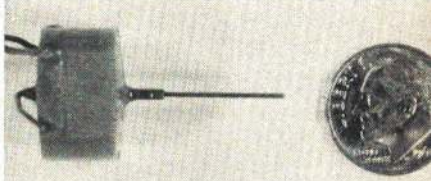
TESTOR RX CONVERSION PC BASE

Printed Circuit base for plane and receiver c version is available separately for the scrat builder.

No. 28K75—Dickerson-Testor Rx Board, $3.25

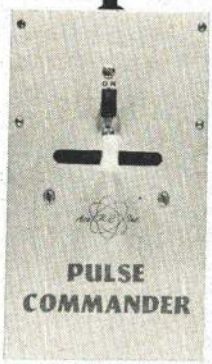
NEW!

BENTERT ACTUATORS



Smallest, lightest magnetic actuators made. T German import is precision crafted. Small mo weighs 7.5 grams and has 50 ma drain on 3 Large model weighs 15 grams and has 80 drain on 3 v. Single coil, magnetic return.

No. 14K1—Small Bentert Actuator.....$8
No. 14K2—Large Bentert Actuator.....$8



COMMANDER PULSE TRANSMITTER

The Commander Pulse Transmitter is designed expressly for magnetic actuators. Unlike most GG units, which are difficult to convert for Rudder Only, this unit makes effective rudder control with magnetic actuator possible by a width variation of 95/5 instead of the usual 65/35 ratio. Engineered as a complete package, this is not a conversion unit or add-on.

RF section uses powerful silicon transistors. Pulser section uses stable unijunction. Has an electronic centering adjustment to fit your installation in the airplane. Once set, does not require readjustment or constant trim adjustments.

Housed in exclusive Aluma-Sheen anodized-finished metal case measuring 6 7/16" tall x 3 11/16" wide x 2 1/8" deep. Uses large 9 volt battery of the M1603, D6 or 276 types for extra long life. Has base loaded antenna which collapses to 9 inches. Nicely balanced for easy-to-fly feel. Spring loaded stick is internally mounted.

Designed expressly for the Commander DE Superhet receiver. With 2 nickel cads and an Adams magnetic actuator, this makes an ideal beginners package.

Quality throughout, rugged reliability, custom crafted; completely assembled, tested and guaranteed.

No. 11K1—Commander Pulse Transmitter $39.95
(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)

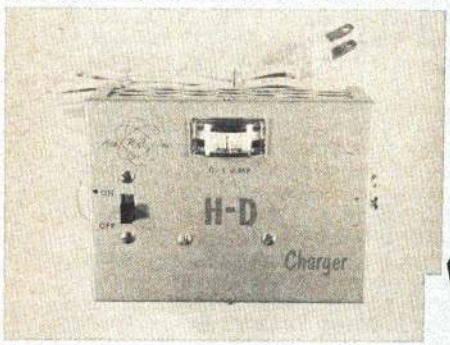
COMING SOON!

Watch for announcement of our GG Package #2. Will feature the Dickerson switcher, overall airborne weight of only 5½ ounces. Price will be $109.95! The lightest—the best!

The Versapro system to be featured in American Modeler will be available on a parts package and component basis.

COMING SOON! — Don Dickerson's Dual Ditber low cost all transistor decoder for use with Rand actuators; a Micro Decoder Center which is all solid state including Adams actuators for completely inter-action-free flying. Also the Radio Control Modeler Decoder which will be featured soon will be available in kit from Ace.

Watch our ads for details—or better yet get on our mailing list by sending us an order! Free catalog supplements AND R/C Data—acclaimed by do-it-yourselfers all over the world



NEW! H-D CHARGER

The H D refers to Heavy Duty—and that's exactly what this brute is—capable of charging your larger nickel cads and wet cells. For rates of 100 ma up to 1 amp. Has meter for monitoring and for setting of charge rate. Not dual purpose, but made for those husky charging jobs where you need the power. For nickel cadmiums from 1.2 to 10 ampere size. Will also series charge transmitter battery packages. Adjustable internal resistor sets rate.

Uses all new components double the ratings necessary to assure long life. Housed in aluminite case, with ventilated back, and rubber feet. A deluxe design. Assembled, tested, guaranteed.

No. 34K1—H-D Charger, assembled.....$13.95

COMMANDER R/O PULSE PACKAGES
Ideal for Beginners and Sport Fliers

Get one of the Ace Commander R/O packages and you get the Commander DE Superhet Receiver, Commander Pulse Transmitter, Adams Actuator of the size you want, along with matching nickel cads, and completed wiring harness, AND you save up to $10.00 over buying singly.

We have the packages as matched sets in three basic offerings to suit your every R/C sporting need from the smallest to the larger sized aircraft. Ready for easy installation.

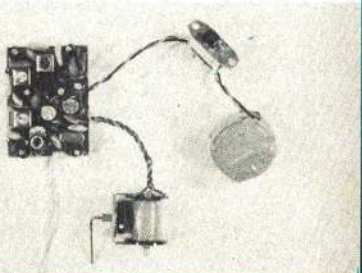
The Baby Pack is for the .010 and .020 jobs although it can be used with tame .049's. Package has two GE 225 ma BHL nickel cadmium batteries and Baby Adams. With wiring harness and switch, completely assembled.

The Standard uses the LV Single Adams for more power for .049 to .07 size. Is furnished with two GE 500 ma BHL nickel cadmiums. With switch harness, assembled.

The Stomper uses the LV Twin of the Adams line for up to .15 or even .19 size jobs. Comes with two GE 600 ma cylindrical cells. With switch harness, assembled.

(Charging equipment not furnished.)

No. 10G15—Commander R/O Baby pack....$69.95
No. 10G16—Commander R/O Standard Pack 71.95
No. 10G17—Commander R/O Stomper pack 74.95
(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)



PROVEN WINNER!
ACE VARI-CHARGER

IN KIT FORM OR ASSEMBLED

Will charge nickel cadmium batteries—20 mils to 150 mils. Capable of charging up to 12 volt packs. Indexed dial & simple chart for correct milliamp reading for charging different size battery packs. Completely isolated from AC line supply. An extra deluxe item. New transformer of highest quality. UL approved line cord. On-off switch. 500 milliamp diode. Full instructions.

No. 34K21—Ace Vari-Charger assembled $8.95
No. 34K22—Ace Vari-Charger Kit 7.50

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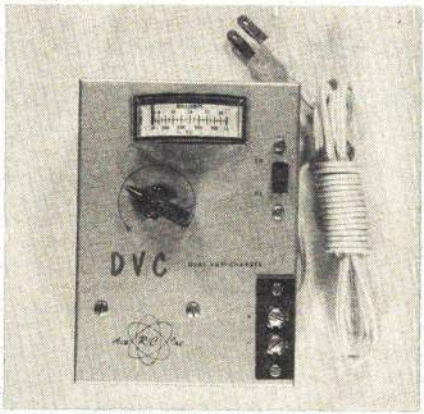

DUAL VARI-CHARGER

This is the one you've asked for—A dual rate all-purpose charger! Has two ranges to cover your every nickel cad battery charging need. Completely metered in BOTH ranges so that you know how much you are putting into your batteries, and BOTH ranges are adjustable!

Heavy duty transformer for complete isolation and shock hazard protection. All components used are twice required ratings to insure long and trouble-free life.

Dual range meter has LO range of from 0 to 100 milliameters; HI range is from 0 to 1 ampere. LO range is completely variable by external knob from 0 to 100 ma; HI is internally adjustable from 100 ma to 1 ampere for the huskiest batteries.

UL approved line cord, ventilated metal case for safe heat dissipation, HI-LO switch, edge reading US made meter, screw terminal output. Completely wired, tested and guaranteed.

No. 34K2—Dual Vari-Charger (Assembled) $17.95

NEW HANDBOOK-CATALOG FOR 1969!
For the Fun Flyer and Tinkerer

Our 1969 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 —acclaimed 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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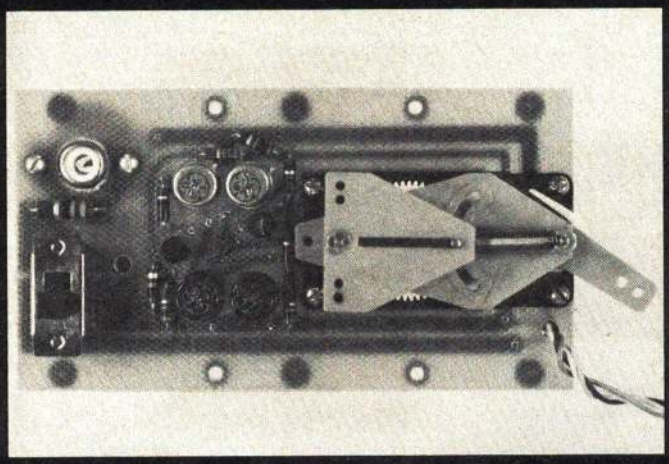
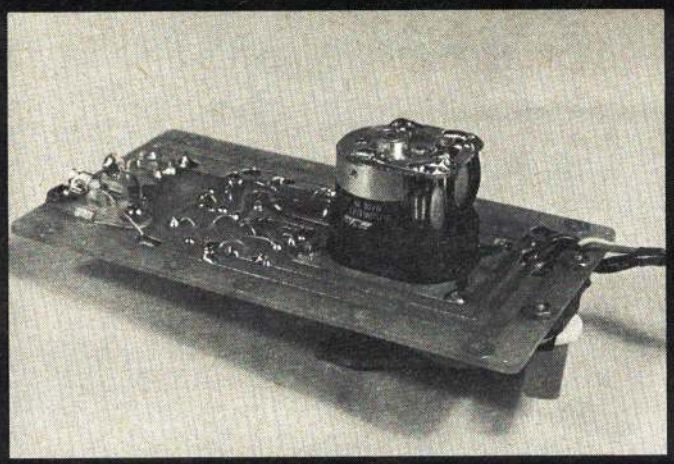


Switcher is just the gadget for light, inexpensive, and compact small planes. Its assembly is quite easy. Uses a Rand LR3 actuator.

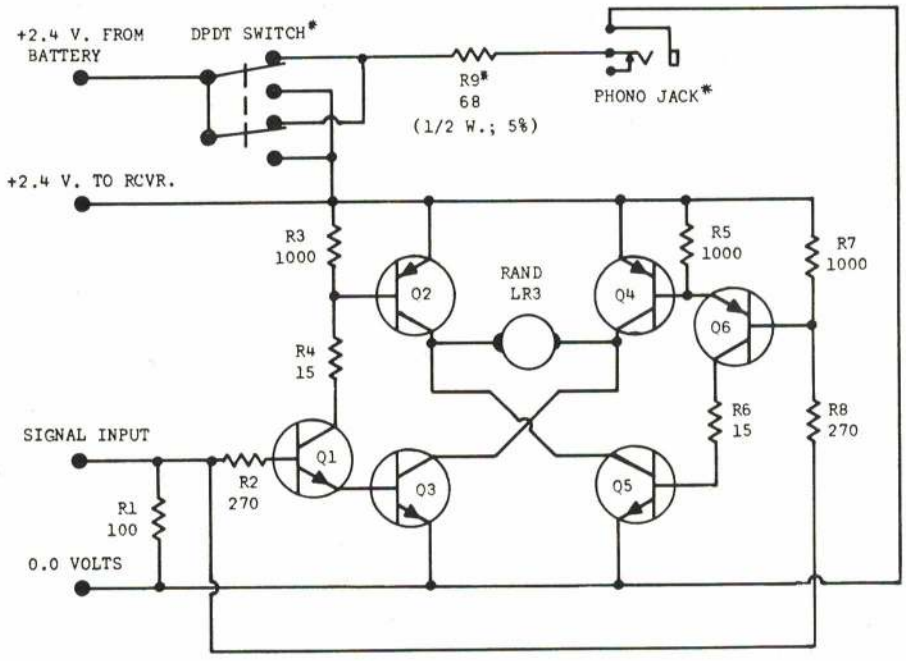


Upside-down view shows the proper mounting of the transistors. Their leads are bent back through the PC board and soldered.

See-Saw Switcher

An ideal companion for any single-channel receiver offers dependable relayless Galloping Ghost operation on 2.4 volts.

DON DICKERSON



Q1 - 2N2926 (G.E.) OR 2N3704 (T.I.)
Q2,4 - 4JX11C1132 (G.E.)
Q3,5 - 4JX11C1847 (G.E.)
Q6 - 2N3702 (T.I.)

ALL RESISTORS 1/4 W. CARBON, 10% TOLERANCE EXCEPT WHERE NOTED

* THESE PARTS FROM TESTOR

FIGURE 1 SERVO DRIVER

The paramount feature of the amplifier is its powerful drive with only 2.4 volts.

Special Note: The See-Saw Switcher is the result of the author having a Testor Skyhawk single-channel ready-to-fly plane and wanting to have more flying performance with it and its radio system. The switcher is designed to operate directly from the PNP output transistor of the Testor's receiver and on the same batteries with the receiver. It is also capable of direct operation from virtually any single-channel receiver, as all of them have a PNP output either for driving an escapement or a relay. With this in mind, here is a universal Galloping Ghost system for your receiver which features operation from only two nicad batteries, having the servo, charging plug, on-off switch and amplifier circuitry conveniently located on a small, sturdy PC board.

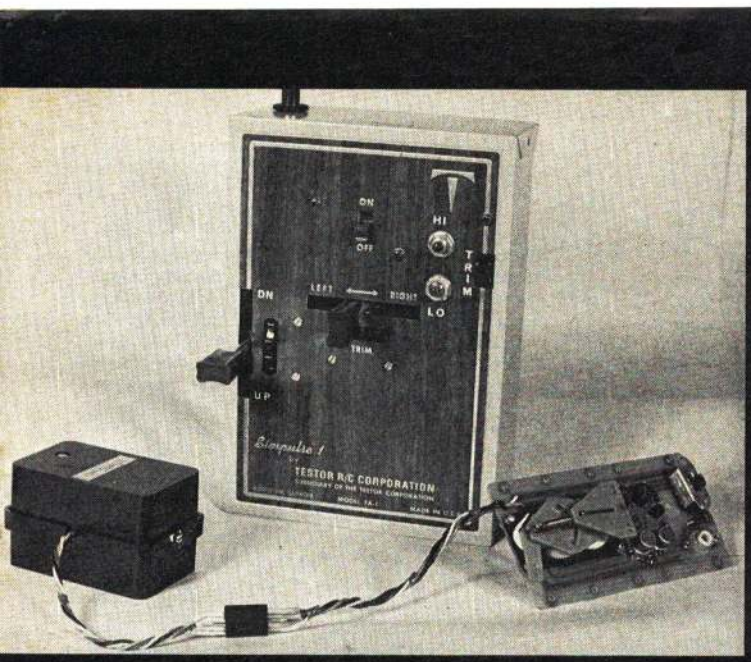
Galloping Ghost conversion for the radio control equipment used in the Testor Skyhawk ready-to-fly airplane, isn't difficult and no test equipment or knowledge of electronics is required to get it into operation.

The modification to the airborne equipment consists essentially of replacing the existing Adams magnetic actuator with a Rand LR3 Galloping Ghost servo, adding a six transistor see-saw switching circuit to drive the Rand, and removal of one resistor from the receiver.

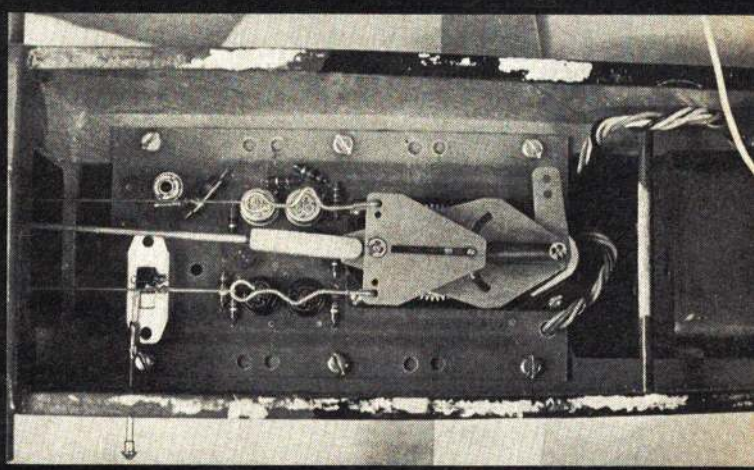
The entire airborne equipment operates from the same two 600-mah nickel-cadmium batteries that power the Testor receiver. The Rand draws about 350 ma average, which limits safe operating time to approximately one hour on one battery charge. If you want longer flying time per charge, two 750 mah or 1200 mah batteries can be used. With the 600 mah batteries, the weight of the airborne system is a mere 6.2 oz! With the 1200 mah size, weight is 8 oz.

The battery charging current limiting resistor, R9 in Fig. 1, as used in the Testor, is also included in the circuit, and is wired to the off-side of the DPDT power switch.

Electrically, the best feature of the servo switcher circuit used in this conversion



The switcher was originally designed as an improvement for the Testor's single-channel system in the ready-to-fly Skyhawk plane.



Here the unit is installed in a Midwest Astro Mite. It is being used with the Testor receiver. Note cable rudder-drive system.

is that it permits reliable relayless operation of the Rand servo on only 2.4 volts. Most other relayless see-saw circuits require 3.6 volts for proper operation.

The circuit is useful with other relayless receivers having a PNP transistor output or receivers with relays or reed switches, provided they meet the basic requirements for pulse proportional. If a relay-type receiver is used, the movable contact should be connected to the switcher input and the fixed contacts one to each side of the servo batteries. Since most receivers require more than 2.4 volts, it will be necessary to use separate batteries for the receiver, or to add one cell in series to the servo batteries to provide 3.6 volts to the receiver only.

Much care was taken in designing the circuit to assure that it is not possible for the transistors all to be turned on simultaneously, which would result in their destruction. This protection cannot be assured if you change certain resistor values, substitute germanium for the silicon transistors specified (Q2 and Q4 are germanium), or operate the circuit from greater voltage than supplied by two nickel-cadmium batteries. Follow directions and don't substitute parts!

Modification to the Testor transmitter consists of adding another control stick and associated parts to provide a variable pulse rate and a simple, but essential modification to improve the linearity and reduce the sensitivity of the existing pulse width function. The modification also includes an electrical pulse rate trim for in-flight adjustment of elevator neutral, and optional pushbutton switches which permit utilization of the throttle control feature of the Rand servo.

The transmitter modifications are very simple to accomplish; however, the instructions and drawings would require excessive space. The instructions are included in the ACE Testor Transmitter Conversion Kit or can be obtained separately from ACE; therefore, they are not included here. The following instructions assume that your Testor transmitter is converted to GG or that you have a commercial GG transmitter that is compatible with your Testor receiver.

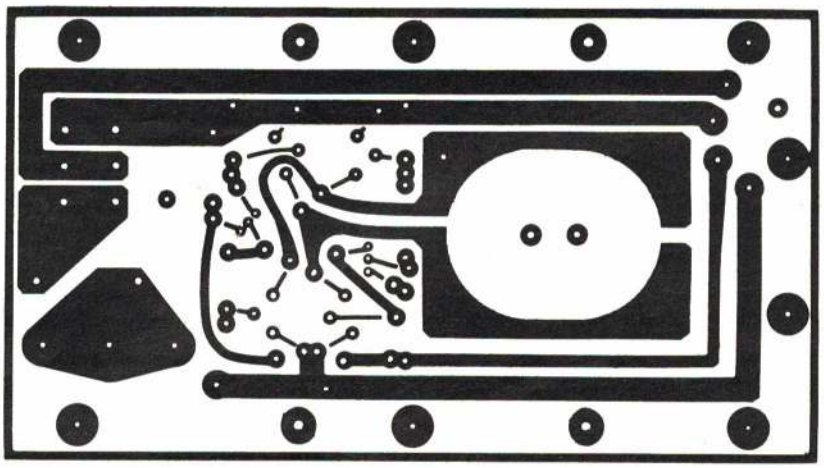
If you convert your Testor transmitter, it is recommended that the airborne equipment modification be made first because this can be checked out without modification to the transmitter. Therefore, in the event of difficulty, you will know that the problem is in the airborne equipment and not the transmitter. Let's proceed on this basis as follows:

Receiver modification: Remove the guts from the Testor airplane. This will include the receiver, Adams actuator mounting board, and the switch. The receiver is held in place by two sheet-metal screws accessible from the front of the firewall; one of the screws is behind the engine. Disconnect the receiver from the Adams actuator board by desoldering the receiver wires at the board.

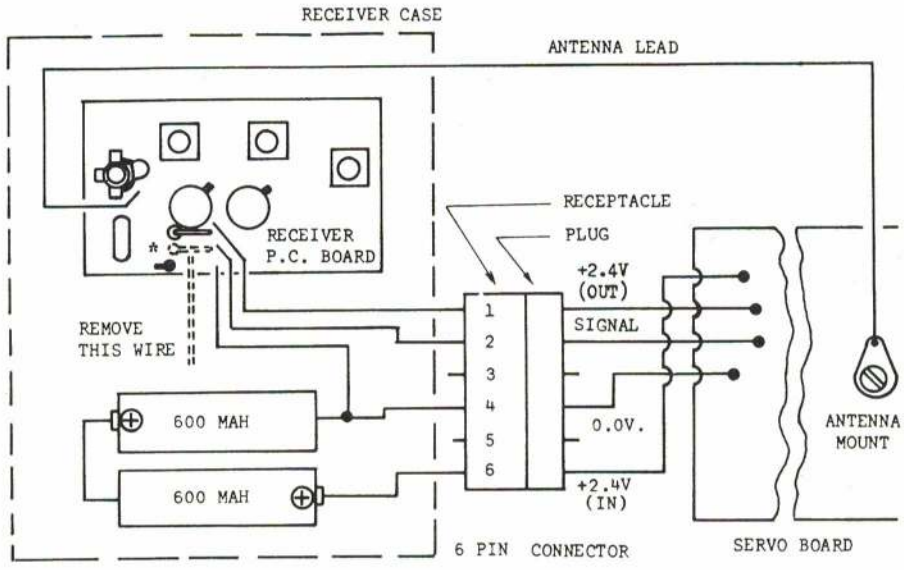
Remove the receiver from the plastic case and carefully examine all the wire connections to the batteries and printed-circuit board, for broken strands, possible shorting, etc. It is advisable to tape the battery wires to the battery to provide strain relief. Now remove the 68-ohm resistor (blue-gray-black-silver) and the wire formerly connecting to one of the Adams actuator coils as shown in Fig. 2. Carefully reassemble the receiver: make sure the antenna lead-out wire is routed out the proper slot and is not near the remaining lead-out wires.

Assembling the servo board: Drill all holes, make the servo opening, and clean the printed-circuit board prior to attaching any components. Be certain to remove the little copper doughnuts used as drill guides for the transistor lead holes. Check all components for fit prior to assembly. The servo opening should be chamfered on the component side of the board to clear the fillet on the servo casting and must have sufficient clearance to permit passage of the lead wires.

Assemble the board in this order: resistors, transistors, switch, charging jack, lead wires, and the servo. Before mounting the switch, drill a 1/16" hole sideways through its handle. The servo is secured with 1/4 x



Copper side shown. Note: Be sure to remove the transistor lead guides before assembly.



* 68 OHM RESISTOR REMOVED FROM P.C. BOARD

FIGURE 2 PICTORIAL WIRING DIAGRAM -- RECEIVER AND SERVO BOARD

Conversion of the Testor's airborne system uses existing case, wiring, and batteries.

2-56 machine screws and nuts; the lead wires are soldered to the pads provided on the PC board. Be careful to "clock" the epoxy transistors correctly per the component layout. (Fig. 3.)

Do all soldering with a clean, hot, iron of 35- to 50-watts size. All connections should be smooth, bright and shiny. Do not bend component leads over the solder lands with the exception of the transistor leads whch are bent over to and then up through the solder pads.

In airplanes other than the Skyhawk, it is not mandatory that the antenna be fastened to the servo board. You can use your favorite method of installation, but be sure total antenna length, including the receiver lead out, is the same as the original Skyhawk installation. Otherwise, the receiver may require retuning. It may be well to retain the vertical style antenna, too. The receiver can either be wired directly to the servo board or a connector can be used.

You can now fire up your transmitter and functionally check the airborne equipment. The Rand servo should respond left and right to control stick command, and should wag at or near the neutral position with the transmitter stick in neutral. If your Testor transmitter behaves like the several I've seen, you should approach maximum servo throw and cause the servo to go-around with the control stick somewhere between 35 to 50% of full deflection in either direction. This is definitely too sensitive and is the reason for modifying the pulse width section of the transmitter! You can check the response to pulse rate command by varying the trimmer resistor nearest the end of the transmitter printed-circuit board, if you wish.

Assuming that you have converted your Testor's transmitter, or are using a commercial Galloping Ghost transmitter, it will be necessary to adjust it for operating the see-saw switcher. Begin by centering the rudder servo. Simply rotate the rudder-pot shaft on the stick assembly until the output disc of the rudder servo is pulsing evenly about neutral. This adjustment is made with the trim and stick in neutral position.

Adjust the pulse rate by applying full-down elevator and full-down trim, and adjusting the elevator stick pot shaft to obtain a total dither, or flutter, excursion of about $\frac{1}{32}$ of an inch as measured at any point on the reciprocating elevator cam plate on the Rand servo. This corresponds to about 12 pps. The rudder cam plate should be pulsing symmetrically about neutral during this adjustment.

Check for the proper slow pulse rate

Continued on page 57

MOUNTING HOLE DIA. AS DESIRED FOR MOUNTING ON RAILS.
EXCEPT (*) WHICH ARE 3/32 D. FOR TESTOR AIRPLANE.

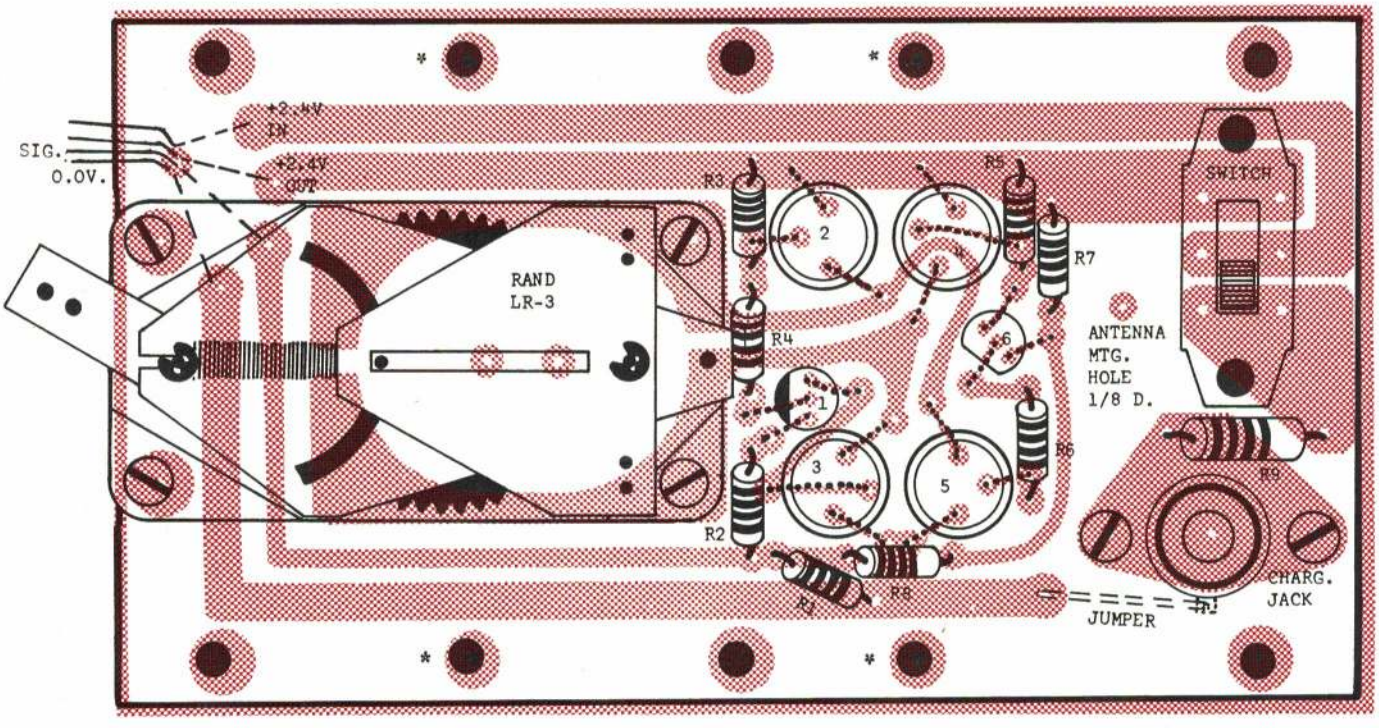
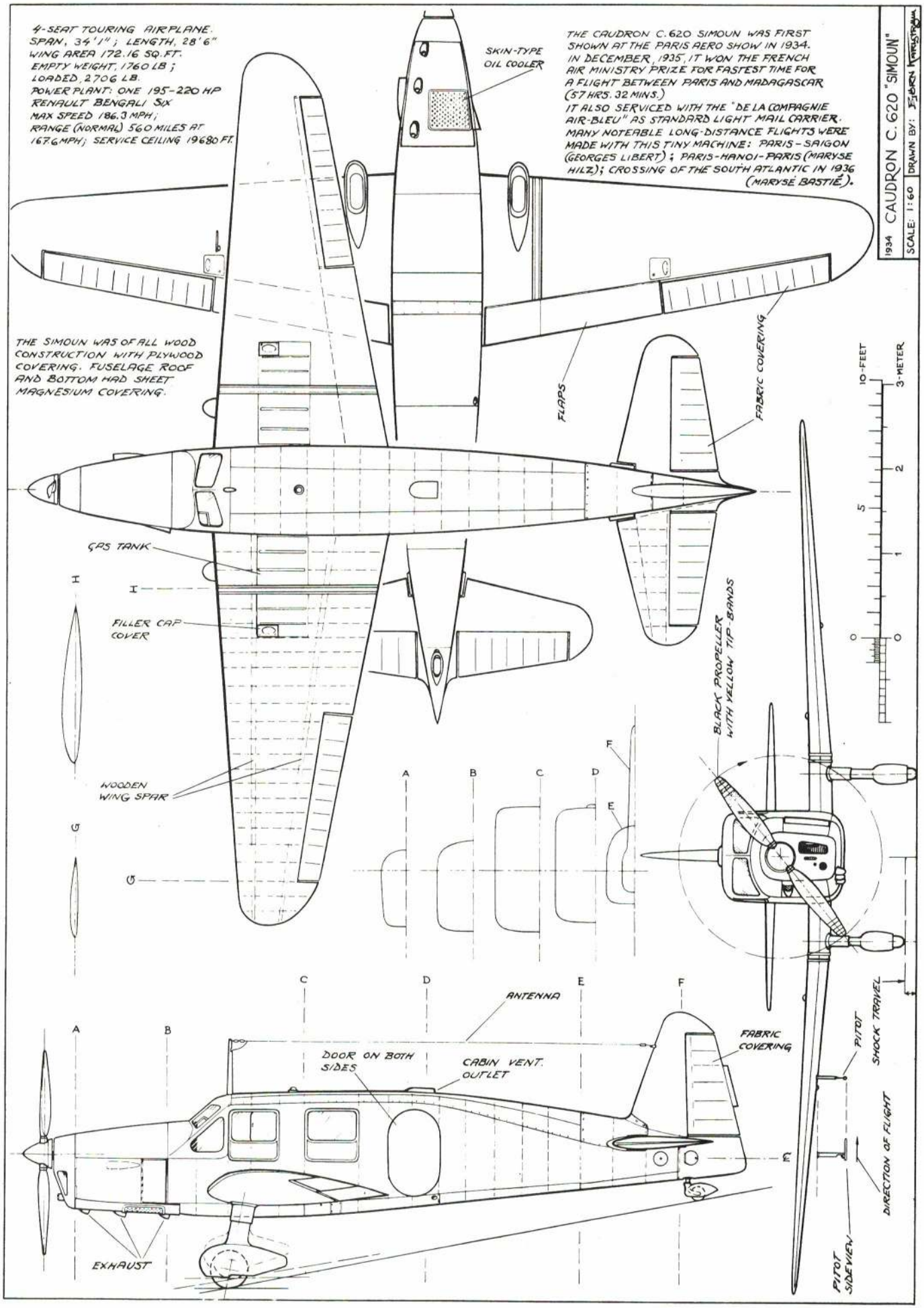


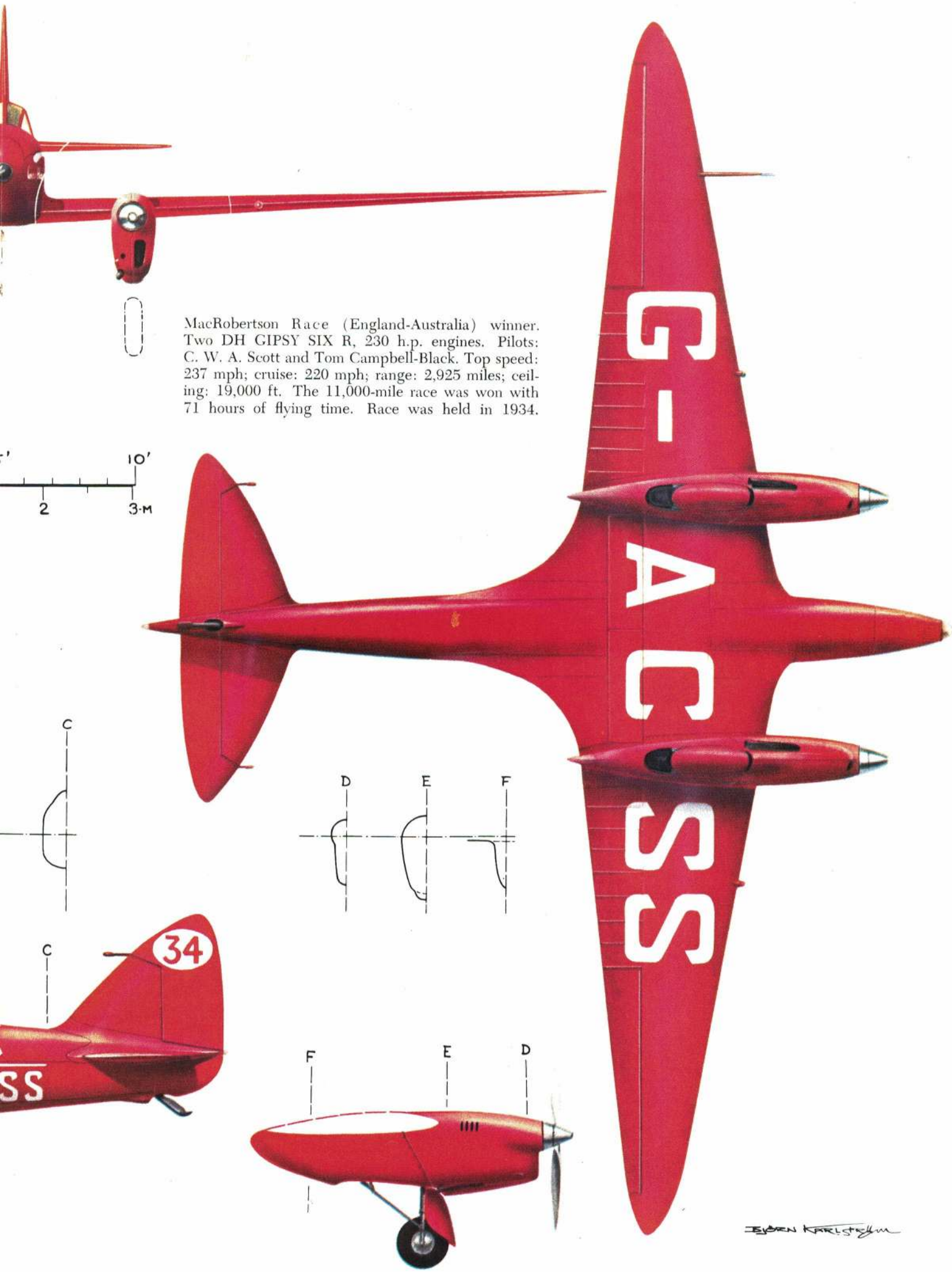
FIGURE 3 - COMPONENT BOARD LAYOUT

Relate the number on each component with the circuit diagram and locate it according to this drawing. Install the resistors first.


4-SEAT TOURING AIRPLANE.
SPAN, 34'1"; LENGTH, 28'6"
WING AREA 172.16 SQ.FT.
EMPTY WEIGHT, 1760 LB;
LOADED, 2706 LB.
POWER PLANT: ONE 195-220 HP
RENAULT BENGALI SIX
MAX SPEED 186.3 MPH;
RANGE (NORMAL) 560 MILES AT
167.6 MPH; SERVICE CEILING 19680 FT.
SKIN-TYPE OIL COOLER
THE CAUDRON C.620 SIMOUN WAS FIRST SHOWN AT THE PARIS AERO SHOW IN 1934. IN DECEMBER, 1935, IT WON THE FRENCH AIR MINISTRY PRIZE FOR FASTEST TIME FOR A FLIGHT BETWEEN PARIS AND MADAGASCAR (57 HRS. 32 MINS.)
IT ALSO SERVICED WITH THE "DE LA COMPAGNIE AIR-BLEU" AS STANDARD LIGHT MAIL CARRIER. MANY NOTEABLE LONG-DISTANCE FLIGHTS WERE MADE WITH THIS TINY MACHINE: PARIS-SAIGON (GEORGES LIBERT); PARIS-HANOI-PARIS (MARYSE HILZ); CROSSING OF THE SOUTH ATLANTIC IN 1936 (MARYSE BASTIÉ).
1934 CAUDRON C.620 "SIMOUN"
SCALE: 1:60
DRAWN BY: BJÖRN KARLSTRÖM
THE SIMOUN WAS OF ALL WOOD CONSTRUCTION WITH PLYWOOD COVERING. FUSELAGE ROOF AND BOTTOM HAD SHEET MAGNESIUM COVERING.
FLAPS
FABRIC COVERING
10-FEET
3-METER
GAS TANK
FILLER CAP COVER
WOODEN WING SPAR
BLACK PROPELLER WITH YELLOW TIP-BANDS
ANTENNA
DOOR ON BOTH SIDES
CABIN VENT. OUTLET
FABRIC COVERING
PITOT
SHOCK TRAVEL
DIRECTION OF FLIGHT
EXHAUST
PITOT SIDEVIEW

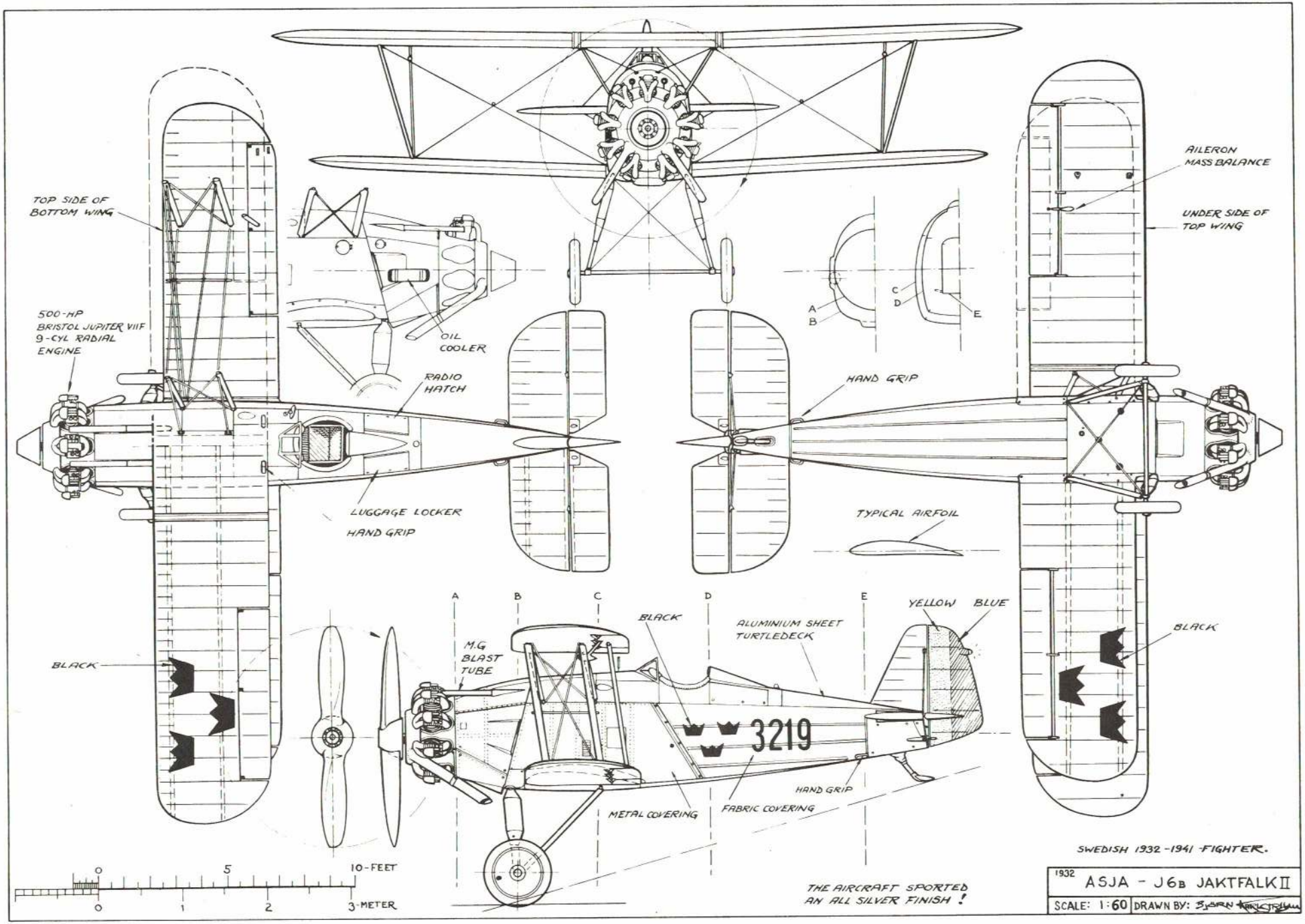
American Aircraft Modeler album of all-time favorites:

DE HAVILLAND DH 88 COMET



MacRobertson Race (England-Australia) winner. Two DH GIPSY SIX R, 230 h.p. engines. Pilots: C. W. A. Scott and Tom Campbell-Black. Top speed: 237 mph; cruise: 220 mph; range: 2,925 miles; ceiling: 19,000 ft. The 11,000-mile race was won with 71 hours of flying time. Race was held in 1934.

BJÖRN KARLSTRÖM


TOP SIDE OF BOTTOM WING
500-HP BRISTOL JUPITER VIIF 9-CYL RADIAL ENGINE
OIL COOLER
RADIO HATCH
LUGGAGE LOCKER HAND GRIP
AILERON MASS BALANCE
UNDER SIDE OF TOP WING
HAND GRIP
TYPICAL AIRFOIL
A B C D E
BLACK
M.G BLAST TUBE
BLACK
ALUMINIUM SHEET TURTLEDECK
YELLOW BLUE
BLACK
3219
METAL COVERING
FABRIC COVERING
HAND GRIP
0 5 10-FEET
0 1 2 3-METER
THE AIRCRAFT SPORTED AN ALL SILVER FINISH !
SWEDISH 1932-1941 FIGHTER.
1932 ASJA - J6B JAKTFALK II
SCALE: 1:60 DRAWN BY: BJÖRN KARLSTRÖM

JANUARY 1969

MODEL AVIATION

Official magazine

A.M.A. NEWS

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

Double Win for Xenakis in FF Team Finals

Months of frenzied model designing and building, test flying, and competing came to a head for 85 AMA members who assembled at Bong Field, Wisconsin, last August 31-September 2. At hand before them was the final contest of the two-year program designed to pick the very best U. S. teams for the 1969 Free Flight World Championship. The top three men in each of Wakefield rubber, Nordic A-2 towline glider, and FAI Power free flight gas events would have the honor of being our representatives.

Before these 85 modelers was three grueling days of flying 5 flights each day. For 15 flights, the models of each would have to perform flawlessly, and the pilot would have to use his best thermal sense and not launch into a "downer." The cream of the crop was there. What would be the result?

NORDIC A-2

Round one took its toll, when 14 of the 31 flyers failed to make maximum, 180-second flights. Yet, two of the men who missed perfect first flights were to show a remarkable rise in their place positions. By round two, there were only eight with perfect scores. By the end of the first day, round 5, only Bill Hartill, Canoga Park, Calif., had a perfect score, but many others were pushing him hard.

Round six saw Hartill lose his first place position when he had a 97-second flight. The contest was wide open again, and others who had missed maxing in the earlier rounds were going strong. At the end of round 10, the leaders (with flight times in seconds) were Phil Klintworth, Birmingham, Mich., 1611; Gene Simpson, Houston, Tex., 1599; Jim Taylor, Albuquerque, N. Mex., 1592; Bill Hartill, 1585; George Xenakis, Houston, Tex., 1564; Dick Monts, Wichita, Kans., 1548.

Pressure was immense the third day. Phil Klintworth missed a max with a 106-sec. flight in round 14, and Dick Monts, who had been steadily turning in maxes on this day, moved into first place — only to bomb out in round 15 with a 62-sec. flight, placing him 6th. Klintworth turned in a round 15 max to regain first. Jim Taylor dropped to 4th as a result of a 122-sec. flight in round 11, but he maxed out the rest of the day causing his place position to rise to third, and then to second, as others dropped lower. Xenakis also missed his max in round 11, dropping him to 9th place; then with perfect flights for the rest of the day, his position steadily climbed to 8th, 6th, and then 3rd, as others missed perfect flights. Carl Perkins of Mission, Kans., entered the 11th round in 10th place, but proceeded to fly 5 maxes which placed him 4th in the

Continued on page 46

Frank Monts

The U. S. 1969 FAI free flight team. L-R: back row — Jim Taylor (New Mexico), Phil Klintworth (Mich.), Sandy Norton (Calif.), Bob Sifleet (Maryland), Henry Spence (Texas); front row — George Reich (Ohio), George Xenakis (Texas). Missing from photo is Herb Kothe (Colo.) and Pete Sotich, team manager. Only slight margins separated team winners from runner-ups.

Too Late to Renew AMA Membership without Losing Service, Magazines?

December 15 is the critical deadline. Owing to the publication lead time, the very least to be expected for members renewing after this time is that their March *American Aircraft Modeler* will reach them late. This is because the March issue is mailed in January, and the address tapes of AMA members are prepared for the publisher during the latter half of December. Late copies, to those renewing between December 15 and January 15, will have to go out via a supplementary mailing in late January. Furthermore, should you delay in signing up for 1969 membership beyond January 15, you will completely miss the March magazine, because AMA copies have to be ordered by that date.

The February *AAM*, which is printed and mailed in December, is the last magazine to be mailed to 1968 members — all 1968 AMA memberships expire December 31, 1968.

Renewal notices were mailed to 1968 members in early October. Some changes have been made, a development probably not unexpected to readers of these pages. However, the idea of separate competition license apart from membership has been scrapped. The "whats" and "whys" were fully explained in the membership renewal package, basically:

Some dues up, some down. The adult (Open member, Leader member and Contest Director) membership for 1969 is $10, but the rate for a Junior or Senior member is only $2. The latter receive all the benefits as do adult members, except that subscription to *AAM* is not included with dues; subscription is available optionally at a greatly reduced rate.

1968 AMA Chartered Clubs If You Are Looking For —

- **HELP ON MODEL PROJECTS**
- **ANSWERS TO TECHNICAL QUESTIONS ABOUT MODELS AND EQUIPMENT**
- **THE LOCATION OF FLYING SITES**
- **LEADERS OF LOCAL MODELING EVENTS**

Use the following list of 1968 AMA Chartered Clubs as a basic source for the answers to your questions. Contact the person listed for the club nearest you for meeting times and places.

Over 450 clubs are listed. They have a total of over 10,000 members of the Academy of Model Aeronautics.

ALABAMA

Birmingham RC Assn.; John Gurosky—Sec.
863 Vanderbilt St., Birmingham 35206
Decatur MAC, Elbert Minter — Secretary
2317 Calumet Ave., SE. Decatur 35601
Gulf Coast RC Club, George Dowell — S.-T.
424 LaBorde Dr., Mobile 36609
Montgomery Ringmasters MAC, J. Saint—P.
312 Holly Ridge Ave., Montgomery

ALASKA

Ft. Wainwright Mod'l'rs, D. McDougall—P.
4135-6 Cedar St., APO Seattle, Wa. 98731

ARIZONA

Air Zona MAC, Shirley Dierdorf — Sec.
8122 N. Central, Box 45, Phoenix 85020
Cholla Choppers MAC, F. Townsend — T.
2751 No. Campbell, Tucson 85719
Phoenix MAC, Quentin T. Webster
521 East Camelback Rd., Phoenix 85012
Tucson RC Club, Ken McDaniel—President
4808 E. Fairmount, Tucson 85716

ARKANSAS

Fayetteville Aeromod's, Gary Heithold — S.
Box 419, Fayetteville 72701
Mid Ar. RC Soc., Bob Richardson — S.-T.
32 Warren Dr., Little Rock 72204
Pine Bluff RC MAC, Norman H. Ross—S.-T.
1909 Edmar Dr., Pine Bluff 71601

CALIFORNIA

Alkali Angels, C. K. Banks — Secretary
303F Blandy, China Lake 93555
Antelope Valley Tailwinds, Inc., Ken Beck
1508 W. Kildare St., Lancaster 93534
B.I.R.D. Club, Inc., Van McKinzie — Sec.
3966½ Studebaker Rd., Long Beach 90808
Calif. Aeromodeling Soc., Doug King
1392 Mairfield Rd., Riverside 92506
Capitol Condors, Inc., E. F. Bellinger — Sec.
3029 Great Falls Way, Sacramento
Chicken-Sticks, J. Fitzgerald Jr. — Pres.
1826 Dorothea Ave., Visalia 93277
Conejo Valley MAC, Gordon Hobbs — Sec.
3864 Hartung Court, Newbury Park 91320
Cordova Model Masters, H. Roby — Treas.
2648 Palo Vista Way, Rancho Cordova
Diablo Valley RC's, Bill Moore
127 Shady Lane, Antioch 94509
East Bay RC's, Win Biscay
6036 Telegraph Rd., Oakland 94609
Eureka RC Club, R. R. Lay — President
2211 F Street, Eureka 95501
Fresno Gas MAC, Ocie Randall — Secretary
1725 Kenmore Dr., West Fresno 93703
Fresno Radio Modelers, Jim Madsen — T.
3432 No. Fourth, Fresno 93726
Kings Co RC's, Bill Bailey
P. O. Box 544, Hanford 93230
Marin Radio Control Group, A. C. Kenners
6 Navajo Lane, Corte Madera 94925
Max Men of So. Calif., Robert White -- Sec.
1030 Norumbela Dr., Monrovia 91016
M.A.R.K.S., Brandon O'Brien — Secretary
3008 N. Broadmoor Blvd., San Bernardino
Mission Bay Prop Twisters, R. Perry —P.
4659 Bermuda, San Diego 92107
Modesto RC, Ralph Bambacigno
4930 McHenry, Modesto 95350
Monterey Peninsula RC Club
1772B Fremont Blvd., Seaside 93955
NAA Flightmasters, J. O. Bailey
11161 Mansel Ave., Inglewood 90304
No. Glendale Model Assn., W. Coleman — P.
1125½ No. Pacific, Glendale 91202
Oakland Cloud Dusters, D. Foote — S.-T.
2438 Palmetto St., Oakland 94602
Orange Co. Thunderbugs, Jos. Demers — P.
16330 Jody Circle, Westminster 92683
Peninsula Chan. Cmdrs., Inc., Jim Wight—S.
2340 Valleywood Dr., San Bruno 94006
Pioneer RC Club, Inc., Jim Sunday — Sec.
6667 Rainbow Dr., San Jose 95129
Radio Control Bee's, Bill Boone — Sec.
517 Middlerfield Dr., Aptos 95003
Redding RC Club, Inc., Bruce Reiser — Sec.
7203 Rivercrest Dr., Anderson 96007
Redding Wire Flyers, Thomas Hall — Sec.
P. O. Box 551, Redding 96001
Redwood Modelers, R. Triebel — Sec.-Treas.
5523 Mulberry, Santa Rosa 95405
Sacramento Aero Aces, Ted Werner — Pres.
10549 Malvasia Way, Rancho Cordova
San Fernando Valley RC Flyers, P. Leonard
23401 Welby Way, Canoga Park 91304
San Francisco Vultures, John Pond—Treas.
2162 43rd Avenue, San Francisco 94116
San Gabriel Valley RC League, H. Hays
Box 632, Montebello 90640
San Jose Wavemasters, Max Bowman
921 Princess Anne Dr., San Jose 95128
Santa Barbara RC Modelers, J. McClure—S.
16 W. Anapamu St., Santa Barbara
S.M. Valley Flyers Mod Assn., W. Vosburg
1280 Talmadge Rd., Santa Maria 93454
San Valeers, Raymond Peel — Secretary
10140 Glade Ave., Chatsworth 91311
Simi Valley Flyers, Dallas Van Dyke—Pres.
2517 E. Phyllis St., Simi 93065
Sky Hoppers of Orange County, Bob Vinson
233 East Wilson, Costa Mesa 92627
Smog Cutters MAC, Dave Lane — Secretary
9771 Culver Blvd., Culver City 90231
South Bay Balsa Busters, Bill Kandler
1916A Voorhees Ave., Redondo Beach
South Bay Piston Poppers, Ray Thiel — Sec.
314 No. Francisco Ave., Redondo Beach
So. Alameda Co. RC's, C. Reynolds — Pres.
37980 Parkmont Dr., Fremont 94536
So. Ca. Antique Mod. Plane Soc., J. Adams
11421 Salinez, Garden Grove 92640
So. Calif. Aero Team, Ross Steckel
7437 Collett Ave., Van Nuys 91406
So. Calif. Ignition Flyers, Bruce Chandler
7858 Farralone Ave., Canoga Park
The 900 Club, Richard Geer — VP-Treas.
1921 Rock St., Apt. 2, Mountain View
Thermal Thumbers, Russell Johnson—Pres.
7891 Cramer St., Long Beach 90808
Thunderbugs MAC
1448 W. 227th St., Torrance 90501
Tracy Skyliners, Neill Rabon — President
3031 Telegraph Ave., Stockton 95204
Vaca Valley RC's, E. R. Williams — Pres.
1712 San Diego St., Fairfield 94533
Willing Able Modelers, Myrtle Coad — Sec.
228 Culp Ave., Hayward 94544
Woodland RC Club, Douglas Barton
12 Hays St., Woodland 95695

COLORADO

Grand Junction Modeleers, G. Kirkham—P.
258 Hill Avenue, Grand Junction 81501
Jefco Aeromodelers Club, C. E. Lippstreu
6900 W. Alameda, Suite 105, Denver
Magnificent Mountain Men, W. Henshaw—S.
730 Moore #2, Denver 80315
Model Museum Flying Club, B. Schliem—S.
110 South Forest, Denver 80222
Pikes Peak RC Club, Scottie Shroff — Sec.
501 Widefield Dr., Security 80911
Mile-Hi RC Club, Herman Geller — Treas.
7020 E. Colfax Ave., Denver 80203

CONNECTICUT

Bristol Hornets MAC, John Eldridge — Sec.
6 Milton Road, Bristol, 06010
Central Ct. RC Club, Matt Marvin
115 Glenview Drive, Newington 06111
Middlesex Aero Modellers
389 Main Street, Portland 06480
No. Connecticut RC Club, R. N. Bruce—Sec.
P. O. Box 205, East Grandy 06025
No. Eastern Drone Soc., R. E. Hamel — Sec.
Hobby Shack, Rt. 1, Box 143, S. Coventry
RC Club of Connecticut, David Fortuna
47 Bay Edge Court, Fairfield 06430
RC Prop Busters, Hope E. Weaver — Sec.
White Oak Trail, Old Lyme 06371
So. Ct. Aero Modelers, J. Whittles — Sec.
43 Fairview Avenue, Saybrook 06475
Torrington Balsa Bandits, S. Collins — Sec.
1125 So. Main St., Torrington 06790

DELAWARE

Delaware RC Club, Anthony Stecyk — Sec.
56 Holly Lane, Newark 19803
Dover Mosquitos, William Gottorf — Pres.
P. O. Box 336, Dover 19901

FLORIDA

Aero Modelers of Perrine, P. Hendricks
11742 SW 176th Terrace, Miami 33157
Barons RC Club, Bud Gush — Sec.-Treas.
3420 NW 8th Court, Ft. Lauderdale
Capital City Cable Kinkers, Doug Miller
718 Simmons Street, Tallahassee 32303
Central Pl. Min. Air. Assn., John Moorman
3380 1st Avenue So., St. Petersburg
Flying Rebels Model Club, Leon Autry
9770 Doolittle, Jacksonville 32216
Ft. Lauderdale Modelers, M. Ryals — Sec.
6021 SW 14 St., Plantation 33314
Gulfhawks of St. Petersburg, Bob Woods
1044 45th Avenue, N. St. Petersburg
Indian River Kontrol Soc., A. Andre — Sec.
1749 Country Club Dr., Titusville
Moonport Modelers, Robert Welch — Sec.
Hobby Shop, 230 Orlando Rd., Titusville
Palm Beach Aeronauts, John Cheraso — P.
225 Sandal Lane, Palm Beach Shore
Pensacola Aeromodelers, Jim Knaus — P.
6088 St. Cloud Dr., Pensacola 32503
Pompano Bch. Balsa Busters, Ralph Decker
2721 NE 4th St., Pompano Beach 33062
RC Club of Jacksonville, Milt Lazarus
5310 Cresta Way, Jacksonville 32211
R. C. Assn. of Cen. Fl., Harold Ludlow—S.
P. O. Box 6152, Orlando 32803
Sky Pirates, Albert Bursey — Sec.-Treas.
2336 Redwood Rd., West Palm Beach
Spaceport RC's, Inc., Robert Kimmel — Sec.
1211 Yale Lane, Cocoa 32922
Tampa RC Aircraft Club, Donald Haas — S.
1502 Bougenvilla Avenue, Tampa 33612
Tropic Aeros RC Club, C. Quick — S.-T.
1975 NW 36th Street, Miami 33142

GEORGIA

Albany RC Club, Frank Watson — V.P.
101 Marian Street, Albany 31704
Atlanta RC Club, R. L. Lamb — Sec.-Treas.
2479 Paul West Dr., College Park
Cobb County RC Mod. Club, Dick Norton
2798 Cottonwood Dr., Marietta 30060
Cobb County Sky Rebels, Dick Schneider
3346 Key Street, NE., Marietts 30060
Flying Eight Balls, Warren Lawrence — P.
2210 Tilson Circle, Decatur 30032
Robins Model Flyers, C. Manspeaker — P.
P. O. Box 546, Warner Robins 31093

HAWAII

Hawaii RC Club, Bob Barnes
169 Kuulei Road, Kailua 96734
Schofield Wheeler MAC, B. Conchin — Sec.
Dad's Club, Schofield Barracks 96557

ILLINOIS

Aero Angels, Tom Hoynacki — Secretary
8211 West Eastwood Avenue, Norridge
Aero Telemechanics Inc., Jack Burns — Sec.
827 South East Ave., Oak Park 60304
Alton Area Thunderbolts MAC, H. Morris
108 Herman, East Alton 62024
Campus RC Modelers, Harry Ryks — S.-T.
23 Hampton Dr., Glen Carbon 62034
Centreville Cadets, S. Andrews — S.-T.
120 Williamsburg Dr., Belleville
Champaign County RC Club, Carl Audo—S.
106 So. 6th St., St. Joseph 61873
Chicago Aeronuts, Peter Sotich — Sec.
3851 West 62nd Place, Chicago 60629
Chicagoland RC Modelers, Jim Kennicker
837 North Laramie Ave., Chicago 60651
Dekalb Cloud Dusters, Lester Forrer — Sec.
504 East Roosevelt St., Dekalb 60115
Illinois Iowa Aero Assn., Ron Pawlowski
5330 Grace, Chicago 60641
Illinois MAC, Charlie Sotich — Secretary
3851 West 62nd Place, Chicago 60629
Illinois Valley RC Club, Bill Adrian
Box 147, Dalzell 61320
Joliet RC Club, Tom O'Connor — Secretary
929 So. Cedar Rd., New Lenox 60451
Lakeshore RC Club, Joe Schilling — Sec.
521 Sumac Road, Highland Park 60035
Lily Lake Air Knockers, W. Morrison — P.
R. R. #1, Box 218, St. Charles 60174
Pelican MAC, Robert Elman — Sec.-Treas.
17707 Burnham Avenue, Lansing 60438
Palos Park RC Club, Harry Wood — Sec.
6750 South 79th Ave., Oak Lawn 60458
Peoria RC Modelers, John Rediger — Treas.
1012 Miller Street, Washington 61571
Prop Choppers, Gerald Krieger
130A Rear No. Main, Edwardsville
Quincy Flying Falcons, L. T. Boden — Sec.
1527 Cherry Street, Quincy 62301
RC Club of Chicago, H. Kelly — Secretary
18 Clark St., Glenwood 60425
Rockford Aeromodelers, James Bonser — S.
3117 Liberty Dr., Rockford 61103
Sentral Illinois Radio Society
309 Dooley Ave., Downs 61736
SKAT Club, Dr. Victor Carnelli — S.-T.
2714 Birchwood Lane, Deerfield 60015
Skylarks RC Club, Edward Migon — Sec.
299 Lincoln Lane, Wheeling 60090
Springfield Sun. Flyers RC Cl., G. Languell
1404 Fayette Ave., Springfield 62704
Suburban Aero Club of Chicago, E. Roberts
818 Elm Street, Flossmoor 60422
Tree Town Modelaires, Karl Zerbe — V.P.
7606 Woodridge Road, Woodridge 60515
Tri City Sky Steelers, A. Gonzales — Sec.
2417 Glen Place, Granite City 62042
West Suburban RC Club, Bill Teeters — S.
303 Myrick, Addison 60101

INDIANA

Bloomington Wing Kings, Herman Vaught
120 W. Rogers St., Bloomington 47401
Converse RC Flying Club, Ira Sherman
218 North 4th St., Elwood 46036
Ft. Wayne Flying Circuits, B. Schenkel—S.
1324 Sinclair St., Ft. Wayne 46808
Hamilton Fly Models, H. J. Vandiver — P.
28 Wilson Drive, Carmel 46032
Indianapolis RC Modellers, I. Hopper — S.
3511 North Grant Ave., Indianapolis
LaFayette Cloud Jockeys, W. J. Stump — S.
2733 Medford Street, LaFayette 47905
Maple City Modelers, Charles Sioner — S.
1915 West Clinton St., Goshen 46526
Midwest Sundowners Flying Club, J. Wallin
Box 159A, Sunset Dr., Chesterton
No. Indiana Model Aero Assn., K. Bunting
8041 Madison Avenue, Munster, 46321
Tri Valley RC Club, H. J. Nelson — Sec.
122 East Oakside St., South Bend
Whitewater Valley RC Mod. Cl., D. Herrick
1320 East 5th St., Connersville 47331

IOWA

Armstrong RC Society, L. P. Jensen — Pres.
Box 194, Armstrong 50514
Balsa Busters, Richard Feight — President
50 North Main, Council Bluffs 51501
Cedar Rapids Skyhawks, J. Robertson — S.
2008 East Avenue, NE., Cedar Rapids
Central Iowa Buzz Bugs, Ron Fisher — P.
R. R. #2, Marshalltown 50158
Des Moines Modelaires, Inc., Roy Stark
1106 68th St., Des Moines 50311
Dodger RC Club, E. M. Milenberg — Pres.
1278 7th Avenue North, Ft. Dodge
Northeast Iowa Modelaires, E. Marting — S.
104 West Center Street, Monona 52159

KANSAS

Hi Plains RC Club, B. Mowrgy — S.-T.
R. R. #2, Box 56, Kinsley, 67541
Mid-America Radio Controllers, J. Inman
2229 Swygart, Topeka 66605
Shawnee Mission RC Club, G. Anderson
10915 West 59th Terr., Shawnee 66203
Wichihawks
2214 South Pinecrest, Wichita 67218
Wichita RC Club, Raymond Boyles — Sec.
431 North Waco, Wichita 67202

KENTUCKY

Balsa Bees, Loren Warmon — Secretary
8106 Preston Hwy., Louisville 40219
Central Ky. RC Club, A. Morgan — V.-P.
1192 Devonport Circle, Lexington 40504
Cumberland Flyers, David Noll — V.-P.
Company A, 6th Bn. 3rd Inf., Ft. Campbell
Evansville RC MAC, Jim Conklin — Pres.
2625 South Cherokee Dr., Owensboro
Louisville RC Club, Robert Clark — Pres.
7900 Red Cedar Way, Louisville 40219
Owensboro Flying Ringmasters, B. Melvaur
1728 West 5th St., Owensboro 42301
Syntonic Aero Club, Bob Lutkengoff — S.
141 Ohio Ave., Ft. Thomas 41075
Tri State RC Club, R. Hotfield — Sec.
2316 E. Jepson St., Ashland 41101

LOUISIANA

Acadian RC Club, Charles Castaing — Sec.
P. O. Box 788, New Iberia 70560
Crescent City RC Club, Les Sanborn — Sec.
1010 Nashville Ave., New Orleans 70115
Dixie Flyers, Benny Miller — President
Rt. 2, Box 305, Houma 70360
Dyna Soarers MAC, J. Damare—Sec.-Treas.
5773 Wickfield Dr., New Orleans 70122
Ouachita R. Kontrol Soc., Ray Bedingfield
27 Elmwood Dr., Monroe 71201
Shreveport Area RK Soc., Ron Alexander
P. O. Box 8365, Shreveport 71108

MARYLAND

Aero Masters MAC, Dennis Redman — P.
2605 220th Street, Pasadena 21122
Baltimore Aero Craftsmen Mac, H. Weil—S.
3606 Monterey Rd., Baltimore 21218
Chesapeake Bay RC Club, Howard Griffith
704 Greentree Road, Linthicum 21090
Cumberland Aircraft Model Soc., R. Miller
Ave. C & F, Potomac Park, Cumberland
D.C. Maxecuters, E. Violet — President
3737 Marlbrough Way, College Park 20741
DC RC Club Inc., Dr. Carl Maroney — Sec.
11429 Cherry Hill Rd., Beltsville
Flight Streaks, Jim Booker — Vice-Pres.
3402 Cornwall Road, Baltimore 21222
Frederick MAC, John Patton — Sec.-Treas.
Route #5, Frederick 21701
Martin Modelers, Bernard Trent — Sec.
14 Hydroplane Drive, Baltimore 21220
Meade Modelers, V. F. Hendricks — Treas.
Attn: M22, NSA, Ft. Meade 20755
Mid Atlantic RK Soc., Paul Ennis — Sec.
211 Naylor Street, Salisbury 21801
National Capitol MAC, Larry Murphy — S.
5707 18th Ave., Hyattsville 20782
Pegasus RC MAC, Larry Miller — Treas.
533 North Mulberry St., Hagerstown
Prince Georges RC Club, Rodger Binger
15 Park Drive, Mitchellville 21109
RC Modelers of Baltimore, J. Green — T.
Route 2, Box 116, Phoenix 21131
Westminster Aero Modelers, B. Pease — P.
65 E. Main St., Westminster 21157

MASSACHUSETTS

Cape Ann RC Model Club, Bob Smith — S.
239 Central St., Rowley 01969
Cape Cod RC Aeromodelers, T. Crosby — S.
Hyannis Hobbies, 676 Main St., Hyannis
Charles River RC's, Richard Janson — P.
6 Pine Street, Wellesley Hills 02181
Hampshire County RC's, R. Yarrows — Sec.
5 Moody Bridge Road, Hadley 01035
Lawrence Air-Istrocrats, W. Leonhardt — P.
100 Abbott Street, Lawrence 01843
New Bedford MAC, Cindy Robinson — Sec.
8 Rodney Street, New Bedford 02741
New England RC Modelers, Jim Facey — T.
18 Orchard Street, Leominster 01453
Northshore Model Air. Assn., Dick Parletta
317 Broadway Street, Lynn 01904
Precision Modelers Assn., Phil Hinson
26 Bates Ave., So. Weymouth 02190

MICHIGAN

Aero RC Club, W. Mitchell — Sec.-Treas.
1406 Canniff Street, Flint 48505
Ann Arbor Airfoilers, R. Bremer — Sec.
2620 Hampshire, Ann Arbor 48104
Detroit Balsa Bugs, W. Hartung — S.-T.
14759 Kilbourne Avenue, Detroit 48213
East Wings Model Club, Ed Sanctorum — P.
2636 Marlborough, Detroit 48215
Flying Robots RC Club, Ed Heiser — Pres.
35483 West Chicago, Livonia 48150
Garden City MAC, Clarence Helm — Treas.
7718 Terri Drive, Westland 48185
Grand Rapids RC Club, John Wolfin—V.-P.
3971 Causeway Drive, Rt. #1, Lowell
Jackson RC Club, Rolland Benson — Sec.
862 Bellevue Avenue, Jackson 49202
Lansing Flying Aces, Robert Strobel — Sec.
10901 Skinner Highway, Dimondale 48821
Lapeer RC Association, A. Woodley — Sec.
1133 West Brocker Road, Metamore 48455
Livonia Rib Crackers, C. Rappley — Sec.
29824 Westfield, Livonia 48150
Michigan RC Club, Willard Vognoe — Sec.
20817 Sunnydale, Farmington 48024
Midwest RC Society, Inc., J. Porter — P.
7845 Wyoming Avenue, Dearborn 48126
Pontiac MAC, John D. Camp — Secretary
409 East Maryknoll Road, Rochester 48063
RC Club of Detroit, Mrs. H. Brett — Sec.
18864 Millar Road, Mount Clemens 48043
Saginaw Valley RC Club, Inc., Gerald Gill
2020 Lone Road, Freeland 48623
St. Clair Shores Modelers, Don Bambrick
27829 Rockwood St., St. Clair Shores
Seaway RC Club, Don Wilson — President
1775 Manz, Muskegon 49442
Signal Seekers Soc., Bernard Polzin — Sec.
317 South Hotka, Westland 48184
Strathmoor Model Club, D. Marshall—S.-T.
706 Hazelwood, Apt. 204, Detroit 48202
Whirlwinds MAC, Alan Steinke — Sec.
608 Park Street, St. Joseph 49085

MINNESOTA

Central Minnesota RC's, K. Bentz — S.-T.
Route #2, St. Cloud 56301
Minneapolis MAC, Dell Marchant — Treas.
2004 Hillsboro Ave. North, Minneapolis
Minneapolis Piston Poppers, Jeff Welliver
7525 59th Place North, Minneapolis
St. Paul Model RC Club, G. Anderson—Sec.
P. O. Box 8041, St. Paul 55113

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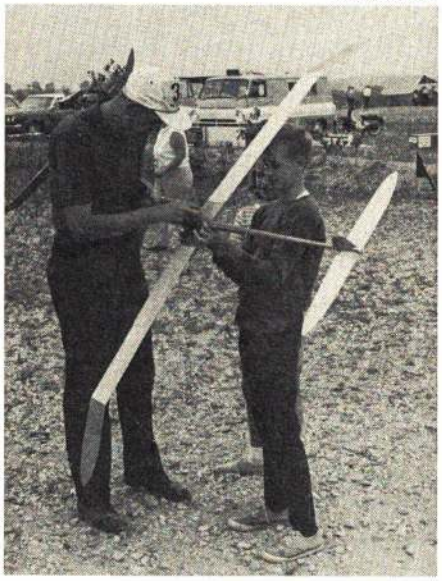
FAI free flight is a family affair, as shown by several combinations at the team fly-off last September at Bong Field, Wisconsin. At upper left is Dale Wilson with Nordic model and his youngsters. Upper right shows son Dick and Ed Dolby winding dad's Wakefield. At bottom is Frank Parmenter winding his Wakefield, with his son holding.

Frank Monts



Frank Monts

Frank Monts

FF Team Finals

Continued from page 43

final standings. Bill Hartill, early leader, flew strongly in all rounds, never dropping lower than 5th place at any time; his final position was 5th.

The A-2 flying was notable for the consistent high standard of flying which was demanded in weather conditions which were flyable at all times, but far from ideal mostly. This consistency is well illustrated by the fact that only six seconds separated the first three places at the end of 14 rounds!

No revolutionary Nordic designs were seen, indicating that A-2 development may have progressed to the point where major design improvement is not likely.

Tactical flying (polite nomenclature for "piggybacking" — the observance of a model in a thermal and a quick launch to try for the same thermal) was more in evidence than in the previous team final, but was reported to be generally much less successful.

FAI POWER

Use of tuned pipes was the major difference of the models at the 1968 team finals as compared with previous years. However, they were by no means universal. Reportedly, the tuned-pipe models were not obviously better performers. The only nonconforming design was Doug Joyce's canard (tail-first) which placed him 8th.

Bob Sifleet, Owings Mill, Md., took top honors. His 2688-second total for 15 flights was only a scant 12 seconds from the maximum possible. His low, 168-sec., flight occurred in round 2. This caused him to be placed 4th at the end of round 5, but his position improved to 2nd by the end of round 10 as others failed to max; and as he continued to turn in flawless flights while others dropped away, his eventual placing was first.

Sandy Norton, Pomona, Calif., whose final

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Chartered Clubs

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MISSISSIPPI

Capitol City RC Club, Bill Payne — Sec. 378 Naples Road, Jackson 39200
Mississippi Coast RC Club, P. Western 2500 16th Avenue, Gulfport 39501

MISSOURI

Eldon Model Club, P. O. Box 293, Eldon 65026
Hot Heads MAC, Bob Gaither — Secretary 3613 Ashoy Road, St. Ann 63074
K. C. Northern Knights MAC, G. Thompson 1114 E. 44th St., North Kansas City
Kansas City RC Assn., D. Linthicum — Sec. 10009 Cambridge, Kansas City 64134
LaFayette Esquadrille, A. Vogele — Sec. 703 Connie Lane, Manchester 63011
McDonnell RC Club, Bill Gillis — Sec. 1130 Laire, Bellefountain Neighbors
St. Charles Phantom Flyers, Ed Gross 431 Vine Street, O'Fallon 63366
Signal Chasers RC Club, Charles Rancilio 825 Avenue H, Lemay 63129
Sky Devils, Paul Woodford — President 5536 Highland, Kansas City 64110
So. St. Louis Yellow Jackets, A. Schafer 5400 Pennsylvania Avenue, St. Louis
Spirits of St. Louis Flying Club, B. Butters 2565 Bradwell Drive, Florissant 63033
Whiteman Aero Modelers, F. Dashnaw — P. Mobil Manor #73, Knob Noster 65336

MONTANA

Bozeman Air Tragedy Soc., C. Curtis—Sec. 1202 South Spruce Drive, Bozeman 59715
Helena Flying Tigers, M. Blanchard — Pres. Valley Speedway Road, Helena 59601

NEBRASKA

Aero Design Flying Club, R. Klone — Sec. 1212 South 10th Street, Lincoln 68502
Firedogs, Jess L. Graham — Sec.-Treas. 320 North 16th Street, Geneva 68361
Hastings Skylarks RC Club, Don Bruntz RFD #2, Hastings 68901
Mid Nebraska Model Club, D. Anderson—T. Box 125, Loomis 68958

NEVADA

Reno RC Club, James Freshman — Treas. 2865 Van Buren Lane, Reno 89503

NEW HAMPSHIRE

Concord Aeroguidance Soc., G. Prest-Sec. 24 Rumford Street, Concord 03301
S. New Hampshire RC Club, S. Jacques 177 Nashua Street, Milford 03055

NEW JERSEY

Burlington County RC Club, J Ehrich —S. RD 3, Box 3098B, Browns Mill 08015
Central Jersey RC Club, Ed Welsh — Sec. 227 Grove Street, Montclair 07042
East Coast Indoor Modelers, C. Wroz—Pres. 184 Oak Street, East Orange 07018
Garden State Circle Burners, John Miske D-3 Orchard Court, Clifton 07012
Islanders MAC, Glenn Peacock — President River Road, RD #1, Belle Mead 08502
Jersey Coast RC Club, W. Bayconich — Sec. 7 Peach Tree Road, Oakhurst 07755
Jersey Tailwinds, Walter Bechta — Sec. 24 South Sussex St., Gloucester City
Mercer County RC Club, R. Hamer — Sec. 45 Moran Avenue, Princeton 08540
Mis-Guided Missiles, E. Marine—Sec.-Treas. Linden Court, Millville 08332
Monmouth MAC, Inc., R. Sarpolus — V. P. 34 E. Highland Ave., Atlantic Heights 07716
North Jersey RC Club, Don Post — Pres. 40 Hill Street, Wyckoff 07481
Perth Amboy MAC, John Gyorfi—Secretary 636 Watson Avenue, Woodbridge 07095

Prop Snappers MAC, John Monts — Pres.
7 Rupells Road, Clinton 08809
Rahway Wings, Charles Fallstich — Pres.
89 Star Street, Iselin 08830
Rockaway Valley RC Club, Ed Hoffman—S.
158 Carpenter Street, Belleville 07109
Rockland County RC Club, J. Fowler—Sec.
39 Hering Rd., Montvale 07645
Sky Furys MAC, James Caroleo—President
Clinton Street, Clayton 08312
S. Jersey Flyaways, Inc., J. Gamble — Sec.
603 State Road, Mantua 08051
Thunderbugs, E. A. Franklin — Pres.
226 Harrington St., Bergenfield 07621
Tri-County RC Club, Eugene Cannon—Sec.
RD #1, Box 278R, Jamesburg 08831
Twin Boro Flying Club, Ed Paul — S.-T.
19 Clark Street, Dumont 07628
Vineland MAC, Philip Godlewski — Sec.
North Brewster Road, Vineland 08360
W. Jersey Radio Flyers, R. Viebrock — Sec.
17 Deerhead Drive, Boundbrook 08805

NEW MEXICO

Hobbs Aero Radio Kontrol Soc., J. R. Cox
101 West Alto Drive, Hobbs 88240
Southwest Aero Team, J. R. Bicknell — Sec.
12329 Princess Seanne, NE, Albuquerque

NEW YORK

Aeroguidance Soc., Inc., B. Young — Sec.
Box 52, Endwell 13760
Aero Radio Club of Syracuse, Ed Izzo—Sec.
3950 Highland Avenue, Skaneateles 13152
Blue Angels RC Club, Martin Meyer — Sec.
79 Charles Street, New Rochelle 10801
Flying Knights MAC, Jean Hultberg — Sec.
RFD #1, East Nassau 12062
Flying Knights of Hamburg, D. Holtz—Sec.
5581 Meadow Drive, Hamburg 14075
Island Model Plane Soc., R. Steele — Pres.
23 Raynham Drive, Syosset 11791
IBM RC Club, D. G. Buso — President
11 Maple Lane, Hyde Park 12538
Kingston Aeromodelers, R. Presendorfer
Box 118, Glenford 12433
Lazy Eight RC Club, P. Czelusniak — Pres.
229 Brookside Avenue, Amsterdam 12010
Long Island Drone Soc., O. Weingart — Sec.
251 Cedar Road, East Northport 11731
Meroke RC Inc., Earl Beer — Secretary
130 Bulson Road, Rockville Center 11570
Mohawk Valley RC Modelers, G. Yell—Sec.
5624 Mapleton Drive, Utica 13502
Nassau Aero Guidance Soc., J. Blohm—Sec.
12-43 147th Street, Whitestone 11357
New York Sky Blasters MAC, N. Cortijo—P.
182 South Street, New York 10038
Olean MAC, John Carls — Secretary
RD #2, Olean 14760
Oswego Valley Model Aires, R. Tetro—Pres.
172 Riverside Avenue, Fulton 13069
Pennsylvania Avenue RC Soc., Joe D'Amico
9224 Rost Place, Brooklyn 11236
RC Soc. of Marine Park, Dr. Jack Malkin
2731 Whiteman Drive, Brooklyn 11234
Sky Rovers Finger Lakes RC, D. Bowerman
72 Buffalo Street, Canadaigua 14424
Sky Scrapers of N. Y., Mal MacLean — Sec.
6 Larry Drive, Commack 11725
Squadrone Escarole, Inc., J. Sbare — Sec.
3240 Barker Avenue, Bronx 10467
Suffolk Falcons, James Reid — Secretary
P. O. Box 150, Westhampton Beach 11978
Suffolk Wings, George Bryant — Sec.-Treas.
201 Front Avenue, Brentwood 11717
Thundervolts R.C. Club, Frank Czech—Sec.
1857 7th Avenue, Watervliet 12189
Valley RC Model Club, Robert Dean—Pres.
77 Lincoln Street, Waverly 14892
Westchester Radio A. M., B. Ehrlich
40 Sammis Lane, White Plains 10605
West. N. Y. RC Pulsers, H. Dombrowski
7 Deborah Lane, Cheektowaga 14225

NORTH CAROLINA

Charlotte RC Club, John Perkins — Sec.

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National AMA Indoor Records as of October 1

AMA Ceiling Category I (not over 35')

Class A ROG	Established	Time
J — Bob DeShields	4-12-63	6:55.1
S — Larry Loucka	11-29-64	8:30.0
O — Hubert Entrop	4-15-61	12:10.0
Paper Stick		
J — Linda Randolph	11-27-66	8:28.0
S — W. James Skinner	4-21-63	8:50.0
O — James Richmond	3-24-68	12:49.8
B Stick		
J — Bob DeShields	3-8-63	8:57.6
S — Larry Renger	9-14-62	10:38.6
O — Stan Chilton	5-19-68	17.03.6
C Stick		
J — Kristi Tenny	12-23-67	8:57.0
S — Michael Fedor	4-3-68	12:54.0
O — W. Hewitt Phillips	3-10-68	19:30.2
D Stick		
J — Kristi Tenny	2-11-68	10:14.4
S — Tom Neumann	3-31-62	14:36.1
O — Harold Crane	4-21-68	16:46.2
B Cabin		
J — Jim Skarzynski	3-31-62	5:08.4
S — Neil Shipley	12-30-66	9:19.6
O — Dick Stamm	12-4-60	7:12.1
B Cabin ROW		
J — Dale E. Hacker	12-10-67	1:42.0
S — David Erbach	12-28-63	3:31.2
O — Ronald Ganser	4-5-64	4:51.0
C Cabin		
J — Ronald J. Ganser	12-12-65	3:48.0
S — Larry Loucka	4-27-63	9:12.0
O — Ronald Ganser	11-29-64	9:15.0
Autogiro		
J — Herbert Schubert Jr.	12-1-63	2:25.5
S — Edmund Smith	1-22-65	2:40.5
O — Ronald Ganser	12-12-65	4:19.0
Helicopter		
J — Dave Erbach	12-29-62	3:52.4
S — Nickey Jones	6-8-63	6:31.0
O — Walter Erbach	3-7-65	6:32.2
Ornithopter		
J — Dave Erbach	12-29-62	0:30.1
S — Edmund Smith	3-26-64	2:41.4
O — Ronald Ganser	4-5-64	3:07.0
H. L. Glider		
J — Bill Schubert	12-12-65	1:01.0
S — Bill Schubert	11-27-66	1:13.8
O — Ron Wittman	2-11-66	1:11.5
FAI Stick		
J — Kristi Tenny	12-23-67	8:01.0
S — Michael Fedor	3-24-68	11:06.0
O — W. Hewitt Phillips	2-26-67	16:59.0

AMA Ceiling Category II (35'-100')

Class A ROG	Established	Time
J — Don Chancey	12-22-62	8:10.9
S — Larry Loucka	12-29-63	10:19.5
O — Joseph F. Hindes	6-23-68	15:53.2
Paper Stick		
J — Linda Randolph	8-4-68	15:30.5
S — Larry Loucka	7-20-64	16:03.2
O — Robert Randolph	4-27-68	20:41.4
B Stick		
J — Linda Randolph	8-4-68	15:30.5
S — David Erbach	12-28-63	17:16.8
O — Robert Randolph	6-18-67	22:47.0
C Stick		
J — Linda Randolph	8-4-68	23:12.1
S — Larry Loucka	7-20-64	19:18.5
O — James Richmond	5-7-67	29:21.5
D Stick		
J — Ronald Roharik	5-6-62	20:37.0
S — Jim Skinner	5-6-62	22:59.2
O — Dick Kowalski	4-30-61	29:47.4
B Cabin		
J — Robert J. Dunham II	8-4-68	11:58.4
S — Dave Erbach	8-24-63	11:31.8
O — Al Rohrbaugh	6-18-67	18:25.0
B Cabin ROW		
J — Dan O'Malley	1-21-61	4:30.6
S — David Erbach	12-28-63	7:44.7
O — Warren Williams	4-19-64	9:15.8
C Cabin		
J — William Gibbs	8-4-68	11:58.0
S — Larry Loucka	7-20-64	18:06.4
O — Buck Servaites	8-4-68	20:08.5
Autogiro		
J — Herbert Schubert Jr.	12-29-63	2:10.0
S — Dave Erbach	3-7-65	5:02.2
O — Walter Erbach	3-27-66	6:32.8
Helicopter		
J — David Erbach	7-23-62	3:47.2
S — Nickey Jones	6-8-63	6:30.3
O — Walter Erbach	12-29-62	5:50.8
Ornithopter		
J — Robert Postage	8-4-68	2:04.0
S — Dave Erbach	4-27-63	1:15.0
O — Kenneth B. Johnson	6-23-68	5:15.2
H. L. Glider		
J — Bill Schubert	12-26-65	2:12.1
S — William E. Schubert	1-21-67	2:14.1
O — Donald A. Reed	8-4-68	2:10.6
FAI Stick		
J — Linda Randolph	8-4-68	23:12.1
S — Jan Servaites	6-23-68	14:38.2
O — James Richmond	8-4-68	31:07.8

AMA Ceiling Category III (over 100')

Class A ROG	Established	Time
J — Arthur Saltzman	9-29-40	10:09.0
S — Raymond B. Harlan	10-6-57	15:01.4
O — Joseph Foster	7-29-62	21:52.0
Paper Stick		
J — Linda Randolph	8-20-68	21:07.0
S — Raymond B. Harlan	7-30-57	19:48.6
O — Frank Cummings Jr.	5-10-64	24:52.2
B Stick		
J — Ronald Cummings	10-3-54	24:03.0
S — Don Kennedy	4-18-48	25:37.6
O — Tom Finch	6-3-62	34:15.6
C Stick		
J — Bob DeShields	4-14-63	27:17.0
S — Raymond B. Harlan	10-6-57	26:38.4
O — Thomas Finch	7-4-65	39:55.0
D Stick		
J — Daniel Champine	6-22-65	25:45.4
S — Drew Morris	7-8-62	30:26.0
O — Ernest Kopecky	8-2-63	43:42.0
B Cabin		
J — H. Kaczynski	7-5-40	12:42.4
S — Raymond Harlan	8-31-58	18:24.4
O — Frank L. Cummings Jr.	10-23-61	25:44.0
B Cabin ROW		
J — Stephen Stackhouse	8-27-61	3:06.4
S — David Call	6-13-42	13:13.0
O — Anthony D'Alessandro	10-16-65	17:20:0
C Cabin		
J — Randy Richmond	7-26-65	18:33.3
S — Raymond B. Harlan	9-22-57	19:21.8
O — Joe Bilgri	11-10-63	29:06.3
Autogiro		
J — Edward A. Vargo	4-11-42	3:53.8
S — David Erbach	9-5-66	5:27.4
O — Fred J. Weitzel	6-11-67	8:27.0
Helicopter		
J — Curtis B. Lee	9-5-65	4:38.2
S — Edmund Smith	10-6-63	6:45.6
O — Hal Cover	7-29-62	8:11.0
Ornithopter		
J — Edward A. Vargo	12-27-41	1:18.0
S — John Bock	1-3-42	3:22.0
O — Fred J. Weitzel	6-11-67	4:30.5
H. L. Glider		
J — Randy Richmond	7-26-65	2:08.8
S — Arthur Markiewicz	7-25-67	2:20.2
O — Curt Stevens	4-11-65	2:50.4
FAI Stick		
J — Linda Randolph	8-20-68	11:02.0
S — (No current record)		
O — (No current record)		
FAI Stick (FAI Ceiling Categories)		
I — JSO — Stan Chilton	5-19-68	17:52.8
II — JSO — Stan Chilton	6-17-67	17:15.0
III — JSO — James Richmond	8-3-67	33:47.5
IV — JSO — James Richmond	7-24-67	28:52.0

A Junior's View of the Nats

by Kathy Mollica

It's different! Quite different from any contest I have ever been to.

Although the weather left something to be desired, everything was great. The organization was fantastic as were the people.

I heard there were a lot of people who attended the Nats, but I didn't expect to see and meet as many people as I did. I had the privilege of meeting interesting people such as the AMA president's wife, Charlene Werick; the *Model Airplane News* editor, Walter Schroder and his son Butch; the defending U-Control champion Dick Loomis; Mr. Phil Kraft; F & M Electronics representative, C. G. Hoover, and many, many, many other people.

Until the Nats, I had never heard of Free Flight, and was fascinated to see how they worked. I might even try it myself sometime.

To promote Junior participation, there was a Delta Dart contest held for kids between 5 and 15. When you registered for the contest, each person got a kit that had to be put together. My brother, Mike, and I took part in this event. Although we didn't place, we had fun trying to beat each other. One word of advice: don't take practice flights AFTER the contest. You might cry! Mike thought he would be smart and have one last flight before we left the hangar. It was 35 seconds, which would have placed him 2nd in the contest.

The Nats is a completely new adventure for young and old alike, and I can't wait to get to Philadelphia next year to see my old friends and make new ones too. Who knows, I might even compete, too!

(Reprinted from Watts New, *voice of the Fresno Radio Modelers, Inc., Fresno, Calif.)*

Now is the Time to Start Beginner Programs

Winter being upon most of us now, this is an ideal time of year to kick off a program to introduce newcomers to model airplanes. During the cold days to come, when outdoor activities are at a minimum, youngsters will be eager to settle down to an interesting, instructive, building and flying session.

Why do it? Most all of us have desire to introduce to others the activity from which we derive so much pleasure. And cooperation is readily obtained from civic-minded organizations that have been convinced of the character-building aspects of the activity.

How to do it? There are many ways, depending upon one's own personal interests, the organizations to which he belongs, his place of employment, his promotional abilities, etc.

Keep in mind that it has been proven that best results come when an inexpensive, easy-to-build, sure-to-fly model is introduced to rank newcomers. Modern technology has affected everyone, especially youngsters whose attention-span already is short, so that good, meaningful results are necessary within a short time — at least until the "bug" takes hold. Many models that present-day experienced modelers started with just won't do for most of today's young people. For instance, what may now seem like an extremely simple operation to you — the bending of a wire for a rubber model prop shaft — is a real stumbling block for 12-year-olds.

A beginner's model which has had repeated success (not necessarily to the exclusion of other beginner's models presently being developed) is the AMA Cub, produced in kit form by Sig Mfg. Co. at low cost. This rubber-powered model of 12-inch wingspan, designed by AMA Technical Director Frank Ehling, can be built completely ready to fly in about two hours (if not too much glue was used). Beyond the kit, the only things needed are a few straight pins, single-edge razor blade, and white glue.

As an individual, it is possible to do a number of things. For instance you can buy a few AMA Cub kits from hobby shops (35c each), and gather the neighborhood kids together for a building and flying session. Or you can contact a neighborhood youth group (Scouts, boy's club, recreation center group, etc.) and interest them in the project; by offering your services and know-how as instructor and organizer, leaders of such groups would welcome you with open arms. Perhaps more important than anything else you can do, if you are a member of a model club, is to push for the club to adopt a Junior program. Note the following, which indicates how clubs and sponsors can work together.

As a model club, with more manpower available, opportunities exist for promoting model airplanes on a grand scale. If the club is a large one and the treasury is in good shape, perhaps it would want to proceed on its own. Special order blanks from AMA HQ for AMA Cub kits from the manufacturer allow for a purchase of 1,000 kits for $160, a cost of just 16c each.

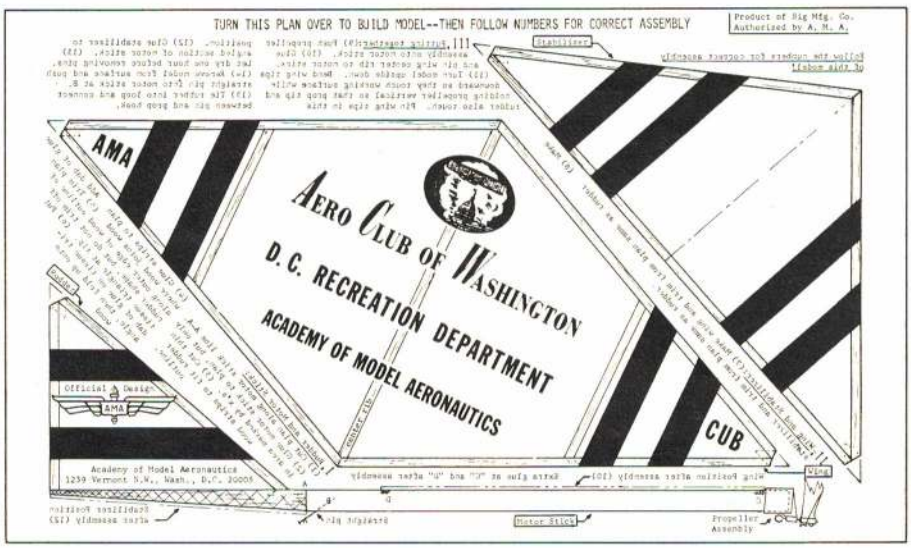
But a going AMA Chartered Club carries substantial prestige in the community. Here, then, is an opportunity to obtain sponsorship for a good-sized building-flying program which might culminate in a city-wide competition with prizes for outstanding models. With use of the AMA Cub model kit, a club has a substantial selling point for a sponsor beyond the values intrinsic in the activity: the model is designed so that there is a large space on the wing covering within which an advertising message can be printed. Such imprinting on orders of 1,000 kits is included with the basic price; advertising for several organizations may be included (see illustration).

If a club does enlist a sponsor with a large program in mind, it should figure on providing members as instructors for the youngsters at a number of well-distributed locations. Another way, which serves the same purpose if, for instance, a number of recreation centers are involved, is for club members to train the recreation center leaders who, in turn, will instruct the youngsters.

In keeping with the idea of a winter program, the AMA Cub models preferably should be flown indoors. Yet, they fly equally well outdoors if no sufficient area, such as a gymnasium readily is available.

For a big program, best idea is to start now, immediately, in order to allow time for getting all the wheels in motion, sponsorship secured, kits obtained, publicity outlined, flying site secured, etc.

How about putting on the wind-up contest during the Christmas school vacation? Easter school vacation is another good time. Look for opportunities when youngsters are not tied down by other activities.



AMA Cub kits offer unusual advertising opportunity for Junior program sponsors. Wing area is available for an ad, provided free when kits are ordered in 1,000 lots. Details from AMA HQ.

Chartered Clubs

Continued from page 47

Route 5, Box 1078, Charlotte 28208
E. Carolina RC's, Garland Williford — Sec. 514 March Lane, Goldsboro, 27530
Gastonia RC Club, Reid Sipe — Sec-Treas. 1710 Wildwood Road, Gastonia 28052
Greensboro RC Modelers, Jesse Dean Route 4, Box 519K, Greensboro 27406
Modeler's Paradise, Bill Pfister — Pres. 1501 Griffith Road, Monroe 28110
Montgomery Randolph RC Club, J. Pugh Box 455, RFD 1, Franklinville 27248
Piedmont Aeros. Inst. Airmites, B. Powell Smith-Reynolds Airport, Winston-Salem
Skymasters of Raleigh, C. Douglas Holland 3517 Fernwood Drive, Raleigh 27609

NORTH DAKOTA

Red River RC Club, Carl Jude — Secretary Box 3485, Grand Forks AFB 58201

OHIO

Alliance Balsa Bees, C. Wagoner — Pres. 1486 Lilly Lane, Alliance 44601
Capital City Controlliners, C. Hemmerly 5607 Sandlewood Bend, Columbus 43224
Central Ohio Free Flight Club, Lou Willis 1006 East 12th Avenue, Columbus 43211
Central Ohio Old Timers Society 113 West High Street, Fostoria 44830
Central Ohio RK Club, R. Bluestone—Pres. 2696 Halleck Drive, Columbus 43209
Cincinnati Aeromodelers, Gerhard Vogeler 2873 Carroll Drive, Cincinnati 45211
Cleveland RC Club, Roger Zucker — Pres. 815 Superior Ave., Room 1520, Cleveland
Dayton Buzzin' Buzzards, Daniel Rheim 118 E. Foraker, Dayton 45409
Dayton Wingmasters, M. Richardson—Pres. 7130 Claybeck Drive, Dayton 45424
Electronic Flyers, Robert Crowl — Sec. 712 Wildwood Dr., Mansfield 44905
F.O.R.K.S., Art Feigley — Sec.-Treas. 331 Lewis Avenue, Lancaster 43130
Lake Erie Gas Model Club, Dick Woodward 6150 West 54th Street, Parma 44129
Lakewood Flite Masters, Dennis Glaeser P. O. Box 2631, Lakewood 44107
Newark MAC, Don Colangelo — Sec.-Treas. 247 Concord Ave., Heath 43055
Northern Ohio Free Flight Assn., T. Jones 2021 Lakeland Ave., Lakewood 44107
Prop Busters, Anthony Christopher — Pres. 30062 Frank Drive, Wickliffe 44092
RC Short Circuits Club, Bill Gaston — Sec. 418 West Lincoln Way, Lisbon 44432
S.H.O.O. Flyers MAC, Stephen Stanford P. O. Box 89, Ohio City 45874
Skylarks, Robert Ellis — Secretary RD 2, Box 435, Hubbard 44425
South West Ohio Free Flighters, Bob Pione 10340 Southwind Drive, Cincinnati 45242
Suburban MAC, R. Altenburger — S-T 931 Georgette Lane, Cleveland 44109
Toledo Weak Signals Club, R. Grabenstetter P. O. Box 5772, Wernert Station, Toledo
Trumball County RC Modelers, Dick Culp 478 Iowa Street NW, Warren 44485
Western Ohio RK Soc., R. Wetzel — Pres. 2635 Ferncliff Ave., Dayton 45420
Wing Busters Aeromodelers, Steve Brazill Box 17378, Lockbourne AFB 43217

OKLAHOMA

Muskogee Modelairs, Rick Webb—V-Pres. 205 Kent Drive, Muskogee 74401
Northwest Ok. Min. Aircraft Develop. Soc. NW Hobbies, 1736 Cherry St., Alva 73717
Okla. City Controliners, Bill Dove — Pres. 3713 NW 58th St., Oklahoma City 73112
Ponca Skeeter Pilots, Dale Courtney 1712 Potomac Drive, Ponca City 74601
Radio-U-Control Free Flight Soc., G. Post 2109 West Sherwood, Stillwater 74074
Tulsa Glue Dobbers, Bill Jacobs — Sec. 4241 East 24th Place, Tulsa 74114

OREGON

Eugene Prop Spinners, S. Roberson
1481 W. 24th Pl., Eugene 97405
Eugene RC Aeronauts, H. Barckley — Sec.
1071 Diamond Street, Eugene 94701
Falcons, Tim Dunlop — President
8530 East Burnside, Portland 97216
Fly-A-Ways RC Club, Bob Brown — Sec.
12775 Southwest Bowmont, Portland 97225
Klamath Basin Model Club, Larry Burton
111 Trinity Street, Klamath Falls 97601
Portland Stardusters RC Model, K. Thorstad
4503 North Interstate Ave., Portland
Rogue Eagles RC Club, R. Hawkins — Pres.
Route 3, Box 226-B6, Medford 97501
Salem RC Pilots Assn., Tony Caragol — Sec.
573 Manbrin Dr. N., Salem 97303
Willamette Modelers Club, Earle Moorhead
548 NE 21st, Salem 97301

PENNSYLVANIA

Allegheny Model Aeronautics Council,
29 Maplewood Ave., Pittsburgh 15025
Beaver County MAC, George Yeager—Pres.
RD 1, New Brighton 15066
Blue Mountain Buzz Bombs, Herbert Hazell
2955 No. 7th St., Harrisburg 17110
Bucks County RC Club
244 Bustleton Pike, Featerville, 19048
Delco RC Club, W. Geissinger — President
1033 First Ave., Media 19063
Erie Model Aircraft Assn., Victor Didelot
421 Rondeau Drive, Box 8212, Erie 16505
Flying Dutchmen MAC, P. Spillman — T.
3902 Grant Street, Reading 19606
Flying Falcons, Robert Mohr — Secretary
Box 221, Fogelsville 28700
Glenside Air Scouts RC Club, J. Salisbury
2909 Joyce Road, Roslyn 19001
Golden Eagles, William Gove — President
605 Bickmore Drive, Wallingford 19086
Greater Erie Modeling Soc., L. San Frotello
109 Elk Street, Lake City 16423
Hedgehoppers MAC, Stanley Bucior—Sec.
RD 1, Box 90B, Sellersville 18960
Keystone RC Club, J. Bachelor — Secretary
732 Longshore Ave., Philadelphia 19111
Lancaster RC Club, T. A. Eck — President
78 Pitney Road, Lancaster 17603
Laurel Highlands MAC, J. Cline — Sec.
922 Main Street, Latrobe 15650
Lehigh Valley RC Soc.,
P. O. Box 2203, Allentown 18001
Mercer County MAC, Tedd Engstrom
Box 167, Greenville 16125
Penn-Ohio RK Soc., Zach Allerton — Pres.
124 Richeleu Ave., New Castle 16101
Philadelphia RC Inc., Jay Gerber — Pres.
1142 Longshore Ave., Philadelphia 19111
Philadelphia Sky Pirates, S. De la Veaux
4820 Fillmore Terrace, Phila. 19124
Pittsburgh Aero Modelers, Ron Ganser
1745 Brett St. Pittsburgh 15205
Quaker City RC Club, Jack Healy
P. O. Box 6674, Philadelphia 19149
St. Mary's Area RC Soc., J. Floria — Sec.
123 Fourth Street, St. Mary's 15875
Science Park Aero RC Club, L. Lang —Sec.
835 Church Drive, State College 16801
Sky Masters, Carl Critz
1236 Wendover Road, Rosemont 19010
Tri County Wing Snappers, Earl Stoyer
210 Washington Street, Schuylkill Haven
Valley Forge Signal Seekers, Jack Salmon
221 Waterloo Avenue, Berwyn 19312
West Hills Aeromodeling Kontroline Soc.
30 Ingram Ave., Pittsburgh 15205
York Line Tamers, Charles Fink
165 Scott Road, RD 8, York 17403

RHODE ISLAND

North End RC Club. David Simpson
9A Penbryn Ave., Smithfield 02917
Rhode Island Aeromodelers, Bob Cassity
141 Sumner Ave., Warwick 02888
Rhody Aero Guidance Soc., Walt Pasciak
74 Oakland Ave., Cranston 02910

Continued on page 50

Record-breakers and officials at 1968 Labor Day weekend FAI trials at Dahlgren Naval Weapons Lab in Virginia are shown in upper photo. L-R, back row: Maynard Hill, AMA's FAI Coordinator; Ray Smith and glider which reached record height of 4,330 feet; Ernie Conrad and Roger Boutchyard, radar tracking operators; Tom Rankin and seaplane which was clocked at record speed of 83.8 mph. Bottom row: Doug Smith, ass't.; Dr. Jack Symborski, C.D.; Carlton Middlebrook, ass't. C.D.; Jack Newman, ass't. Lower left photo shows Tom Rankin of Maryland and record-breaking RC seaplane which was converted from an experimental FAI pylon racer. Repaired after first-day crash, model bettered previous flight. At lower right Bob Scott of Virginia, former holder of RC world speed record at 126 mph (1963), is shown with 1968 plane entered by him and Ernie Green.

Once Over

The National Free Flight Society awarded the Dick Black Memorial Service Award to Hardy Brodersen during the 1968 Nationals for his excellent work in preparation of the first Annual NFFS Symposium.

The unofficial indoor flying scale event held in conjunction with the '68 Nats exceeded expectations, says Jim Root, who directed the event. Winners were Thomas Peadon (pre-WW I), Jed Kusick (WW I), Don Garofalow (inter-war), and Russ Kuhlen (WW II and racing). Other unofficial events were for Coupe D'Hiver, payload, clipper cargo, and old-timer models.

Interesting idea of the B.I.R.D. Club, Long Beach, Calif., is the Model of the Month feature of its meetings. Judging takes into account whether the model was built from scratch (from plans and all parts cut out and assembled by modeler) or prefab, whether the model was built by the owner, whether model was of original design or was scaled up from original plans, and for workmanship. July winners were Ed Rambo and Joe Stream, according to *Birds Eye Views*, official newsletter of the club.

National AMA records for Senior and Open Control Line Endurance models as reported in the September "Model Aviation" were in error. Problem was that the models reported to have set new records were powered by .15 cu. in. engines, while the rules require an engine of from .19 to .36 cu. in. Regrettably, this oversight was not caught in time to correct the initial error, although the listing for this category in the November issue was corrected.

Deserving of special mention is Bud Romak, manager of AMA's World Championship Indoor Team, competing in Rome, Italy, as this was written. In addition to administering the program for selecting the three-man team, Romak took upon himself the chore of obtaining additional financial support beyond that provided in the AMA program. He was very successful not only in this venture, but also with obtaining sponsors for the National Contest (Nats). Contributions came from steel suppliers who deal with the Romak Steel Co., which is run by Bud and his dad in Moraga, Calif. Shows what can be done by dedicated modelers. Others who have helped in this manner are Bill Lank of Dallas, Tex., and Dick Maystead of Sepulveda, Calif. Aren't any of our other AMA members in similar industry positions outside of the model business?

Richmond Wins Indoor

James Richmond (Ill.) was individual winner of Indoor World Championship at Rome, Italy. Czechoslovakia was team champion; U. S. placed second, Germany third. Clarence Mather (Calif.) placed 6th; Al Rohrbaugh (Ind.) 15th.

FF Team Finals

Continued from page 46

standing was 2nd, waited until the 12th round before messing up his up-to-then perfect score. He was fortunate that he did not miss the mark by far, with 167 seconds in round 12 and 150 seconds in round 13. Two additional maxes in the final rounds assured his high place.

Henry Spence, Arlington, Tex., came in third to gain his position on the U.S. FAI Power team. Spence missed maxes in the 3rd, 7th, 12th and 13th rounds for a still remarkable score of 2626 seconds out of a possible maximum 2700-second score. Bob VanNest was runner-up with 2552 seconds.

WAKEFIELD

George Xenakis was the first placer in the Wakefield team finals to make him a member of both the Nordic and Wakefield teams — a terrific accomplishment. His 15-flight total was 2578 seconds. Joining him on the Wakefield team are George Reich, Cleveland, Ohio 2567-sec. total); and Herb Kothe, Boulder, Colo. (2534-sec.).

Experience — these modelers have it. Reich was Wakefield World Champion in 1961; both Xenakis and Kothe have previously competed in World Championships, each being on the 1967 Wakefield Team. (None of the Nordic and Power Team are repeaters from 1967.)

Thermals play a big part in any free flight event, especially in these. Xenakis brought an electronic thermal sniffer as an aid, while Kothe and Reich seemed to rely on visible signs and instinct.

Power patterns of all three winning models was extremely smooth. None exhibited a bit of excessive bank or dip as the torque of the wound rubber started to fall; every inch ounce of torque was used for altitude. Props ran true and free of vibration.

Models of all three team members were neat, practical and straight-forward. Xenakis had torque-controlled stabilizer incidence, and Reich had a polyethylene tube inside his tissue-covered fuselage. The tube keeps the rubber lubricant off the tissue, and it softens the blow of an exploding, over-wound rubber motor. Reich blew two motors during the team trials.

The nose block, prop shaft assembly used by Kothe and Reich was a simple wood and wire affair with thrust bearings and rubber tubing. Some of the other models had such superb pieces of machinists' skill up front that it would take several full feature articles to describe them.

Our thanks to Frank Monts and Ed Lidgard for supplying the commentary from which the foregoing was excerpted. Special thanks go to Floyd Miller, Columbus, Ohio, for his administration of the team selection program. He also was Nordic event director at the finals, assisted by Pete Sotich as Power director and Bill Bogart as Wakefield director.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

Dec. 8 — Taft, Calif. (AA) SCAT Scramble FF Meet. Site: Gardner Field. B. Bogart CD, 469 Paulette Pl., LaCanada, Calif. 81011. Sponsor: **Southern Calif. Aero Team.**

Dec. 28-30 — Sebring, Fla. (AAA) 15th King Orange International Meet for FF & CL. Site: Sebring Air Terminal. S. Slater CD, 42 Magnolia, Sebring, Fla. 33870.

Dec. 29 — Fresno, Calif. (A) Fresno Monthly FF Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr. W., Fresno, Calif. 93702. Sponsor: **Fresno Gas Model Club.**

Dec. 29-31 — RCACF Field, Fla. (AA) Tangerine International RC Championships. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789. Sponsor: **Remote Control Assn. of Central Florida.**

Chartered Clubs

Continued from page 49

SOUTH CAROLINA

Charleston RC Soc., Elmer Riggin — Pres. 5727 Oleander Dr., Hanahan 29406
Columbia Aero Nuts, Bob Cory — Treasurer 212 Hanover Ave., Columbia 29203
Dixie RC Control Flyers, George Stiefel 3721 Augusta Road, Aiken 29801
Florence Aeronautical RC Club, J. Dewees 708 Manchester Ave., Florence 29501
Florence MAC, Inc., Ernest Lowry — Sec. 875 Pearl Street, Darlington 29532
Green Wood Aeromodelers, G. Sargent Route 3, Box 365, Greenwood 29646
Sumter MAC, Charles Johnson — Secretary P. O. Box 621, Sumter 29150
Western Carolina RC Club, Henry Williams 103 Alpine Dr., Taylors 29609

SOUTH DAKOTA

Flying Eagles Model Club, John Donovan 1409 Thompson Drive, Sioux Falls 57105
Rapid City Propbusters RC, C. Besancon 4926 Pierre Street, Rapid City 57701

TENNESSEE

Coffee Air-Foilers, Jim Perdue — Secretary 603 Crestwood Drive, Tullahoma 37388
Lebanon RC Specialists, Larry M. Farris Box 128, Lebanon 37087
Memphis Propbusters, Lester Goldsmith, 38 Northwood Drive, Memphis 38111
Memphis RC Club, Richard Stewart 2104 Belover, Memphis 38127
Middle Tennessee RC Soc., Henry Waechter 4428 Alcott Drive, Nashville 37215
Rutherford Air. Mod. Soc., Ross Babits, 110 East Vine Street, Murfreesboro
Sodbusters, James Scarbrough, Pres. Route 1, Ford Road, Lenoir City 37771
Tenn. Valley RC Club, Paul Wright, Jr. 4606 Murry Hills Drive, Chattanooga
Tri-Cities Aeromodelers, Merwyn L. Chase 117 Green Hills Drive, Kingsport 37663

TEXAS

Alamo RC Society, Harry Pullen, Pres. 714 Marquis Lane, San Antonio 78216
Amarillo Radio Kontrol Soc., C. Culver 8500 Triangle Drive, Amarillo 79107
Austin RC Association, Harvey Hobbs 4615 Banister Lane, Austin 78745
Beaumont RC Club, Don Still, V. Pres. 306 Orleans, Beaumont 77701
Corpus Christi Bees, Howard Tilley, Pres. Box 7337, Corpus Christi 78415
Cowtown Circle Burners, B. F. Davis, Pres. 1613 Carl, Fort Worth 76103
Dallas Aeromodelers Assn., John Clemens, 1905 Greenville Avenue, Dallas 75206
Dallas Cloud Climbers, Charles Sturgill, 621 Sparks Drive, Grand Prairie 75050
Dallas RC Club, Frederick Warming, Sec. 709 Bowman Street, Irving 75060
Flying Chaparrals, Murry Style, Pres. 3625 Shell, Midland 79701
Fort Worth Planesmen, R. E. Latham, Sec. 4121 Field Street, Fort Worth 76117
Golden Triangle RC Club, J. Groom, Pres. 1804 Mimosa Drive, Arlington 76010
Gulf Coast Remote Con. Assn., B. Shepherd 1308 East Polk Street, Victoria 77901
Houston Free Flight Model Club, W. West 2235 Coryell, League City 77573
Houston RC Club, Raymond J. Heller, Sec. 310 Stratford, Houston 77006
Mad Modelers (Aircraft Division) Box 563, Mesquite 75149
Manned Spacecraft Cen. RC, J. McPherson 219 Coronation, Houston 77034
Odessa Prop Busters Club, Webbie Russell, 1207 Smith, Odessa 79760
Pasadena Prop Proppers, Herbert Bowers, 1314 Tupelo, Pasadena 77502
Rev-Devils of Dallas 9903 Witham, Dallas 75220
Richardson RC Club, Ed Hurt, Sec-Treas. 2402 Fairway Drive, Richardson 75080
Sidewinders MAC, Ben H. Bartels 2114 Santa Anna, San Antonio 78201

UTAH

Utah State Aeromodelers, Larry Lutton 1363 Dupont Avenue, Salt Lake City 84116

VIRGINIA

Brainbusters Model Club, Don Orr, Pres. 102 Beckfield Drive, Newport News
Fairfax Model Assoc., J. Clawson, Treas. 1846 Lusby Place, Falls Church 22043
Flyaway RC Club, W. L. Phillips, Pres. 2105 South Pierce Street, Arlington
Norfolk Aeromodelers, Tim Palmer, Pres. 846 West 48th Street, Norfolk 23508
Northern Virginia RC Club, Tony Little 3025 Kadola Place, Falls Church 22042
Richmond Area RC Club, Inc., W. Gentry, 1200 Vickilee Road, Richmond 23235
Skyline RC Club, J. D. Ross, Sec. 2201 Forrest Drive, Waynesboro 22980
Southeastern Virginia RC Group, W. Conklin 915 Thornbriar Court, Hampton 23361
Thunderbird RC Club, Nelson A. Rose, Pres. 43 Jarvis Road, Chesapeake 23323
Tidewater RC Club, H. L. Bruff, Jr., Sec. 8012 Danbury Drive, Norfolk 23518

WASHINGTON

Balsa Hawks of Renton, Vernon Graham 705 E. Street, Renton 98055
Barons, Manuel Arriaga, Sec. 8919 East Maringe, Spokane 99206
Everett Radio Modelers Assn., D. Saunders Box 313, Marysville 98270
Kent Strat-O-Bats, John B. Crosetto, Jr. 14809 Southeast 54th, Bellevue 98004
Mt. Rainier RC Society, Ken Crawford, Sec. 1417 East 97th Street, Tacoma 98445
Nor'Westers, Keith Alberts Route 1, Box 610, Ridgefield 98642
Palouse Ridge Runners, Dwane Sorenson 205 Taylor, Pullman 99163
RAMS, George E. Hickson, Sec-Treas. 11809 18th Street SW, Seattle 98146
Sea Airs MAC, Don McLeod Route 2, Box 314, Walla Walla 99362
Seattle Radio Aero Club, Wayne Nodland 9909 227th Place SW., Edmonds 98020
Seattle Sky Raiders MAC, R. F. Stevenson 8326 17th Avenue, Northwest, Seattle
Tacoma Model Aires, Bruce W. Gale 811 9th Avenue Southwest, Puyallup
Tri City Modelers, Gerald B. Becker, Sec. 2403 Torbett, Richland 99883
Walla Walla Org/Radio Kontrollers 26 South Roosevelt, Walla Walla 99362

WEST VIRGINIA

Cen. West Va. Model Club, J. Bush, Pres. 349 Court Street, Weston 26452
Flying Hillbillies, J. S. Hudnall Route 1, Shawnee Est., Winfield 25213
Hill Hoppers, William Slaughenhoupt, Pres. 4 Bethany Pike, Wheeling 26003
Valley I.F.O.'s MAC, W. L. Seckman III 3000 Fernwood Avenue, Moundsville
Vienna Sky Sharks MAC, H. Nilsen, Sec. 1003 27th Street, Vienna 26101

WISCONSIN

Black Hawk RC Club, D. Condon, Pres. 1117 Woodman Road, Janesville 53545
Green Bay R.U.F. Club, R. Cowles, Jr. 2424 Ducharme Lane, Green Bay 54301
Lakeland RC Club, Robert Wischer, Treas. Rt. 1, S/221 Lapham Peak Rd., Delafield
Marathon Modelers, Wm. D. Backer, Pres. 3118 10th Street, Wausau 54401
Milwaukee Flying Electrons, F. Morrissey 14100 West Park Avenue, New Berlin
Tri-City Radio Controllers, G. Reinhard 1513 Lincoln Heights, Beloit 53511
Valley Aero Modelers, John A. Schmeiding 2118 North Division Street, Appleton

Jerry Nelson on R/C

Caught just after takeoff at Nelson Glider Ranch in California is Paul Sherlock's now famous model of Boeing 747 Jumbo jetliner.

One of the most active modelers in the nation views the R/C scene.

What is professionalism? The subject of professionalism in R/C competition has been the subject of much recent debate. Thought I might as well toss my comments into the hat too.

What is a professional in terms of R/C competition? I say a pro is one who competes for prize money that constitutes a major portion of his income. Do we have contests in which such large portions of prize money are given out? No. We have very few contests where money is given for prizes and, when money is given out, the amount hardly covers the cost of attending the meet. So, what is this professionalism problem?

Just because certain individuals (a very small group indeed) who earn their livelihood in R/C manufacturing occasionally win contests, why do some people label them professionals? These guys are just modelers, not professionals. They have to practice like everybody.

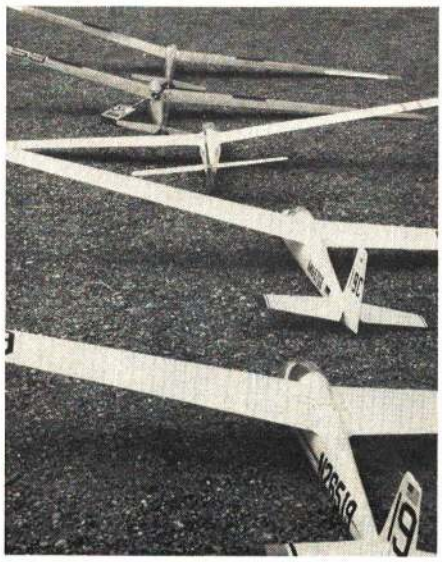
I think that the people who cry out professionalism are, in reality, poor losers. It is an excuse to cover up their lack of ability. All it takes to win a big meet like the Nats is ability and skill. Unlimited supply of R/C equipment won't help your chances a bit. It is up to the flyer to push those levers, and not up to his pocketbook.

San Jose Wavemasters contest: Attended the San Jose Wavemasters precision contest August 10-11. Was the first R/C meet by this group. Would you believe that this contest was one of the biggest ever held in Northern California? It would also rank as a larger-than-usual meet in Southern California, too. Over 60 entries were counted.

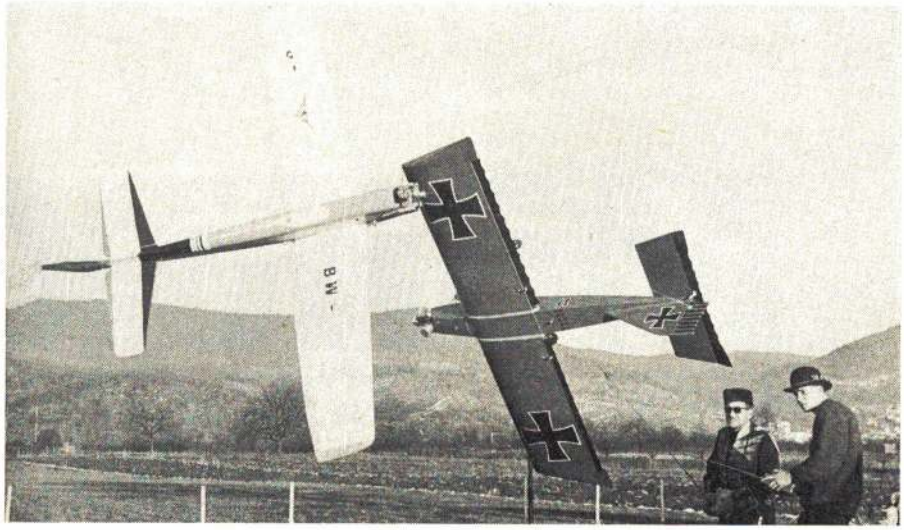
Scale entry was by far the largest I have seen in recent years in a Stunt/Scale meet. Floyd Carter from the Pioneers club came out on top with a near perfect Aeronca Champion. Floyd had an excellent source

Continued on page 58

After considerable experimentation, Pioneer R/C Club of California has a successful flying banner towed by Ben Gadberg's model. Could this lead to some commercial application?



Inaugural meeting of National R/C Soaring Society (NRCSS) allowed for plenty of fun flying. Giant gliders await turn for a tow.



An alert camera fan caught a Taurus and Ugly Stik which seem to be colliding. Flyers are trying to avoid the inevitable. Fact is the picture was rigged, but how?

SOMETHING REALLY NEW UNDER THE SUN!

SUPER MONOKOTE™ TRANSPARENTS

Pat. No. 3,388,651

THE COVERING WITH THE BUILT-IN-FINISH

TOP FLITE

Introduces Brand New TRANSPARENT SUPER MONOKOTE

GIVES YOUR MODEL A GLOWING BRILLIANCE! ALLOWS STRUCTURE TO SHOW THROUGH! GIVES BETTER IN-FLIGHT VISIBILITY!

Dave Linstrum, VTO Editor, MODEL AIRPLANE NEWS.

"New transparent MonoKote is extremely unique as it shows through, highlighting the beauty of the structure in the sunlight and makes the model have greater in-flight visibility so timer sees model longer as it drifts downwind"...

Dale Willoughby

"New transparent SUPER MONOKOTE is an ideal covering for R/C gliders because of its light weight, and non-warping properties. It waterproofs wing, stab and/or rudder. Wings covered more than four months ago still remain drum-tight. I find it very easy to apply, even on compound curves.

"New Transparent MonoKote is unsurpassed for ease of covering and in-flight visibility. In addition, it has an aesthetic quality that will be appreciated by any modeler. Tested, approved and recommended by R/C Modeler Magazine"...
Don Dewey, Editor, R/C MODELER MAGAZINE.

PERFECT FOR COVERING FREE FLIGHT R/C GLIDERS

Transparent Super MonoKote is lighter in weight than the opaque type Super MonoKote, yet is just as strong. Because it's so much more puncture and tear resistant than silk or tissue and dope finishes, models covered with Transparent Super MonoKote better withstands crash landings and puncture from sharp objects. Super MonoKote does not dry out or become brittle with age. It's also the ideal covering for under camber.

MOST IMPORTANT... your model retains high visibility in the air so you and the timer can follow it easier and longer.

PLUS . . . IT GIVES YOU ALL THE ADVANTAGES OF THE OPAQUE TYPE SUPER MONOKOTE!

Quick and Easy to Apply

Requires no pre-covering

Exceptionally strong

Highly puncture resistant

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Odorless . . . eliminates dangerous fumes

Light . . . weighs far less than an equivalent silk or tissue and dope finish.

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TRANSPARENT SUPER MONOKOTE

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3 Never-Before-In-Modeling-History Finishes

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PIPER YELLOW
JET WHITE
AZTEC GOLD
MUSTANG ALUMINUM
INSIGNIA BLUE
FOREST GREEN
MIDNIGHT BLACK

CORRECTION

The prices for the TOP FLITE kits listed in the advertisement on the 3rd Cover of the December 1968 issue of AMERICAN AIRCRAFT MODELER were in error and should have read:

NOBLER, KIT N-1	$14.95
JUNIOR NOBLER, Kit N-6	7.95
FLITE STREAK, Kit N-2	5.95
JR. FLITE STREAK, Kit N-3	3.95
STREAK TRAINER, Kit N-10	6.95
KWIK-FLI III, Kit R/C-12	39.95

Cutie Coupe

Continued from page 34

smooth hammer handle. Pull motors to about five times their length and hold about two minutes; this will be enough to give them a permanent stretch. Keep motors in polyethylene bags in a dark place, like a coffee can. Heat and light ruin Pirelli. Be sure a motor is installed when you balance body before gluing pylon in place.

Adjusting and flying: Check to see that you have a completed model according to the plans and then strap on the wing and stab with short rubber bands and install a motor and prop using the handy motor inserter. The U-shape head spreads the loops apart so the rear peg can be slipped through. Be sure your peg is slightly smaller than space between ply spreaders. Slip your finger through one end of motor, stretch it taut with inserter and shove the spread end back to the rear peg. Slip this in place and remove inserter, attach s-hook (which should be padded with fuel tubing) to motor and prop shaft to hook. Fold the prop and try gliding the model. If you used the triangular shim under the stab as shown on the plan, Cutie will be near to gliding trim. You may need to shave off shim if it stalls in glide, or add to it if model dives.

Glide should be in a gentle right turn; you may achieve this with a combination of stab tilt and rudder tab, but go easy on the latter. Put about 150 turns on the motor using a 3.75 to 1 handdrill with a screw eye soldered in the chuck as a winder (Sig sells one). Stretch the motor about 3-4 times its slack length and walk toward model as you wind. Of course, you must have a helper to hold the model.

Attach the prop, remove the securing wire and hand-launch into the wind. If model stalls under power but glide is

O.K., then correct with right thrust. If model climbs to left, also use shims between nose plug and body to give right thrust. If model turns too tight to right, give it left thrust. You may discover that the glide is not what you thought it was when you were gliding from hand level; make appropriate adjustments for turn and glide angle. As you trim climb, increase turns to a maximum of about 375. You can now practice ROG. Simply set tail on ground with body pointed up at 45 degrees and release prop, then body. Cutie Coupe will leap off the ground and into a right spiral climb. With the Sig prop, she will even VTO, although this is not recommended. Be sure you use a DT fuse on every flight.

Free advice: This model is presented in response to a challenge by the Editor to the National Free Flight Society to create simple models that beginners can build and fly successfully. Since it is impossible in an article of this length to cover every fine point of construction and adjustment in detail, I will be glad to answer any questions you have or help solve any problems you encounter if you will write and tell me about them. Simply send me a stamped, self-addressed envelope and a brief description of your problem and you will get a prompt reply. Remember the only question that is really "stupid" is the one that is never asked for fear of appearing ignorant. I'll be glad to share my experience with you, and perhaps I can notify a free-flighter near you who can give you on-the-spot help. Build your Cutie Coupe as neatly and accurately as you know how, learn how to fly it, and if you get a chance, enter it in a contest such as the CdH event at the Olathe Nats sponsored by NFFS. Whatever you do, as the Frenchman who dreamed up CdH would say: "Bonne chance, mon ami!"

Curtiss BFC-2

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tail hook, wheel centers, gas tanks, flotation panel covering, all struts (landing gear strut, wing struts, etc.) are light Navy gray. All fabric covering is aluminum color. Upper surface of top wing is chrome yellow. Entire under-surface of top wing is aluminum and light gray. Entire lower wing is aluminum color.

Markings: Fuselage band: true blue, cowling: true blue, numeral "3": black, numeral "7" black, letter "B" white, dashes (- -): white. Tail surfaces: white (for a short time the VB-2B flew with red tails before changing to the VB-3B Squadron, which unit had white tails).

Conversion for Lindberg F11C-2: Photostat drawing in article up one-third larger (so the actual measurement for the upper wing will be 7⅞" — this is 1/48th scale in Lindberg kit).

Remove turtleback by method easiest for you — sawing, cutting, etc. Trace pattern for turtleback from photostated drawing and transfer to piece of balsa, bass, or pine wood.

Trace side-view template of turtleback from photostat on piece of wood selected. Repeat process on top view. Be sure to include centerline on your block, as it will make it easier to carve; the part will be accurate, and you can line up the centerline on turtleback with seam where fuselage joins along center seam of fuselage halves. Mount turtleback and cement in place (see Fig. 1); after securely cemented, carve to shape. Check cross-section on drawing for correct shape — see also Fig. 2.

Fig. 3 shows preliminary work on flotation panels. Lay out panels using drawing as pattern. Drill small hole in one corner and insert jeweler's blade, then saw out the panel where flotation bags were stored. After both sides have been cut and filed smooth, insert piece of plastic which is a snug fit and sand smooth across the top so that it will look like a metal panel when finished, rather than a fabric area.

After the lower part of the upper wing inserts are smooth and to your satisfaction, join to top of upper wing, using instructions in Lindberg kit as guide. Spray primer coat on entire wing — top and bottom — then sand smooth. Spray entire undersurface of top wing light gray. While upper wing is drying, cement both lower wings together. After cement is dry, sand both lower wings smooth and spray with primer coat. After primer coat is dry, sand and spray both sides aluminum color.

Spray top of upper wing chrome yellow (Fig. 4). Fig. 5: Mask off the ailerons and flotation panels on the underside of upper wing and spray exposed parts aluminum. Fig. 6: Completed wing — mask off chevron on top of upper wing and spray true blue; when dry, mask off true blue and spray white outline. Another way of doing this is to cut thin strips of white decal paper.

Fig. 7: Completed fuselage with lower wings attached and Section Leader's blue band added. Model is ready for decals and cementing upper wing. Fig. 8: Motorize your model with a small electric motor and pencells.

Add decals, and after they are dry, cement windscreen in place, then add telescopic sight, tail hook, and wheels.

Spray engine with crankcase gray (medium gray), cylinders: black, cowling: either gray or color of Section or Section Leader. Paint propeller aluminum color. Tips of propeller are painted with equal-width bands of three colors — red, yellow, and blue — painting from the propeller tip toward the hub. (Each band to be approximately ⅛".)

Conversion for Monogram F11C-2: 1) Follow directions for making and installing turtleback as given for Lindberg F11C-2 model. Remember, the drawing accompanying article as is, is exactly 1/72nd scale. 2) Paint upper wing as per directions for Lindberg model. You will not have to cut out the flotation panels as these are already incorporated in the Monogram wing in kit. 3) Paint entire plane with same colorscheme as for the Lindberg model, or according to Monogram's instructions.

See-Saw Switcher

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by applying full up elevator with the trim pot at the neutral position. With the sweep second hand of a watch, you can easily count the low pulse rate of 4 pps.

With the high and low pulse rates properly adjusted, the neutral pulse rate, 6 pps, should be set mechanically. The electrical trim is used for in-flight trim. The Rand is fairly sensitive to battery voltage, and you will find that an increasing amount of up trim will be required as the battery voltage decays from full charge.

With the pulse rate at neutral, the pulse width sensitivity pot should be adjusted such that with the stick at either extreme, the rudder cam plate on the Rand servo deflects an average of about 20 degrees to either side of neutral.

If your Ghost is properly galloping, you can button up the transmitter and install the equipment in your airplane!

When flying this system, it is well to keep in mind some of the fundamental limitations of GG systems in general. For one thing, the control functions are not completely independent or simultaneous. For example, rudder application also results in some up-elevator, and at maximum rudder deflection, no down-elevator is available at all! This is actually beneficial in gentle turns since the interaction tends to hold the nose up. But, where extreme rudder deflection is called for, such as tight turns in slow glides, you better watch out! The up-elevator you didn't signal for might stall you out!

You may find, too, that the Rand actuator will tend to go-around with full deflection of the rudder stick at slow pulse rates. This can be detrimental during up-elevator if you don't remember to go easy on the rudder. And, as expected, our airplanes wag their tails in flight especially at slow pulse rates during up-elevator maneuvers. After all, that is how Galloping Ghost got its name! From slight to full down-elevator, though, they fly as smooth as silk! Another less than perfect feature is the throttle control. Upon throttle command, the airplane jumps sharply upward. This is to be expected because the elevator is actually in an average up condition during the throttle command go-around condition of the Rand LR3. Use the throttle control if you are strong of heart and have plenty of altitude. And last, GG is not satisfactory for large, heavy airplanes. I wouldn't expect to use this equipment in planes larger than powered by 19 size engines.

However, in spite of the limitations, GG is a lot of fun at low cost and is constantly increasing in popularity. With it you can do most of the pattern maneuvers and it is wonderful training for full house multi-proportional flying (or is it the other way around!). Because of the small airplanes, it is great for tossing into the back of the car to take along on vacation or for flying at the local park.

To date, our conversion has been very reliable and hasn't required any tinkering.

Nelson on R/C

Continued from page 51

of Scale data. Seems that he owns the full-size ship that the model was patterned after. Paul Sherlock, also from the Pioneers club, flew his Boeing 747. Ten feet of fuselage is quite spectacular! The size of his 747 is so outstanding that when he flies his ship, the entire contest shuts down and everybody watches.

The spectator turn-out was excellent, especially considering how far from town was the contest site. The reason for the good attendance was a local radio station and a sky-watch helicopter which led the people to the field with detailed instruction on the radio.

The Class A, B, and C pattern schedule worked to perfection. The turn-out for the A and B pattern increases with every meet. This meet was no exception. Tim Symes, Vallejo, Calif., was high-point man. Tim is a novice flyer! One more meet and Tim will probably be in the expert class. Just hate those guys that practice! Seems that Tim took a night job so that he could practice every day.

West Coast Championships: The Championships were held in Los Angeles over the Labor Day weekend. The Birds Club was the main organizing group. Other California clubs also provided officials, judges, etc., the first two days Stunt was flown. The third day's events were Scale and Formula I Pylon.

The winner in Class C Expert was Joe Bridi flying his own Sun Fly design. Joe had a great amount of practice during his recent model flying tour of South Africa. As in most high competition level competitions the winner was not determined until the last few flights of the meet.

Class C Expert competition normally is the top scorer. I could say always. In the last two contests here in California, Tim Symes of Vallejo, Calif. has come out on top point-wise. Tim is flying in Novice Class C. All Tim needs is one more win in Class C Novice to put him in Expert. Don't think this will really cut down his chances much, because he is already out-flying the experts. Needless to say, the guys in Class C Expert were a little shook up with Tim's success. Tim's successful flying is a real shot in the arm for the hobby. He has no business connection in R/C. Just a modeler out having a good time beating some of our so-called experts connected business-wise with our hobby.

As I have mentioned before, I am not against professionalism but it still is refreshing to see someone like Tim come out top dog in competition with our "professionals."

Winner in Scale was Granger Williams with his Nieuport that he flew to first place at the recent Nats. Winner in a fierce battle in Pylon was George Kileene. Interesting observation in Pylon was the first, second, and third place flyers using Crawford Pylon fuel. As usual the K&B 40 provided all the horsepower.

National R/C Soaring Society: The preliminary steps have been taken to form a national group of modelers who have a primary modeling interest in R/C sailplanes. The first organizational meeting for this proposed organization was held at the Ted Nelson glider field in Livermore, Calif., August 18.

An informal spot-land sailplane competition was held in the morning on the main glider runway. Scot Christionson, from the Pioneers Club in Sunnyvale, was the winner. All flights were done via winch or hi-start. Twenty-five sailplanes were entered. Over 150 people from Sacramento to Los Angeles attended the meet.

The Twins are Here! 1/72 SCALE

Famous aircraft in flying formation—the Combat Team with rocket launching choppers — the Racing Pair with "big bore" racing Mustang and Bearcat

Huey Cobra Combat Team

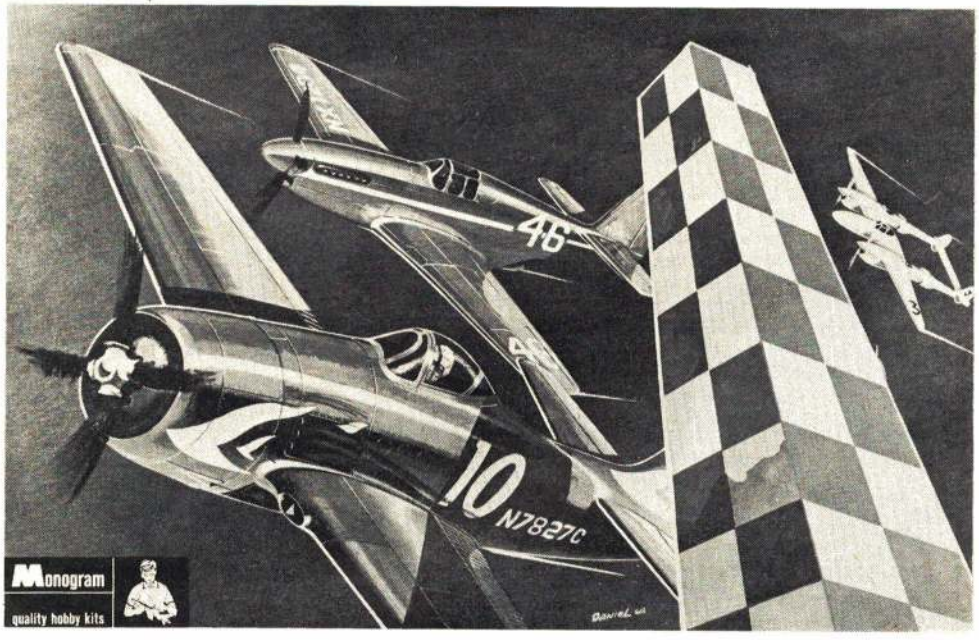
Two fully detailed models of the effective AH-1G Cobra helicopter, now in action, (usually in pairs), in close support of U.S. Army ground forces. Kit includes two identical models plus display stand for mounting the aircraft in realistic combat formation. Models are molded in olive drab color and accurate to scale with detailed cockpit interiors, clear canopies, complete armament, figures of two crewmen, rotating main and tail rotors and dull finish decals.

Kit PA191 • $1.50

"Big Bore" Racing Pair

Two fascinating models of WWII fighters—Air Force P51 Mustang and Navy F8F Bearcat—in red and blue civilian dress with racing numbers. Both are record holders in trans-continental and closed-course National Air Races competition. Red and white checkerboard racing pylon for mounting models in racing "action" included. Accurate scale, fine detail, cockpit interiors and pilots. Can be assembled with landing gear up or down. Dull finished decals.

Kit PA218 • $1.50



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After the morning flying, the meeting of the NRCSS was held. To get things started I was chosen temporary chairman. Hans Weiss volunteered for secretary/treasurer. As soon as we have a sufficient membership throughout the USA, then we will have a formal vote for permanent officers and by-laws. But for now we have to appoint people to get things started. How can you have a vote without a membership?

Dale Willoughby will edit the Zefier newsletter. This will be a 100% sailplane-oriented newsletter.

The purpose of this Society (NRCSS) is to promote the hobby and sport of R/C sailplanes. The intent of the NRCSS is to provide our AMA with an advisory group to handle R/C sailplane problems. It is not to be a radical new organization to fight against the AMA, but a truly organized 100% AMA-orientated group dedicated to help promote the sport of R/C Sailplanes. It is impossible for our AMA actively to promote such an event without an organization like the NRCSS.

An 11-man contest board will be established with one man from each of the AMA districts. We hope to have the chairman of the contest board on the East Coast. We can have our initial paper-work department out West and the rules department in the East. This will provide a national organization.

An 11-man executive council will also be established in the NRCSS. The purpose of this group will be to provide leadership in terms of policy matters, promotional affairs, and reporting for the newsletter. The NRCSS chairman will preside over this group.

A $5.00 membership dues has been proposed. AMA membership will be required to compete in any NRCSS-sanctioned contest. A $25 industrial membership also is available. Membership in the NRCSS will entitle the member to the monthly newsletter, a rule book, or organizational handbook for setting up glider meets, a vote in rules marking, and entry in a Sailplane Nationals.

A National R/C Sailplane nationals is planned. This will be a one-week meet. Each day will be a different task. The competitors will receive points by placing in the tasks. The soaring nationals will not be held at the normal AMA nats.

A national R/C sailplane fly-in will be held during the last week of June, 1969, at the Nelson Glider Field in Livermore, Calif. The purpose of the fly-in will be to try out the various rules the contest board decides upon. It will be run in an informal manner so that, if a change is required to make an event practical, we can change it on the spot. We can find out what will or won't work. The next year, 1970, will be the official Nationals. The Livermore site will be one of the proposed sites. Both ridge and thermal soaring can be done at this site.

At this time only one basic rule decision has been made. That is to have two classes of gliders — above or below 100" in wingspan. Rules will be established for thermal and slope soaring. The major rules thinking will be for flat-land flying. Most of the sailplane flying sites are flat-land ones. Unfortunately, there are not many good slope sites. One of the primary slope soaring events will be Pylon racing. Duration will be a major event in the flat-land flying.

With this organization many things can be done within the glider group. The limit of what can be done is up to us and our efforts. For more information or for a membership application form, write to NRCSS, Hans Weiss secretary, Wilshire Blvd., Santa Monica, Calif.

As you can tell, I have become very in-

terested in R/C sailplanes. This phase of our hobby is extremely challenging. Even much more so than our 125-mph pylon racers. Making use of nature's powerplant, called lift, is much more difficult than getting the most power out of a K&B 40. With the gliders you can make the ship as simple as you want or as complicated as you like.

The ship I am flying is my own KA6E. It is a scale glider with a 12′ span. It weighs over 10½ pounds and has a full set of controls plus spoilers. Even has a telemetering system that tells me what my rate of climb or sink is. A full-house stunt job is quite simple compared to such a ship like the KA6E. On the other side of the ledger you can have a simple rudder-only pulse system installed in a small 5′ glider that weighs maybe only 2 lbs. and still have a ball flying the ship.

In many of the proposed glider events, such as the spot-landing event, it doesn't really matter what type of ship you have. This makes the hobby even more interesting.

Germany R/C Championships, August 16, 17, 18: Shortly after our Nats, the German Aero Club held their R/C Nats. The meet was held in two parts. In the first part, the National champion was selected. In the other part, the German team for the 69 Internats was selected. The team selection consisted of the top eight from the championships. The results of the top eight in the national championships, plus the results of the flyoff, determined the team selection.

The winner of the championships was an 18-year-old from central Germany, Heinz Elsasser, flying a conventional, multi low-winger equipped with a Simprop radio. Last year's German team members did not place too well. Bosch, Bauerheim, and Schmitz placed 4, 5, and 7th in that order. The top eight flew off the following day. The top man in the fly-off was Josef Wester from Northern Germany. The combining of the championship placing and the flyoff placing, gave first spot on the team to the new national champ, 18-year-old Heinz Elsasser; second to Josef Wester, and third to Wilbert Schonfeldt. Schonfeldt is the designer of the recent 200-mph speed record model. Bosch was 4th, thus making him the team manager. Schmitz was 6th and Bauerheim 7th.

It should be noted that in the finals Bauerheim was well in the lead during the first two rounds. However, in the third and last round, he suffered a wing failure during the double stall-turn, thus ending his chance for the team. In the FAI procedures as used in Europe, you have only three flights, and all three flights are totaled together.

It will be interesting to see how the young Elsasser will do against our seasoned team of Kraft, Kirkland, and Whitley, at the 69 championships in Bremen, Germany.

Boeing F3B-1

Continued from page 21

of what was in store. Not to be outdone. Boeing flew their factory-fresh Wasp-powered fighter down from Seattle to get into the act. The Curtiss machine, designated F6C-4, was basically the same as previous Hawks but with the 425-hp radial engine installation. Boeing's bid was a modified but direct development of the earlier FB series with a Wasp in the nose. Both aircraft were company-financed and sponsored, although the F6C-4 had, prior to the San Diego trials, been tested at some length by the Navy at Anacostia. The Boeing was rushed to completion just before the meet and thus only company testing was done

before its confrontation with the Hawk.

Toward the end of October, when the concentration and exercises were over, the Navy was highly impressed with the Boeing's performance. They requested additional tests under their direction. The qualities of the Curtiss were pretty well known and a production order was placed for 31 machines. The Boeing was given the XF2B-1 designation and an intensive series of tests were conducted. By December, an order was placed for 32 production models.

Congress became a little more sympathetic toward military appropriations in the late '20's and, with the coming utilization of two large carriers, the Navy sought even more aircraft. The whole picture was changing. New specifications were drawn up. In the fighter category the request went to the industry for an extremely robust plane, specifically designed for everyday hard carrier usage. It was to have better landing and takeoff qualities than any previous VF types, it was to be wheel/float convertible and be stressed for catapult use in either configuration. Of course, the Navy's choice, the P & W R-1340 Wasp engine, would be the power source.

Once again, it was Boeing versus Curtiss with company-sponsored prototypes. Boeing's machine, design 74, was little more than a beefed-up and reworked F2B. The upper wing taper planform was the same but the lower wing panels were new, having a straight chord, unlike the elliptical F2B lower wings. The tail surfaces were of the same design and construction as the predecessor. It had extra fittings for the installation of a single main central float and smaller wing-tip balance floats. Power was the P & W R-1340B Wasp of 450 hp, takeoff rating. With this, Boeing felt they could get away with the least amount of modifications possible and still meet the new requirements.

The Curtiss entrant, on the other hand, was an entirely new design. Initiated in 1926, it resembled a scaled-down single-seat version of the Falcon observation type. Nicknamed by the Curtiss Company the "Seahawk," it was designed from the outset as a carrier-based fighter. Previous Hawks (F6C series) were in reality adaptations of a design built for the Army as the P-1 pursuit series. During Navy tests it was designated XF7C-1. Ironically, when the competition trials between the Curtiss and Boeing Companies were completed, 16 Sea-

hawks were ordered, but they never went to carrier squadrons. All were turned over to the Marine Corps as shore-based equipment. So the plane specifically designed for Navy carrier use was never used aboard the flat-tops.

Both the Curtiss XF7C-1 and Boeing XF3B-1 were ordered on June 30, 1927. This date is misleading since both aircraft, as private ventures, had been delivered to Anacostia quite some time before this for Navy evaluation. The Boeing, given the XF3B-1 designation and BuAer number 7674, arrived in March. The plane was given full treatment, including trials aboard the U.S.S. Langley. The rigid tests were well behind and things seemed under control whether it was in wheel or float configuration, when the Navy announced it was not completely satisfied. In the meantime, the Bureau decided to abandon the float installation idea. The XF3B was superior to the Curtiss but neither ship had exactly what was needed.

The XF3B gave a top speed of 156.7 mph in landplane configuration and landed at 54 mph. The ceiling was 21,300 ft. This was actually 2 to 4 mph slower than the service F2Bs. Other performances were about on a par with their predecessors. To justify any production, improvements were in order. The XF3B was returned to the Boeing plant for modifications.

Back at Seattle, the plane underwent a number of changes. The upper wing was enlarged, the span being increased from 30′-1″ to 33′-0″. The planform was swept-back 6 degrees-28 minutes, starting at the centerline of the span, and was straight in chord. It appears the lower wing was unaltered. The total wing area was thus increased to 275 sq. ft. The prototype was 235 sq. ft. Fuel tanks were installed in the upper wing panels in the same general area where flotation bags were fitted on the earlier F2B models. Fuel on the F2Bs was carried in the fuselage, and wing tanks were temporarily fitted in the wings on the original XF3B. The installation was permanent and pre-planned in the new model. Corrugated aluminum-covered ailerons were new features also.

The vertical tail surfaces underwent several alterations. Originally the F2B configuration was employed; first fabric-covered and then corrugated metal was used. The final configuration and adoption for production were entirely new, with a much reduced fin but enlarged and elliptical-shaped rudder. The horizontal tail surfaces pretty well remained the same, but wound up some 7″ greater in span and corrugated covered. About the only thing to survive was the basic F2B fuselage, engine installation and landing gear.

All this is mentioned mainly to describe the vast differences between the original X model and the production machines. Construction was similar to that pioneered with the F2Bs. The fuselage was of bolted, square, dural tubing; wood fairing formers, fabric and aluminum covered. The wings were spruce box spars, wood ribs and fabric covered, with the exception of the ailerons.

When the reworked ship was returned to Anacostia for further trials, it showed a great improvement in maneuverability and better high-altitude performance. Although its top speed was about the same as it had in its original configuration (156 mph), it was 2 mph slower than the F2B but some 7 mph faster than the Curtiss Seahawk.

Cruising speed was listed as 130 mph with a reasonable range of 340 miles. Absolute ceiling was about 21,500 ft. Its big upper wing permitted slow, easily controlled carrier landings without sacrificing the best in speed and maneuverability from the P & W R-1340-B 450-hp engine. It was a sturdy

machine, withstanding constant carrier landings with no ill effect to the structure. It was well received by pilots. There was nothing weak or spooky about it. It was not at all like those Curtiss machines which were plagued with weak landing-gear systems.

After the usual series of trials, the new XF3F, Boeing Model 77, emerged highly praised by the Navy. On June 30, 1927, a production contract was awarded Boeing for 73 planes, designation F3B-1. This was the largest single order placed for fighter aircraft by the Navy to that date. Boeing was in solid and well on their way toward making the mid-'30's the era of Boeing fighters. With the introduction of the F3Bs successor, the F4B/P-12 series, the predominance of Boeing Navy fighters went unchallenged until the stubby Grummans started poking their noses into the picture.

The F3Bs began arriving for squadron service in October 1927. Records show that the first ship was received by VF-1B on October 17th, although they never used F3Bs during carrier assignments. VF-1B retained their F2Bs between 1928 and 1930. In 1931 they reformed with Curtiss F8C-4 Helldivers. Thus, this first delivery entry is uncertain. VF-2B, the Flying Chiefs, gave the F3Bs their first sea legs in early 1928 aboard the U.S.S. Langley. By January 1929, however, VF-2, VF-3, VB-1 and VB-2 were Boeing F3B-equipped and, by 1930, VF-6B was formed with the 3s also. They operated the type through 1932 and were the last squadron to have them assigned in full 18-plane complement. VF-3 was probably the senior F3B squadron having them in 1929/1930 aboard the Lexington and 1931/1932 aboard the Langley. The little ships served as the backbone of Navy fighter strength for nearly three years, carrying out fighter, scouting and light dive bombing missions almost daily.

By this time the F4Bs were being delivered and replacing all fighter squadrons. The F3Bs were reassigned and could be found scattered all over as utility machines, staff transports, command aircraft and to test new equipment. As a matter of fact, in December 1928, 14 brand-new radio sets were sent to VB-2B aboard the Saratoga who installed them on their F3Bs. This was one of the first receiver/transmitter (radiotelephone) sets successfully used by single-seat fighters at sea. It proved of great value and led to built-in radio antennae on the later F4Bs.

Quite a number of these single-seaters wound up in use by C.O.s for personal use. Several were overall silver, or silver with yellow topside of upper wing. Others were repainted in command colors of silver and blue. In late use ashore, a small tail wheel was fitted to the end of the skid. This was to facilitate easier handling on concrete runways. The F3Bs could also be seen sporting short-chord engine cowls and large streamline wheel pants when employed for VIP use. This dressed them up, took them out of the "ordinary" squadron appearance. The last F3B-1, BuNo. 7763, was received by the Navy on January 17, 1929, and was subsequently turned over to the Marine Corps. This was the only F3B operated by that branch of the service. It was used as a general utility plane and officer hack. A

few were still in use for minor but essential use as late as 1937.

To some, the F3Bs may appear to have been an interim fighter, almost forgotten because of its successors' popularity. Considering the large production of the type at this period of history and the length of time they served, they were far from it. They weren't the fastest fighters in the world but few Navy planes ever claimed that honor. Pit one against some other speedster in a dog-fight or aerobatic contest and the maneuverability of the Navy fighter will come out on top. The F3Bs were well liked and a definite step forward in the progressive development of the Navy fighter.

NAR Nats

Continued from page 30

Washington, D. C. area, sporting 3080.

The Space Pioneer section boasts two national champs and a reserve champ (runner-up). Junior National Champion and Bendix trophy winner was Connie Stine, NAR #1300 with 743 pts. Junior Reserve Champion was won by Johnny Drake, NAR #7515, with 670 pts.

Their section's chairman, G. Harry Stine, NAR #2, is Senior National Champion and winner of the Bendix trophy, with a total 970 pts. Senior Reserve Champion was Howard Kuhn of the Mars Section, NAR #11628, with 518 pts.

There were several other champs and awards at the big meet. Leader National Champion was Robert Mullane, NAR #4157, of the Pascak Valley Section, with 615 pts. His next highest competitor and Leader Reserve Champion was James Stevenson, NAR #11763, of the Mars Section. Bob is an 18-year-old rocketeer; Jim, 17.

The Barrowman Team took the Senior Open Spot Landing category with 33 ft. from the target to capture senior national honors with 719 pts. They are Jim and Judy Barrowman of the NARHAMS Section. Another team award, in the Leader category, was won by the Guill Team, with 512 pts. garnered by Talley and Jeff Guill of New Canaan, Conn. Talley is a 19-year-old; brother Jeff, 15.

Robert Forbes, 20, of Ft. Riley, Kan., and the Astro-Modelers Section, was named to receive the Sportsmanship Award. Truly one of the highest honors which can be paid any athlete, modeler, or person involved in national meets.

INDIVIDUAL CHAMPIONS AT THE MEET

This column of national honors would not be complete without mention of the first berth champs in each category. We will denote the member as a: Senior (S), Leader (L) and Junior (J). Their point total will follow this letter.

In the Scale event, national champions were: Bryant Thompson, NAR #1202, (S) 795, James Stevenson, NAR #11763, (L) 769, and Michael Poss, NAR #5702, (J) 824.

The Sparrow Boost-Glide event was won by Jim "Kasey" Kukowski, NAR #4668, (S) 59 seconds, Philip Slaymaker, NAR #6432, (L) 44 sec., and John Drake, NAR #7515, (J) 57 sec.

Model rockets perfected according to exact specifications and exhaustive testing before the meet proved winners for their owner-builders in the Class II Scale Altitude event. Champs included: G. Harry Stine, NAR #2, (S) 1087, Guill Team, (L) 741, and Michael Poss, NAR #5702, (J) 1190.

One of the most difficult and newly approved events in NAR, egg lofting, was the scene of both smiles and red-faced embarrassment while being held among young and old on the range. But some of our

favorite breakfast food actually landed intact so NARAM-10 would have champs. They are: Gerald and David Gregorek, NAR #9193 & 9204, (S) 408 meters, Paul Conner, NAR #5787, (L) 322 m., and Carl Guernsey, NAR #9925, (J) 373 m.

Then we have the spot-landing contest event (open), where NAR rocketeers shrewdly calculated every favorable possibility before launching their model. Top spots were won by the Barrowman team (S) with 33 ft., Charles Gordon, NAR #6948, (L) 12 ft., and Loren Fagen, NAR #9100, (J) 16 ft.

In the Space Systems event, G. Harry Stine, NAR #2, (S) with 451 pts., Alan Malazia, NAR #4740, (L) 282 pts., and Charles Duelfer, NAR #2580, (J) 587 pts., were named champions.

Swift Boost Glide event provided more time (duration) of flights than the Sparrow event, in fact, almost doubled and then some. Winners were: Jim Kukowski, NAR #4668 (who also won the Sparrow event), (S) 94 seconds, Bruce Blackistone, NAR #6413, (L) 131 sec. (and best time of the meet), and Andrew Elliott, NAR #7419, (J) 101 sec.

The Class I Parachute Duration Event, also a category watched with close interest by all-age modelers, was the scene of much overland, relay-type action, when every rocketeer who launched chased his model till it drifted to earth. At the top of the heap was Bryant Thompson, NAR #1202, (S) (who took first in Scale), clocked 177 seconds, Philip Slaymaker, NAR #6432 (also first in Sparrow Boost-Glider), (L) 116 sec., and Kevin Stumpe, NAR #9225, (J) 253 sec., who received best time.

Last of the events and perhaps the hardest to win, the Research and Development event was judged according to the best model and system together with pertinent, factual info. Champions were: Gerald Gregorek, NAR #9193, (S) of C.S.A.R. Section, Mark Mercer, NAR #5839, (L) of NARHAMS, and Connie Stine, NAR #1300, (J) of Space Pioneers.

Curtiss-Wright Junior

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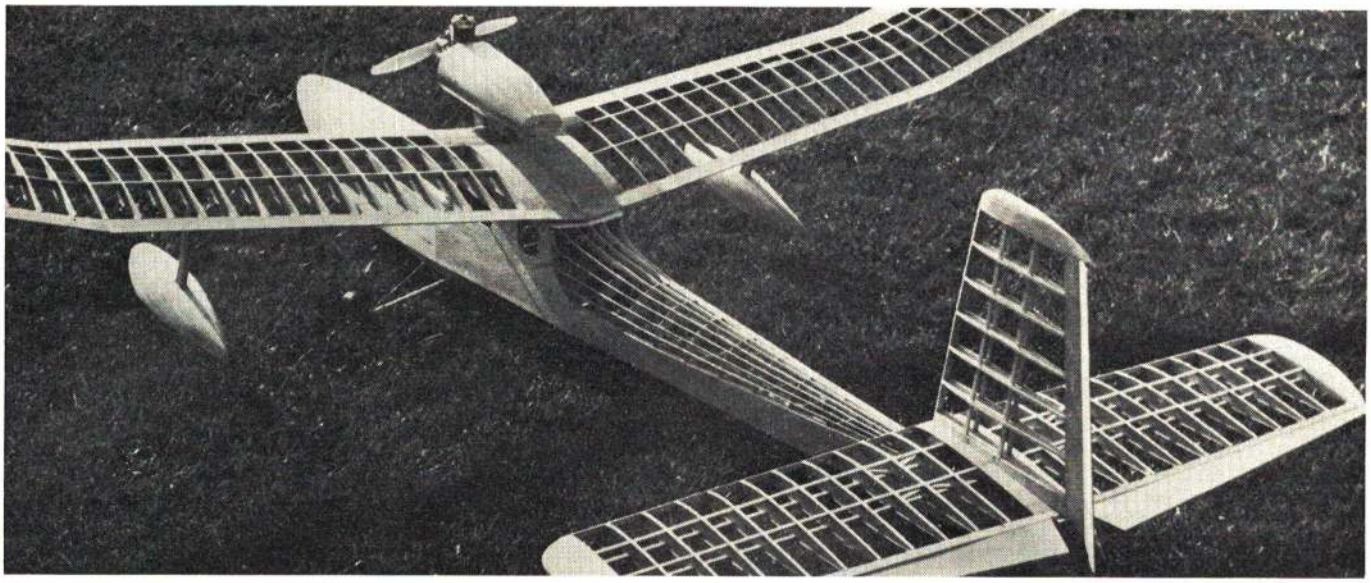
the fuselage. It is best to have the ⅛ plywood receiver mounting board in place in the rail slots when the rails are positioned in the fuselage. This will then assure that the mounting board can be easily slid in or out of the fuselage.

Wire up the switch, battery box and receiver socket before applying 1/16 hard R/C balsa between the bottom sides of the fuselage. Check the complete radio installation before these sheet-balsa, fill-in sheets are cemented into place. Note the grain



direction. Then, apply a second layer of 1/16 R/C balsa from the rear fuselage bottom piece all the way to the front of the nose block. Note that the grain should be crosswise to the centerline of the fuselage. Because the rear cockpit is surrounded by cabane struts, it is necessary to plank the area from former "I" back to former "J," using 1/16 x 3/16 hard balsa strips.

Fit short pieces around the metal cabane struts. After these are cemented in place and sanded, the cut-out for the cockpit can be made — do half of it from each side. Lots of the sandpapering around the rear cockpit and between the cabane struts can be done with an emery board (small sandpaper nail file). The sheet for the front cockpit can be cut from a single piece of 1/16 x 4" balsa and bent over the formers. Be sure to center the cockpit cutout on the fuselage.

Cover the wing and fuselage with Silkspan and install the stabilizer and fin. Apply three coats of clear butyrate dope to all surfaces and sand with very fine wet or dry sandpaper. The original model has a Miami Blue fuselage and Diana Cream wing, stabilizer and fin. The engine nacelle on the full-size plane was the fuel tank and is painted silver on the model to resemble the sheet metal tank. Be sure the windshield stands up straight enough that the battery box clears it, when the plywood mount is slid upward out of the front cockpit. The original full-size plane only had a windshield on the front cockpit, none on the rear one. After three coats of colored dope, apply license number decals and trim tape outlines on the ailerons and elevator and then spray on a final coat of Aerogloss fuel proofer.

The antenna on the plane is fastened from the top of the fin to the bottom of the right-handed rear cabane strut. A pair of wire hooks have a very small rubber band

between them to provide tension on the antenna wire which is anchored to the cabane strut with a ⅛ wide strip of Scotch Electrical Tape, No. 33. From the cabane strut forward, the antenna is looped loosely around the rear cockpit R.H. edge and attaches to a small Fahnestock clip mounted at the front of the cockpit on former "I."

By mounting the receiver on the receiver board with only rubber bands and padding it with a 1½ x 2¼ piece of ½ thick foam rubber, the receiver is almost instantly removable for use in other planes. A five-connector socket (called a "plug socket" at radio supply stores) is mounted on a ⅛ plywood strip at the rear of the front cockpit. By pulling out the plug and disconnecting the receiver antenna wire from the Fahnestock clip in the rear cockpit, the receiver is completely free from the plane. On the front side of the receiver board is mounted the plastic battery box that holds two pencells. It, too, is held in place with rubber bands.

The Cox Babe Bee engine shown is equipped with a Cox #338 spring starter. This left-hand spring starter turns the engine in a clockwise direction, so a right-handed propeller can be used and still provide thrust in the rearward direction. Thus, the engine can be started without manually flipping the propeller and possibly misaligning the wing with the fuselage centerline. Keys are used to maintain alignment of the wing on the wing mount.

With two pencells in the battery box, the plane should balance longitudinally as shown. Add lead-weight to either the front cockpit floor or the rear of the fuselage until balance is correct, if it doesn't check correctly the first time. Total weight of the original model with all items as listed in the parts list is 20½ ounces.

We aren't sure yet just how aerobatic this plane may be. As far as smooth, gentle, slow-speed flying, it's a great model for the Sunday afternoon sport flyer.

This is a slow-flying plane that is quite realistic with its slow, easy takeoff and gentle climb to altitude. There is sufficient dihedral that you get gentle turns without any diving tendencies unless you "hold" the turn continuously for about 270 degrees. It has a ballooning recovery from a spiral dive and doesn't gain too much speed because of the inherent drag of the design. In summary, it's an easy-to-fly plane — good for beginners in R/C scale.

Straight and Level

Continued from page 6

gin with, there are a half-million active rocketeers. By active, the model rocket industry means a guy who has built at least one flyable rocket a year. The average age lies between 12 and 16, many, many years younger than the average in the plane field — thanks to our radio control more than anything else. Oddly to us, very few people under 12, or over 16, build rockets — suggesting the truly incredible business yet to be done when answers are found to keeping older hobbyists involved. Or perhaps that field, like airplanes of old, is simply growing up, and the age level naturally will rise with time. Tomorrow's "open" class rocketeers may be today's "Seniors" and "Juniors," to use an AMA-type yardstick. And if that happens, rocketry, like model airplanes, may have a Junior problem!

The business, once entirely mail order, is only now beginning to develop a significant hobby-shop type of distribution. It is still largely mail order. A handful of manufacturers dominate the scene. The high level of their approach discourages new competition. This is not like breaking into the model airplane business. These people are big league in their ideas, promotion, and in what goes into their kits and literature. They don't mind spending a buck. Literature and promotional packets are fantastic by model airplane standards. The bigger firms have two educators apiece on their staffs, young, highly educated people (and rocketeers, of course), and the results of their enthusiastic endeavors are everywhere apparent. One can look a long way and not find anything like this in aircraft. There is a proved relationship between this and audience participation.

This is not an industry which grumbles about bad cycles, or even asks you how business is. They know it is good and constantly growing. They don't wait for business to come to them. They go get it, constantly, aggressively. The kit values are terrific. Cement, dopes, even batteries, are in the kits. You need nothing. And quality is right on. It will be interesting to see what future widening competition will do to these lofty ideals, what effects heavy model industry trade discounts will have upon kit contents.

There are darn few people indeed in the model airplane industry who do not have a lot to learn from the rocketry industry's acute sense of public relations and highly impressive promotion. The consumer is god. No stone is left unturned to expand and educate the public to the educational joys of rocketry. There simply is no parallel in the model airplane field. We should be ashamed of ourselves.

Skyraider

Continued from page 27

Since it's that easy, let's start the construction. The wing should be built first, although the fuselage can be started while the glue on the wing is drying. Assemble each side of the wing alternately on a flat board using the main spar as a joining member. The cut-outs for the lead-out wires should be made on the left side before the top skin is glued on. When these are dry, glue in the center section of ⅛ balsa and pin down flat, blocking up each wing tip to the proper dihedral. Turn the wing over and glue in the lead-out guide plate from the bottom. For the lead-out bearings, use epoxy glue to join the short pieces of $\frac{3}{32}$ o.d. (outside diameter) brass tubing to the places on the plate and wing. Sand the tips and leading edge to final shape and the wing assembly is completed. If you sand first with medium paper, use fine paper to eliminate any fuzz.

A word or two about the landing gear installation. On the model shown, I used a removable main landing gear. This is achieved by using 4-40 blind nuts epoxied to the plywood plate. These are positioned before the wing is assembled by using the landing gear wire and the metal clips as a guide. I prefer the metal clips, although nylon is available. If a permanent installation is desired, J-bolts could be substituted. If these are used, then the landing gear must be installed before the top skin is glued on the wing. The Roberts bellcrank should be cut down so that the lead-out spacing is 2¼. Attach the $\frac{1}{32}$ music wire lead-outs to the bellcrank and then install in the wing on the ⅛ plywood mounting platform. This platform should be glued down flat against the center section of the wing, and butt up against the main spar.

The fuselage is basically a box structure. It can be assembled directly over the plans to keep the alignment true for all bulkheads. The firewall can be made from a piece of ¼ plywood or by gluing two pieces of ⅛ plywood together. I prefer the laminated piece. The Tatone engine mount should be bolted to the firewall and the alignment checked. Use the neoprene disc with the Tatone mount as this helps to dampen-out the engine vibration. Any deviation of the engine bearers from 90 degrees will give an adverse thrust-line condition and should be adjusted to be at right angles to the firewall. When everything is set to give the proper thrust-line, the firewall can be glued to the fuselage sides using a generous amount of epoxy glue. Braces can be added to the back of the firewall using scrap balsa. Two pieces of ½" thick balsa are added to the front as fillers at the sides only. These must be cut out some at the center to give clearance to the engine mount. The space at the bottom should be kept square as this serves as the keyway for the cowl. The rest of the bulkheads should be glued to the fuselage sides following the plan outline. If the triangular strips were glued to the fuselage sides already, make a few cross cuts behind the number "C" bulkhead for ease of bending the fuselage sides.

The horizontal tail should be completed before proceeding further with the fuselage. The elevator is most easily cut out as

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one piece. Then drill small holes and epoxy in the control horn. When this has set, cut out the center section. Shape the elevator and stabilizer to a symmetrical airfoil cross section, using a sanding block. The cloth hinges are then glued on as shown on the plan. A variety of other hinges can also be used, including nylon tape and the Rand plastic hinges. Following this assembly, glue the completed horizontal tail to the fuselage crutch.

Take the fuselage from the board and install the throttle pushrod, elevator pushrod and position the wing on the fuselage. Solder small washers to the pushrods as retainers. Remember to bind and solder the hook release wire to the elevator pushrod before final installation. The use of a droppable tail hook is a small extra feature and can be omitted. When all this is done, operate the controls and make sure there are no binds and that everything works freely. When you are satisfied that the controls are bind-free, especially the throttle pushrod, glue the wing to the fuselage.

The junction of the wing and fuselage and the bottom wing sides (1/16") with the (1/8") center section must be reinforced. I like to use nylon tape (3/4") and epoxy glue for this purpose. Fiberglass can also be used, but it is important to strengthen these joints. I have not shown a specific fuel tank on the plans. There is enough room in this fuselage to use just about anything. This should be glued-in solidly using epoxy and scrap pieces of balsa. Any commercial tank will probably have to be modified to have all the filler tubes and fuel tube come out in the right places. The fuel pick up tube should come through the firewall above the engine mount. I recommend the use of crankcase-pressure fuel system. One method I like to use is to connect the crankcase pressure line to one of the filler tubes and use a cap on the other. In this way the pressure line is disconnected to fill the fuel tank and the hazard of flooding the engine during fueling is eliminated. This saves fingers and frayed nerves.

The arresting hook assembly package should be put together as shown in the sketch or another suitable assembly used. The important thing here is to provide enough strength to hold the hook to the plane when the arresting cable is engaged during the landing operation. The 1/8 plywood platform should be glued to the fuselage aft of the "D" bulkhead flush with the fuselage bottom using epoxy glue. Reinforce it with scrap pieces of balsa. The bracket can be made from 1/32 steel or brass and the pivot bearing (1/8 o.d. brass tubing) is soldered to it. The pivot should be approximately 1/4 from the plywood to allow enough clearance for hook removal.

The rest of the assembly goes fast. Glue on the top and bottom balsa pieces. While these are drying, cut out the rudder and shape the airfoil cross section. The cowl pieces are made from leftover 1/2" balsa and are glued together as a box. The canopy can be either carved from balsa block or formed from plastic. A razor plane should be used to shape the fuselage top and the cowl to a round section. A 1/8 deep groove is cut in the fuselage top to accept the rudder when the shaping operation is complete. The bottom cowl piece extends back to the firewall and serves as a key, locking the

cowl in place. The cowl hold-down is a piece of ½" wooden dowel with a blind-nut epoxied to the top. A small piece of ⅜ x ½ motor mount wood will also work. A piece of ⅛ plywood is inlaid in the fuselage bottom. Then, when the hold-down bolt is tightened down, the dowel bears against the plywood and all the load is taken up by these hard surfaces rather than the soft balsa. Two small pieces of dowel can be glued to the cowl sides, mating with appropriate holes in the fuselage to serve as additional positioning guides for the cowl.

The assembly operation now is complete and the entire structure can be given a final sanding with fine sandpaper. The next decision is how to finish the little beast. There have been countless articles printed on finishing, so I'll not review all of them here. Two factors should influence this decision; namely, how much work you're willing to put into a finish, and the other is what type of fuel will be used. Any type of dope finish will be affected by hot fuel. Since this is a competition plane, hot fuel (40% nitro or better) should be used. My particular design was finished with Hobbypoxy paint, but this is a little difficult to use because of its attraction to dust particles. I used two coats of clear wet sanded (400 paper), a coat of Stuff wet sanded (400) and then two coats of white color sprayed on with a Binks airbrush. The trim was masked off and single coats of orange and black color were sprayed on with a Binks airbrush. This can be left just as it is or rubbed out after it has hardened for at least two weeks. Then wet-sand the entire plane with 600 wet paper just enough to remove the rough spots. Final polishing is done with a buffing pad, electric drill and Dupont #7 polishing compound, ala Dave Gierke's method. This step takes plenty of time, but will give a high gloss that is "truly" *hot* fuel proof.

All that remains now are the flying and the collecting of trophies. Good luck and may your next flight be a record breaker.

Hallco 123SS System

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the drive for a Rand LR-3 servo, used for rudder and motor control and a Rand HR-1 servo used for elevator control. The rudder is controlled by the width of the transmitted pulse in a range of approximately 30-70 to 70-30 (*i.e.*, a duty cycle of 70% on

and 30% off for full left and conversely.) The rise of the rudder pulse is capacitively coupled to an electronic rate decoder which controls the elevator servo in response to a pulse repetition rate of approximately 17-5 PPS. Neither the transmitter nor the elevator decoder introduce any identifiable interaction, thus truly independent control of elevator and rudder is obtained.

The system was bench-checked for selectivity, rejection of unwanted signals, battery life and flexibility of control arrangements and mounting. The receiver is capable of rejecting signals from adjacent channels under any condition when the 123 transmitter is on and will even reject transmitted signals on adjacent channels with the 123 transmitter off as long as the offending transmitter antenna is positioned greater than 6" from the receiver antenna. The airborne battery pack sustained satisfactory operation for the full manufacturer-stated 80 minutes under continuous operation. Considerably greater operating time would be obtained when on-off operation is used as in normal flying. The direction of rotation of the servos can be changed easily and instructions are provided for this. In addition, the position of the elevator and rudder servos can be reversed; however, insulated jumper wires will be required and you must know what you are doing.

The sample system was field-checked and flight-tested. Installation was in a Sterling Rudder Bird with an O.S. 30 engine to present a significant challenge to the system. Range checks in the field gave a range of about 300 ft. with the transmitter antenna collapsed. Range with antenna up was far beyond. Bear in mind that a 30 on this size airplane is a lot of power. The airplane was flown through quite a number of flights with good results. Motor control is limited to four positions by the Rand servo throttle

arrangement but this presents no problem since elevator trim is adequate. To trim for level flight, throttle changes present only a slight, rapid wiggle because servo go-around is fast. There is no change in average flight path during throttle changes and touch-and-go's, throttle changes during final approach, etc., are quite readily achieved. No problems were encountered beyond an inadvertent collision with a huge oak tree which leaped up into the flight path due to pilot error. Examination revealed a dinged wing, landing gear missing, but an unharmed airborne unit wiggling as usual in the fuselage lying on the ground.

In summary, the unit tested met or exceeded all claims, instructions are full and extremely complete, and installation is flexible. No charger is provided for the airborne pack but is available as an extra. A charge rate of 100 milliamperes is required and a charging receptacle is provided on the airborne pack. Pay careful attention to charging because the charge receptacle is an uncoded two-pin plug. The pin furthest from the switch is the positive (+) terminal.

— **Fred Marks**

Radio Control World

Continued from page 37

metal screening, lets the sound out. The volume control of the BC set must be extended to the front panel, with a small knob. It was found possible just to clear the converter on-off switch with this knob. A small hole was also made to reach the BC set tuning capacitor for adjustment with a screwdriver.

The original backplate of the converter case was replaced with a plain sheet of aluminum, and a housing was made of thin sheet aluminum to hold two 9V transistor set batteries. Careful planning is needed to get all parts in the case but it's really not too tough. The two batteries are in parallel for longer life and as circuit B shows, the on-off switch on the converter supplies power to both the converter chassis and that of the BC receiver (when buying the latter, be sure it is intended for operation on 9V).

The only other connection between the two chasses is to feed the converter output into the BC section; this is done via the ground end and the tap on the BC set loopstick (to give a little more space, we removed the loopstick entirely). The hot end of the loopstick goes to one lug on the tuning capacitor, but after conversion this capacitor section is not used — the input of the BC set is tuned via a core in the output inductance of the converter. Only other

task is to add a small antenna of some sort; one taken from a defunct AM-FM pocket receiver is perfect.

Tuneup is simple and is detailed in the converter instructions. DO NOT disturb any of the tuning points on the converter chassis except that in the output coil. If the BC set is tuned to the proper spot — about 1500 MHz — the converter front panel calibration will be found quite accurate. One point to watch: when finally assembled and turned on, we could get no AF output. It was found that the shaft from the BC chassis volume control is not insulated, and our metal shaft from it had shorted to the front panel and killed the audio. A little panel insulation took care of this nicely. The unit is not perfect — for one thing it tends to overload on strong sigs — like when you try to check your own transmitter — but it's a start and may give the tinkerers some ideas. Meanwhile we hope to evolve a simpler and lower cost 50 MHz monitor.

Prop saver: When operating from rough fields, Walt Watkins (RFD 1, Box 137, Eatontown, N. J.) found that his nose wheel flopped fore and aft so violently that it often hit the prop — with damaged LG and broken props a result. His cure was a simple cable per dwg. herewith. It is loose enough to allow proper steering, but will not let the strut snap forward into the prop.

Simpro I MC: Desiring to add throttle action to his Simpro I plane, Tom Sanders (83 E. Shore Blvd., Timberlake, Ohio 44094) made a few additions to the rudder servo that enables him to trigger an escapement, which then shifts engine speed as desired. A pin was soldered to the crank assembly on the motor shaft (remove assembly for this operation, to prevent heat damaging the motor). One fixed contact was soldered to the bolt which holds the centering

spring, the other contact is attached to a small block which is epoxied to the servo base. In Tom's setup, when either full on or off tone are given, the servo "goes around" and closes the contacts. This keys an escapement linked to the throttle of the Cox 049 engine.

Neat hatch fastener: Loving care went into construction and finish of a new Goldberg Skylark 56 by Vincent Tolomeo (343 Midway Dr., Lexington Park, Md. 20653) and when it came time to add means for fastening the hatch cover, he just couldn't bear to ruin the sleek nose with screws, wires or rubber bands. But wife Linda came up with the perfect solution — use Rand double-sided sticky tape! It works like a charm; Vince simply cuts a piece of the 1/16" thick tape for the full length of the hatch on each side. The cover is held firmly in place; to remove, a razor blade cuts the tape in half lengthwise, and the portions left are easily peeled off.

Pirate flag: After listing the proper color flags for all the three R/C bands (27, 50 and 72) Editor Art Byers noted in the Wram's Horn (Westchester Radio Aero Modelers, N. Y.) that a few R/Cers were using pirate crystals at the club field — obviously they are not WRAM members! — and their transmitter antenna flag should sport a skull and crossbones *on a field of crashed airplanes*; because crashed planes is one certain result from the use of bootleg and pirate R/C frequencies!

Lettering planes: Small lettering required on scale planes may be put on easily with Hobbypoxy, according to word Jack Beauchamp (avid Texas R/Cer) gave us at Nats. He suggests use of rubber stamp sets that you can obtain at any stationery store; they come in a variety of type sizes. He paints black Hobbypoxy on a sheet of glass, lets the 'poxy set till it is a bit tacky, then applies the rubber lettering to it and prints as desired on the model. Jack says if the job doesn't turn out perfectly, you can remove the lettering with lighter fluid (which we assume will not attack any dope or other finish you have on the model) and start over again. The Hobbypoxy should certainly produce lasting and fully fuelproof lettering.

Further hints: From Peninsula Channel Commanders Newsletter (Belmont, Calif.), clear Hobbypoxy makes a fine base coat for finishing model plane wood structures due to its excellent penetration, but it is sometimes a bit gummy to sand when it has set; Hobbypoxy formula II cement thinned 12-15% goes on nicely by brush, seems to fill as well and it sands easier than the clear . . . from same source, some users find it difficult to insert the threaded rods into the inner tube of Nyrods, often being able to get only 3-4 threads; if you warm the threaded portion in flame of a cigarette lighter (hold other end of rod with pliers!) the metal part will easily turn into the nylon tube all the way. Before slipping smaller tube of Nyrod into large, squirt in some Selmer white silicone powder (purchase it at large music stores) for a perfect "lubricant."

From The Shoo Flyer (Shoo Flyers MAC, Ohio City, O.), to keep varnish from building up on the outside of your engines, coat the dirty spots with Sunbeam Metal Cleaner (from the blue Can), one of the best substances found so far to remove burnt-on oil . . . from M.A.R.S. Pulse (Model Aeronautic Radio Specialists of Montreal, Quebec), spring clothespins are used by many builders as clamps, but work better if you take them apart and reverse the wooden parts, to produce a clamp with a better tip. Also, use some as they come but cut the inside of the jaws back to suit special jobs . . . same source, a good suggestion

relating to kits to assist removing parts from diecut balsa sheets — sand the *back* of the sheet (opposite side from where the die has made its cuts) with fine paper. This will allow the parts to drop out of the sheet without the stringy edges you sometimes get from just breaking the sheet apart — and without damage often caused by trying to cut the parts from the sheet. And, if you find indentations in a nicely finished balsa surface, simply rub a little water on them (spit on your finger!). This will swell the grain, usually higher than original surface. When dry, you can smooth down to a perfect surface again. This must be done before you have doped the surface.

From SIRS paper (Sentral Illinois Radio Society), club members have borrowed a trick used by ukie flyers in area, use Rit dye (obtainable in grocery stores) to color model canopies; mix dye in warm water (too-hot water might damage canopy), dip canopy in it — the longer you let it soak, the deeper the color . . . from The Glitch (Soo Modelers RCC, Sault Ste. Marie, Ontario), an idea borrowed from the NVRC Feedback, styrofoam wings and stabs by Midwest may be doped if you first apply a coat of 70% Titebond glue and 30% cornstarch thinned to brushing consistency; apply three coats, sand, then apply color dope.

Grassroots

Nine at once! We note in recent issue of the Pioneer's Modulator (San Mateo, Calif. area) that a fly-by of nine planes was organized on spur of the moment. This was at a club picnic held at the Jerry Nelson Ranch. We assume all the flyers who participated in this fly-by were experienced; report says all got off and back down again safely. This many planes in the air at once can be a real wild affair, if they are all going off on their own — as happens at some large R/C fun-flies. Nowadays at many club fields it is not unusual to have as many as half a dozen planes up at once; this can get hairy when some of them are rather inexperienced (but bold!). We note that quite a few clubs have started limiting the planes in the air at any one time to four, or even three. This probably is tough on the "sky hogs" — the characters who take a dozen flights in a row, pausing between only long enough to refuel. But it really helps the less experienced flyers (those who are not so bold) and who would tend to just stay on the ground until the traffic thinned out — if it ever did.

R/C in F/F: We've discussed in past issues the use of simple and light R/C equipment in free-flight planes, utilized mainly to keep them from gliding rapidly downwind and out of sight on small fields. It's become known as RAFF (Radio Assisted Free-Flight) amongst the F/Fers. Now we have a plea from one of these modelers for some info on radio for still another F/F purpose — to help find planes that have come down in heavy brush, cornfields or woods. Here a very low-powered transmitter would be carried in the model, and the flyer would have a simple direction finder — which would hopefully enable him to "home in" on the errant plane, regardless of its hiding place.

Donald Assel (1012 Milford St. N.E., Canton, Ohio 44714) sent us a plea for info on this subject. He notes that horns have been tried on the models, but are heavy and can only be heard 50 yards or so in heavy growth. He also says that he normally carries some 3-6 oz. of lead ballast on his Nordic A2 gliders, which could just as well be allotted to a small transmitter. Don feels that a range of several hundred yards would be ample, so only low power would be necessary; but it is quite likely that the plane might be in an unfavorable attitude

on the ground, even with the antenna partly shorted — and certainly shielded somewhat. Don notes that the antenna may be no great problem to install, as builders of such planes often run turbulator cords the full length of the wing; wire could be substituted here to form a pretty fair antenna. Direction finders have been used quite successfully to locate lost R/C planes, the only signal from which was emitted by a super-regen receiver. A couple of D.F.'s intended for this use appear in the "Radio Control Handbook"; we strongly recommend the one on p. 257 — it's fairly low in cost and simple to build. This is a tube job (uses a single 3A5 dual-section tube) but the 45V battery lasts a long time so battery costs would not be high.

We would strongly suggest that the plane transmitter be turned on when the dethermalizer operates; would save battery life and reduce the possibility of interference to regular R/C planes. Twenty-seven mc would probably be the best band to use, and if transmitter input were kept under 100 milliwatts no license would be required, and *any* frequency in a rather wide band could be employed. The transmitter should definitely be modulated, but this would still only require two transistors at most. In areas where there is a great deal of C.B. phone activity, a superhet D.F. might be mandatory; this could use a crystal matched to the exact transmitter frequency, so interference should be a negligible factor. It is probable that a low cost C.B. handy-talky could be converted quite easily for this use; such units can be had for $12-15. If any free-flighters try this, we urge them *not* to operate on the specific frequencies set aside for R/C purposes. There is no legal need to do so, since this would not be an R/C application.

Junior R/C Program? Note from Bryan Sattler (29 Waldorf Pl., Schenectady, N. Y. 12307) suggests that perhaps the AMA should look into a program specifically aimed at getting Juniors into R/C. Bryan has flown in many R/C meets this past season with his father (well-known R/Cer Adam Sattler), gained a 1st and a 3rd in Class B Jr. He has seen only one other Junior flying R/C in all these meets. He has read of the heavy program under way by AMA to get Junior flyers into free-flight, wonders if something couldn't be started to lure them a bit farther — into R/C. It appears to us that a young modeler aspiring to R/C needs a father in this same field, or at least one who is an active modeler (Bryan is most fortunate this way); the AMA program enables a youngster to enter F/F competition for a very few cents — but unfortunately even the simplest R/C rig and plane costs vastly more. This is where Pop comes in! But it's

quite likely we could do more to get the young modelers into R/C, and into competition; better prizes for this category, heavy promotion on the matter, help from experienced R/Cers could all help.

AMA Frequency Fund: As we have noted recently, this fund is defunct, yet we still need legal representation to watch over F.C.C. doings that might affect R/C, possibly to seek new frequencies. The request has gone out for more donations. The Peninsula Channel Masters (Belmont, Calif.) have a simple way to do this. They found that their initiation fee plus insurance etc. for each new club member totals up to $19; it was voted to make this an even 20, and give the extra buck to the AMA Frequency Fund; this way the money comes in general from newscomers to R/C, rather than the old-timers, many of whom have already donated to this fund.

Competition Flying

Rhinebeck 1968 — Second Annual WW I R/C Jamboree: At Old Rhinebeck (N. Y.) Aerodrome, two days of balmy weather on Sept. 14 - 15, were enjoyed by a much larger gathering than last year. The sponsor was the IBM R/C club.

About 43 planes were judged for scale fidelity. There was a relatively huge entry, which shows that this sort of contest is definitely needed — and more power to the IBM R/C club for making it possible.

Though the judges were awarding higher points for planes that flew close to scale speeds, not many did. Outstanding, however, were a Bleriot monoplane (pre-WW I vintage) by Don Carkoff, the JN4 of Doctor Reg Mitchell, and Doctor Gallagher's Avro 504K.

The sponsors intend to inaugurate stiffer scale rules in 1969; any plane may be entered, but will have little or no chance at prizes unless it is a fairly accurate scale

copy. The events in 1969 are expected to remain about the same, but some changes may be made in the balloon burst, since this one (called "The Mission" in '68) takes a lot of time — and a lot of balloons! But, bursts are almost nil.

Bomb Drop and Spot Landing were also scored under "The Mission" and were far more successful. Sixteen fliers entered "The Mission" event.

The "Maneuvers" event had the most entries (about 44, with 25 actually flying), was scored on 19 stunts, plus scale fidelity, structural consistency, finish and markings, overall appearance. The "Scale" event had 21 entries, was based mostly on the AMA Scale event, and scored on fidelity to scale, flying ability (flying realism and scale speed were considered), plus "message or flare dropping," firing a gun or rockets (none of the latter two, as far as we know!).

"Combat" was between two models and was very exciting at times. Thirteen teams signed up and flew in this real crowd-pleasing event.

Top Winners: *Maneuvers* — (1) Hale Wallace, N. Y., Bristol Bullet (195.5 pts.); *Scale* — (1) Bob Wischer, Wisc., Sopwith 1½ Strutter (23,691); *The Mission* — (1) Walt Moucha, N. Y., Eindecker (250); *Combat* — (1) Bill Wischer, Wisc., Bristol M. 1B, and Dick Allen, N. Y., Sopwith Camel (20.7 pts.); *Best Finish* award went to Dolly Wischer (Bristol M. 1B, also flown to a Combat win by son, Bill). *Most Spectacular Entry* award went to Al Signorino (Kansas) who flew a replica of Snoopy's Doghouse, complete with canine pilot on the roof! This .60-powered creation made a dramatic flight each day.

Unusual prize split: A new method of distributing prizes was used at the Flying Aces Air Races (June 15-16, Jamestown, N. Y.) that might be of interest to other clubs. The sponsors divided the complete list of winners in each event into three equal parts; the top third were the experts, middle third were sportsmen, lower third were novices. Thus performance at *that particular meet* determined your category, not what you had done at previous meets (or what your "reputation" might be). This required three first-place prizes, three seconds and so on, for every event in the meet. However, some $1000 in prizes were available. The result of the prize split was that a flyer could get a very valuable prize, even though he might end far down the list — where he would usually be considered completely "out of the money." This should certainly encourage the sport and Sunday flyers, who normally have little chance of collecting anything worthwhile when competing against the hotshots.

There was a smaller entry in Goodyear — er, pardon — Formula I racing than expected, but a good turnout in Formula II (the old 600 cu. in. size), with ten in each. Hal deBolt won Formula I, had the best heat time of 2:02; Bob Noll took Formula II with 2:22, but best heat time in this category was 2:12 by Ed Keck. Meet also had 30 entries each in Open Pylon and Cabin Pylon, but NMPRA News Release, from which we copied above info, did not have results of these two events.

More FAI claims: It's difficult these days to keep up with all the new claims being sent to AMA for FAI R/C records, but a

couple of new ones came out of the DC/RC Record Trials over Labor Day weekend at Dahlgren, Va. Ray Smith, pioneer glider enthusiast of the DC/RC got his craft up to around 4990', which considerably surpasses the previous record of 4330' set by German modeler Friedrich about a year ago. Ray's craft had 120" span and weighed about 5 lb. It could still be seen (just!) with the naked eye at maximum altitude, but Ray operated during much of the flight from the tracker provided by the Navy, at this Weapons Lab field. Tom Rankin flew an R/C seaplane at some 83.8 mph average through the speed trap, topping the figure of 66.9 mph made by Di Noto at the June Westover A.F.B. trials. Both figures came on Monday afternoon, no one doing very much earlier on the weekend, despite many tries at altitude and speed.

Tom's plane was rather badly wrecked on Saturday morning when he made a pass rather close to the runway, and the plane apparently "glitched" the rest of the way to crash (this problem has been noted before on close passes over the steel-reinforced concrete runway). But he had it back in flying shape by Monday; the plane was actually one built for the tentative FAI 1.7 meter pylon event (flown for the first time in the U. S. at the DC/RC Mirth of July meet), uses a ST 23 engine; Tom used a 10-8 prop and hot fuel for the record try, found the plane handled nicely on floats, getting off the water in 50' or less. Above info gleaned from FAI Record Attempt Newsletter.

Learn the maneuvers: Letter from Bill Aaker, prexy of the Dallas RCC, notes that he feels the main reason more less-experienced flyers don't go into stunt competition isn't because they're afraid to — it's due to lack of knowledge of how to do the maneuvers. Bill suggests that all new flyers

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buy the book by Duane Cole entitled "Roll Around a Point," study the ten lessons given therein, *then* practice the AMA maneuvers. Bill had written that his club was swamped with 59 entries at their May meet, mainly because they didn't have enough paved runways to run multiple flight lines. He also wrote that he was hoping to drop the Proto taxi and taxi-back-to-hangar maneuvers from their 1969 meet, as the time gained would possibly allow another complete round — for perhaps as many as 50 entrants. He was way ahead of the AMA; the Contest Board voted to drop these maneuvers among others during their meeting at the Olathe Nats.

NEW IN R/C

An impressive box houses the **Top Flite Models, Inc. (2635 S. Wabash Ave., Chicago, Ill. 60616)** kit for the **Kwik-Fli III,** a plane design that won the 1967 World Champs, the 1967 and the 1968 Nats R/C stunt titles for Phil Kraft. Prefabrication is featured as is a complete set of hardware (user needs only to get three wheels). There are many sheets of diecut balsa, one of diecut ply and especially shaped hardwood engine rails. Big feature is in the very bottom of the box — four sheets of 1/16" wing covering balsa, each 11¼ x 30"! Plans as such are almost non-existent; you don't need any! Build the fuselage right on its top block; wing is constructed on a jig you assemble from the heavy cardboard furnished. Stab is built on one diecut sheet; the rudder and fin are diecut from thicker sheet. All steps are nicely illustrated with assembly sketches. Plane spans 60", has 650 sq. in. area, use with .45-.60 engines. Kit costs $39.95.

New addition to model plan line of **Bob Holman (Box 741, San Bernardino, Calif. 92402)** is the **Albatros D-Va** in 2" scale, 3 sheets for $4. List now includes some 20 WW I types, half a dozen WW II designs and others; list is being expanded rapidly. Scales vary from 1 to 2", but since the advent of smaller, propo gear, stress will be placed upon the smaller sizes. Some 26,000 photos are available, mostly German aircraft; there are over 300 of the Bf 109 alone. Prints (5 x 7) cost 30c each. Fiberglass fuselages, foam wings, plastic cowls are offered for a few planes. Holman will carry Complete-A-Pac, pre-cut wood kits of many scale models from Scotland. Also coming, built-up wood fuselages for Fokker D-VIII and D-VII in 2" scale, around $20; others to be added. Send for plans list, information on photos and other items.

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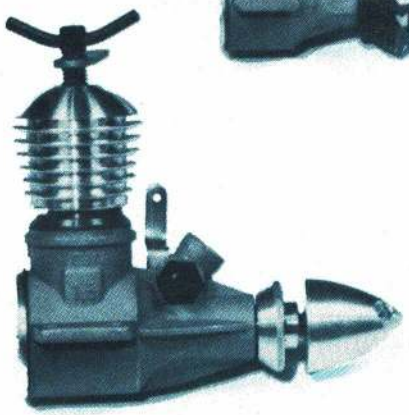

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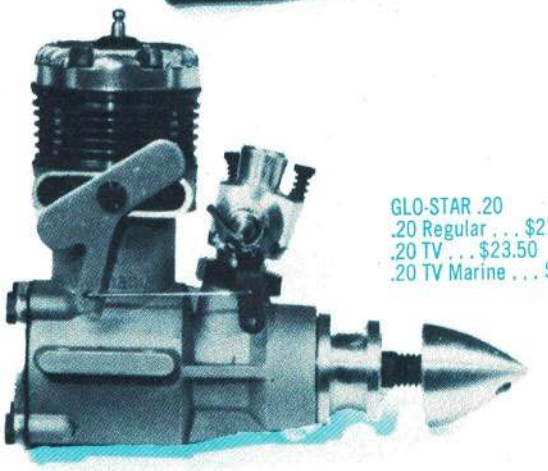

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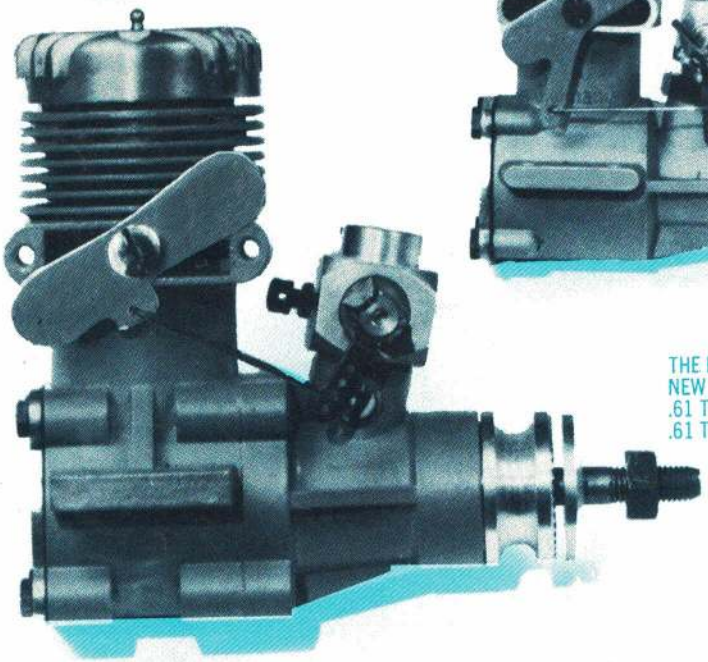

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