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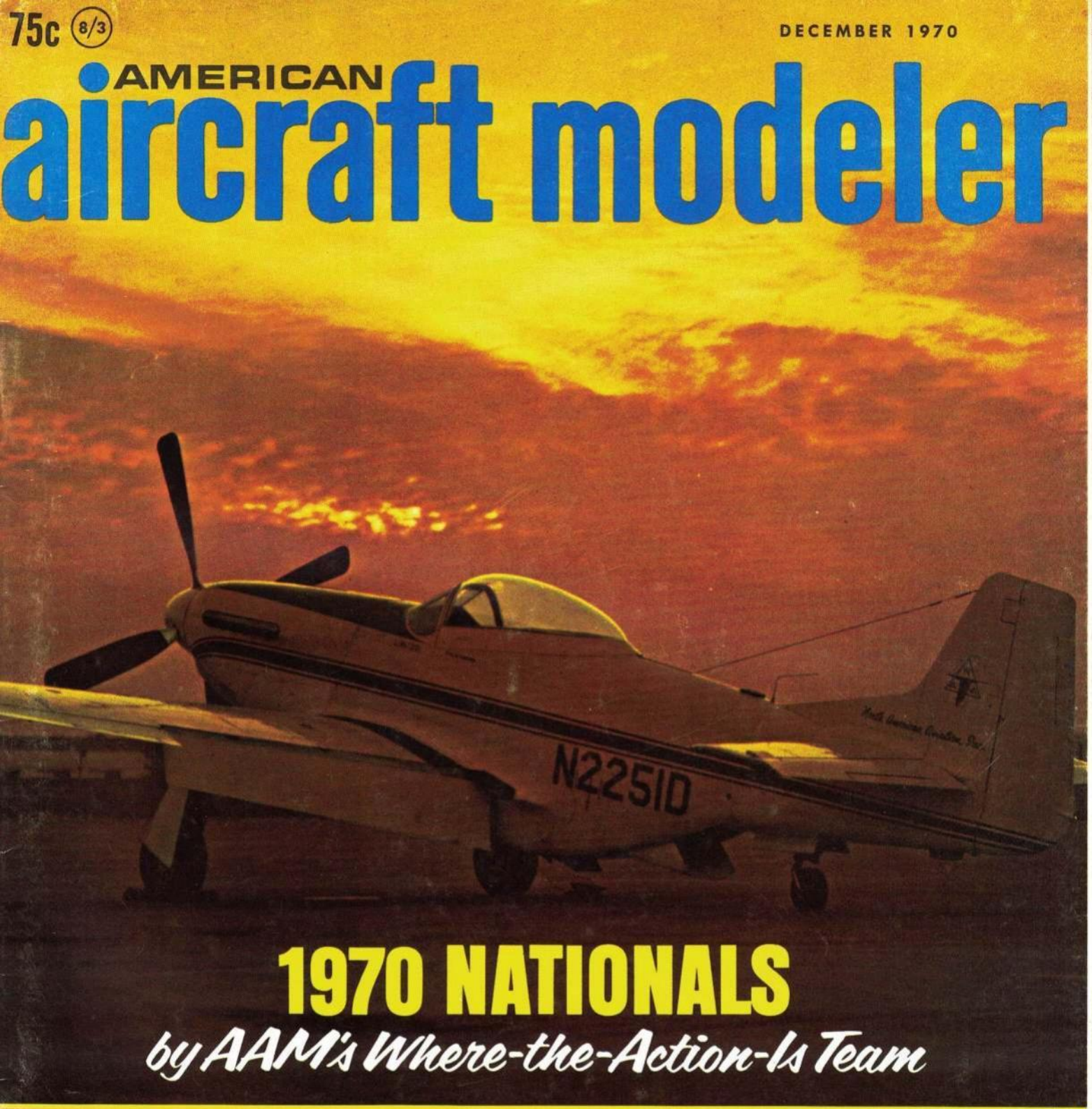
DECEMBER 1970

AMERICAN aircraft modeler



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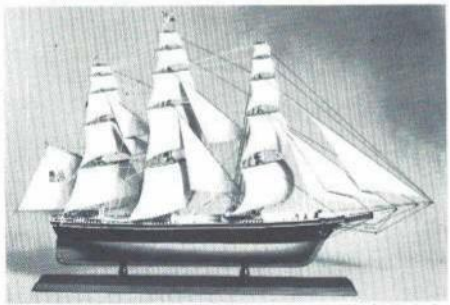

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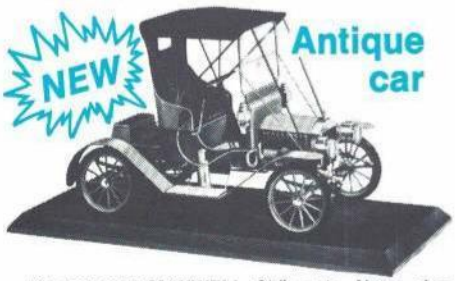

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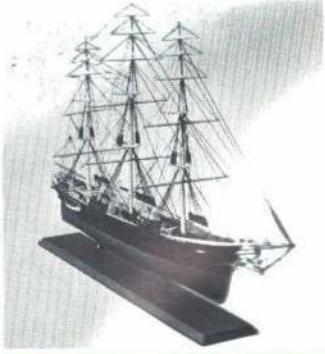

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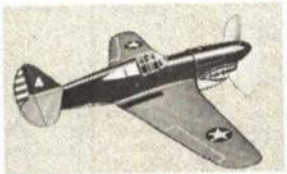

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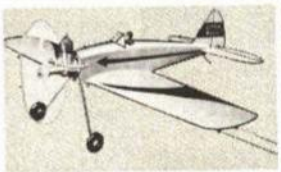

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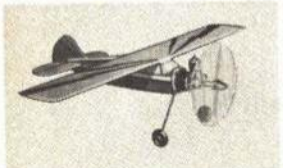

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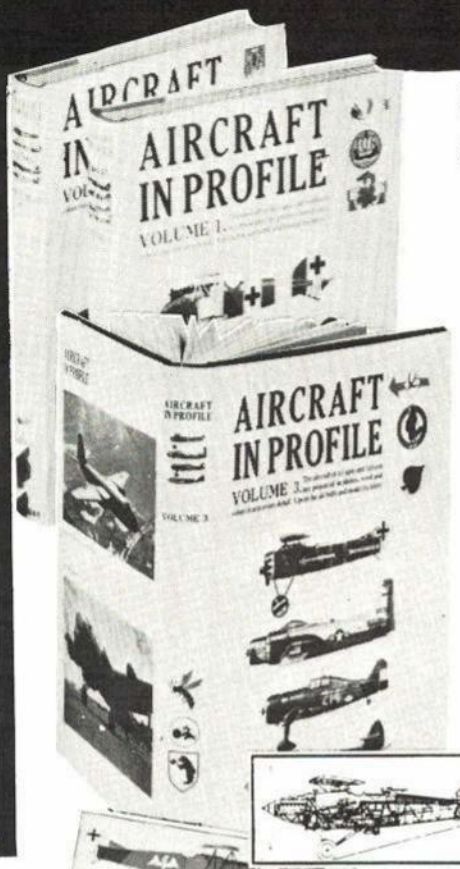

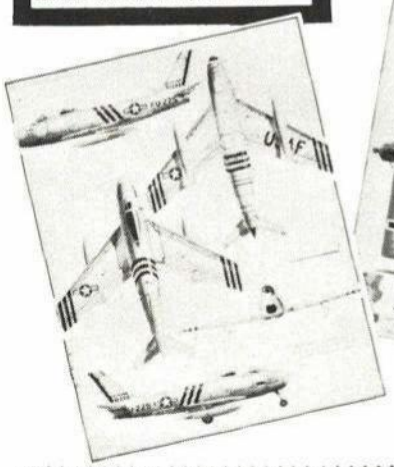

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Editorial

Straight...and Level

When will the Smithsonian build the Air and Space Museum?

THE SMITHSONIAN INSTITUTION has always been of uncommon interest and importance to the model airplane hobbyist, as well as to those interested in aircraft and the display and documentation of historical aviation. The most important aspect of the Smithsonian from the viewpoint of all of us involved with aviation, full scale or models, is the Air and Space Museum.

There is something terribly wrong with the Smithsonian's Air and Space Museum. In 1946, Congress established the National Air Museum as a bureau of the Smithsonian Institution. One evidence of the shortcomings of the present A and S Museum is the many-years-old Silver Hill facility—a partial stop-gap means of trying to preserve numerous priceless specimens of historical aircraft which are an important part of American heritage. In spite of a yeoman effort by a seriously understaffed group, many such aircraft cannot be displayed and it is a desperate battle to keep many specimens from degenerating into oblivion.

In 1958, Congress authorized a Mall site for the new A & S Museum. Funds were allowed for detailed plans of the building. During 1964 and 1965, almost $2 million was appropriated so that architectural design and layout for the Museum could be completed. Its concept goes back 26 years. Architectural work is complete, plans are finished. The site is designated and approved by all concerned, and Congress has approved actual construction. Yet, to quote Senator Barry Goldwater who has addressed the Senate on the Smithsonian, "Yet, as of today, not one dollar has been funded for construction of the Museum."

Fairness requires mention of the fact that Congress shares heavily in the abortive Museum program. Although Congress authorized construction of the Museum building in 1966, it tied construction to a substantial reduction in military expenditures in Vietnam—roughly four years ago! Since then such achievements as the first lunar landing have intensified the need for the building. Yet there is no such tie for constraint on other Smithsonian activities—such as the construction of the Hirshhorn Museum, the renovation of the Renwick Gallery ($2.6 million), or the sought-after construction of two Bicentennial Pavilions ($6 million). The Air Museum stands peculiarly alone in its funding problem.

But there is much more to the Air and Space Museum debacle than Congressional attitudes of four years ago. The present National Air and Space Museum actually is a WW I temporary hangar erected in 1917. The second building in use is 90 years old. Moreover, these humble facilities appear to be a thorn in the side of Smithsonian management. Senator Goldwater states that one official wanted to expel the Flight Museum, and its exhibits, from the Mall. It was proposed to "get rid of the tin shed" and "get the missiles out of view." The Smithsonian drastically limits the Museum's share of the Institution's budget so conspicuously that its policies deserve questioning.

When S. Paul Johnson, then director of the Air and Space Museum, resigned in 1969, he had only recently addressed the Washington Aero Club about the Smithsonian environment which helps confound building of the Museum. Johnson is one of the great authorities in aviation.

". . . It comes down to a question of priorities—and when money and manpower are being rationed, the question is: 'Where do money and man-power go first?' . . . Answer: 'Not to the Air and Space Museum.' "

". . . the current art and 'ology'-oriented management appears to favor sculpture gardens, folk art, and elaborate housing for the scholarly, over the more practical, hardware-oriented technologies of flight . . . essential operating dollars for the Air and Space Museum have almost dried up completely. Out of the more than $30 million federally appropriated Smithsonian budget, the A and S Museum's share is approximately two percent . . . with personnel, about two percent of the total Smithsonian complement."

Yet, less than $500,000 was appropriated by the Smithsonian to the Museum in 1970 out of $28.1 million allowed by Congress. Contrast this with over four million visitors who went through the air and space exhibits in 1969, out of a total of 12,438,909 visitors to the Smithsonian park. This represents more than one-third of the overall Smithsonian audience, more than visited the Lincoln Memorial in that year!

The figure is all the more startling when it is considered that pertinent A&S exhibit areas were closed every Monday in January, February and March of 1969, and at 4:30 p.m. throughout the year, whereas History and Technology exhibits stayed open until 9 p.m. for five months of the year.

Senator Goldwater quotes Mr. Johnson in regard to the organizational pattern in effect at the time of Mr. Johnson's retirement, under which the Museum reported to the Assistant Secretary for History and Art.

"The incumbent, according to Mr. Johnson," stated Senator Goldwater, " 'takes some pride in the fact that he has never come within miles of the Pentagon, physically or spiritually. He has little interest in aerospace matters, and yet he is representing us in the Upper Councils of the Smithsonian . . .' "

In 1965, there were 34 authorized permanent positions for the Museum. There are 30 today (as we write), including secretaries and 14 people working on preservation and restoration of aircraft stored at Silver Hill. The Curator's professional staff includes two people, down from four. The historical Research Center which documents significance of acquisitions and answers 6000 inquiries yearly, and runs a reference library, has only three employees. When this was written, the museum has no Director—Johnson has not been replaced after 20-odd months. Actual employment is 30 out of 1889 for the total Smithsonian staff. (The Smithsonian has requested an increase in authorized positions for the A&S Museum, but so far the number of authorized positions reserved is purely a paper figure.)

The name "Smithsonian" is hallowed in the mind of every citizen. It is difficult to accept the fact that this great institution holds a prejudice within its inner sanctum toward the air and space age which qualifies the long overdue Air and Space Museum. The Smithsonian belongs to all of us.

William Winter

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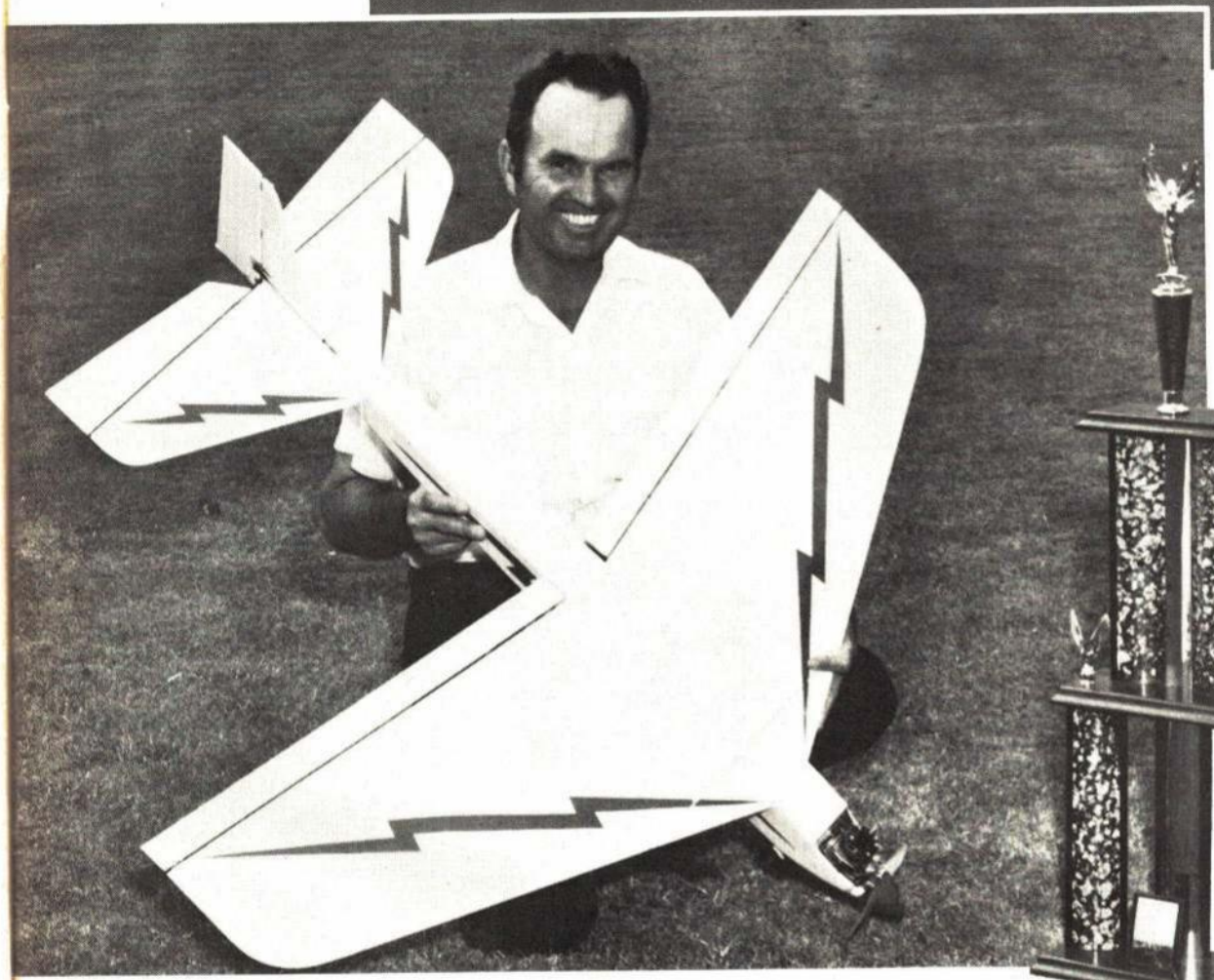

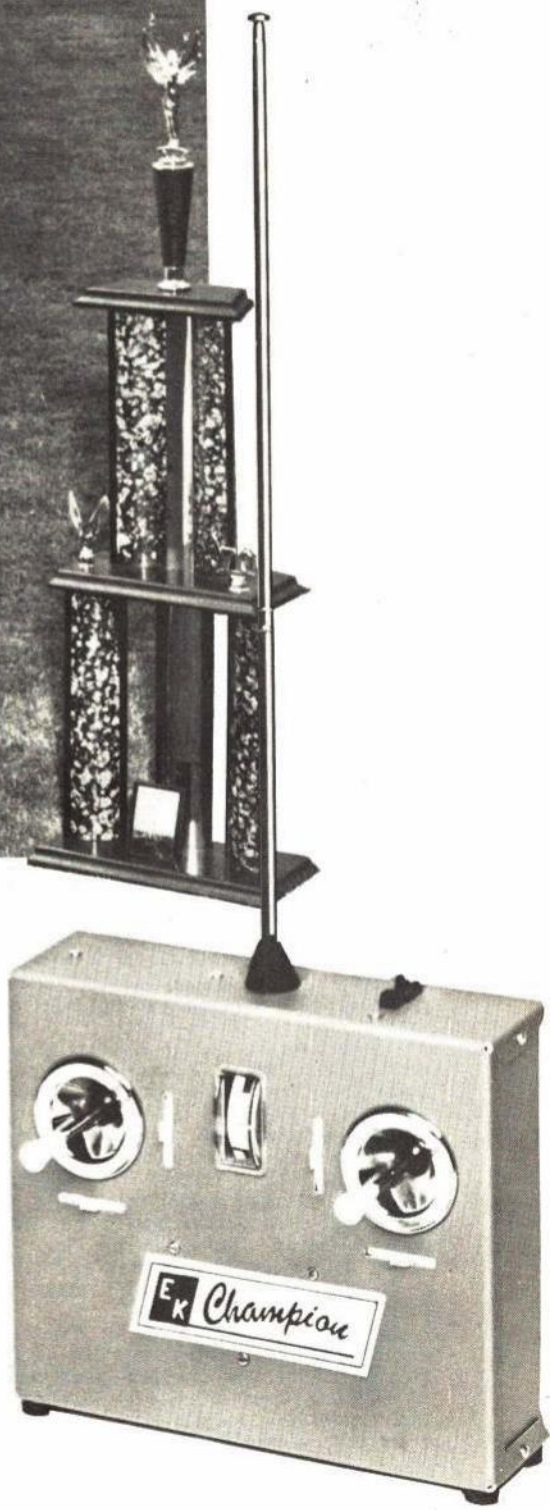

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Earhart buff

I am doing research on the last flight of Amelia Earhart, and would like to know if solid or flying models of her aircraft were ever available as kits or made-up, by whom and where.

Also, if possible, where currently available or who might have a kit or made-up standard Electra 10. All I have located are old plans. Would also appreciate it if any of your readers could offer information on Ford Trimotor kits.

Robert Townsley, Ph. D., 5939 Almaden Lane, Oakland, Calif. 94611

If the editors piled all these info requests one upon the other, we'd break the altitude record. Anyway, there's a full address given —you readers who can help, be our guests. —the Publisher

Conversion challenge

I have a problem which I hope another reader can help me with. It appears that I have in my possession three pieces of RC equipment in dire need of . . . well, they don't work.

These are: a Kraft-tone transmitter; a C.G. Hercules eight-channel tone transmitter; a C.G. Atlas eight-channel receiver, of the reed relay variety. (I know, that's an outdated anchor and why not get a new ri,.) However I would like schematics and service information on these units if at all possible, plus I'd like to convert these units to six meters. Any help along these lines would be greatly appreciated.

I've been flying single channel since 1965, starting with a Firecub and a Babcock Magic Carpet—proved its crash resistance beyond all doubt. I graduated to a Controlaire 4, and another Firecub (possibly the last in captivity, it has since been put out of its misery, thanks to a kindly old fence.)

Then came (and, following the tradition, went) an Astro Mite. I've still got that noble bird's wings—they may fly again. Since then, I've designed and flown some of my own creations with the same high degree of success and feel I am now ready to face the challenge of multi.

Along came this ancient and inoperable reed rig. The Babcock gear I used originally came in semi-kit form without plans, instructions or any of the other niceties. They were immediately put on six meters and finished—successfully. This can get monotonous.

Michael Tauson, Box 109, Bradford Woods, Pa.

Misery loves company

I have been a modeler for years and never had the urge to write to a magazine, much less correspond with other modelers, but the most enjoyable "You Said It" column of your August issue has "done urged me!"

Do I remember the GHQ and the Thor? Oh, the nostalgia! They looked real, felt real and were darned inexpensive in their day. But this was their greatest and only attribute, and obviously the single element which created their popularity, because I never got either one to run. I have never admitted this until now, but since misery loves company, I want to add my name officially to your list of readers who labored long hours over these two nefarious machines; spinning props, changing fuel mixtures and batteries, washers, gaskets and worn out cams, only to have soaring hopes—lofted by a few pops—dashed to bits by swollen, numbed fingers totally and frustratingly unable to turn the prop over one more time. It is just simply nice to know, after all these years, I was not alone.

I never traded them. I never sold them. I did not bury them.

Nor did I convert either one when glow was first introduced. They just lay in a box for years, collecting dust. Today, my youngsters enjoy taking them apart and putting them back together, each time learning a little more about the mysteries of the miniature model internal combustion engine.

So, like the Mets, who were more beloved because they were failures, the GHQ and the Thor are loved by us older modelers who experienced them, helping to produce the knowledge and affection for our sport born out of the puzzlement and frustrations of earlier days.

Edward Seibert, Baltimore, Md.

Less fancy stuff!

Why is it that since many modelers are purchasing digital proportional RC sets, the ones with simple pulse proportional sets are left out?

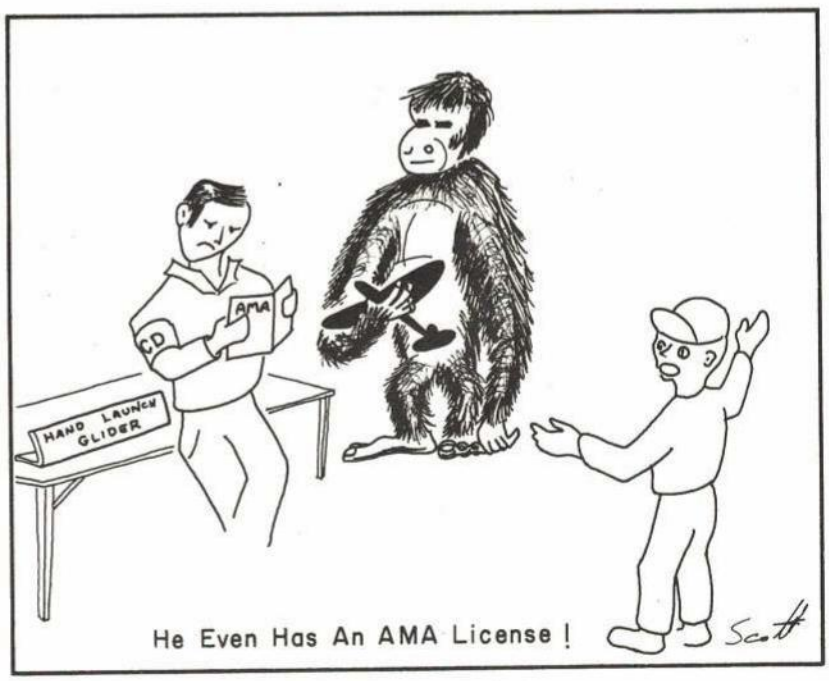
I have been reading *AAM* for over a year and not yet have I found airplane plans for the bulky receivers and actuators which many of us RC beginner modelers own. Many beginners (myself included) are looking for plans of a G.G. or R/O plane to learn to fly in.

The plans you have published are either of the scale type or for the super lightweight radio gear which is being built today. Why doesn't someone wake up and help us?

Tom Black, Carmichael, Ca.

Believe it or not, there is a soft supply of such aircraft. The editors would be interested in proposals. Meanwhile, some simple designs have been accepted and will appear in future issues.

—Publisher.



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CONSTRUCTION ..... MOLDED FOAM CORE—FULL SPARS
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FUSELAGE AND TAIL ASSEMBLY

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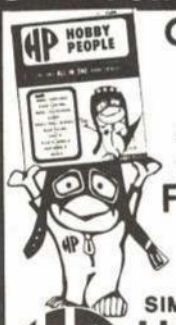

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On the Scene

Paper Planes at Naval Academy

Not only does the U.S. Navy sponsor our Nationals, it also held this wacky, meet for distance, duration, aerobatics, and design.

E. K. STOCKSDALE

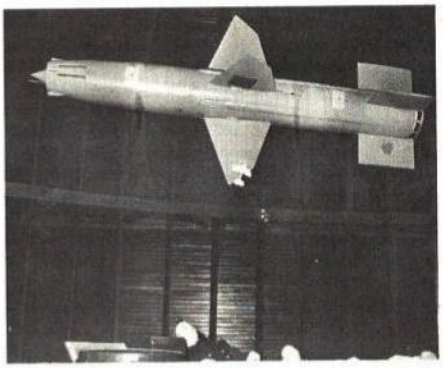
U. S. NAVAL ACADEMY MIDSHIPMEN and faculty were given the opportunity to display their aeronautical talents at a paper airplane contest held in Dahlgren Hall. Well over 100 contestants, including participants from the community, enjoyed what was a high spot in Academy activities this year.

The contest was sponsored by the midshipmen chapter of the American Institute of Aeronautics & Astronautics. Categories included distance, duration, aerobatics and original design. Ground rules limited the design of planes to a single sheet of paper no larger than 12 x 12". In addition, only one paper clip could be used to establish CG.

For weeks before the contest, when preparations were booming, scores of planes littered the passageways of the labyrinthine Bancroft Hall. "Every day, upon arrival at class, I was hit in the head with paper airplanes," commented Lt. Com. H. B. (Bruce) Bartels, officer representative of the midshipmen chapter of AIAA.

At last, the night of the contest arrived. As tension mounted, over 150 spectators lined the balcony of the old

(Continued on page 69)



Past an out-of-date guided missile, a small plane descends from the balcony.

Officer rep., midshipmen AIAA chapter, holds winning original design entry.

Sharon, hit of the evening for her tiny flight, is escorted to launching circle.

Streamlined delta and fragile biplane are admired by midshipmen Harrison and Culp.

"The Pro," Peter Tasi, brought a basket of various designs—some quite complicated.

Watching their dad's plane, Andrea and Amanda Tasi seem to hold their breaths.

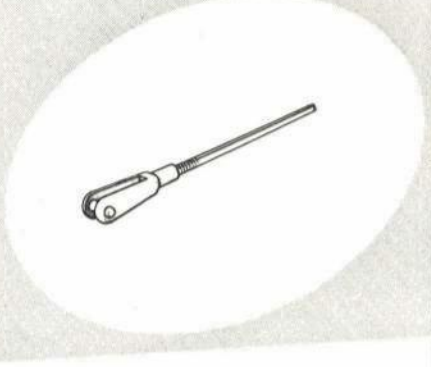
This young lady waits her turn to launch in the distance event. Good flight too.

CARL GOLDBERG

THIS MONTH IN THE SPOTLIGHT

CG MINI-LINK

I think a lot of modelers are going to like our new MINI-LINK. It's strong enough to hang 3 big 7 lb. ships from it. But it's small enough to look right on the new small models. Made of tough nylon, so you can use it anywhere because it makes no electrical noise. MINI-LINK comes with a long, strong rod (needs no connector) and has a mini-price—29¢. See your dealer for it.

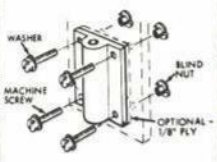


Send 10¢ for 4-pg. Illustrated Catalog, with recommendations on "Getting Started in R/C."

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

FITTINGS and ACCESSORIES

NOSE GEAR BEARING

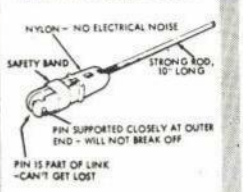


One-piece Nosegear Bearing mounts easily to firewall without alignment problems. If extra steering angle is desired, use ⅛" ply stand-off. Includes blind nuts, screws, etc. .....60¢

LONG CONTROL HORN

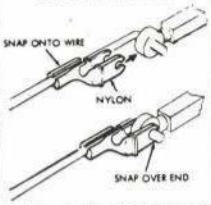
Control Horn has right size holes for 1/16" wire, and nut plate for simplest mounting to control surface. Horn is long for maximum range of throw; can be cut down. 50¢ for 2

NYLON AJUSTO-LINK



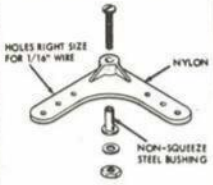
Ajusto-Link is used for adjusting linkage to control surfaces, throttle, steerable nose gear, etc. Nylon-tough and no electrical noise. Takes heavy load. ..... 29¢

SNAP'R KEEPER



Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Nylon can be squeezed together with pliers to work on wire under 1/16" diameter. .....50¢ for 4

AILERON BELLCRANK



Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise — all metal parts are screwed tightly together. 50¢ for 2

NYLON REINFORCING TAPE

Extremely tough. When applied with heavy coats of cement, it approaches fiberglass. Excellent hinge material. ¾" wide x 5 ft. .....25¢

SHEET METAL SCREWS

Sheet metal screws—like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers. #2x5/16 20¢ for 10, #4x⅜ 20¢ for 8

STEERABLE NOSE GEAR

Steerable nose gear with shock absorbing steering arm, molded one-piece nylon bearing. Includes blind nuts, screws, etc. $1.95

Falcon 56 Canopy	75¢	Skylark 56 Canopy	75¢	Falcon 56 Nose Gear ..	50¢	Falcon-Skylark Wing	$7.95
Sr. Falcon Canopy	75¢	Jr. Skylark Canopy	25¢	Jr. Falcon Nose Gear ..	25¢	Sr. Falcon Wing	....$14.95
Jr. Falcon Canopy	25¢	Shoestring 54 Canopy	75¢	Shoestring Land. Gear	$1.50	Skylane 62 Wing	....$14.95

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Ranger 28

RANGER 21 — All die-cut balsa parts. 21" span beauty. $1.98

RANGER 28—"Pre-fab plus paper." 28" span, 2 colors. $1.98

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CESSNA 180 — The champion of business liners, 21" span. $1.98

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½A BLAZER — Die-cut balsa, tissue, 40" span, for .049 engine. $4.50

RANGER 30 — Die-cut balsa, 30" span, for .010-.049 engine. $3.50

VIKING — 48" span, Hi-thrust, for .049-.051 engine. $5.50

½ A CONTROL LINE

Stunt Man 23

LITTLE TOOT — Sporty Biplane, for .049 engine, all die-cut balsa. $3.50

LI'L WIZARD — Shaped balsa wing, die-cut fuselage, 21" span, for .049 engine..... $3.50

STUNT MAN 23 — Die-cut balsa, 23½", for .049-.09 engine. $3.50

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VOODOO — 36" combat-stunt for .19-.35 engine.
Single kit $4.50 Double kit $7.95

LI'L SATAN — 19" span, ½A combat-stunt for .049 engine. $2.50

JUNIOR SATAN — 29" span, combat-stunt, for .15 to .19 engines. $3.50

RAT RACING

SKAT RAT — Shaped wing and fuselage, 31" span, for .29 to .40 engines. $5.95

ACCESSORIES

Safti-Flite ½A Handle including lines ..... 68¢
½A Flying Line ..... 25¢
Nylon Tape ¾" x 5 ft. ..... 25¢
Eng. Bracket for Cox "290" ..... 79¢
#4-40 Blind Nuts ..... 20¢ for 4
Snap'R Keeper ..... 50¢ for 4
#2 x 5/16 Sheet Metal Screws with Washers ..... 20¢ for 10
#4 x ⅜ Sheet Metal Screws with Washers ..... 20¢ for 8
Long Control Horn..... 50¢ for 2

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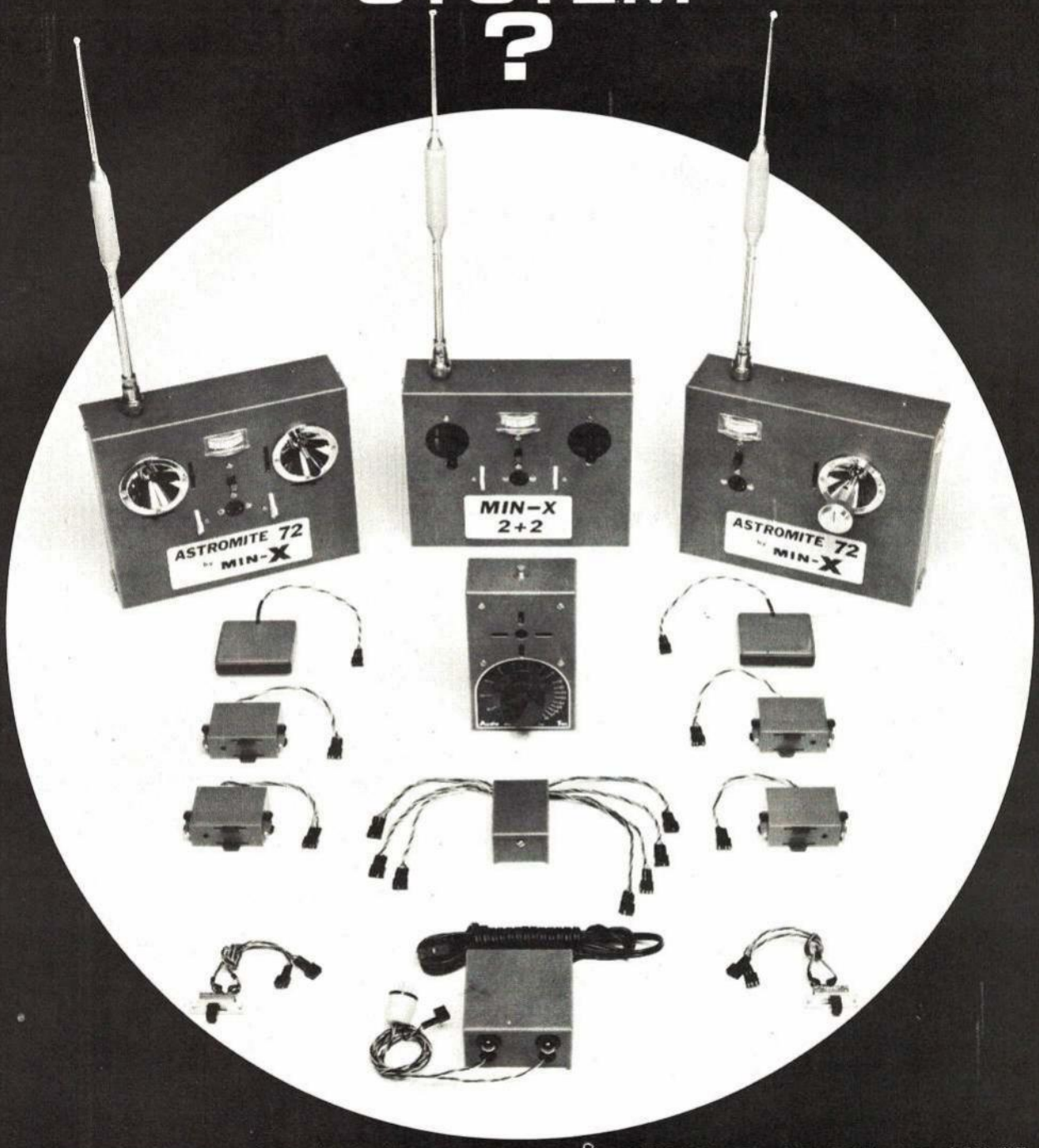

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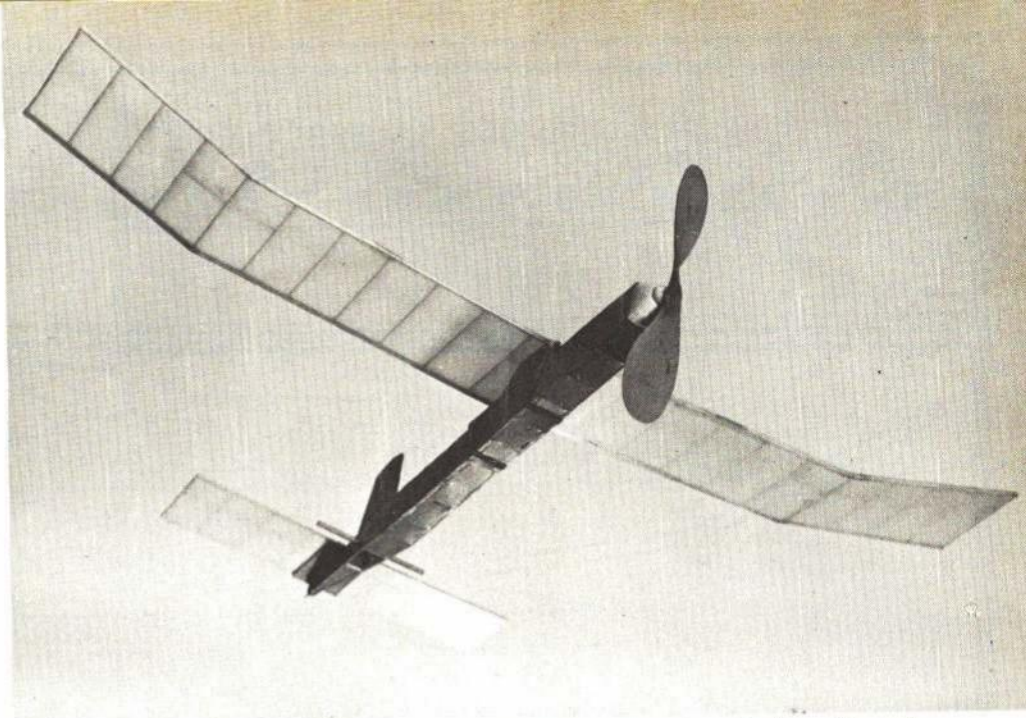


For learning model construction, Sundancer is next logical step after other AAM Tenderfoot designs. Uses commercial plastic 7-inch prop.

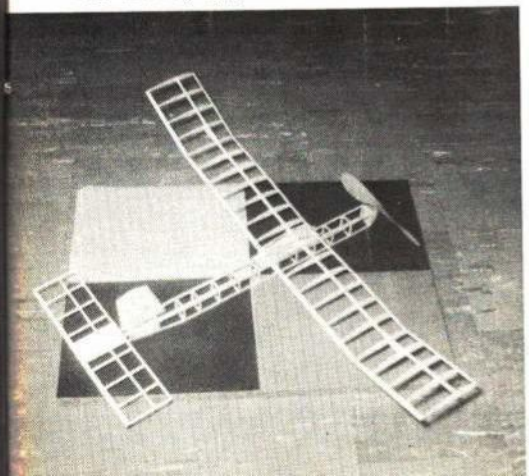
Sundancer

Stick and tissue models fly great and are simple to make, but do take time. Send AAM a picture of your completed model and we'll send you a Tenderfoot decal for it.

JOYCE HARLUKOWICZ

SUNDANCER IS DESIGNED for the Tenderfoot who is ready to tackle something a little more difficult. This ship is the logical step up from small all-balsa models. It was built as a last resort, after many frustrating experiences with "beginners" models which were "guaranteed" to fly, but didn't. Most of them were too small; hence, this model is a bit larger than any presently available. Not a high-performance ship, Sundancer is meant to be a tough little model that will fly and fly and fly. It can be flown in a small lot, on a playground, or in any relatively large obstruction-free area.

Skeleton of any model is rather flimsy, covering adds considerable strength. Keep it light for best flying performance.



Construction

Because it is larger, this model will take more time to build and finish. However, with care in building and proper adjustment, it will be a fine-flying model.

Before starting construction, order the required 8½" lightweight wooden propeller from Paul K. Guillow, Inc., Box 229, Wakefield, Mass. 01880, care of Mr. Earl Smith. (Cost is 29¢, plus $1.00 for postage and handling charges.) Other materials and tools are listed at the end of the article.

Ambroid model cement should be used throughout and all joints cemented by the double glue method. Coat the ends to be joined with a thin coat of cement. After it has dried and been absorbed into the wood, apply a second coat and join the ends.

Select medium grade balsa. It is not soft and pliable, like A grade, nor is it hard as a rock, like C grade. B grade is the manufacturers' term for firm, but not too heavy, balsa. Do not select wood that is badly warped.

Wing: Lay down the leading and trailing edges of the two panels, taking care to pin on both sides, but not through the wood. Do not cut the leading edge or trailing edge at the joint for the outer panels. Cement all the ribs in place, except the A rib at the center joint. Trial-fit the spars in place, cement them to the ribs, but do not cement the spars to any of the A ribs. When the frames are dry, remove them from the board, shape the leading and trailing edges as shown.

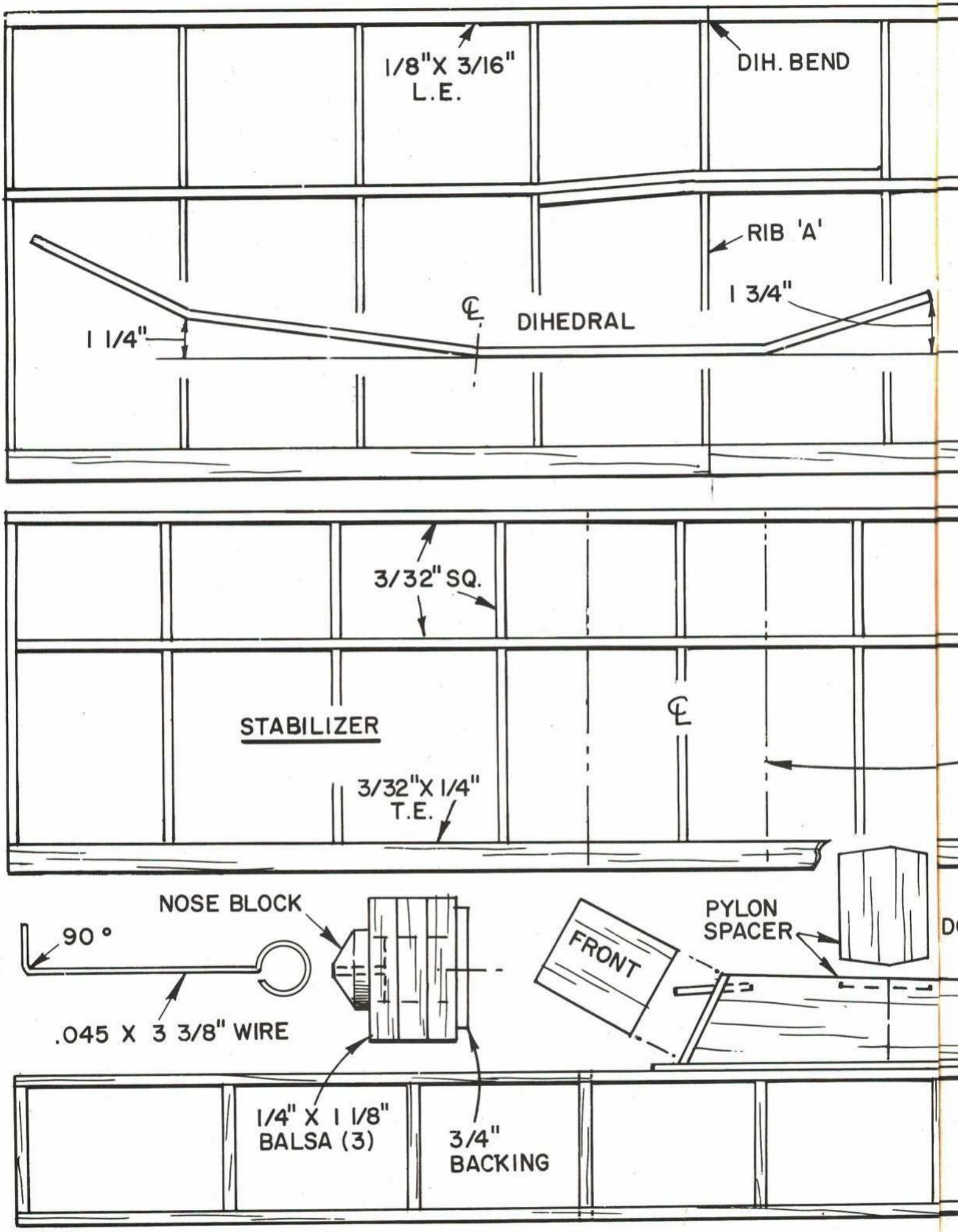
To put dihedral in the wing, start on the outer panels. Turn the wing over and cut halfway through the leading edge and the trailing edge at the outer panel joint. Pin down the main panel and then gently crack the outer panel up 1¾". Block up the panel, making sure it measures 1¾" at both the leading edge and trailing edge. If measurements are not the same at both places, a twisted panel will result and the plane will not fly properly. Spread some cement on the leading and trailing edges, and attach the spars to rib A.

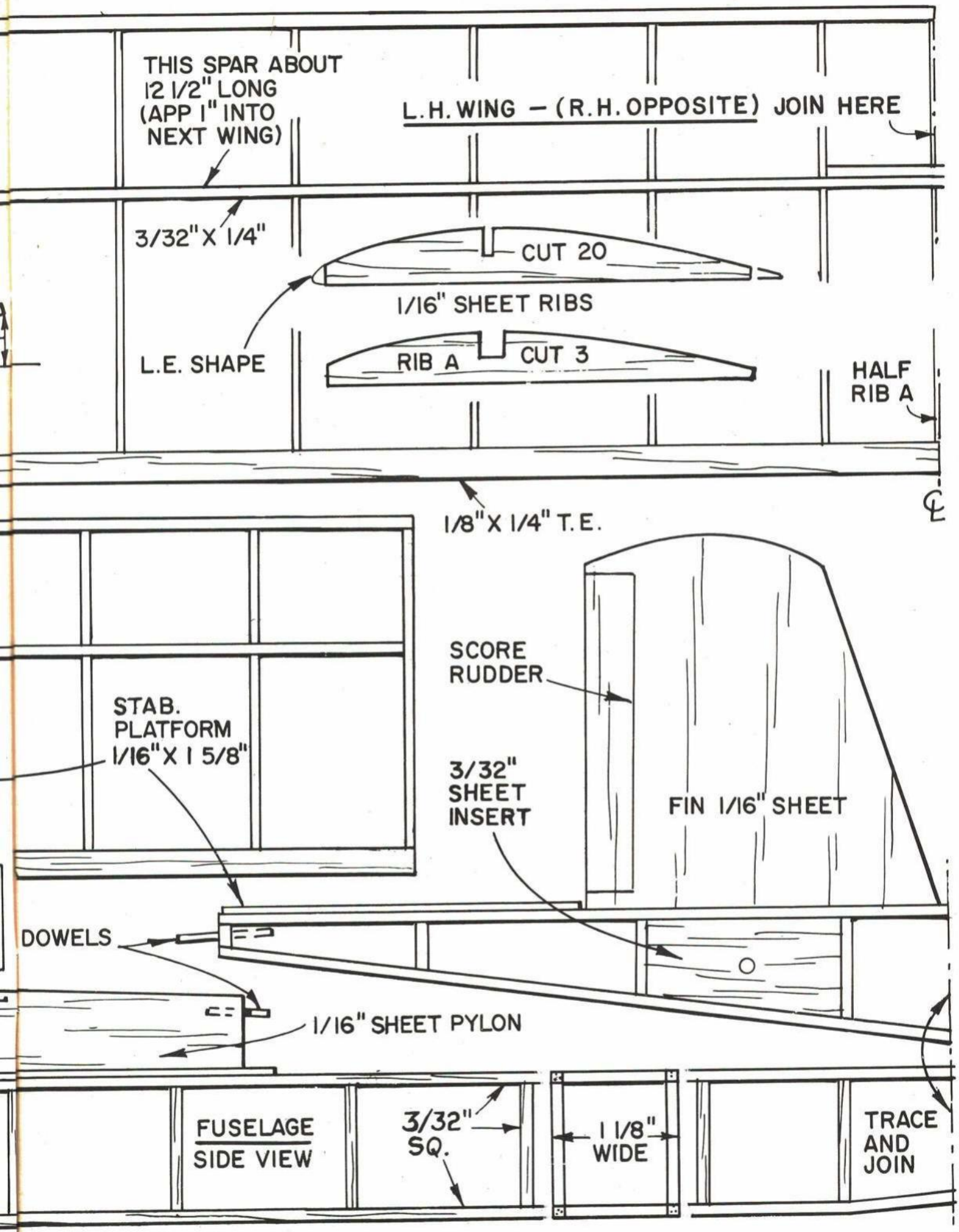
When this assembly is dry, remove the panel from the board. Cut small pieces from an old nylon stocking and cement them around the leading and trailing edges where they are cut for the outer panel joint. This makes an extremely strong joint.

Now take the two panels and bevel leading and trailing edges so that they form the correct angle for the center joint. Pin one panel flat to the board, and slip the last A rib on the spar. Pin the other panel to the board, block it up 1¼" and then cement the leading and trailing edges together. When they are dry, cement the last A rib in place.

Finally, crisscross the spars, cement them together and then to the rib.

(Continued on page 79)


1/8"X 3/16"
L.E.
DIH. BEND
RIB 'A'
1 3/4"
1 1/4"
℄
DIHEDRAL
3/32" SQ.
STABILIZER
℄
3/32"X 1/4"
T.E.
NOSE BLOCK
90°
.045 X 3 3/8" WIRE
FRONT
PYLON
SPACER
1/4" X 1 1/8"
BALSA (3)
3/4"
BACKING


THIS SPAR ABOUT
12 1/2" LONG
(APP 1" INTO
NEXT WING)
L.H. WING – (R.H. OPPOSITE) JOIN HERE
3/32" X 1/4"
CUT 20
1/16" SHEET RIBS
L.E. SHAPE
RIB A
CUT 3
HALF
RIB A
1/8" X 1/4" T.E.
SCORE
RUDDER
STAB.
PLATFORM
1/16" X 1 5/8"
3/32"
SHEET
INSERT
FIN 1/16" SHEET
DOWELS
1/16" SHEET PYLON
FUSELAGE
SIDE VIEW
3/32"
SQ.
1 1/8"
WIDE
TRACE
AND
JOIN

Where the action is... RADIO CONTROL

DON LOWE

1970 Nationals

THE NATIONALS ARE like nothing else on earth. To the modeler it's Utopia—heaven—you name it! Where else can you witness every facet of aeromodeling known to man? The Nats are so big and so complex that those who compete must confine themselves to their specialties and then read about everything else that happened.

The Nats RC '70 included every AMA-sanctioned RC event except Class C Pattern. Even an unsanctioned RC glider meet was held during Nats week for those with that particular inclination.

Everything in life is a compromise, unfortunately, and Nats RC scheduling this year was designed for maximum flight activity per event. It accomplished that goal admirably but, darn it, too much going on to see everything!

RC activities ran all week, with Pylon Formula I and II qualification flights on Monday and Tuesday; Class D qualifying flights on Wednesday and Thursday; Class D Expert finals, Scale and Formula II Pylon finals on Friday; D Expert finals, Scale and Formula I Pylon finals on Saturday; and Classes A and B and Pattern on Sunday morning.

Class D fliers were allowed eight qualification attempts using a short pattern. In two days, that's enough flying for anybody to determine the finalists. The short pattern flights also determined the D Novice and Jr., Sr. winners. Twenty D expert fliers were advanced to the finals where a complete Class D pattern was flown.

Class D finals and Scale were flown Friday and Saturday mornings on a frequency time share basis. Half the Scale fliers put in their flights on a separate two-flight line complex, using half the available frequencies, while Class D fliers did the same at the other complex at the same time. As it worked out, Class D finalists flew three flights in rapid succession and then turned the complex over to the other ten finalists. Scale fliers did the same. Classes A and B were flown on four flight lines using the full A and B patterns. These fellows received five flights each and seemed to have a fair share of the time available.

Pylon fliers had three qualification attempts each, with the top twenty in each class selected for the finals. Finals were flown in four-ship heats with each flier getting five rounds.

Kirkland dominated Class D Expert, although others' points were close.

Scale event winner was Ed Ellis with much-modified kit of Spirit of St. Louis.

Points Champ Larry Leonard flew colorful Liberty Bell. Won Formula II also.

Don Lowe flew Phoenix 5, latest in design series. Citizen-Ship and Max engine.

Pattern prelims were flown in high (hot and humid) crosswinds blowing straight across the runway, so all ma-

It's hard to imagine the flying ability of one B-36, but two were at the Nats! Here Drummond's takes off.

Second-placer in Scale, magnificent flying and rocket-firing P-47D by Frank Nosen.

HOW THEY FINISHED

Class D Expert	Class D Novice	Class A	Class B	Formula I	Formula II	Scale
(1) Kirkland°	Dave Brown	H. Clark	S. Buck	B/S Team	(1) Leonard	(1) Ed Ellis, 15236 pts., "Spirit of St. Louis"
(2) Edwards*°	Tom Walker	Jay Marshall	K. Fischer	Bob Smith	(2) Keck	(2) Frank Nosen, 14827 pts., P-47D
(3) Kraft°	Jim Satler	T. Goelz	B. Matthews	Jeff Bertken	(3) V. Smith	(3) Richard Graham, 14574 pts., Liberty Sport
(4) Whitley	Jerry Worth	A. Smith	Ernie Weiss	Al Sager	(4) Leftwitch	(4) Bill Bertrand, 12613 pts., Fokker D-7
(5) Leonard*°	Jerry Vanderwalker	Randy Shartle	R. Eson	V. Smith	(5) Telford/ Violett	(5) John Roth, 12001 pts., Volksplane
(6) Coleman*°				L. Leonard	(6) Stockwell	
(7) Chidgey*				Bob Upton	(7) Lowe	
(8) Page*°				Faber/Nupen		
(9) Martin*°				M. Barry		
(10) Bonnetti*°						
(11) Lowe*						
(12) Oddino						
(13) Salkowski						
(14) Spreng*						
(15) B. Smith*°						
(16) Weirick*						
(17) Hill°						
(18) Dupler°						
(19) Dougherty						
(20) Noll						

* Qualified for FAI Team Selection Finals (Kirkland, Kraft, Whitley already qualified)
° Flew with retract gear
Larry Leonard selected National Champion
Best Senior—Class B—Steve Buck
Best Senior—Class A—Randy Shartle
Best Junior—Class A—Bern MacAvoy
Best Junior—Class D—Bill Hiller
Best Senior—Class D—Bob Smith

Ed Keck used deBolt-designed Caudron to place second in Formula II. Speedy plane.

Family effort, Ernie Weiss and sons made 4th place, Class B. He's mighty happy.

neuvers were flown crosswind or slightly quartered in order to avoid the crowd. For those who hadn't worked on crosswind maneuvers, this was difficult, but it did not handicap the practiced expert. At least it was equal for all. Finals were flown under gorgeous conditions with little or no wind.

This was the year of the retracts. Most of the top fliers were sucking them up. Eleven of the twenty Class D finalists had them and eight of the top ten finishers had retracts. Discussions with a number of these fliers in regard to the value of retracts prompted comments ranging from "nah, they only have judge appeal," to "you better believe they help, particularly on the top of some of the big looping maneuvers or in the Top Hat."

My observation is that they do help in the technical execution of the maneuvers. At this point, their weakness is mechanical in that crosswinds are tough on their fragile construction and in-flight failures occur too often. What is needed is more competition and development in this line of equipment.

Mufflers were in wide use, with most top fliers using them. Not only do they take out the savage bark of the engine, but the model seems to fly better! The smoke trail that they generate is also of benefit to the judge and pilot in tracking maneuvers. Will smoke generators become a standard competition item? Could be. The maneuvers certainly are prettier with a smoke trail.

Jim Kirkland dominated the Class D Expert prelims but received a strong challenge from Doc Edwards, Phil Kraft and others in the finals. There was about

(Continued on page 56)

Fast fixing by Dick Allen on Formula II ship which turned 1:52 in prelim heats!

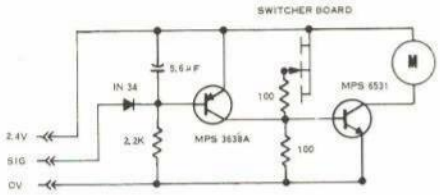
Jim Wilmot's Pegasus MK IV in Class B. Two-wheel gear handicap in crosswinds.

Just released, Al Sager's Minnow. This one aircraft type dominated the Formula I event. TOIN!

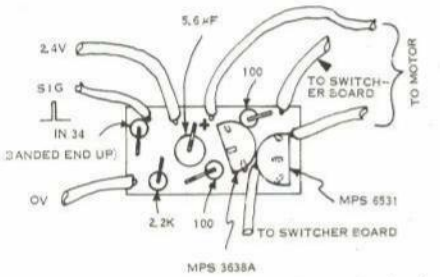
George Hill's brand-new midwinger, known as Virginian, used retracts too. Half of top 20 had them!

R/C FRED MARKS
Specialist Correspondent
TECHNICAL ITEMS
AERODYNAMICS

Adding a Function to a Digital Set by Use of a POD, Conclusion: Last month, the POD to be used with a negative-going input pulse to give an auxiliary function was described. Figs. 1, 2, and 3, present the schematic, pc layout and component overlay for the POD required for operation from a positive-going input pulse.



Positive pulse circuit for extra function on digital sets. Printed circuit plan shows copper side.



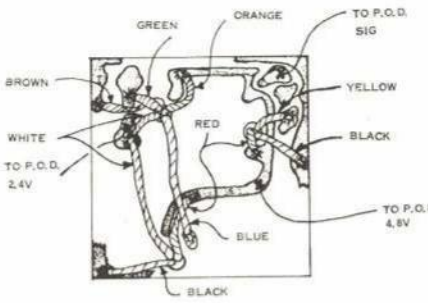
Component placement and wiring are simple with so few parts. Fits tiny servos.

Hookup of either POD to an existing system is as follows. Determine the presence of the center tap, 0V, 2. 4V and signal at any convenient servo plug. Either construct a parallelling plug (i. e. a tie harness) or wire in at the back of the servo plug. Polarity of the input pulse must be known. The majority of sets have a positive-going pulse. The EK, Pro-Line, F&M, and Controlaire MAN 2-3-4 series have a negative-going pulse.

Pulse omission can be obtained at the transmitter simply by locating the pc land or wire carrying the pulse train from the encoder to the modulator. Insert a normally closed miniature push-button switch which, when depressed, will interrupt the pulse train for the approximate quarter of a second required to activate the auxiliary servo.

The unit built and tested was used with the Controlaire Digit Migit single channel digital system to provide motor control. The Digit Migit and the newer Controlaire systems using the S-4B servo have a positive-going control pulse. To permit a cleaner installation and provide separate wiring, the arrangement shown in Fig. 4 was developed for the Digit Migit decoder.

The underside of the Digit Migit decoder board, as drawn, shows sufficient identification of pc lands and wiring to permit the POD to be attached. The point identified as "to POD Sig" pre-



Negative pulse POD (shown last month) used with Digit Migit at decoder shown here.

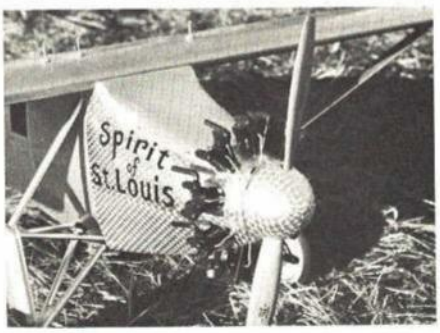
sents a negative-going pulse, so the POD for a negative-going pulse is used. This arrangement works exceptionally

(Continued on page 77)

R/C CLAUDE McCULLOUGH
Specialist Correspondent
SCALE

That's The Spirit: Those who think extra engines, 10,000 rivets, folding wings or retract gear, are necessary to get anywhere in competition at a national level, should take heart from the success of Ed Ellis. At his first Nationals, using a kit-based airplane meticulously built and detailed, he defeated an impressive list of models and fliers.

Prepared to satisfy increased emphasis on scale speed and realism, the "Spirit of St. Louis" had its Supertigre 60 loaded down with a 14-6 prop and a homemade .018 silver-soldered steel muffler. Ed feels the muffler's square shape does a better job of silencing. The resultant low sound level contributed greatly to the overall effect, an illusion which would have been shattered by the usual high-revving shriek.



Royal Products kit used by Ed Ellis to create this masterpiece. Details in text.

Where's the pilot? Lindbergh's sparse cockpit and panel are carefully duplicated.

The engine-turned metal-covered front of the model is a real eye-catcher. It was hand-shaped with a mallet over a wooden block form. The material, a decorative aluminum sheet with the "whirlies" applied, is made for instrument panel and similar use by Croname Inc., 6201 Howard St., Niles, Ill. 60648. . . .

Wing mounting screws are countersunk into holes in the wing surface and concealed with small hatch covers. A handy idea for sticking them down temporarily was the use of Dum-Dum (or Mortite) Window Sealer, a putty-like stuff that does not dry out or harden. It should work for similar items that need to stay

(Continued on page 75)

R/C HOWARD McENTEE
Specialist Correspondent
GLIDERS and FAI

New World's record for closed course distance was set Aug. 30, by Robert Boucher, flying a stock Malibu. Distance covered in 11 hr., 9 min., was 189 mi. The Kapiolani RC Club, Hawaii, provided witnesses.

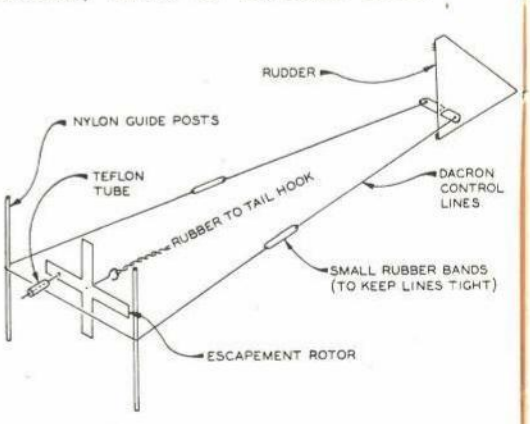
Saving Those Legs: Retrieving the hook end of a winch tow system is doubtless good exercise, but it does get tiresome during a long flying session! At the glider meet during 1970 Nats week, we saw the first trials of a closed-loop winch cord system. It had just been completed and tried out by the Detroit glider group Sunday afternoon before the meet.

The standard winch had a drum core covered with rubber; the cord was wound three times around this, went to a distant pulley mounted on a stake (as normally used with winches), but then was returned to the winch in a closed loop. The actual tow cord with cloth at the tow-ring end was spliced onto the closed loop of cord.

One successful launch was made, but apparently the wrong type of cord was used (the twisted nylon variety) because the tow cord wrapped along a good length of loop cord. The idea is that, after a plane has been towed aloft, the tow cord, cloth and ring will be pulled through the distant pulley, back to the winch and around its drum, and out toward the pulley until the ring is just beyond the winch,

(Continued on page 76)

Control linkage for escapement, by Jack Perecman, suitable for long-bodied gliders.



Getting Started in RC

THIRTY-FIFTH

IN A SERIES

Elementary Electrical Mathematics

HOWARD McENTEE

CERTAIN SIMPLE FORMS of math are helpful to those working with radio control equipment. Most of the circuitry dealt with by the flier (and which can be measured with a simple volt-ohm-milliammeter) carries direct current (DC). Some circuits may also carry alternating current (AC) or radio frequency power (a form of AC) but these require measuring equipment and techniques not common to home shops.

Direct current relationships and calculations are based upon Ohm's Law: "The current flowing in a circuit is directly proportional to the applied emf and inversely proportional to the resistance." Emf (electromotive force) is another way of saying voltage. From Ohm's Law three basic equations are derived: I (amperes) equal E (Volts) divided by R (Ohms); R equals E divided by I; or E equals IR. Thus, if any two of the three terms are known the other can always be found.

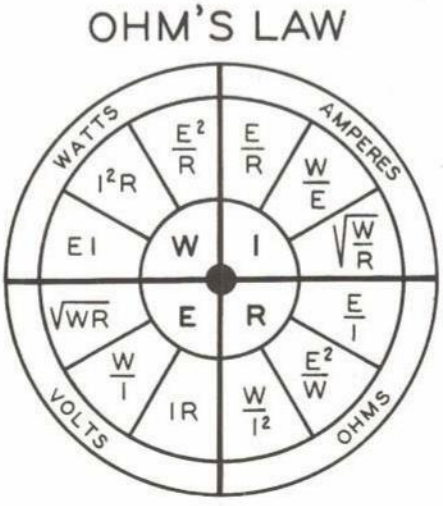
Note that, while these three equations are based upon volts, ohms and amperes, much of RC circuitry operates on milliamperes. Therefore, milliamperes (also known as milliamps or mils) always must be converted into amperes (amps) to obtain the correct answers.

Since expressing large numbers in any of the three basic electrical values can be awkward, prefixes are used to simplify things. They are: micro—one millionth (abbreviated with a symbol that looks like a lower case u but with a slight "tail" at the bottom of the first upward stroke; a plain u is often utilized); milli (m)—one thousandth; kilo (k)—one thousand; mega or meg (m) —one million. To say or write 1 megohm is much simpler than one million ohms. Most ohm values used by modelers are considerably over one ohm, usually over one volt, not too often above one ampere.

The simplest Ohm's Law equation to remember is E equals IR (Note: the three letters are in alphabetical order). Be sure of this version, then either of the other two can be derived when needed.

Watts have a direct tie-in with Ohm's Law. A watt is the electrical unit of power; one formula for it is W equals EI. One of the best ways for the uninitiated to relate these facts is the circular chart shown. Its origin is not known, but it was circulated years ago by a relay manufacturer (Potter & Brumfield). Each of the four main segments of the circle is divided into three parts. When any two of the values of amperes, volts, ohms or watts are known, the unknown can be calculated. Paste a reproduction of this chart in a prominent place!

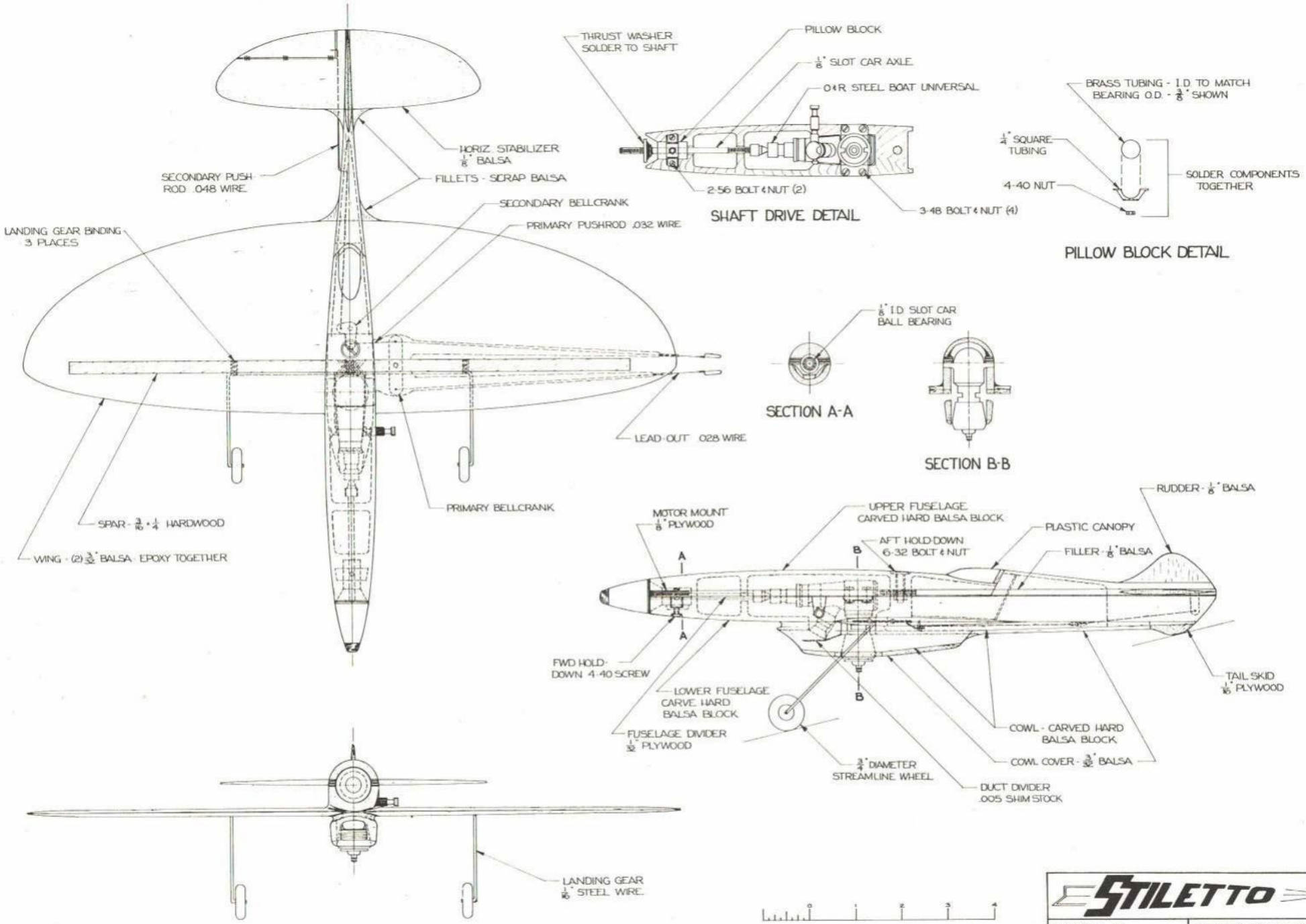
Whenever a voltage forces a current through a resistor, a loss of voltage in the resistor results. That is, the resistor will have a different voltage at each end, as measured from either battery terminal. This is known as a voltage drop in the resistor. If a voltage of 5.0 is going through a resistor of 50 ohms, the current in the circuit can easily be calculated by Ohm's law and without use of a milliammeter. This 50-ohm resistor possibly may be in series with one or more additional resistors of unknown value. It makes no difference.



If the 50-ohm resistor is directly across the battery, the current is five divided by 50—0.1 A or 100 milliamps. If there are other resistors in the series, part of the battery voltage will appear across each, in proportion to its resistance. If the voltage across any one resistor is measured and then divided by the value of **that same** resistor, the result is the current flowing through the entire string. To measure current directly it is necessary to break a circuit and insert an ammeter (or milliammeter) in series with the resistors. This is often inconvenient or undesirable. Current in the circuit can be checked by the voltage-drop method, if any one resistor can be reached.

Batteries in RC planes are often buried in some forward part of the fuselage where their weight is needed for balance. As a result, connectors may not be separated conveniently for measuring battery voltage. This is often true of simpler RC systems, which may come completely wired and without connectors of any sort. However, actuator, escapement or servo terminals may be more accessible. If so, battery voltage can be measured across the terminals of such units and the current flowing through them calculated (if of interest). When transistors are fully "driven" they act like a closed switch, with practically no voltage drop across them. Simply measure the battery voltage across the escapement, actuator or servo motor terminals. This has the added advantage of measuring the voltage under the normal battery load (the receiver having been triggered on by the proper transmitter signal). There are seldom any other resistors in series with such an output transistor circuit.

Resistors are a vital part of DC circuitry. When resistors are connected in series, the total resistance value in a circuit is obtained by adding all the individual resistances. However, resistors in parallel pose a little more complexity.



STILETTO

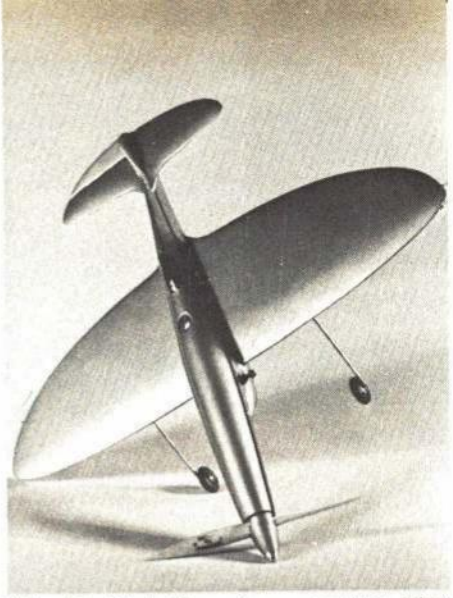
WINGSPAN - 14 IN LENGTH - 13.3 IN POWER - .049 CU IN COX T.D.	DR BY: RICHARD LACONTE 3/13/70 SCALE: FULL SIZE

FULL SIZE PLANS AVAILABLE—SEE PAGE 70

STILETTO

Unique appearance and superior streamlining are achieved on this ½ A Proto racer with simple shaft extension. Idea would work on any size speed model.

RICHARD LaCONTE



This futuristic-looking plane resembles ideas seen in Air Trails of the '40's.

THE PROTOSPEED MODEL, by definition, is supposed to resemble a full size airplane, but in order to achieve good aerodynamic design, these models now are looking more like—to quote the Contest Director of the '69 Nats—"Hell Razors on Wheels." The Stiletto is intended as a step toward the original intent of the Proto rules and as an efficient aerodynamic design.

Several areas of design improvement were explored. When it is reworked, the 049 engine, because of its size, does not respond with large increases in power, and some engines seem to be at their peak in stock condition. Since few gains are to be made in engine modifications, the next logical place for improvement is in aerodynamic design, beginning with the propeller.

Little information is available on model propeller performance, except that such propellers are very inefficient when compared with full size counterparts, and that the airflow is extremely turbulent and forms a spiral around the fuselage. To obtain maximum use from the prop wash, the maximum cross-sectional area of the fuselage is best placed as far aft of the propeller as possible. In present designs, the forward location of the engine puts the maximum cross-sectional area just aft of the propeller and any attempt to reduce the area is limited by engine size. Also, the abrupt vertical rise of the cowling does an effective job of disrupting the prop wash before it can stabilize its flow.

With the amidship location of the Stiletto's engine, this design succeeds in obtaining the desirable aft location of the maximum cross-sectional area and at the same time creates a sleek and realistic looking model. Other benefits obtained from this engine location are being able to use larger intake ducts for the carburetor and cooling and—of interest to stunt enthusiasts—a reduced rotational moment of inertia due to the larger mass of the engine being placed near the aerodynamic center of the wing. This results in an airplane that is highly responsive to the controls.

Now comes the question—does the amidship location of the engine increase the performance? A 1967 prototype used a Cox Space Hopper engine which had given consistent Protospeed runs of 64 to 68 mph under W.A.M. rules in California. A 12-in. minimum wingspan and no minimum area were specified. The prototype, built to AMA specifications, weighed a heavy 8¼ oz. Several drive systems were tried, and the Stiletto is the design which finally evolved.

About 20 flights were made with the prototype, using a 4½-7 Rev-up prop to be consistent with the old Protospeed engine runs. The unofficial speed range of the test flights was 71 to 78 mph, indicating a substantial increase in performance. High winds and a control failure brought the prototype to a crashing end. Then the Stiletto was built but, due to unfavorable weather conditions and a new engine, it was not flown for a speed run. Initial flights did show excellent handling characteristics and a potential for high speeds. Both the Stiletto and its prototype are quite stable, but yet extremely responsive to controls.

Construction

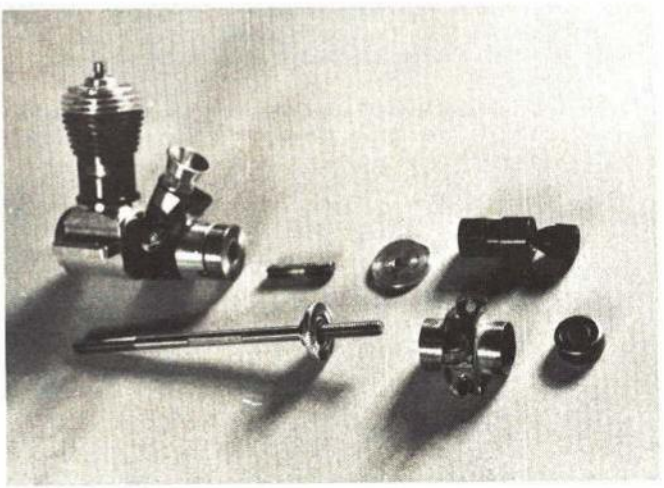
Construction is broken down into two main parts: (1) the drive system and (2) the airframe.

The shaft drive system is the heart of the Stiletto and care must be taken in its construction. All components are easily obtained at any hobby shop that stocks model airplane, boat, and slot-car parts. The engine is a Cox 049 Tee Dee in stock condition. Its needle valve is rotated to a forward position, and the edge of the valve body radiused to clear the crankcase.

The universal joint is an O & R steel boat universal with 5-40 threads at

(Continued on page 78)

Long nose makes prop more efficient. Engine weight at CG results in very maneuverable model, yet design is quite stable.



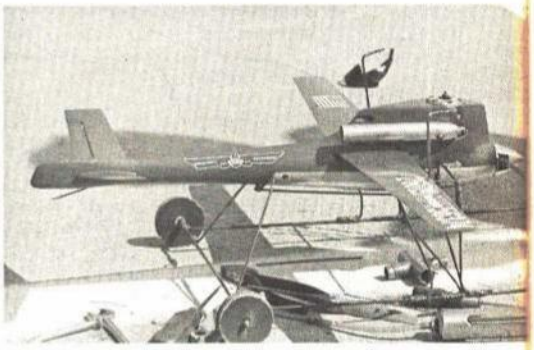
Long prop shaft and associated parts are standard off-the-shelf items, such as a slot-car axle, bearing, and boat universal.

Where the action is... CONTROL LINE

1970 Nationals

Senior Rat winner uses K&B with 8/8 Rev-up prop. Cobra is by Tim Zimmer.

Cathy Burnstine took top place in Junior scale with 2" to 1' scale Nesmith Cougar.



Non-critical short pipe used by Bartley/Garner C job. Adds 5-600 rpm regularly.

BILL BOSS

THE PLACE WAS GLENVIEW Naval Air Station, just outside Chicago, Ill. Here modelers from all over the country converged to do their thing in the National Championships. Two young modelers did so well that they received AMA's $1000 scholarship awards in a special ceremony at the conclusion of competition.

Miss Susan M. Weisenbach (Cleveland, Ohio) and Charles W. Reed (Raytown, Mo.) were the recipients. In addition to AMA's scholarship award, Miss Weisenbach also was presented the Dr. Edward R. Sharp Memorial Scholarship Award of $500 by Anthony N. Montagino, Model Aviation Director of the Cleveland Division of Recreation. The first girl to win this award, Susan plans to study aeronautical engineering at Kent State University. Charles plans to major in physics at the University of Missouri.

Another top event presented throughout the week was Testors "Learn to Fly" activity, run by Ernie Petit. It provided an opportunity for youngsters who have never flown a U-Control plane to try it and to learn some of the techniques for starting model plane engines. The lineup of youngsters waiting for a chance at flying one of the training planes was endless.

Navy Carrier

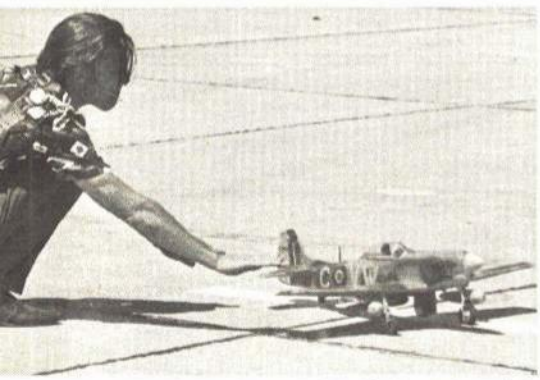
Carrier flying got off to a slow start because of the processing of the ships for pull test and a shifting wind which necessitated moving the three decks. Once again, fliers had to walk their planes and lines from a central ready area for at least the distance of two circles, thus slowing up the event. Several more people doing the pull test and inspection of lines on the circles would have speeded up this event tremendously.

Despite these problems, some excellent flying was done. A most outstanding performance was put in by eight-year-old Robert Sawicki (Wyandotte, Mich.), last year's Profile Jr. Champ. He flew a French Loire Nieuport 42, to first place in both Class I and II. The plane weighed in at 30 oz. and had a 30-in. wingspan. Using a K&B 40 engine equipped with a Kavan throttle control.

The battle in the 60 class was between Don Gerber (Laureldale, Pa.) and Ray Wilmann (St. Louis, Mo.). It seemed Don had first place sewed up with his MO-1 and a score of 550 when, in the last few minutes of competition, Ray turned in a score of 590 to take first place. Ray flew a 36-in. Grumman Guardian, weighing 44 oz. and using a Rossi 60 equipped with Bill Johnson's custom slide bar throttle and three-line control system.

Ray's son Mike flew in the Nat's competition for the first time and captured the Profile Class championship using his own design, equipped with an ST 35 RC engine. Mike, like many other contestants, also used the Johnson throttle, metering and control systems.

Generally, the planes flown were much the same, with Maulers and Guardians everywhere. Rossi 60, K&B 40 and ST 35 RC were the most commonly used engines. Among the unusual planes seen in Carrier was the



Dave Platt releases John Glab's P-51 which won Senior Scale. Weathered coloring.

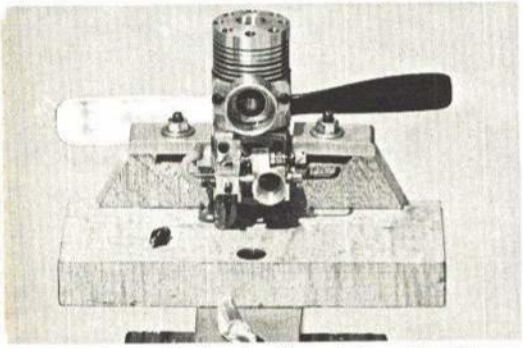
Ray Wilmann and son Mike won their events in Carrier flying solid wire, not stranded.

Senior Stunt winner, Tommy Morgan, modified a Nobler to do it. Fox 35. Weighs 40 oz.

Mary Lou Brown captured Senior A Speed and beat record. No back-up flight.

Any Carrier-operated plane of any nation OK in Carrier. French Loire Nieuport 42.

Blue Angels honored by this fine built-up construction stunter by Bill Suarez.



This is IT. The Roselle and Frye 60 with centrifugal fuel control. Note test prop.

Skyshark, by Glenn Simpson (Worcester, Mass.), featuring construction of molded plywood over a minimum of formers and a cam slot system in the flaps for operating the aileron on the outboard wing for the slow-speed flying. Charles Beverson (Lloyds Neck, N.Y.) flew a T-28C made from an old Berkeley Kit. Robert Wright (Pontiac, Mich.) entered 40 class with an ME-109, while Paul Burlingham (Kenosha, Wis.) used a P-51 Mustang from John Blum's plans featured in AAM.

Learn To Fly, the theme of free flying lessons given by Ernie Petit of Testors Corp. using their new 049-powered trainer. He was busy all day long, hundreds of kids.

Despite all the discussion over the use of solid vs stranded lines, Ray Wilmann and his son Mike both used solid lines this year. Ray says the advantages of the solid lines are less turbulence over the wires during flight, thus increasing speed, and a more positive and smoother operation on the three-line control system.

Stunt

Scoring was low but consistent, with Tommy Morgan (Midland, Tex.) the new Senior Champ, putting in the only over-500 score in the final standings with his Modified Nobler. Mike Jackson (Long Beach, Calif.) placed first in Junior with 439 points, while Keith Trostle (Dayton, Ohio), a member of the USAF team, took top honors in the Open class with a score of 488. Flying a semi-scale Focke-Wulf 190, he also captured the Jim Walker Trophy. Only 24 points separated first from fifth place, indicating some really fine flying by the top five.

Al Rabe, with an all-new Bearcat, took second place in Open, only points behind Trostle. Al's new ship featured not only his rudder control system but also a formed balsa covering and a removable wing, which allowed him to make adjustments of the elevator travel.

Rabe's idea of scale-like planes in stunt seems to be catching on since many of this year's planes were of the scale or semi-scale type. Among the new breed of stunt aircraft were Rabe's Bearcat, the Sig Chipmunk by Mike Stott, Jack Sheek's Stuka F-4, Bill Suarez's Blue Angels Jet, and the Navy Crusader by Vic Macaluso. His ship was one of the most photographed stunt models. Vic's design features a droop wing—yes, negative dihedral—is outfitted with bombs and missiles, has good cockpit detail and a scale paint job. The negative dihedral didn't seem to affect the plane's flyability. It was extremely stable, turned corners well, and was not affected much by wind. It weighed 51 oz. and used a Fox 35 for power.

Overall, contestants did well at finishing, many earned 35 or more points for workmanship and appearance. Construction was varied, in that both foam and built-up wings were used, with several of the planes featuring full sheet covering. Supertigre, Fox and O.S. Max were the most commonly used engines, many of them in the 40 to 45 displacement range needed to pull the larger planes through the pattern.

There was even a Fox 59 used in a

(Continued on page 61)

Brian Pardue used pen-bladder fuel system on TD 049 proto entry. Turned 70.09 mph.

Hundreds of entries in Combat! Murray Frank, Event Director, watches start of final round of flying.

Navy Crusader theme in this highly detailed stunter. Note anhedral wings too. By Vic Macaluso.

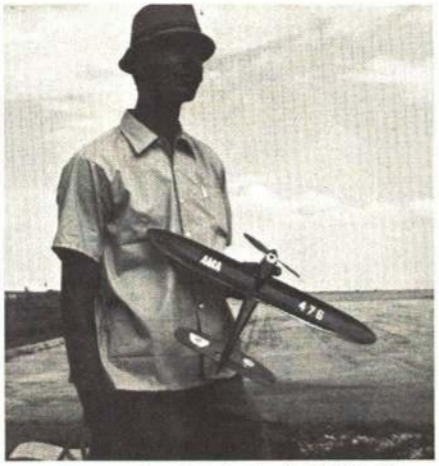
C/L JOHN SMITH
Specialist Correspondent
SPEED and RACING

We All Do Our Thing: Those who didn't make the Nats missed the fun contest of the year. Friendliness seemed to be the order of the day—the contestants, the Navy (God bless 'em), everybody was happy. From processing, to flying, to the great beer hall—you heard me, the Navy had this set up in two large tents—everything went smoothly.

The large turnout expected for ½A Speed failed to show. Over one hundred had preregistered, but many were flying for championship points and evidently either didn't need the points or were out of the running and didn't fly the event. Not many innovations were seen this year. The high point of the whole week, which stands out in my mind, was Frye and Roselle turning the high time in C (a 189+) and the gang in the pits standing as a group to give them a large, loud round of applause. Jack and Jerry were visibly shook.

These same people and over three hundred speed entrants made my week as Event Director a very happy one. Luke Roy and I both say, "Thank you, gentlemen, for making our job a very easy and enjoyable one." . . .

New Products: Dale Kirn has a staking tool for renewing the factory fit on Cox engine piston-rod assemblies. To use it, just drop it over the rod socket, give it a tap with a hammer, and it's back in business. $5.00, from Dale Kirn, 283 N. Spruce Dr., Anaheim, Calif. 92805. . . .

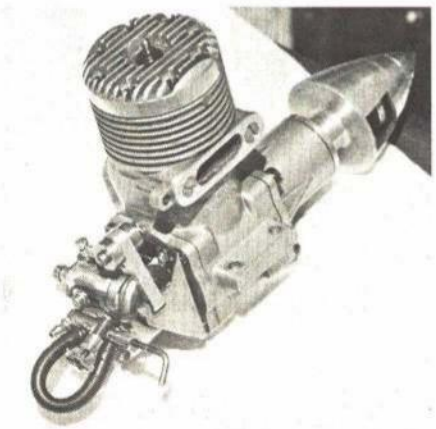


Ed Thomas with FAI job. Used ST 15. Planes getting larger again in speed.

Fuel Switch on Piped ST: According to Doc Jackson, the switch works like this: Lever A when turned, drops ball on plate B, turning screw wheel C, releasing a small nut which cranks over valve D on the way. . . . C'mon Doc, tell it all. . . .

New Event Fails to Interest Juniors: The new 40 Class Speed event hasn't had the effect it was designed for. Only three Juniors showed for this event at the Nats. One of them was flying a Combatwing. All Rat-racer-types should look into this event. Your engines are competitive for this event and all you must do is fly in the pylon and you

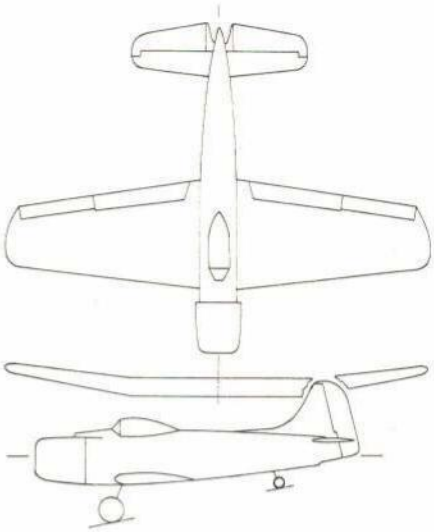
(Continued on page 74)



Another of "those" engines. Fuel-metering system varies with speed on this ST 60.

C/L JOHN BLUM
Specialist Correspondent
CARRIER and STUNT

Stunt at the Nats: The numerous stunt rule changes under consideration provided plenty of comment at this year's Nats. Depending on who was asked, retaining appearance points proved to be either popular and unpopular. A close estimate provided the following figures: Open fliers were 60% to 70% in favor of retaining appearance points, while 30% to 40% thought it would increase the popularity of the event if the requirement were dropped. Junior and Senior participants expressed the opposite opinion, with 25% presenting a "don't care" attitude. In short, youngsters view the stunt event as one of action, and the appearance aspect becomes important only as they enter the older group. . . .



Carrier possibility—the popular Martin AM-1 Mauler. Good moments and areas.

Martin AM-1 Mauler: This model, as can be seen in the 3-view which gives the basic proportions, is a good Carrier subject. Available in a kit, it has a 37½" span producing about 283 sq. in. of wing area. With good nose and tail moments, the Mauler is excellent for the novice Carrier flier and can be built around 40 oz. . . .

Stunt School: The Aero Modelers newsletter (San Jose) announces the beginning of a stunt fliers training school. Sessions will be at the Wilcox High School in Santa Clara. It's not necessary to be a pro with a modified Nobler to get started in competitive stunt flying. An attractively finished profile ship will do most of the pattern and provides the novice an opportunity to participate. It is interesting to note that second place in Junior Stunt at the Nats was won with a modified Magician flown by Alan Adamisin. . . .

Fuel Soaking a Problem: Models with cowled or partially cowled engines, particularly those with throttle, develop the problem of excess fuel soaking into model parts. Fiberglass or epoxy resins are ideal for fuel-proofing the interior of the engine compartment, but openings in the firewall for throttle pushrods are another problem.

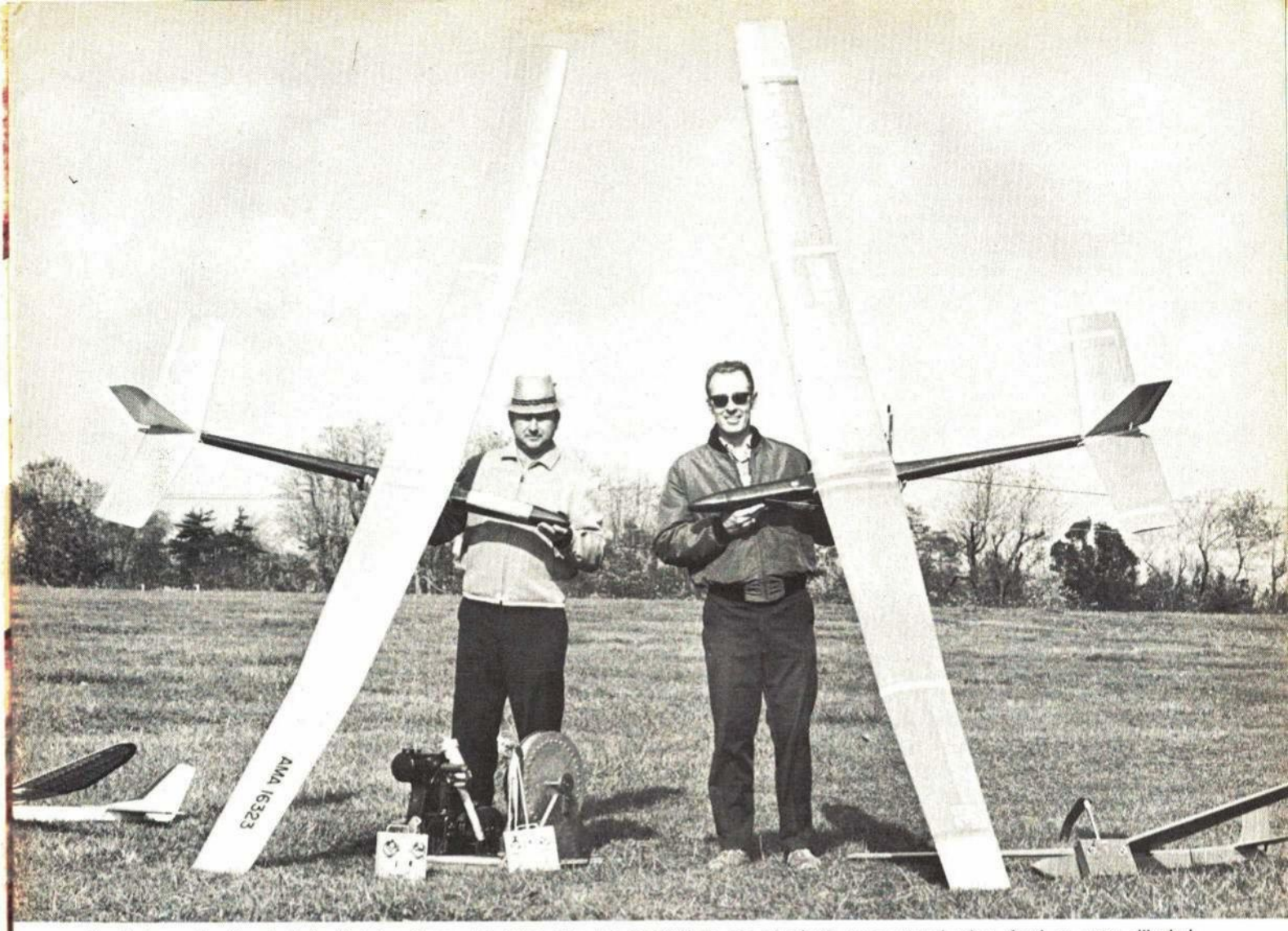
Ray Willman handles this situation by attaching part of a balloon to the pushrod. At the air entry end, about 1½ in. is cut from the balloon's body. This portion is then slipped over the throttle pushrod, prior to engine installation, and the reinforced end is glued

(Continued on page 75)

George Brown launches for his daughter. How about an afterburner on the pipe?

Realistic-looking stunters are catching on. Here's Joe Radle's K&B Focke-Wulf.

Roland Baltes fires up K&B 40 in Hawker Hurricane Class 1 Carrier job.



Joe Roslyn and author hold the first two Kongs, still flying after two years! Note use of plastic tape around wing chord at outer dihedral breaks to seal air gap and retain tips. Heavy-duty gas-powered launch winch in foreground.

KING KONG

Twelve-foot span, flat-land soarer is fast, functional, and durable machine for winning contests. Disassembles to practical size for transportation.

DICK SARPOLUS

THE KING KONG was designed for one purpose—to win in soaring competition. And that it has been doing. In three East Coast RC soaring contests in 1969, the Kongs placed first and second at Dover, third and fourth at Lakehurst after leading in all rounds except the last, and fourth at Columbia. They showed an amazing—and unexpected—ability to float in dead air. The two Kongs now flying weigh seven and a half and eight and a half lbs., but they still float as well as or better than the lightweights. They glide fast enough to cover a lot of territory and penetrate wind extremely well. Because of their large size and swift flying qualities, they can go far downwind—which is where it seems that the best thermals always are to be found.

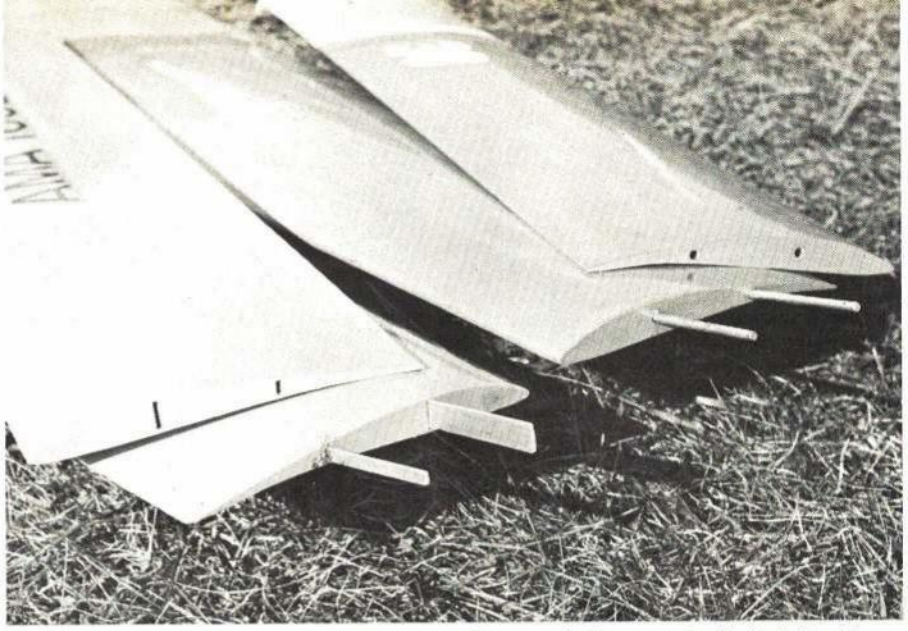
The design was somewhat of a group effort. Dr. Ed Morris started the trend to big gliders in our club with a 12-ft. model. Then we got together with Doc to make a fiberglass fuselage pattern for a new design. Fred Kingsbury, local fiberglass expert, made the mold and the fuselage pieces. Joe Roslyn did some airfoil research and picked the Eppler E-387 section. Then we got together to settle on the overall layout. The prototype was made up with Joe's choice of wing and the fuselage and tail I selected. It flew so well a second model was quickly finished, and we headed for the contests.

Some further comments on the design are in order. The fuselage was made as small in cross section as was felt practical. It has proved to be quite strong, surviving several almost straight down landings. The horizontal stabilizer has dihedral to protect it on landings, keeping the stab up off the ground. The tail assembly is held on with rubber bands for simplicity and for ease in fitting the plane in a car.

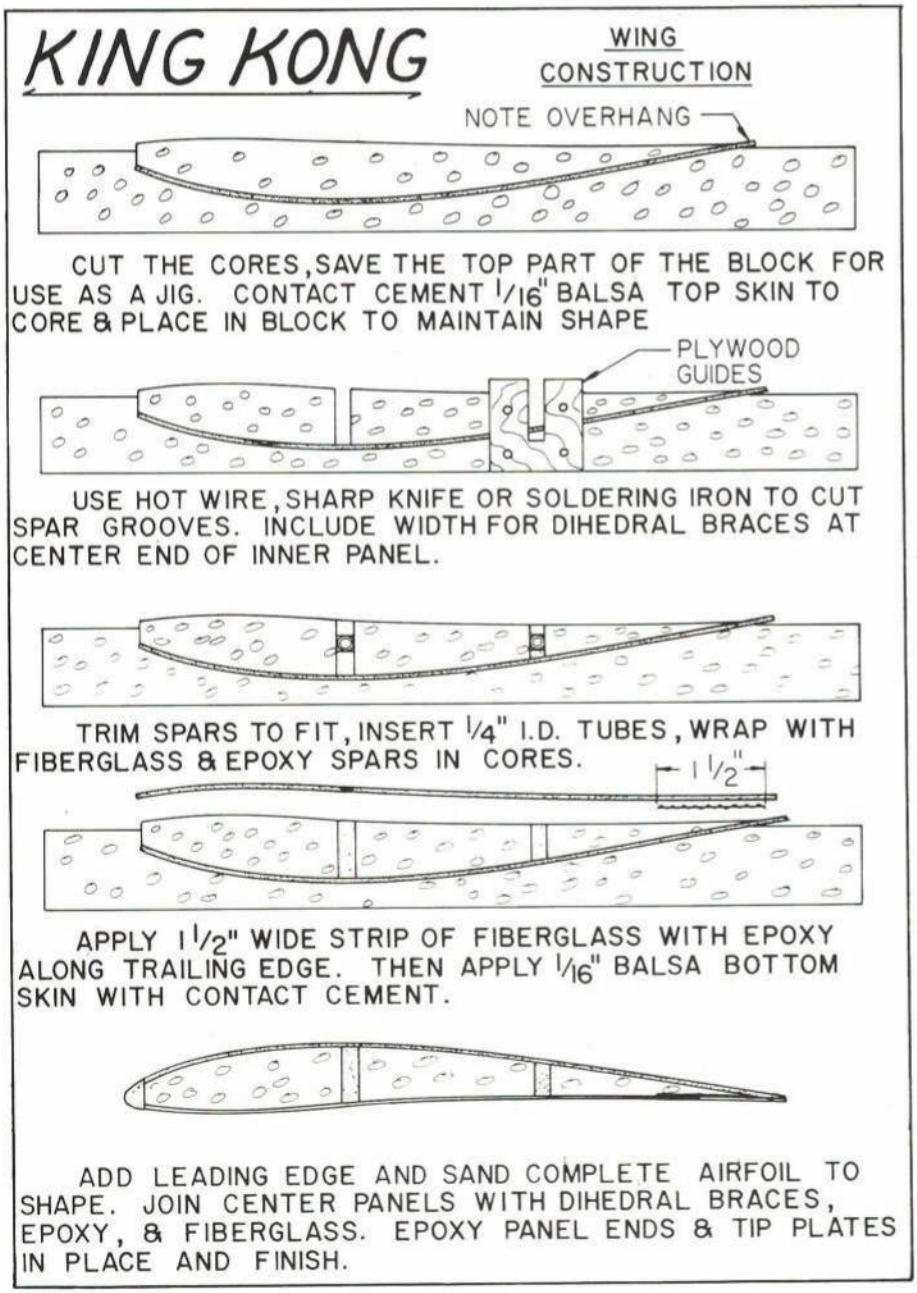
The wing breaks at the polyhedral joints because it was felt that the most strength was needed in the middle. This was achieved with four plywood dihedral joiners and fiberglass cloth. Polyhedral was used for better turning ability. It doesn't look as good as straight dihedral, but the plane will really hang in a turn which helps in the thermals. When the first wing was assembled, ten degrees dihedral were put in the middle. We looked at it and decided it needed polyhedral, so five degrees were put in the tip joints. A few test glides were made this way, but then we went to ten degrees at the tips too.

We didn't try for a high aspect ratio for two reasons: a feeling that it just wasn't needed, and the desire to make the wing easier to build. This seems to have been a good choice. Dr. Walt Good commented that the Reynolds Number effect on the fairly wide chord wing probably allows the airfoil section to operate quite efficiently at the speeds we fly. Whatever the reasons, the results are what counts and this wing really works.

Design was compromised in some areas for easier building. Plug-in wings would be a lot cleaner than a wing resting on top of the fuselage with many rubber bands holding it on, but plug-in construction seemed too complicated. The tail section is rubber-banded on for the same reason. The elevator size shown is most effective; the rudder is just about enough. With a 12-ft. wing, a bigger rudder may not help much, and the ship handles quite well as it is now. Watch those tight turns near the ground; that long wing reaches way down and takes a while to get back up.



Two practical types of dihedral tip joiners. With rods and tubes use one aluminum, one steel. Flat joiners are both aluminum fitting plywood/epoxy boxes.



When it comes to flying, any fairly competent pilot can handle the Kong, once he is accustomed to the somewhat slow turning response and the landings. It floats a lot farther than may seem possible. The plane is rugged enough so that a wing tip can be deliberately lowered to the ground while very low, and the plane spun around for a short landing. This may not be expert technique, but it works and could be better than an overshoot into a fence.

Most important in thermal soaring from a winch tow or high-start is finding lift within the first minute off the tow. Floating ability alone is not enough; move around to find the lift. If the ship doesn't get it in that first minute, it will probably be on the ground very quickly. Come off the start and circle to find the lift. Many times the Kong seems to just maintain altitude for a while before it starts to go up.

Skill must be developed to tell when the plane is in lift. Sometimes there is no doubt; the plane jumps up and it's easy to see. Light lift is hard to find. It takes watching for a wingtip to lift, or seeing the plane slow down. Many fliers go right through thermals, apparently never realizing what they have done. Important indications are birds circling, clouds forming, and noting where the other models are going.

These planes need a strong high-start or winch tow to get them up. The Kong goes up straight. Be easy on the rudder; not much correction is needed on the way up. Don't pull in too much up elevator. With poor technique, its easy to consistently break 125-lb. test nylon line on a winch tow. Wind helps the launch, but too much causes problems.

A power pod, as shown, is practical for test flying. It hinders the glide performance a little and adds about a pound of weight, but it's a lot less work than setting up a high-start. A 29 or 35 is sufficient. One Kong even was put up with a 19. The model was flown once with the power pod, and the outer wing panels left off. It flew fairly well. When test gliding the plane, be sure to really throw it hard—it needs the airspeed.

Construction

Start with the tail assembly, it's the easiest. Foam cores are used for the horizontal stab, which is built in one piece. For the covering, use a 36" piece of light 1/16" balsa. The flat bottom makes it easy to construct. Lay the 1/16" balsa bottom sheet on the work area. Spray the sheet and foam core with contact cement (we prefer Scotch Spra-Ment No. 6060). Let dry until tacky, then lay the foam on the balsa. Do the same with the top sheet, add the edges, and it's done.

We added and shaped the leading and trailing edges and tips before cutting the middle and putting in the dihedral angle. The fin is flat 1/16" balsa sheeting over the framing. Block up the stab for the dihedral angle and epoxy the fin in place.

Building a fiberglass fuselage is nothing to be afraid of, especially if it is a group effort to make several fuselages. The pattern was made from clear pine in two pieces, spot-glued together, joint down the middle. When completely shaped, the two halves were split apart. Each half was then fastened to a piece of heavy plywood slightly bigger than the pattern itself. Here we made our first mistake. The patterns were finished with polyester resin after they were attached to the plywood. More resin got on one half than the other. As a result, the two fuselage halves, when molded, didn't fit together as well as they should have.

Instead, the patterns should be finished with wax and an appropriate release agent. Then build up the mold with a layer of fiberglass cloth, several layers of fiberglass mat, and another layer of cloth, all well-saturated with resin. Since resins vary in the way they are mixed and used, follow the directions closely. Pop the mold loose from the pattern and it's ready to make fuselages.

Clean and wax the inside of the molds; use an appropriate release agent. Next, lay up the fuselage with cloth and resin. Two layers were used for the entire length, and three or four layers from the wing leading edge forward to the nose. When resin was brushed into the mold, it apparently disturbed the release agent. That fuselage never did come out of the mold. However, when the first coat was sprayed into the mold, no further trouble developed.

Joining the fuselage halves is a messy job. Trim and sand the edges, cut out the hatch opening and the opening under the wing. Remove the section for the tail assembly. Then hold the two halves together with tape and rubber bands. Use glass cloth and resin to join the halves together through the openings. Cut a long strip of cloth and feed it through the rear section of the fuselage; then lift up one end of the fuselage and pour in resin so it runs down along the seam. Use a piece of stiff wire to work the resin into the cloth, making sure all the cloth along the seam is well saturated. When hard, turn the fuselage over and do the other seam the same way. Use plenty of cloth and resin in the nose section. The stabilizer saddle is important because it must be strong to keep the tail assembly from rocking. Use plenty of fiberglass and resin here.

An alternate fuselage construction method using 3/32" plywood doublers and balsa sides is shown. It will do a good job but probably won't stand up to punishment as well as a fiberglass fuselage. Those interested in purchasing the fuselage halves may contact Carl Maroney, 3107 McComas Ave., Kensington, Md. 20795.

Much thought was given to building a strong wing. Various materials, such as fiberglass arrow shafts, stainless steel tubing, or dowels, were considered for spars. Full depth ¼" high quality spruce was finally chosen. Bought at a boat lumberyard, the spruce was quite expensive.

Whether buying or cutting foam wing cores, make a point of saving the block of foam from which the core was cut. Make the templates for cutting the cores thicker than usual because of the extremely thin trailing edge. Edge glue the 1/16" sheet balsa skin together and trim to shape. Contact cement the balsa sheets to the top of the wing core, then lay the core back into the block from which it was cut. Now guides can be made for the hot wire, a soldering iron, or razor blade used to cut the grooves for the full-depth spars into the cores. By leaving the core in the foam block when the spar grooves are cut, the wing will not warp or twist out of shape. Put the ¼" spruce into the slots and mark it so it can be trimmed flush with the core.

Determine what arrangement is to be used for the plug-in outer wing sections. Since ¼" rod is probably easiest, cut slots in the spars to accept ¼" I.D. tubing, and epoxy the tubing into the spars. We wrapped the spars/tubing with thin glass cloth and epoxy for strength. As an alternate joining method, 3/32" aluminum joiners, cut to the dihedral angle, will slide into boxes built of plywood and epoxied to the spars.

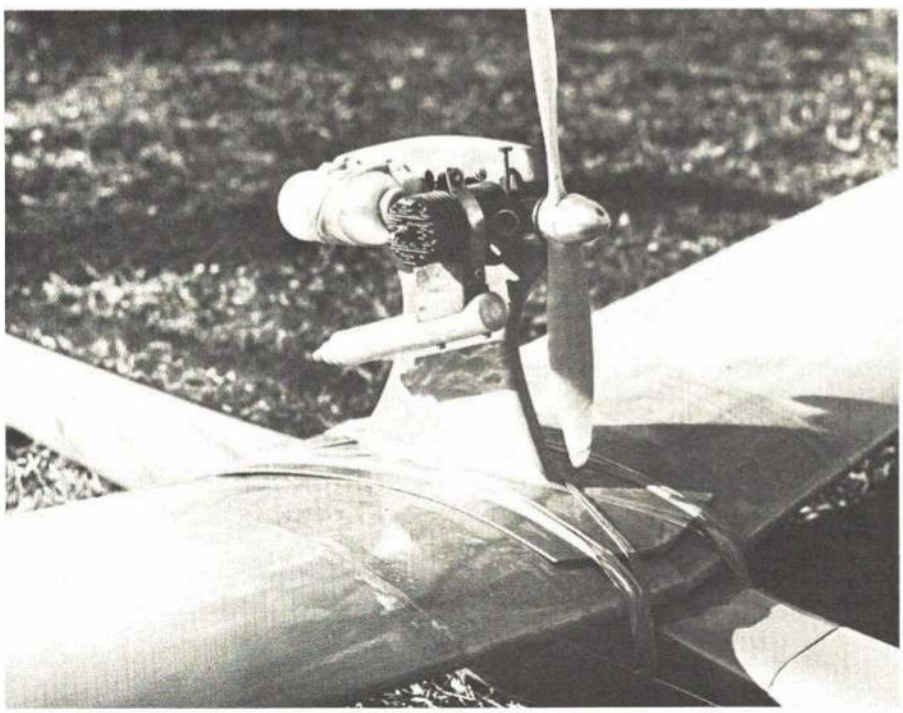
Make the four plywood dihedral joiners and cut away the foam on both sides of the spars in the center section so the joiners may be installed later. Epoxy all the spars into the wing cores.

Because of the thin trailing edge required, the wood overlaps the foam and needs extra support there. Cut some fairly light fiberglass cloth into 1½"-wide strips to be put in all along the trailing edge, between the top and bottom balsa covering. Hobbypoxy Formula II was used for this. Prepare the balsa bottom covering. Leave the wing panels in the foam blocks so there is no chance of twisting a panel. Spread Hobbypoxy along the trailing edge, 1½" wide. Lay on the glass cloth and put more Hobbypoxy on top of it. Using a piece of cardboard to shield the Hobbypoxy, spray contact cement on the foam core and balsa skin. When the contact cement is tacky, put on the balsa skin. The Hobbypoxy is slow drying so this procedure presents no problems.

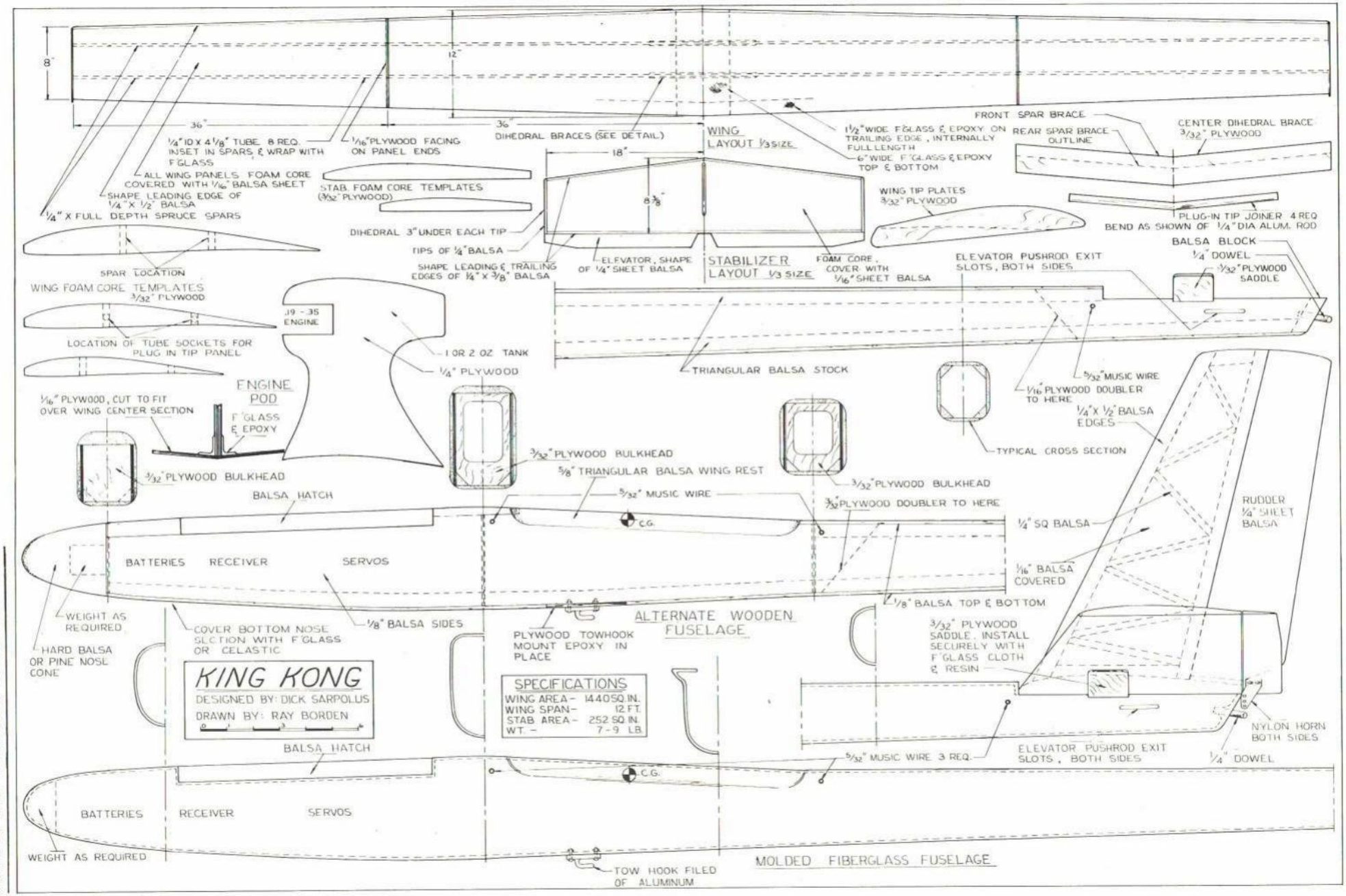
When the four panels are done, join the two center sections with the plywood joiners and plenty of epoxy. Wrap the center section with six-in. wide fiberglass cloth and epoxy. Trim the outer panels for the correct dihedral angle at the joint and cap the ends with 1/16" plywood. Drill the plywood for the ¼" joiner rods first and be sure the panels line up properly. Add the balsa leading edge and the plywood tip plates. Quarter-inch aluminum rod should be strong enough for dihedral joiners. To be safe, we have been using one piece of steel rod and one piece of aluminum rod on each side. Steel rod weight is .0139 lb/in. and aluminum rod is .005 lb/in.

This wing construction with all its spruce, epoxy, plywood, and fiberglass may sound too heavy and too strong. Not so! Many times 125-lb. test line has broken on a winch tow. The Kong weighs almost ten pounds, with the power pod, and that wing has to be strong! When it is flown in strong lift and a lot of down elevator used to keep it from going up too fast, the ship picks up speed and really moves. Therefore, we believe this type of construction is necessary. A Marvelite-covered wing could be tried.

(Continued on page 68)

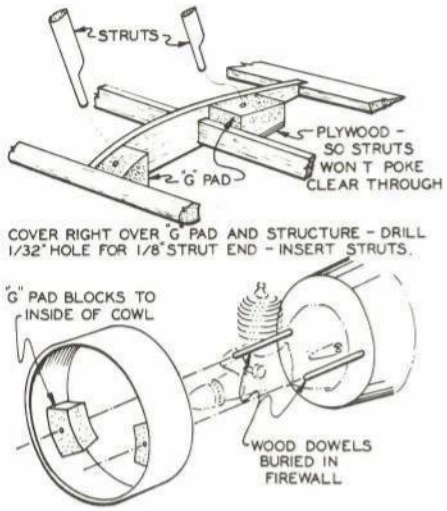


Large engine and small tank work as well as large tank and small engine, but author recommends the fast climb on powerful but light Fox 35 engine. Power pod could be streamlined considerably; it noticeably hinders the glide of King Kong.



FULL SIZE PLANS AVAILABLE—SEE PAGE 70

F/F WALT MOONEY
Specialist Correspondent
SCALE



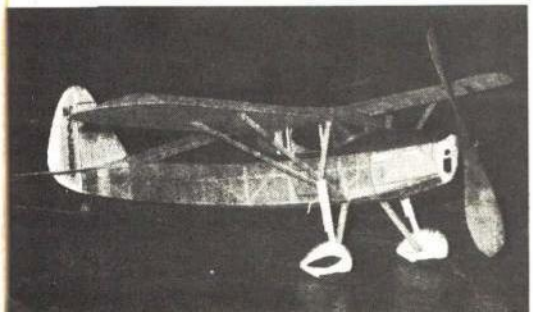
New Installation Idea: Robert Godden has come up with a new way of holding cowls and installing struts on biplanes that promises to simplify and improve on the older standard methods. He uses blocks of G-pad to create resilient sockets which will hold strut ends and still allow them to separate easily in the case of a crash. G-pad is used by radio control enthusiasts to shock-mount radio components and is sold by most model shops. If it is not available, fairly firm foam rubber or polyurethane foam will also do the trick. . . .

Jumbo Scale: The North American Flightmasters held a Jumbo Scale contest, which was an unqualified success. Minimum wingspan allowed was four ft. J. W. Headly of Palos Verdes took second place with a beautiful Focke-Wulf F. W. 47 model, rubber-powered and with a 50-in. wingspan. . . .

Meet at a Rink: An indoor scale meet, at Hicksville, N.Y., late in May, was held in an ice/roller rink during the period of changeover from one operation to the other. The rink has a 40-ft. ceiling, which just goes to show that you can never tell where a good flying site will turn up. The turnout was quite good and the quality of the models excellent, reports Bill Boss. . . .

Another ROW Contest: The word is out that the ROW scale contest the Flightmasters put on in June went over so well that another is scheduled in the near future. Scale enthusiasts should consider this event as an interesting and challenging diversion.

Guillow kit Fairchild 24 by Sal Alu Jr. weighs only 1½ oz. Wins indoor meets.



F/F BUD TENNY
Specialist Correspondent
INDOOR

The Indoor Nats: The 1970 Indoor Nats, well-attended and accentuated by good flying, is now history. Regular AMA events are reported elsewhere, but several "extra" events added a bit of variety. Peanut Scale was sponsored by the Cloud Busters Club of Detroit; and the PennyPlane event, by the Chicago Aeronuts. Cloud Buster members also officiated at Indoor Scale. Ralph Kuenz was CD for the Scale event, while Al Burczycki, Robert Mosher and Al Koehler worked eight hours judging the 56 models. PennyPlane was CD'ed by Erwin Rodemsky, who originated the event. . . .

Peanut Scale: This event, conceived as a fun variation of Indoor Scale, is limited to 13" span and flown under simplified rules. Clarence Mather's Wittman Buster won the Golden Peanut first place trophy donated by the Flying Aces GHQ club (originators of Peanut Scale) and Clarence's son Kim received the High Point Junior trophy, donated by the Long Island Association of Model Airplane Clubs. Bill Hannan donated a Craftsmanship trophy for Peanut Scale. It was won by Bob Clemens. . . .

PennyPlane Nats: The PennyPlane event (flown under rules reported in this column, Sept. 1970) had 26 contestants (eight Juniors) from eight states. Five models were proxy-flown. Highlighting these was Dave Linstrum's multiple entry. He sent three different PennyPlanes in a fancy box labeled "Three Penny Opera." They placed 6th,

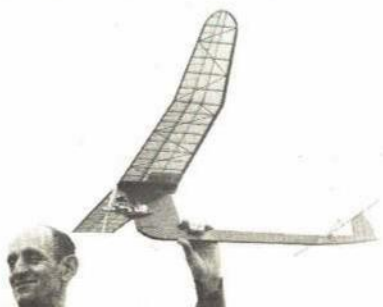
(Continued on page 74)

F/F CHUCK BROADHURST
Specialist Correspondent
POWER

The "Fast DT": Those who never have tried dethermalizing power models fast are missing a good bet. The fast DT will greatly reduce the frequency of the trauma of demolishing a new ship, but only if great care is taken not to DT too fast. A wing can snap in half quicker than you can say "Sig!"

After watching some of the Denver flyers at the Olathe Nats DT'ing their models at the end of power runs on

Clarence Mather, known for indoor flying, also competes with hot gas jobs.



Just below stab is a relay-driving super-het single channel radio for DT. See text.

test hops, I decided to try their system. On my power jobs, the timer on the first flight is programmed so that the engine (going full bore) floods off after two sec., and so that the DT pops two seconds later. If the two-sec. engine run looks safe, I go for three sec., leaving the two sec. DT as is. But if the model shows hard left or right tendencies or an inclination to "go over the hill," appropriate adjustments are made (usually, just one at a time).

The critical point in this process comes when the time between flood-off and DT must be lengthened. When the power run gets up to four or five sec. and the model still appears to be safe (nose up and grooving to the right), then is the time to lengthen the interval between flood-off and DT. The model is beginning to pick up speed now and a two-sec. interval isn't enough. You may luck out, but only if the wing has the strength of a brick.

In short, as the motor run and speed of the model increase, the delay between flood-off and DT must also be increased. You may snap a wing or two getting the hang of this system, but it has saved far more models than it's broken up. It is useful, too, when a tried and true

(Continued on page 72)

F/F BOB STALICK
Specialist Correspondent
GLIDER and RUBBER

Youth Program Content: Last month, this column began a rundown of a typical model building program for youngsters. This month, a week-by-week sequence of the content for the ten weekly classes is presented.

Session 1: Meet the youngsters and introduce them to the equipment, materials and program. If possible, begin building the Sig Cub.

Session 2: Complete the Sig Cub and fly it in an informal competition. Begin step two, a built-up model similar to Top Flite's Rascal 18 or Goldberg's Ranger 21.

Session 3: Work on and instruct to-

(Continued on page 73)

1970 Nationals

Starduster 900, flown in both B and C gas using K&B 29RR and 40FR, won both events for Marty Thompson. Very little difference in flights because of engine change.

BOB MEUSER

THE ONLY POSSIBLE WAY to start this story is to tell about 16-year-old Marty Thompson of Livermore, California, the new Junior Natonal Champion. Under the point system it is quite possible to become National Champ without placing high in a single event, but Marty won five events—Indoor Hand-Launch Glider, A/2 Nordic Towline Glider, and A B and C Gas. In addition, he earned trophies in ½A Gas, CL ½A Speed, and CL ½A Profile Proto. Besides that, he was third in line for the Grand National Championship and the Free Flight Category Championship for all age groups. Not that Marty needs the ten trophies he won—he already has 76! Modeling is not Marty's whole life, however; he gets excellent grades in school too!

Buck Servaites of Dayton became Open and Grand National Champion for the second straight time, and Free Flight Category Champion as well. In all three classifications, he was followed closely by Dennis Bronco (Lakewood, Calif.) a previous Junior and Senior National Champion.

The "Windy City" seemed aptly named, as strong west winds blew almost continuously. The max for all flights, including extra flights needed to break ties, was reduced to three min. for all events, and engine runs reduced to 13 sec. ROG and ten sec. hand-launched. Engine run for flyoff flights was reduced progressively in two-sec. increments. This is the second year under this system, and most agree it is an excellent solution to the problem of holding a free flight contest on a field of limited size. Even with the three-min. max, many models drifted over the fence half a mile from the launch area. Thanks to the skill of the Navy retrieval team and the cooperation of the local residents, most were returned.

Indoor Events

Historic Washington Park Armory was the site of the indoor events on Monday and Tuesday. Its 90-ft. ceiling qualifies it as an AMA Category 2 site (100 ft. max.), but the ceiling is arched, the roof trusses project down five to ten ft., and a dozen light fixtures hang

Fabulous Ford had outer props driven by bands in wing. Fulton Hungerford's beauty.

Highly detailed rubber scale flew great for Ron Martelet. Caused rules controversy.

A Heeb Stratostreak was flown by George Rivers in Unlimited Rubber. Son helps.

Martelet flew Pilatus Turbo-Porter to win Indoor Scale. Light model did 2 min. 20 sec.

Scholarship winner Sue Weisenbach at her fifth Nats, flew rubber, gas and indoor.

Where the action is... FREE FLIGHT

down to the 62-ft. level, which makes the job of utilizing the full 90 ft. a bit tricky.

Beating Jim Richmond is tough under any circumstances, but beating him on his home ground proved impossible. Jim won all three rubber-power duration events—Microfilm-covered Stick, Cabin, and Paper-covered Stick, setting a new Cabin record in the process, and coming within seconds of breaking his own records in Stick and Paper-Stick.

On his first and winning flight with a brand new small FAI-size Stick model, Jim hit every light in the hall at least once, and most of the girders to boot, demonstrating Jim's philosophy of going for broke on the first flight. If the model hangs up, there still are four flights and two models to go.

Jim does things differently from most others—winds his motors to full capacity on a torquemeter, backs off turns until the torque is just sufficient to get his model to the ceiling, then transfers the fully-wound motor to his model—ties his rubber with thread instead of making a knot—keeps detailed records of every flight—omits a rib or a brace here and there and comes out a hair lighter. Seeing him now in this slow-motion world of indoor modeling it is hard to visualize him as the winner of the CL Jet Speed event at the Plymouth Internats.

Outstanding Senior on the indoor scene was Jan Servaites, brother of Grand National Champ Buck. Jan won Stick and Paper Stick, setting a new national record in the process. Ronald Ganser, winningest Junior in 1969, won Cabin and took second in Stick this year, his first Nats as a Senior. Tom Sova, Bill Schlarb, Bruce and Barry Pailet, and Mike Kuehne divvied up most of the hardware in Junior.

Hand-Launch Glider was the usual bedlam, made worse by small floor space, with gliders splattering against rafters, lights, and floor; contestants vainly trying to clear paths for their launching runs; and too-often futile cries of "heads up—official flight." Times were good but not outstanding. Winners were Marty Thompson in Junior, Richard Hixon in Senior, and Dennis Bronco in Open.

The unofficial Pennyplane event, for 18-inchers weighing at least as much as a penny, had 37 entries. Intended for beginners, it was won by US Indoor Teamster Clarence Mather, which must prove something or other. The Jr.-Sr. division was topped by Tim Noonan.

Judges had their hands full processing over 70 entries in Flying Scale, and

(Continued on page 56)

Jim Richmond set new Cabin record at Nats and won Stick with 21:34.2 on first flight.

Open and Grand Champ Bucky Servaites with B Gas entry Honcho. Used K&B 29.

Cathy Burnstine and her Dad like scale. She holds his fine Aeronca C3.

This is a flying team in outdoor HLG. Each flies one of M & P Enterprises' kits. When Flash flies, the BoWeevil chases the U.S. Kid. Perfectly normal, every day.

Canard Jetex 150 entry by E. Wolfe fascinated all, flew well, but did not place.

10-HI

Fabulous flying wing thing is sport free flight with interesting history—author flew Northrop's real twin-engined flying wing.

H. A. JOHNSON

BLAME IT ALL on Nick Linardos, top needler in our small group of modeling enthusiasts who enjoy a busman's holiday away from configuring F-5's, T-38's, etc. During a coffee break session, we were discussing an all-wing contest sponsored by the Northrop Model Airplane Club. Some of the guys were needling Nick about his prospective entry. He neatly diverted them by drawing attention to the fact that, long ago, I had flown Northrop's twin-engine experimental wing, the N9M.

I could sense a trap about to be sprung, and it was. "Johnny, why don't you throw something together and enter the contest? After all, you are the only modeler in this gang who actually has flown a true wing. It's only fitting that you show us what you learned from that experience."

Here was a challenge I had to face! With it came the realization that my entry had to be a version of the N9M I had flown. Anything less would be sacrilegious. That sounded the scramble horn and I was off in pursuit of the necessary information on planforms and airfoil sections. Finally, a three-view drawing of the N9M with all the needed details was uncovered.

With data in hand and loaded with smug confidence, I retired to the workshop. I shouldn't have been so smug—all my experience gained from never having built and flown a model wing came to the fore. It dictated a flying test bed still reverently referred to by my family as the lead sled.

As work progressed, several modification requirements became apparent. Twin and pusher engines were out because of the complications of timing a maximum 15-sec. engine run and the excessive lead requirements for obtaining the proper CG. Directional stability had to be considered, particularly in the glide mode, due to lack of propeller contribution.

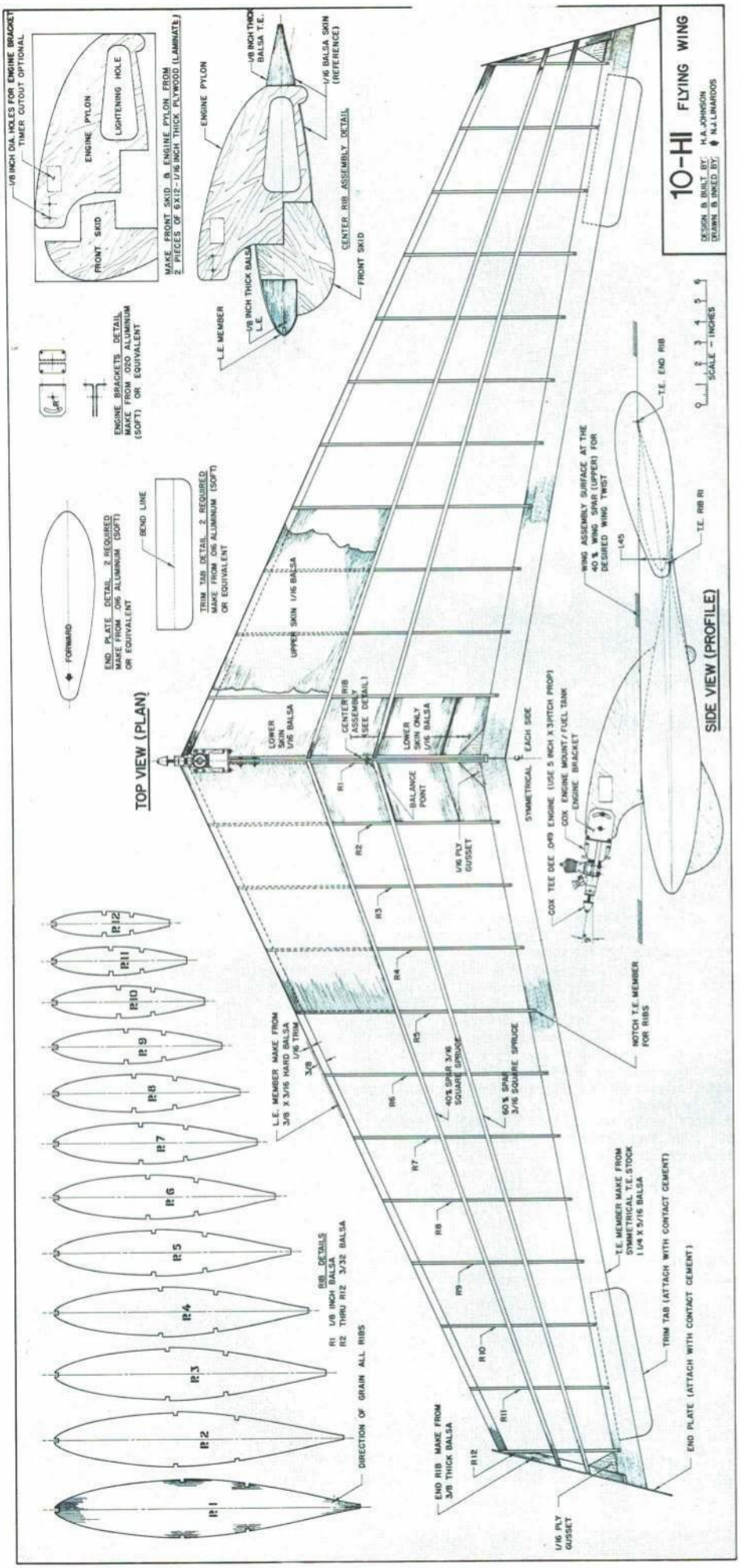
The test vehicle came off the building board with a nose-mounted Cox TD 049, TE trim tabs and wing tip fins canted in at 19 degrees. My son, Bob, took one look and sent my ego into a dive with a hearty "That thing won't fly!" "Enough of this talk," I said, "let's find out."

Bob and I left for our own private Edwards AFB, a knoll just right for test-gliding the model wing. After several flights and adjustments to achieve proper trim and balance, we were ready for the real proof. What happens under power?

Being cautious about pitch under power, I had put in six degrees of downthrust on the engine. We fired up the bomb and set the tick-off timer for a 1½-sec. engine run. With Bob safely stowed in the station wagon, I turned that five inches of whirling Cox prop loose, only to have it disappear right over my head! Had I set the engine run at two sec., my ego would not only have been bent—it would have required some bandaids to patch it up. The model had looped over my head and landed right at my heels!

Shaken by those results and the uproarious laughter from the station wagon, I retrieved the model and cranked in more downthrust. Once more, the routine of set the timer, flip the prop, stow Bob, and launch. Then came the exception—on one launch I forgot to trip the timer. The model, launched nose low, proceeded down the slope for a second and then started into what obviously was going to be fatal loop. As the ship came over the top and started down, the loop tightened up and the model was off in a helical climbout at an angle of 45 degrees to the ground—with a full tank of fuel!

Bob bailed out to watch this mad whirling dervish working its way skyward. My only thought was the magnitude of glide test we were about to



observe. Somewhere around 350 ft., the engine ran out of fuel. Much to my surprise, the model lay over in a flat glide attitude without any pitch or yaw oscillations. It went into a beautiful gliding turn about 250 ft. in diameter, passing directly over our heads on each circuit. Obviously, the only problem left was thrust-line location and angle.

Two more weeks wasted on the original engine installation netted us two sheared center sections and one damaged TD. One can be stubborn up to a point, but by then the contest was only two weeks away. I quickly repaired the test bed and installed a pylon-mounted pusher configuration. Two short engine runs proved the pitch problem was whipped; but, on the second run, the amount of lead in the nose took its toll. Back to the shop to build the contest model with a tractor pylon. The pusher version had seemed too dangerous to launch, which the movies verified, and it required far too much lead for balance.

The remaining week was spent in frantic panic completing the model for a trim flight. During that week, my wife, who delivered my favorite spirits and water to the shop, remarked, "You ought to call that thing 10 High." "Why?" I asked. "Because you've consumed so much of it trying to build that wing," she retorted.

An abbreviated version, which came out 10 HI, was adopted from her suggestion. Friday night we covered the model in transparent yellow MonoKote and applied the name. Saturday morning the wind blew and blew, no tests could be made, and Sunday was meet day.

Challenge day broke with no wind but, of all things, a light rain was falling. I pointed the wagon in the direction of Sepulveda Dam basin to an accompanying chorus of "They won't hold a contest today." However, the plan was to arrive early and get in the sorely needed trim flights. The rain had stopped by the time we arrived at the contest site, but long endurance glides would be hard to come by in the cold, wet air. When we broke out the gear, 10 HI immediately became a spectator magnet. It drew the old pros, whose sage advice paralleled Bob's earlier comments on 10 HI's potential flying qualities. After several glide tests for trim adjustment and two short engine runs to adjust thrust line, we called the CD for a timer. The first long engine run flight was going to be an official flight just in case.

The routine on the firing line began —set the timer, fire up TD and walk away from the crowd for launch. I adjusted the needle valve, tripped the timer during a running launch and turned it loose. What transpired in the next ten seconds stunned the spectators and transformed me into a state of paralyzed shock. 10 HI left my hands at an altitude of about five ft. The 19,000 rpm of the Cox TD was accelerating it at an unbelievable rate toward a point on the ground about 100 ft. away. At an altitude of about three ft., it rotated and shot skyward in a breathtaking, beautiful climb which brought a round of applause from the crowd. We were in and no doubt about it! 10 HI went on to win the powered division trophy. Even more significant were the nine requests for more flights.

10 HI is still flying and still receiving requests for demonstration flights. For thrilling free flight sport flying, audience attraction, and sheer beauty in the air,

(Continued on page 66)

FULL SIZE PLANS AVAILABLE—SEE PAGE 70

Scale Techniques for the Plastic Modeler

Well-done camouflage patterns are always difficult to photograph in black and white because of lines blending. Rakishly-swept angles are exciting even when plane stands still.

RF-101 Voodoo

The 101 has been around for a long time and was one of the first supersonic fighters.

Model is conversion to recon plane, using a Japanese kit.

CAPTAIN JACK MORRIS, USAF

THE F-101 VOODOO started life as a long-range tactical penetration fighter. Its design concept evolved during the XF-88 program in the late 1940's, but lack of funds terminated that project shortly after the outbreak of the Korean War. Then the Voodoo was revived to meet Strategic Air Command's requirement for a long-range fighter to escort SAC bombers. As a result, the XF-88 was redesigned into the familiar F-101 configuration, with J57 engines and the high T-tail.

In 1954, changing requirements led to SAC's dropping the F-101, whose production then was allocated to the Tactical Air Command. TAC had equipped three squadrons with F-101A's, when the outwardly identical but internally strengthened F-101C was introduced. Initial problems with the T-tail design limited demand for the F-101A/C models. However, most of those Voodoos built did serve operationally with the 81st Tactical Fighter Wing in England.

Before long, the F-101 was adapted for reconnaissance. The new camera nose increased the Voodoo's overall length from 67 ft. 5 in. to 69 ft. 3 in. The first flight of the RF-101A took place in May 1956. By the end of production, 203 RF-101A's and RF-101C's were built, as opposed to only 124 F-101A/C's. These camera Voodoos were quite successful and only recently have been replaced in Southeast Asia by the more advanced RF-4C, another McDonnell product.

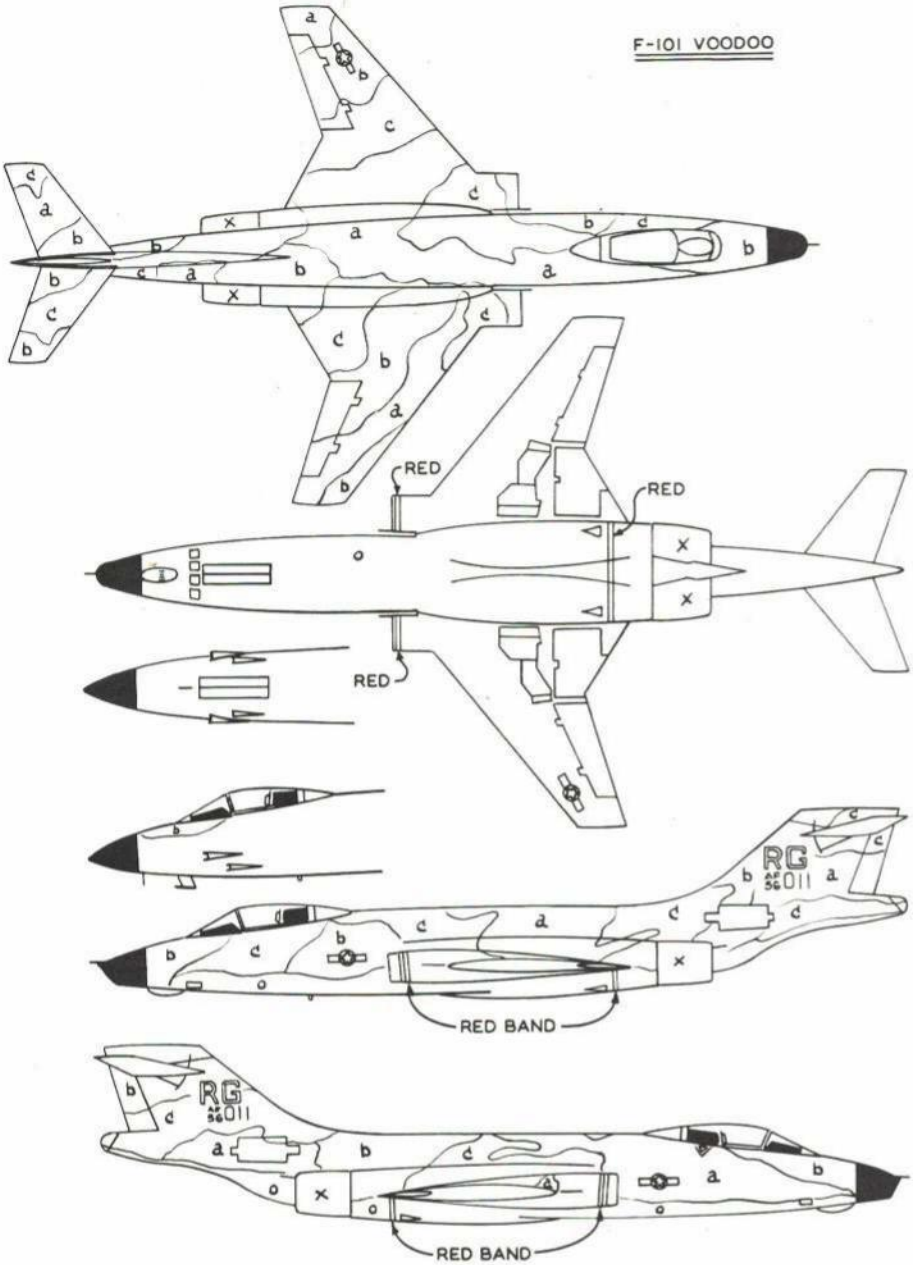
Most recently the F-101 served the Air National Guard. Its tactical reconnaissance squadrons had been using the veteran subsonic RF-84F and RB-57 and were in need of a supersonic replacement. When the F-101A and C were replaced in active USAF service, these aircraft were adapted to meet the ANG's reconnaissance requirements.

These modified aircraft were designated RF-101G and RF-101H, conversions of the F-101A and F101C, respectively. Externally identical, their overall length, including a 12-in. pitot static probe, is 67 ft. 11 in. The 20-mm cannon and the nose-gun-laying radar were removed from the nose and replaced by cameras. The pitot static probe was moved from the underside of the fuselage forward of the nose-gear bay. Air Guard squadrons flying the RF-101G and H models were called up to active duty during the 1968 Pueblo crisis, and some were deployed to Japan.

It took the Japanese to come up with the first 1/72 scale version of Voodoo. The Hasegawa RF-101C, sold in the U.S. by AMT, is an impressive kit.

This model is to have its wheels down and locked. Wheel wells are modified. Camera and radar nose are made of balsa.

Kit nose is shown before modification. Note where plastic part joints were putty-filled and sanded smooth.



Camouflage patterns are not random arrangements of dull colors. On your model, follow the numbers and lines shown above for an authentic job. Nose choices are shown.

It's hard to realize how large the Voodoo really is until it is assembled and placed next to an F-4C in the same scale. Faultlessly detailed, the kit comes with opening speed brakes, complete with actuating rods. Some minor, but easily corrected, construction problems do crop up. For an interesting variation, try a relatively simple conversion from the RF-101A/C to the RF-101G/H. An alternate conversion is the F-101A or C, made by a simple change in plans.

Background information from all available photographs and data on the subject will be of great help. It permits the builder to detect and add any bulges, antennas, stenciling and/or any other fine details not provided in the kit. Becoming completely familiar with each part in the kit, its location and how it is assembled in relation to the total model is also important.

The cockpit area should be completed and painted first. Consoles are painted light gray with black instruments and dials. Addition of a control column and rudder pedals enhances the finished appearance. The ejection seat is light green with a black seat cushion and red headrest. Yellow seat handles and armrests are added. The rear fixed portion of the ejection seat assembly is painted black. Oxygen hoses made of thread and seat straps of paper strips, 1/32" wide, add further touches of realism to the cockpit. The underside of the cockpit floor serves as the nose wheel well and is painted gloss white (as should all the wheel well interiors).

Next, assemble the fuselage halves and let them dry at least 24 hours. With a razor saw, remove the forward 1/16" measuring along the top seam and sawing at a right angle to the fuselage longitudinal axis. File and sand the nose stub to a 21/32" dia. circular cross section.

From balsa or other wood, carve a new nose section 1 1/32" long and 21/32" in dia. The RF-101G/H nose has a circular cross section, which must be maintained during shaping. Add the flat section at the extreme tip; for the fighter version leave the radome pointed. After shaping the nose, take 1/32" sheet styrene, cut it to circular shape a little larger than 21/32" dia. Drill a hole in the center of this disk and fasten it to the rear of the wooden nose cone with a ½" or ⅝" wood screw. This disk permits a clean, tight weldment of the new wooden nose to the fuselage.

Before cementing on the new nose, add sufficient lead shot to the orifice in the fuselage forward of the cockpit area to prevent the Voodoo from becoming a tail-sitter. With the weights in place, the new nose now may be grafted onto the fuselage. Allow this joint to dry at least 24 hours. Then, sand, shape, fill and trim the joint to make a smooth transition.

Determine whether the landing gear is to be left up or down. If the gear is to be lowered, remove the lip moldings inside the wing wheel wells. Hold the wing assembly together with plastic tape and trial fit it to the fuselage. Some misalignment of the intake moldings on the left wing is to be expected and is easily removed by undercutting the mating edge of the top left wing half to match the right wing. The excess molding on the left fuselage wing root joint is removed by filing and sanding along the wing/fuselage upper joining line to allow proper fit without mismatch of the intake surfaces. Cement the upper wing halves to the lower wing center section. After drying 24 hours, this assembly is cemented to the fuselage. Fill any gaps along the joint lines with putty and sand smooth.

(Continued on page 66)

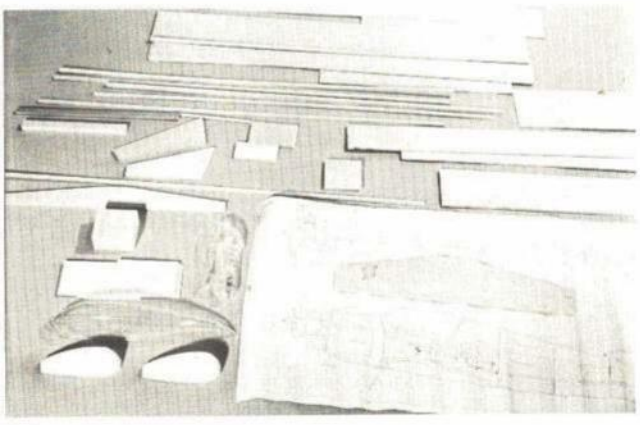
The real plane is surprisingly large. Person of average height can stand under the wing. These planes are now being used by National Guard units.

NEW PRODUCTS CHECK LIST

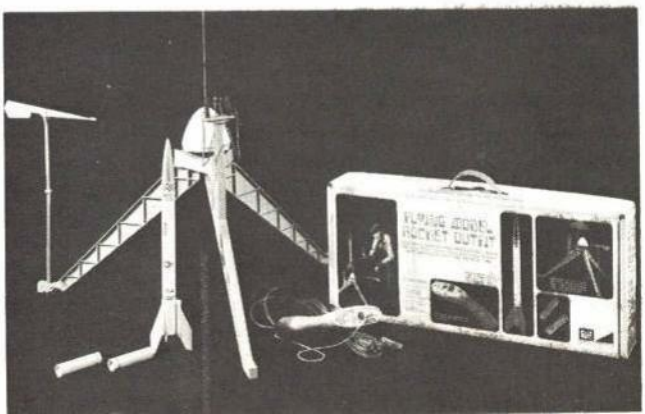
Write the manufacturers for more data; tell them, "I saw it in American Aircraft Modeler."

Aerotec Model Engineering/Scale P-26 plans. Super-detailed plans for building true-scale **P-26A** pursuit of early 30's now available from **Lou Perretti.** Complete down-to-servo-mounting recommendations to build this colorful 50- to 60-powered RC eye-catcher. 2" to 1' scale, full size. **Aerotec Model Engineering Co.,** 76 Conduit St., Harrison, N.Y. 10528

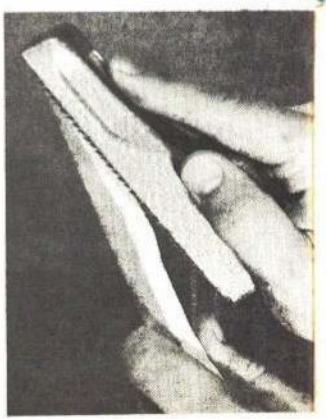
Dumas/Mod Pod. Fiberglass pod and boom, way-out paint job should make **Mod Pod** real show-stopper. Die-cut balsa tail surfaces, built-up wing, can be flown as glider, free flight, RC sport or soarer, or on tether power. Kit **RC-7,** $14.95. **Dumas Products, Inc.,** Box 6093, Tucson, Ariz. 85716



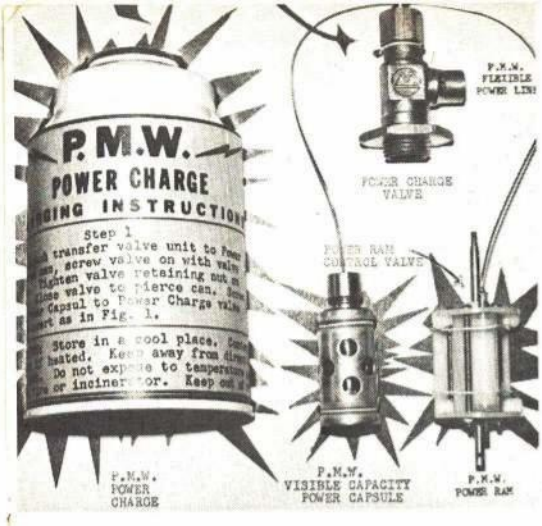
Bob Holman Plans/Auster-Taylorcraft. 72" span plans for British version of **Taylorcraft** are produced by **Complete-a-Pac,** Earlston, Scotland. Plans, $4.50. Also available: complete kit, less plans, $40.45; with plans, $44.95. **Bob Holman,** Box 741M, San Bernardino, Calif. 92402

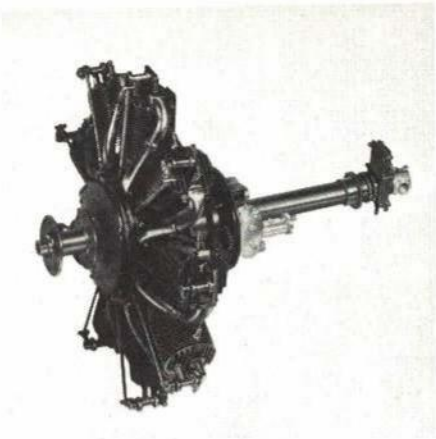


Astro Flight, Inc./Fournier RF-4 kit, 69" span, ship is scaled after VW-powered semi-sailplane which **Miro Slovak** flew across Atlantic. Formed canopy, cowling, plane provides 15-minute flights on 1 oz. fuel. Use from 2-channel up to full-house with retract gear. Recommended for 09 to 23 engines. $22.95. **Astro Flight, Inc.,** 2301 Cheryl Place, Los Angeles, Calif. 90049



Model Products Corp./Pioneer I rocket. Kit contains MPC rocket launch pad, pad controller, rocket two MPC rocket engines, and instruction sheet packed in reusable carrying box. Versatile, comprehensive kit but good for beginners. **Model Products Corporation,** Mt. Clemens, Mich. 48043



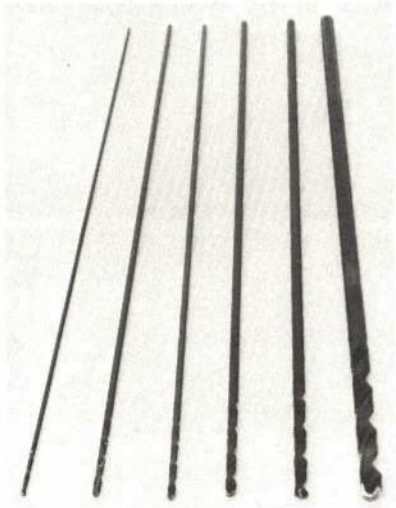


Great Neck Saw Mfgr./Versaplane. An asset to any model builder's kit, versaplane does shaping, smoothing, and planing jobs that sandpaper can't touch. Works well for fine or coarse smoothing, cuts soft or hard woods, plastic, rubber, metals. Non-clogging blade design. $2. Replacement blade, 90¢. **Great Neck Saw Manufacturers, Inc.**, Mineola, N.Y. 11502

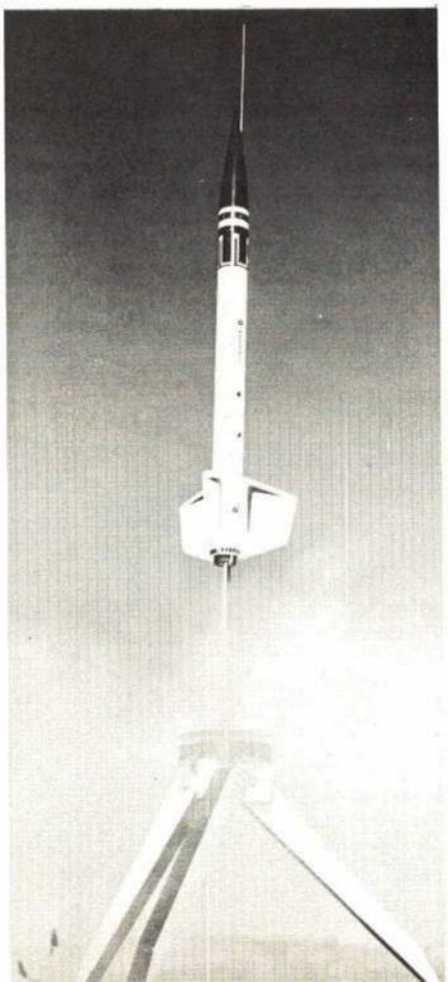
PMW/Hydraulic power retract system. Rechargeable gas-operated power system allows gear retraction with no drain on battery and servo. Initiates from only ⅛" travel of control rod, easily provided from throttle servo. 15-lb. output. Wt. 2 oz. $38.50. Extra canister, $2.25, valve, $3. **P.M.W.**, 2630 West Durham Ferry Rd., Tracy, Calif. 95376

Williams Bros./Scale Le Rhone. Detailed kit of WW I-vintage **Le Rhone** 9-cyl. rotary features movable gears and throttle in hi-impact styrene. Can be used as show mounting for 2" scale RC models or as separate stand-mounted conversation piece. 1" and 1½" scale kits also forthcoming. $11.95. **Williams Bros.**, 181 B St., San Marcos, Calif. 92069

Dwight Hartman/Charger. Unusual, outsized fiberglass cruiser, 61" long, 20½" beam. Powered by 3-hp two-cycle lawnmower engine available through Toro dealers. Big enough to accept all kinds of RC gear. Hull and deck, $95. Cabin superstructure, $27.60. Write: **Dwight Hartman**, Special Fiberglass RC, Argenta, Ill. 62501



C & T Model Specialties/12" drill bits. Featuring 135-degree split-point tips, these hi-speed drills come in six sizes specifically aimed at RC modeling needs. 1/16, 5/64, 3/32, 1/8, 5/32, and ¼-inch sizes. Extra length allows drilling of hard-to-reach areas. Set of six as above, $15. **C & T Model Specialties**, 19 Dogwood Rd., Boonton, N.J. 07005

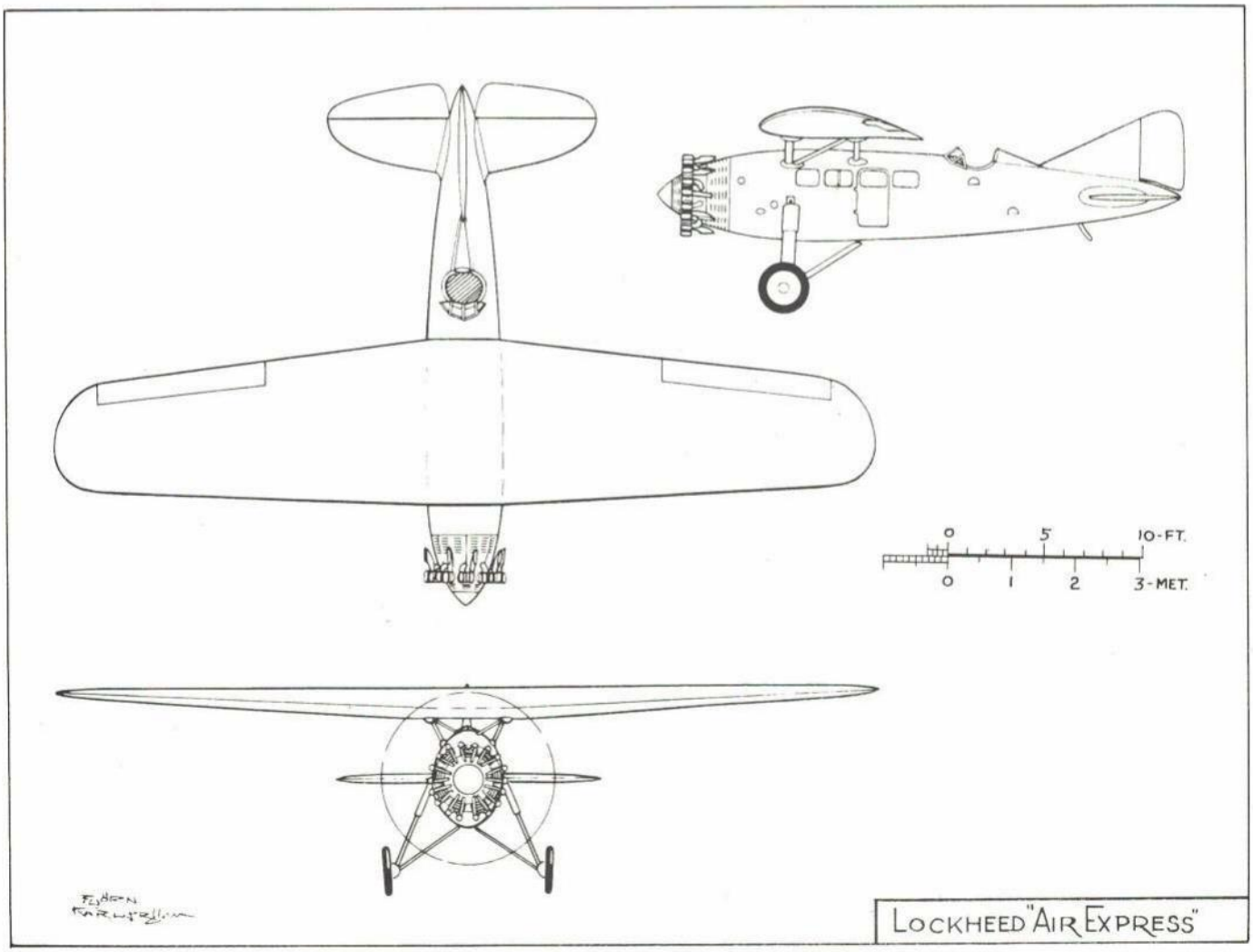


Sherlock Aircraft Models/Learjet. Just retooled, new **Learjet** kit features ultra-smooth hi-gloss precision-molded fuselage, extra rigid tail fin with spar to lock fin and stabilizer in perfect alignment, easier access to RC gear. All monocoque construction fuselage, foam-core plastic covered wing. 60 engine with front carb gives great performance. $89.50. **Sherlock Aircraft Models**, 1275 Dana Ave., Palo Alto, Calif. 94301

Estes Industries, Inc./Cherokee D. Using new **D series** engine with twice the thrust of largest conventional systems, rocket climbs to over 2000 feet with 4-oz. payload. 22" long, parachute recovery. Kit $2.75. Write for data on D engine. **Estes Industries, Inc.**, Box 227, Penrose, Colo. 81240

Lockheed

Although it came after the Vega with its enclosed cabin for the pilot, the Air Express reverted to an open cockpit. Below: Three-view shows less successful forerunner of production version.



AIR EXPRESS

When John Northrop designed this four-passenger, 176-mph craft, it was the ultimate in comfort. Though only seven took to the sky, they became world famous.

DON BERLINER

Photos from Smithsonian Institution

WILL ANYONE REMEMBER how it all started?

In a few weeks, as this is written, Lockheed Aircraft Co. will erupt with great gobs of excitement as its newest airliner takes to the skies for the first time. The 250-300-passenger 1011 TriStar will carry with it the hopes and future of a great company which, like so many today, is in somewhat wobbly financial condition. Within a couple of years, scores of these majestic big ships should be cruising the airways.

But will anyone remember the Air Express?

Before the TriStar came a long line of Lockheed commercial airplanes: the Electra II, the Constellation, the prewar Electra, the Lodestar, the Vega, and finally back to the Air Express, Lockheed's first passenger carrier. Then, as now, the new airplane was much more than merely the latest combination of technical ideas. It was a big step forward.

The world of 1928, when the first Air Express appeared, was a far different place from the one we know today. Airline travel was something that appealed to only a few brave businessmen. Flying demanded nerve and ingenuity and the ability to navigate with only the crudest of instruments and almost no ground-based aids. A 300-passenger, 600-mph luxury liner would have been worthless.

But a four-passenger, 135-mph Air Express with a completely enclosed cabin for the "ultimate" in comfort was a much more realistic project for the time. The machine designed by John Northrop was in many ways a real advancement in the art, and in other ways a step backward. While its basic layout was certainly sleek and streamlined, it placed the pilot far aft of the passenger cabin and out in the open as in most earlier designs.

Shortly before the Air Express bowed in, the Lockheed Vega had been introduced to the public. It featured a cockpit just ahead of the cabin, with its windshield faired into the leading edge of the high wing. Airmail pilots of that era were hesitant about being completely enclosed. Many of them were convinced they could fly only if out in the breeze where their practiced ears could sense the winds and changes in attitude. Lockheed went along with this idea and produced the Air Express with an open cockpit and a strut-braced wing to permit forward visibility.

The forerunner of the Air Express was a special built for Western Air Express, Inc., in June, 1928. On the first trip for its owners, it was badly damaged in a landing accident at Las Vegas, Nev., and returned to the factory. There, it was completely rebuilt into the prototype Air Express and became one of the most famous long-distance record setters of its time. Frank Hawks, the famed "Dawn-To-Dusk" pilot, set a West-East transcontinental record of 18 hours, 21 minutes in February, 1929. Then, in late June, he earned his place in the sun by setting back-to-back transcontinental records, flying from New York to Los Angeles in 19 hours, 10 minutes and, after a brief rest, back to New York in 17 hours, 38 minutes. Hawks and the Air Express were famous.

The first production Air Express was sold to the New York, Rio and Buenos Aires Air Line in March, 1929. It was to have been used for carrying the mail around Argentina—possibly using floats—but the airline was soon bought out by PanAm and the airplane vanished without a trace.

But the next ship off the line more than made up for the lack of fame of its predecessor. NR/NC-3057 lived through several of the most exciting years in the history of any airplane before it was broken up in 1940. Carrying the Lockheed name "The Black Hornet" (other Air Express were built with Pratt & Whitney Wasps; this one had a P&W Hornet), it failed to set a transcontinental record in 1929 and was sold to the General Tire & Rubber Co. and renamed "The General Tire." Henry J. Brown flew it to first place in the forerunner of the classic Bendix Trophy Race: the Los Angeles-to-Cleveland race of the 1929 Cleveland National Air Races. Its time of 13 hours, 15 minutes was 36 minutes faster than the runner-up Lockheed Vega, and its average speed of 186 mph for well over 2000 miles was a real testimony to its class.

The next change in ownership for "3057" saw the beginning of one of the greatest publicity stunts in aviation history. A little known but enterprising airline pilot named Roscoe Turner talked the owner of the Gilmore Oil Co. into buying the airplane, renaming it "The Gilmore Lion" in honor of the firm's trademark, and letting him fly it all over the country in the company of a young lion named (what else?) "Gilmore." Turner, Gilmore, Gilmore products and the cream-and-red Air Express went

(Continued on page 81)

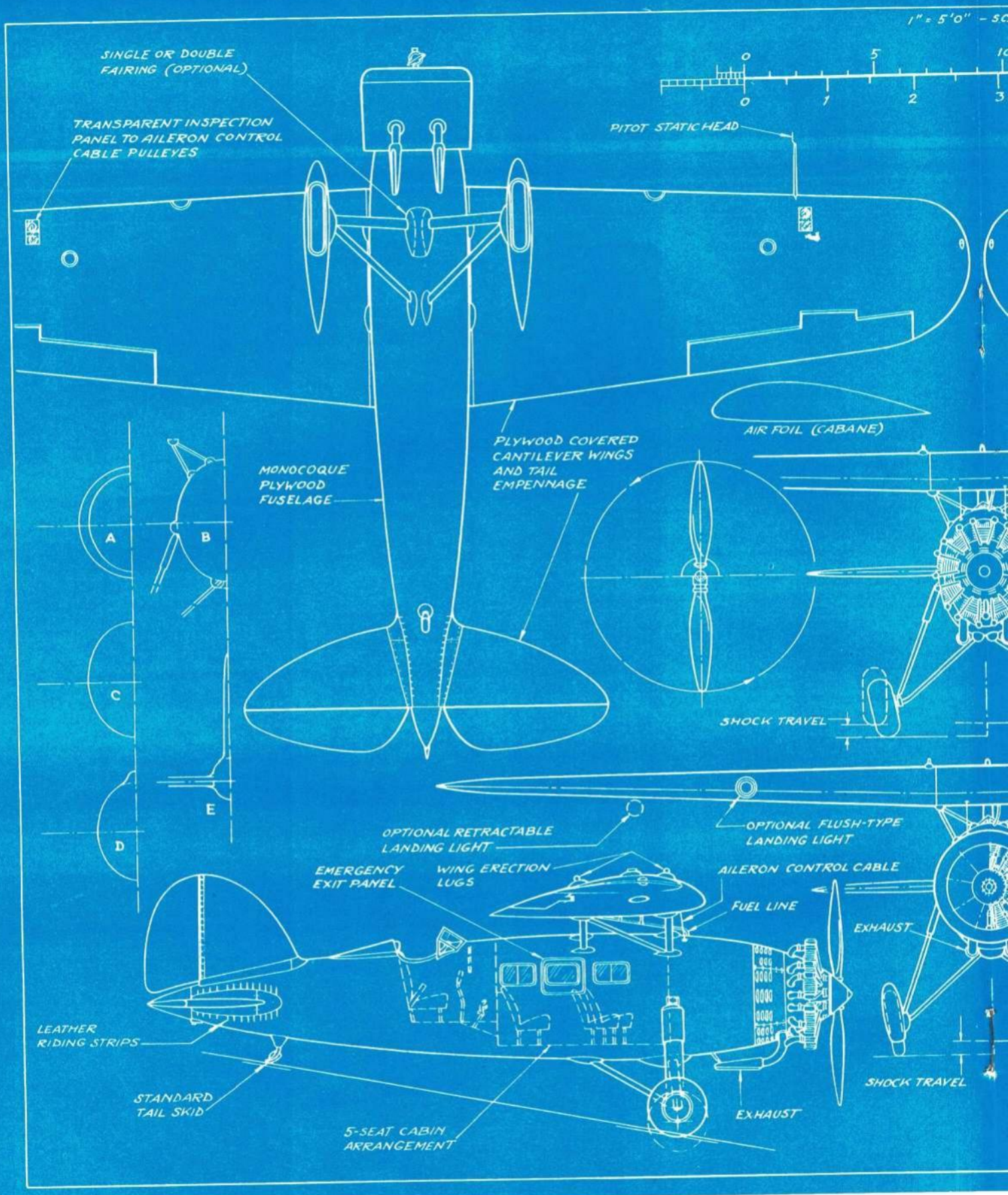
Texaco's Air Express was a plush predecessor to today's corporate aircraft. One of the most famous long-distance record setters was flown by Frank Hawks to west-to-east and east-west transcontinental marks in 1929. By then, a full cowl and spinner added to its performance.

Dimensions

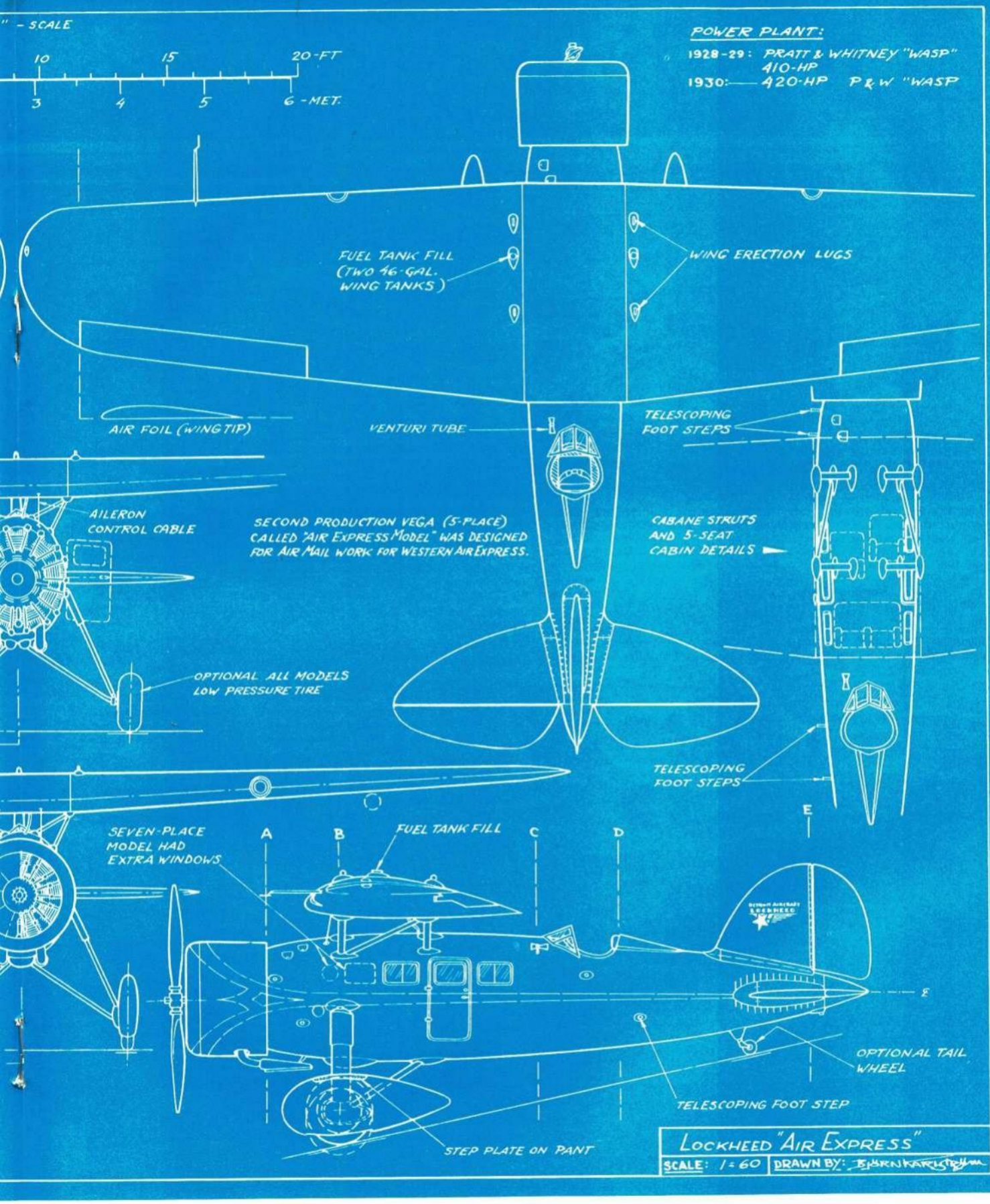
Length—27′ 6″
Wingspan—42′ 6″
Wing Area—288 sq. ft.
Height—8′ 4½″
Empty Weight—2533 lb.
Gross Weight—4375 lb.

Performance

Top Speed—167 mph (without cowl)
176 mph (with cowl)
Cruising Speed—135 mph
Landing Speed—55 mph
Rate of Climb—1500 ft./min.
Service Ceiling—17,250 ft.



Lockheed AIR EXPRESS



The prototype Air Express flown by Frank Hawks was a rebuilt special made for Western Air Express, Inc., in June of 1928. The first production model was sold to the New York, Rio and Buenos Aires Air Line—in 1929. P&W power. Hornet version averaged 186 mph in 2000-mile air race.

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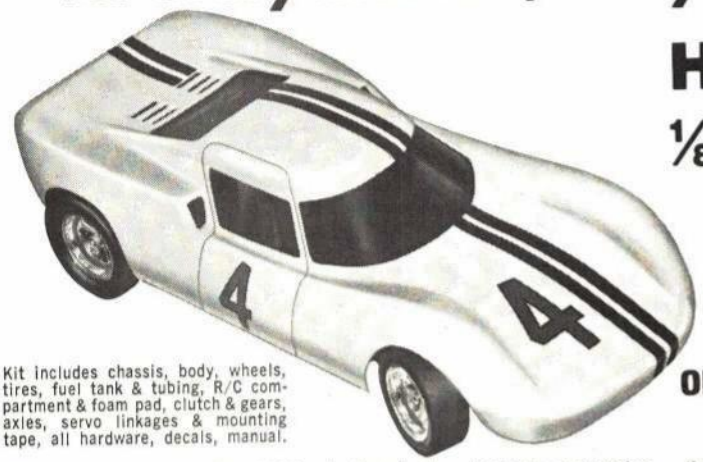

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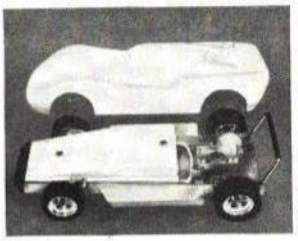

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DECEMBER 1970

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

AMA Proposes Further Revision to FCC Proposal

History. In response to a proposal from model boat interests, the FCC last year considered opening up the five 72-75 MHz model aircraft frequencies to other model activities. AMA objected vigorously, pointing out the safety problems which could be expected due to interference (see April 1970 AMA News, p. 53). As a result of that objection, the FCC modified its proposal—in order to reduce the interference potential—by retaining three of the five frequencies for model aircraft use, allowing sharing of the other two, and adding two more for non-aircraft use (see October 1970 AMA News).

AMA's objection was instrumental in revising the FCC proposal to reduce the sharing, a significant achievement, but the details of the FCC proposal were not produced, suggested, or in any way generated by AMA. The revised proposal was developed within FCC as an attempt to satisfy the several viewpoints previously presented by various model boat, car and aircraft interests.

Upon release of the revised FCC proposal concerning 72-75 MHz sharing the AMA Frequency Committee (**Ed Lorenz**, chairman, **Walt Good, Howard McEntee, John Phelps** and **Paul Runge**) immediately called for comments with a view toward further suggestions to the FCC. The response from AMA members, chartered clubs and RC industry representatives was prompt and positive —overwhelmingly against sharing the five model aircraft frequencies, although in favor of permitting boat and car operation on a non-interference basis.

Current AMA Position. The concensus of response produced a new AMA document which proposes to solve the problem by a further modification of the FCC proposal. Basically, AMA proposes that the FCC leave the five model aircraft frequencies as is, that it add two new frequencies for model boat use, and that it permit model car operations on existing frequencies but restricted to use of 100 milliwatt transmitters. Two basic points of the AMA presentation are that model boats and cars do not need much transmitter power, and model aircraft interference problems are far greater than those involving model boats and cars.

The text of the AMA document submitted to the FCC on August 21 is as follows:

1. The Commission now proposes to amend the Citizens Radio Service and Industrial Radio Service Rules so as (1) to reduce from five to three (72.08 MHz, 72.24 MHz and 75.64 MHz) the number of frequencies in the 72-76 MHz band frequencies which are available exclusively for radio control of model aircraft; (2) to permit the sharing by all model users of the two other 72-76 MHz band frequencies (72.40 MHz and 72.96 MHz) which presently are exclusively reserved for radio control of model aircraft; and (3) to reserve two additional 72-76 MHz band frequencies (72.16 MHz and 72.32 MHz) for radio control of other models, e.g., cars and boats, but not aircraft.

A. Counter Proposal

2. AMA recommends the following accommodation:

(A) Retain the current five frequencies (72.08, 72.24, 72.40, 72.96 and

1971 U.S. Free Flight World Championship team members (L to R): **Power**—Tom Kerr (Philadelphia, Pa.), Jim Taylor (Albuquerque, N. Mex)., Buzz Averill (Albuquerque, N. Mex.); **Wakefield**—John Allen (Albuquerque, N. Mex.), Frank Parmenter (Friendswood, Tex.), Robert White (Monrovia, Calif.); **Nordic**—Lee Polansky (Arcadia, Calif.), Hugh Langevin (Minneapolis, Minn.), Dennis Bronco (Lakewood, Calif.). The FF Team Finals was at Albuquerque, N. Mex., Sept. 5-7, supported by the South West Aero Team. Herb Franck photo.

75.64 MHz) for exclusive model aircraft use.

(B) Reserve two new frequencies (72.16 and 72.32 MHz) for exclusive model boat use.

(C) Allow model car use on the six Class C Citizens Radio Service frequencies (26.995, 27.045, 27.095, 27.145, 27.195 and 27.255 MHz) and encourage such use on other 27 MHz frequencies allowed for transmitters under 100 milliwatts.

AMA's counter-proposal is based on a balancing of the prevailing needs of all hobbyists engaged in radio control of models, aircraft or non-aircraft. The counter-proposal, as will be explained more fully below, gives consideration to (1) the estimated number of users of the three basic types of model activity —air, water and land; (2) the limiting factors of the environment in which the model aircraft performs; and (3) other factors which heighten the differences between model aircraft, boat and model car use.

B. Needs of All Modelers

3. Presently a total of eleven frequencies are assigned for use by modelers: six frequencies are assigned in the 27 MHz band for use by all modelers and five frequencies are reserved in the 72 MHz band for use by aircraft modelers. Under the Commission's proposal, the net effect will be to increase to thirteen the total number of frequencies available to the combined categories of modelers. However, as a practical matter the number of frequencies utilized by modelers will be reduced to seven because the six frequencies in the 27 MHz band will, inevitably, be abandoned by the car and boat modelers. The previous experience of the aircraft modelers voluntarily abandoning almost entirely the use of the 27 MHz frquencies, when the Commission reserved five 72 MHz frequencies for model aircraft, is a case in point. The car and boat modelers will view the 72 MHz band frequencies as a panacea for all of their troubles and desert en masse the 27 MHz band.

4. It is impossible to give an exact estimate of the total number of modelers. However, it is projected that there are in excess of 200,000 modelers and that the number will continue to increase in the future as social-economic pressures and other factors create greater need for relaxation and hobbies. Accordingly, the Commission's action will cause greater congestion in the 72 MHz band than is presently being experienced by the car and boat modelers in the 27 MHz band.

C. Comparative Needs of Modelers

5. Currently, AMA has a membership of 30,000 of which 20,000 engage in radio control of model aircraft. Available information discloses that the International Model Power Boating Association has a membership of approximately 600 persons with an unknown percentage of these engaged in radio control of model watercraft. No reliable figures are available as to the number of model car radio control users. The model car enthusiast is the least organized, a factor, which as will be noted later, somewhat underscores a basic problem in any shared use of frequencies with this group. These figures suggest that the model airplane radio control enthusiasts far outnumber, by a fifty to one margin, the nearest other organized model enthusiasts. However, the predominance of the model aircraft enthusiast is not reflected in the number of frequencies proposed to be reserved for that category over the proposed number of frequencies to be reserved for the exclusive use of other model enthusiasts. Under the Commission's proposal, the model aircraft enthusiasts would have but one more reserved frequency than the land and water model users in spite of the former's much larger numbers. Furthermore, in actuality, the land and boat modelers would have nearly twice as many frequencies as the aircraft modelers since, as will be discussed later in more detail, shared usage of frequencies is a totally unworkable arrangement as far as aircraft modelers are concerned. It is these weaknesses in the Commission's proposal which AMA's counter proposal seeks to correct.

D. Obstacles to Implementation of the Shared Usage of Frequencies

6. Model aircraft and to a lesser extent model watercraft operate under a more hostile environment than do model landcraft. The resultant damage to the models from radio interference conditions is far greater in the case of model air and watercraft than in the case of model landcraft. Actually, as indicated in AMA's initial comment in this proceeding, interference to model aircraft creates a pronounced danger of injury to persons. This type of danger is not present in model water and land craft operations, underscoring the need for greater frequency protection for the aircraft modeler than the other modelers. Thus, the land craft modelers will risk little in using the two shared frequencies whereas the model aircraft users', and to a lesser extent the watercraft users', risk in sharing frequencies are very considerable. In these circumstances, frequency sharing is not workable since all of the various users need not display the same degree of restraint and cooperation. The model aircraft users would thus find themselves in an inferior or secondary position with respect to the two channels proposed to be shared by virtue of the high degree of interference sensitivity to which their model use is exposed. Gresham's law would then apply, with the lower value use driving out of circulation the higher value use.

7. Several miscellaneous matters further complicate the equitable implementation of the Commission's proposed changes in the Rules. First, as noted earlier, model aircraft users of radio are the most organized and users of model water and land craft the least organized. Sites for appropriate use by model aircraft users are scarce and are becoming scarcer. However, almost every parking lot, shopping center and street corner lends itself to easy adaptability and availability for use by model cars. The scarcity of sites for model aircraft operations forces close cooperation within the AMA ranks to prevent virtual chaos in operations. The opposite is true of model car users. Accessibility to numerous sites plus the availability of ready-built radio control model cars create less conscious need for joint and voluntary cooperation for any type of shared use plan. The amorphous nature of the model car community will, moreover, make it especially difficult to enforce regulations requiring cooperation in shared frequency use.

8. It is clear and supported by Commission experience that the permissible or authorized use by low power unlicensed operations of assigned frequencies is not an entirely satisfactory allocation arrangement. Yet, it is workable provided the various users have enough in common to require them thereafter to seek mutually satisfactory solutions to avoid destructive interference. The Commission's proposal to permit the sharing with the model land and water craft enthusiasts of two of the five channels presently reserved for model aircraft users focuses on the only element common to all, namely, the claim of all to be model enthusiasts. As already noted and discussed, the similarities for consideration in this rule making proceeding end there. The difference in terms of frequency needs and protection from interference are substantial and, in AMA's view, decisive.

E. Past Experience

9. AMA's opposition to any proposed shared usage plan with model boat and car enthusiasts stems from past experience which has been fully documented in other rule making proceedings. After an extensive Rule Making proceeding in 1966, model aircraft enthusiasts were assigned five frequencies in the 72-76 MHz band for their exclusive use because of the susceptibility of radio controlled aircraft to interference. The assignment of five frequencies was justified in view of the large number of model aircraft enthusiasts. Since then, nothing has changed which would suggest (1) that shared usage is today a practicable and workable alternative or (2) that the demand does not justify the assignment of five channels for the exclusive use of aircraft modelers. Unless the basic incompatibility of model aircraft radio controlled operations with other radio controlled modeler activities is recognized, any relief to non-aircraft model users based on shared usage with aircraft model activities would be provided at the expense of the aircraft modelers—a price for which there is no justification in the record or experience.

F. State of Development of Car Modeling

10. The Commission's premise that the needs of all modelers are the same is clearly erroneous in the case of car modeling. It is first noted that the Commission in its Notice of Proposed Rule Making in this proceeding characterized Mr. W. C. Young's Petition for Rule Making as supporting the fact that the **car modeler** as well as the boat modeler have exactly the same problems as those flying model airplanes. A careful reading of Mr. Young's Petition reveals no references to the needs or problems of car modelers except in one general conclusionary statement. Mr. Young, in his petition, was writing as a boat modeler and addressing himself to the problems and needs of the boat modeler. Thus, no case has been made for the car modeler and there is no justification for holding that the needs of car modelers are similar to boat and aircraft modelers.

11. Moreover, the development of the state of the art of car modeling more than ever makes the 27 MHz band the logical place for car modelers. Model cars average only approximately 14 inches in length. There is little likelihood

that the size of the model car will get larger. In fact, the popularity of the smaller model is increasing. Due to the small size of the model car, it is difficult to maintain visual contact with the model cars unless they are controlled at close range. Under these circumstances **less** than 100 **milliwatts** of transmitter power is perfectly feasible for use in controlling model cars and is in fact the accepted wattage utilized by most car modelers and offered by equipment manufacturers.

12. Section 324 of the Communications Act of 1934, as amended, provides; "In all circumstances, except in case of radio communications or signals relating to vessels in distress, all radio stations, including those owned and operated by the United States, shall use the minimum amount of power necessary to carry out the communication desired." By allowing the car modeler to utilize the 72 MHz frequencies which permit greater power, the Commission would be inadvertently sanctioning the car modelers in utilizing power **far in excess** of the minimum power necessary to carry out the control of the model car. This would be contrary to the content of Section 324 of the Communications Act. What the Commission should do is to encourage car modelers to utilize other 27 MHz frequencies in addition to the present six. The low operating power required makes this perfectly compatible with other uses in the 27 MHz band.

G. Special Relief for Boat Modelers

13. AMA believes that the needs and interference considerations of the users of model watercraft, while not as pronounced as in model aircraft use, justify providing some protective relief to that group. AMA's proposal allows for this by reserving the two new 72 MHz band frequencies (72.16 MHz and 72.32 MHz) for exclusive model boat use. There are many sizes and classes of model boats, including large model sailboats which are quite popular and are raced regularly. Some of these model sailboats may have masts and sails 5 feet or more in height so that they can be seen for long distances. Thus, these models probably need the longer ranges and higher power that are mandatory for model aircraft. AMA's suggested accommodation takes these factors into consideration.

H. Car Modelers

14. Under AMA's proposal, model car enthusiasts would utilize the six Class C frequencies. Furthermore, the model car enthusiast should be encouraged to use other 27 MHz frequencies allowed for transmitters under 100 milliwatts since the required range of operation is very short.

I. Further Comments

15. Frequencies 72.24 MHz and 72.40 MHz are the two most popular frequencies used by AMA members followed by 75.64 MHz and 72.08 MHz. Thus, AMA opposes the present proposal for sharing 72.40 MHz. If, notwithstanding this comment, the Commission adopts a sharing plan, AMA requests that it be limited to 72.96 MHz with model car and model boat users also sharing with each other 72.16 MHz and 72.32 MHz.

The FCC is currently evaluating all responses concerning its revised proposal.

NFFS Design Competition Results, Review

By Chuck Broadhurst
Executive Director, NFFS

The first **NFFS National Design Competition** is now history. The results, even taking into account certain shortcomings in the rules, far exceeded our fondest hopes. The competition produced 28 designs that, in the judges' opinion, are worthy of publication; and this, indeed, is welcome news to all in the **National Free Flight Society** who worked so long and so hard to "do something for the Juniors."

This, after all, was the essence of the competition—to find (in the words of NFFS publicist **Doug Stump**) "the nine best small rubber-powered designs in the world, designs suitable for free flight beginners to learn and with free flight experts to have a ball with."

Judges **Ed Whitten**, **Bill Dunwoody** and **Bob Hatschek** really had a tough time deciding which of the entrants were to win the coveted NFFS awards. **John Thornhill**, **Henry Struck**, **Walt Mooney**, **Dave Linstrum**, **George Perryman**, **Bill Hannon** and numerous other "name" modelers from all parts of the country submitted entries. And while many of their entries were truly splendid, it is interesting, if not significant, that the nine winning designs came from Juniors and Seniors as well as from the Open age category. Here are the winners.

Best Realistic Designs: "Easy Flier," by **Brent Meyers;** and "AMA Pursuit," by **Bruce Packham.**

Best Duration Models as Follow-up to AMA Cub: "AMA Maxi Jr.," **Richard Miller, Jr.;** "Arrow," by **Ernst Johnson;** "Brownie," by **Stephen J. Fauble;** and "SFFF-2" (Small Field Fun Flier #2), by **Chris Matsuno.**

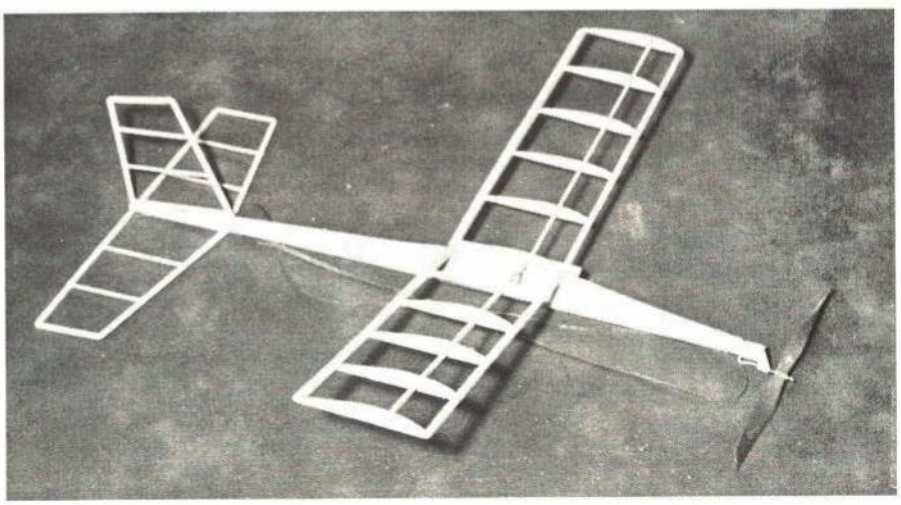
Special Merit Awards: "NFFS-SST," most attractive sport model, by **Dave Stott;** "NFFS Contender," third step built-up model, by **Bruce Packham;** and "The Pusher," best Junior entry, by **Garry Hungerford.**

Richard Miller's "AMA Maxi Jr." came closest to the competition's overall objective of producing a "second step" model to the Delta Dart. George Perryman and others in the **Dixiemasters MAC** kitted the ship from materials made available by **Sig Mfg. Co.** Several of the models were constructed during the Nats Delta Dart Program as a further evaluation of the model, though not as part of the NFFS competition.

Interesting lines of Richard Miller's "AMA Maxi Jr." are shown in this picture. Posing with the winning model is Patricia Thornhill.

Competition Critique. Word filtered back to NFFS that a number of modelers did not submit entries because of the provision in the contest rules which said, "all entries become the property of NFFS." It was unfortunate that this statement wasn't further clarified, for there was no intent by NFFS to profit, financially, at the expense of any entrant whose design eventually may find its way into print. Those who framed the rules simply wanted to protect NFFS and any other prospective publishers. It was felt that the society should protect, too, the individual entrants. While the society is not interested in financial remuneration for itself, it **is** vitally interested in promoting the designs. This is one of the objectives of the competition. If an entrant wants to do the work associated with publishing his design, that's great. But if he doesn't and so advises NFFS, then the society may choose to do so. In short, NFFS considers the design of each entrant as a contribution to the cause of free flight. But from that point on, those who take the pictures and write the stories for publication should certainly receive any fees involved for their work.

Charlie Sotich put his finger on an-



Basic simplicity of the "AMA Maxi Jr." is evident when the model is seen without covering. It uses a commercially-available plastic prop, required of all entries in the NFFS competition.

other weakness in the competition's rules when he said: "I don't think it is practical to insist that a design be so simple that it is as quick to build as a Delta Dart, yet will allow a beginner to really learn anything new about building models. Unless new challenges are given, the modeler won't learn anything. Perhaps everyone is thinking about a different age beginner, so they have different ideas about the skills required to make a model. A 10-year-old and a 14-year-old beginner will require different types of models to keep improving!"

Charlie's point that the entrants had differing ideas about what constitutes a "beginning" modeler is well taken. The designs submitted bear him out. Only a small number of the entries were simple enough to be regarded as a potential "second step" following the Delta Dart. All the owners were either third, fourth or even fifth step designs requiring varying degrees of skill and construction know-how.

And the age of the "beginner" is a complicating factor. A seven-year-old would find it exceedingly difficult to compete with a 14-year-old, for example. In short, beginner's models are among the most difficult to design. NFFS will bear Charlie Sotich's points in mind the next time it undertakes to sponsor a design competition for beginners. The rules must be considerably more precise in this regard.

NFFS gratefully acknowledges the advice and cooperation of the AMA. It was AMA that urged NFFS to "produce something for the Juniors" in this first competition.

There is little more to be said, except to emphasize that the first NFFS Design Competition was, indeed, productive. Just sponsoring it was fun. Producing 28 designs worthy of publication was a real accomplishment!

Executive Council '70 Nats Meeting—Scale CB Accepted

Those present at the meeting on July 29 were **John Patton,** president; **John Worth,** executive director; **Earl Witt,** secretary-treasurer; and the following district vice-presidents: **Cliff Piper,** I; **Bill Boss,** II; **Ron Morgan,** III; **Cliff Telford,** IV; **Jim Perdue,** V; **Gosta Johnson,** VI; **Jack Josaitis,** VII; **W. J. Lank,** VIII; **Stan Chilton,** IX; and **Earl Moorhead** (official proxy for **Bob Stalick,** XI). Associate Vice-Presidents **Ralph Pennetti,** III, and **John Blum,** VI, were also present.

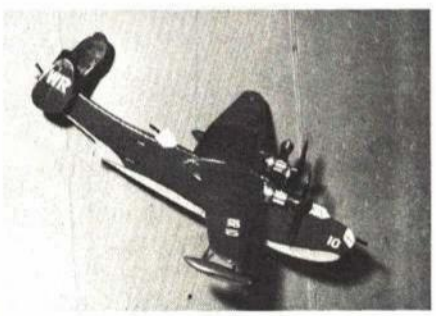
9:40 p.m. Meeting started with Patton advising that **Maurice Woods** had asked to present a proposal concerning election procedures. Patton asked the council to indicate whether such a presentation should be approved. Worth made a motion to approve, seconded by Lank. Telford then proposed allowing 10 minutes for Woods' presentation, to be followed by council action after existing agenda items were acted upon; also to allow **Dave Platt** and **Clark Macomber** to be present when the agenda item concerning their Scale Contest Board proposal was discussed. Seconded by Lank and approved unanimously.

Patton invited **John Clemens** to show AMA movie film footage taken at the 1970 Toledo meeting (in February). Film was unedited (will be done later). It featured AMA activities at the Toledo RC Conference, plus other conference details. Clemens showed the film and described how it would be edited and titled for circulation to AMA clubs.

Woods was then invited to present his proposal concerning **AMA Election Procedures.** He spoke on behalf of a dual vote (primary/final ballots) system which would elect a president in mid-year, at some important national gathering such as the Nats, with appropriate ceremonies. The basic concept would be to allow the membership to narrow down the choice of candidates for final ballot vote, with the aim of eliminating the current Nominating Committee procedure with its typical controversy. Woods left the meeting after about 20 minutes.

Contest Board Status for Scale was the first previously announced item to which Patton moved. Discussion was initiated by Boss. Worth read a letter in support of the proposal by **LeRoy Weber,** currently AMA-FAI Scale Subcommittee chairman and former AMA Scale Advisory Committee chairman. General discussion followed by most council members. Clark Macomber answered questions concerning details of contest administration affecting the current basic categories, CL, FF and RC.

Worth indicated that the system for rules-making was only part of the consideration—that picking the right man to get the job done within any system was a basic need. Dave Platt offered opinions concerning administration problems involving rules-making and district representation. Further general discussion followed concerning details of the



Left: Profiling a model is a way to achieve an interesting effect, such as 29" span twin Cox .049 PBM Mariner built by Ralph DeFalco III. Photo by Ralph DeFalco, Jr. **Right:** FAI RC Slope Soaring Rules were used for the MARKS Glider Fly last July at San Bernardino, Calif. CD Pete Rawlings reports the rules worked okay, but size of landing area should be reduced; however, he still favors RC Slope Soaring patterned after Formula I/II scoring. Shown are Bob Boucher (L) with his Malibu and Milt Webb with his original design model.

Cory Taft of Salt Lake City, above, won for the second time in a row the National Free Flight Society-sponsored Mini-Postal Contest early this year. The program usually includes competitions for HL Gliders and simple Rubber models, though in some of the Mini-Postals there is a class for Catapult Gliders. The competitions are organized by Ed Whitten, New York City, and Lin Haslam, Salt Lake City. Cub Scouts dominated the Salt Lake end of this Mini-Postal. The photo at left shows the eager conglomeration—39 competed. Haslam directs all who wish to encourage youth in modeling to their local Cub Scouts, for the leaders are always looking for interesting projects such as with HL Gliders and Delta Darts. Photos submitted by Lin Haslam.

proposal, including how the FAI rules-making procedures operate under the separate Scale concept. Worth advised that no additional HQ work load would be involved in the proposed change in status.

Chilton made a motion to define Scale as a basic competition category, as per Article XII, Section I of the AMA by-laws. Seconded by Telford. Approved unanimously.

Retirement Plan for HQ Employees was the second agenda item for which Patton asked discussion. Piper moved, after some discussion, that the executive director be authorized to look further into retirement plans with the goal of presenting a specific proposal to the council at the 1971 annual meeting. Seconded by Moorhead. Approved unanimously.

Financial Review, third agenda item. Worth passed out copies of AMA's June 30 (half-year) financial statement. He then gave a brief summary of the statement: AMA currently $17,000 in the black, due to a $2,500 surplus from 1969 and $14,500 surplus in the first half of 1970, but with increased expenses due to inflation expected to result in a year end surplus of approximately $5-6,000.

Frequency Fund Financing, agenda item four. It was proposed that this be provided as a membership benefit from dues income rather than from solicited contributions. Telford made a motion that $2,000 be budgeted from the AMA general funds for this purpose during the next fiscal year. Seconded by Lank. Approved unanimously.

Possible U.S. World Championships, fifth agenda item. Worth explained current status of a proposal for U.S. to host the 1971 RC World Championships, based on AMA chartering of a jet flight from Europe to permit reduced transportation fare for foreign participants. Council guidance was asked by Patton concerning details of financing and sponsorship.

Chilton made a motion to proceed on the basis of a $15,000 AMA commitment limit (to be reimbursed by travel ticket sales), provided a securely backed equivalent sponsorship of $13,000 or more is obtained. Seconded by Morgan. Approved by all except abstention by Perdue and Witt. It was noted that should such sponsorship (which has already been offered) not materialize, possible alternative financial arrangements would be considered at the winter council meeting (approximately March 1, 1971).

HQ Conversion to Data Processing, sixth agenda item. Worth gave a description of the system being introduced for 1971 membership processing and, also, past history of a previous AMA data processing operation in 1965. Details of cost, operational procedures, benefits and system capability were discussed. No council action was requested. The new system is to be operational at the time of 1971 membership renewal mailing (approx. October 1, 1970).

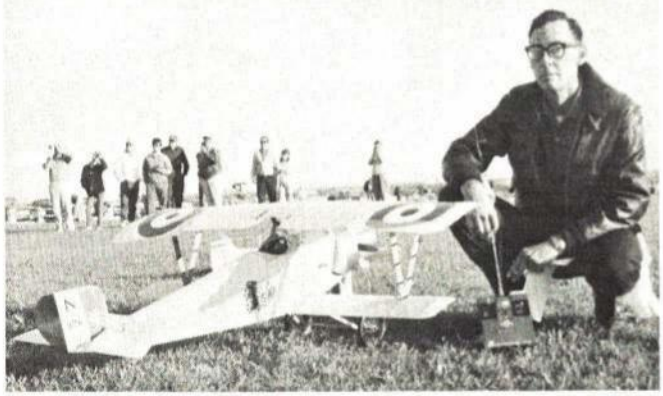
Woods' Election Proposal, seventh agenda item (see previous reference). Considerable discussion developed, including references to the Nominating Committee problems and decisions of its meeting immediately prior to the council meeting. After general concensus revealed a lack of support, based upon agreement that the proposal would not improve chances for upgrading officer candidate selection, the council declined to approve the proposal. Districts I and IX abstained.

Patton asked then for other suggestions for nomination procedure change. Johnson made a motion that an installation ceremony for the office of president be introduced to become effective during the annual winter council meeting following presidential election. Approved by all districts except IX which abstained.

Distinguished Service Awards. There were seven nominations. Presentations were made on behalf of each nominee. Witt then made a motion to accept all in one group vote, seconded by Perdue. Approved unanimously. The awards will be presented later, each in connection with a prestigious occasion. It was noted that publicity and details concerning the awards would be published for the membership at appropriate times.

AMA Fellowship Award. It was proposed by Cliff Telford that [name deleted for later public presentation] be named an AMA Fellow with life membership privileges for his many years of contributions and services directly benefiting and promoting AMA. A motion to approve was made by Morgan, seconded by Johnson. Approved unanimously.

Witt moved that the meeting be adjourned. Seconded unanimously. Meeting ended at 1 a.m.



Eight months of work and George Griffin still wasn't finished detailing his Proctor Nieuport II when he won 2nd in the Dallas RC Club Meet. Uses Fox 74 power, Logictrol radio. Carl Summers photo.

Won't be long before many of us are flying with snow under foot. Photo from last winter when the temperature was but 10 above at Mt. Vernon, Ill.—Earl Blasdel and Tom Duncan shown. Ed Walker photo.

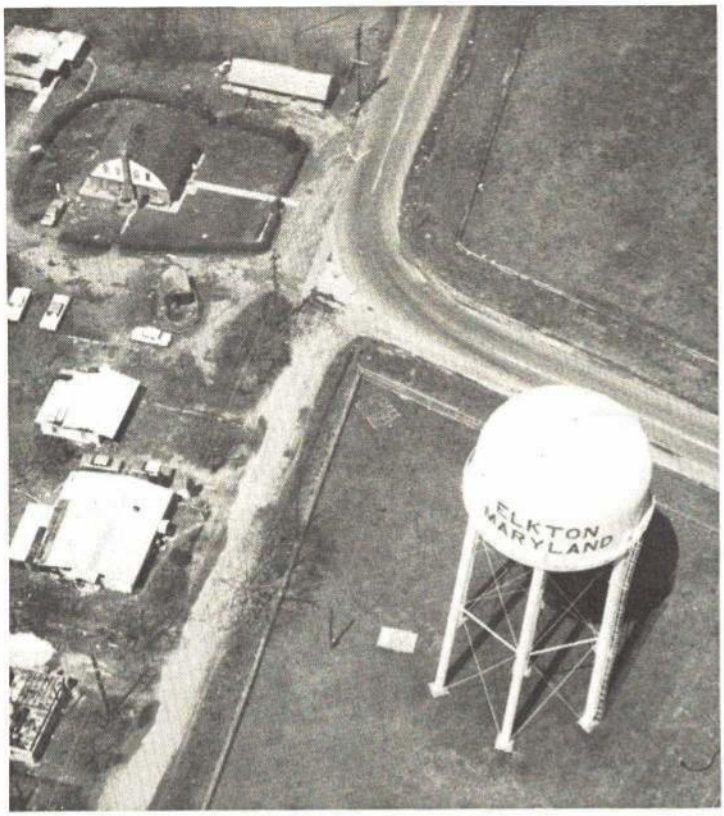
Pitting for a Control Line Rat Racer at a Wichita Falls, Tex., meet are Capt. Roger Paskell (holding) and Jim McEndree (flipping). No waste motion can be allowed in Rat Race pitting. Murry Frank photo.

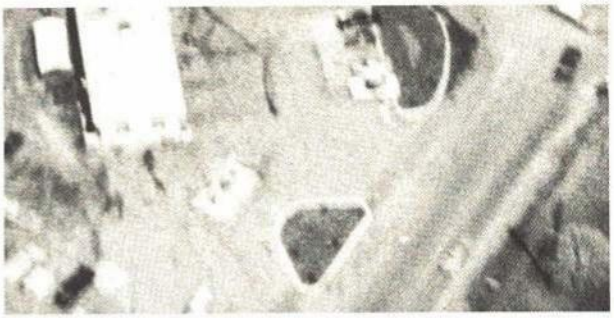
IMPORTANT NOTICE
TO AMA MEMBERS

If you joined AMA as a 1970 member prior to October 1, 1970, and if by November 1, 1970, you have not received your Bill for 1971 AMA Dues, immediately notify:

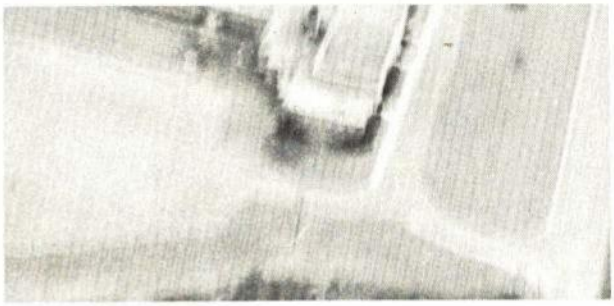
AMA Headquarters
806 Fifteenth St., N. W.
Washington, D.C. 20005

RENEWAL OF MEMBERSHIP IS NECESSARY BEFORE DECEMBER 15 if magazine delivery is not to be interrupted.





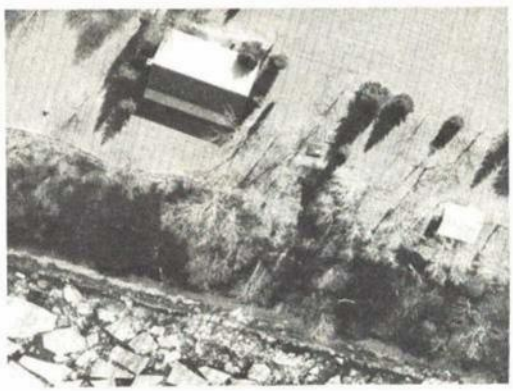
Good photographs from a model in flight takes planning, as the blurred shots above and below depict. With 1/500th camera speed, slow engine speed and straight, level flight is required to obtain the sharp water tower image at left. Double exposure effect of photo above was caused by engine vibration, while the extreme blurring below was the result of a banked turn.



Experiment--RC Aerial Photography

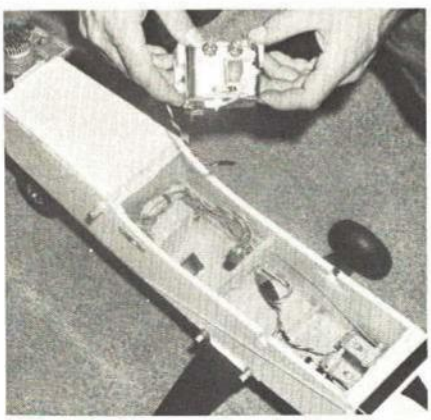
AMA'er teams with photographer—finds that definite techniques are needed to obtain quality pictures.

What inspires a modeler to go into aerial photography? In the case of **Charles A. Brown,** AMA 71849 from Newark, Delaware, it was the considerable kidding he received following several spectacular RC model crashes. One thing led to another, and before long, Brown teamed up with **Andy Lesko** to prove the worth of himself as a modeler and of Lesko as a photographer. The photographs here, the results of the team's efforts, prove that both are worth their salt.



Fine grain film, such as Panatomic-X, was found to be essential for big blow-ups from the 1/3rd frame 35mm negatives. River ice floe, left, overhead view of flyers, right—snow on ground.

Radio modeler Charles Brown and "Das Ugly Stik," the bed from which these photos were taken. Earlier effort with a "Headmaster" resulted in disaster for plane and 35mm camera. Current camera is a Tessina with automatic film advance, essential for multiple shots.



The most versatile arrangement was to mount the camera directly to the servo with silicone rubber—left photo. Aerial view of factory and parking lot at right. Brown says that only a small number of his many pictures have good composition, due to errors in aiming from ground.

AMA News Extra .....

1971 RADIO CONTROL AEROBATIC TEAM

Jim Whitley (Decatur, Ala.), Phil Kraft (Oceanside, Calif.) and Ron Chidgey (Pensacola, Fla.) finished 1-2-3 in the Masters RC Team Selection Tournament at Memphis, Tenn., Sept. 26-27, to become U.S. team members for the 1971 RC Aerobatic World Championship. First and second alternates are Jim Kirkland and Dr. Jim Edwards, who placed 4th and 5th. Look for a full report in the AMA News section next month.

1971 FREE FLIGHT TEAMS

A photograph of AMA members who have earned the right to represent the U.S. in the 1971 Free Flight World Championships (expected to be in Sweden) is on page 45 of this issue.

The overall Contest Director of the FF Team Finals, Bob Bicknell, says that "The 1971 FAI FF Team is thoroughly tested in all winds from 0 to 40." Fourteen rounds were flown in three days over the Labor Day weekend, and a winter storm (in September!) played havoc. During the five rounds flown on Saturday there were winds to 35 mph--gusts to 40-45! Despite this, one of the eventual team members (Lee Polansky in Nordic) turned in a string of five three-minute maxes, and six others only missed one.

The wind on Sunday was again strong and out of the north, which put drifting models into city housing; as a result, only three rounds were flown. Monday, when six rounds were flown, the weather started out better, but the wind again switched to come out of the north at mid-morning, causing flying to be held up from 11 am to 1 pm.

All accounts so far indicate that the contest was as much a test of the modeler as it was of his models. That the flight scores were so close to the maximum possible 2520 seconds (Power--Taylor had 2460 seconds, Averill 2427, Kerr 2424; Nordic--Bronco 2322, Polansky 2256, Langevin 2199; Wakefield--Allen 2295, Parmenter 2286, White 2265) is indicative of truly outstanding American teams being selected. They ought to fare well at the World Championships irrespective of what they come up against.

NEW U.S. WORLD RECORDS?

The past few months have been busy with respect to AMA members trying for new World Records. And they have been successful in several instances, resulting in the following model performances being submitted to the Federation Aeronautique Internationale for tentative records and, later, official homologation.

Bryce Petersen--Powered RC Seaplanes, Straight Line Distance--26.5 miles. The model was flown from Winfield, W.Va., to Marmet, W.Va., on August 15 along the Kanawha River, a curvy course of about 35 miles distance, although the straight line distance is as indicated. The model was an original design flying boat of 74" wingspan, powered by a Webra .61 RC engine with Silence-Aire muffler, Top Flite 14-6 prop, Kraft radio. The model weighed 10 lbs. with 64 ozs. of fuel. The previous record of 11.9 miles was held by a Russian.

Robert Boucher--RC Gliders, Closed Course Distance--187.6 miles. Boucher traveled from his native Los Angeles to Hawaii to find the steady winds necessary to keep his "Malibu" aloft on August 30 for 11 hours and nine minutes to traverse 1,510 laps of the 100-meter course. His own design glider has a wingspan of 75" and weighed 61 ounces for the record flight. Radio was the Kraft KP 4, using only two channels with a 24-hour (1.750) AH nicad battery pack. Previous tentative record was 132.7 miles by a Czechoslovakian.

Maynard Hill--Powered RC Airplanes, Altitude--27,200 feet. This height (subject to verification) was reached on September 6 after only 38 minutes of flight with Hill's eight-foot wingspan model which previously had established the RC Duration World Record of 11 hours, 32 minutes and 30 seconds. This time the 5 lb. model (plus one quart fuel) was powered by a Supertigre 60 glow engine. It was controlled by means of a Kraft radio with special beam antenna. The model is said to be capable of reaching a greater altitude; on this flight it was limited only by visibility. The previous record, also held by Maynard Hill, was 22,939 feet.

Gerald Martin--RC Gliders, Straight Line Distance--21.5 miles. On April 12 Martin flew his "Kuri" sailplane from Hereford Municipal Airport to the Canyon Airport, both in Texas. The flight took but 56 minutes. The "Kuri" was fitted with Martin's own foam wings of 68" span. Previous record in this category was held by West Germany, 15.7 miles.

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

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

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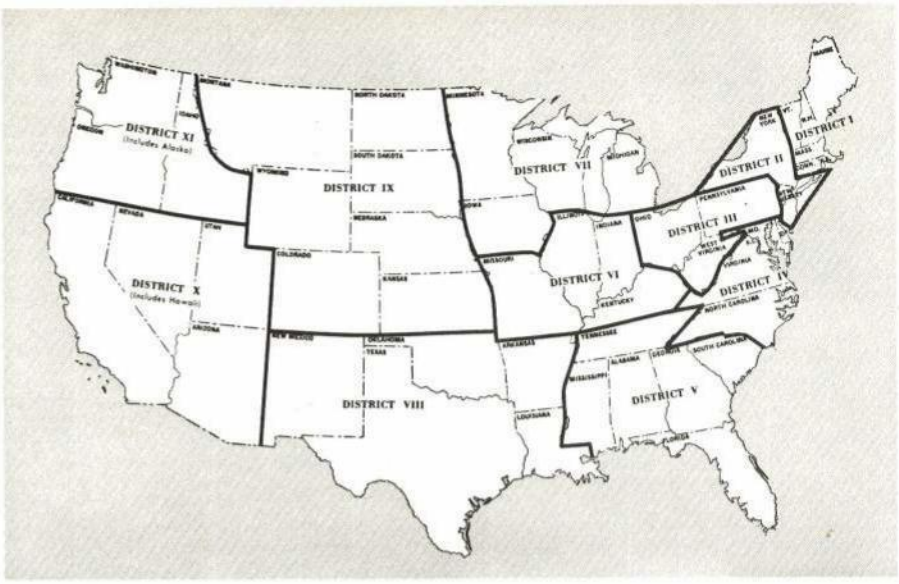

HOW TO USE THIS AMA DIRECTORY

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

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John Worth, c/o AMA Hq., 806 Fifteenth St., N.W., Washington, D. C. 20005

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FF: D. Linstrum, 972 Plum Grove, Buffalo Grove, Ill.
Scale: L. Weber, P. O. Box 355, Rio Vista, Calif.
Rockets: G. H. Stine, 127 Bickford Ln., New Canaan, Conn. 06840

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FF: D. Linstrum, 972 Plum Grove, Buffalo Grove, Ill.
Ind: Bud Tenny, Box 545, Richardson, Tex. 75080
RC: T. Rankin, Team Selection Comm. Chmn., 9410 N. Penfield Rd., Ellicott City, Md. 21043

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J. Phelps, 1 Foxberry Ln., Liverpool, N. Y. 13088
P. Runge, 1107 Main St., Higginsville, Mo. 64037

CONTEST CALENDAR

Official Sanctioned Contest of the Academy of Model Aeronautics

Nov. 7-8—Taft, Calif. (AA) WFFA FAI Annual FF Meet. Site: Gardner Field. B. Vinson CD, 233 E. Wilson, Costa Mesa, Calif. 92627. Sponsor: **Sky Hoppers of Orange County.**

Nov. 8—Johnsville, Penn. (AA) Flying Bucks Fall CL Races. Site: Johnsville N.A.S. R. Leishman CD, 19057. Sponsor: **Flying Bucks of Levittown, Penn.**

Nov. 15—Colorado (A) Magnificent Mountain Men Indoor Meet. Site: Hinkley High School. H. Blubaugh CD, 555 Moline St., Aurora, Colo. 80010. Sponsor: **Magnificent Mountain Men.**

Nov. 15—Sacramento, Calif. (AA) Northern Calif. FF Council Meet. Site: Condors Field, (Weagel Field). D. Foote CD, 2438 Palmetto St., Oakland, Calif. 94602. Sponsor: **Oakland Cloud Dusters.**

Nov. 22—Elsinore, Calif. (AA) Orbiteers Annual FF Meet. Site: Lake Elsinore. G. Howard, Jr. CD, 2801 N. Arroyo Dr., San Diego, Calif. 92103.

Nov. 22—Van Nuys, Calif. (Special Contest) Northrop Flying Wing Contest. Site: Model Airport (Basin). C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250.

Nov. 27-28-29—Tucson, Ariz. (AA) Winter RC Nationals. Site: Marana Air Park. R. Angus CD, 6640 N. Columbus, Tucson, Ariz. 85718. Sponsor: **Tucson Radio Control Club.**

Nov. 29—Fresno, Calif. (A) Fresno's Monthly FF Contest. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

Dec. 13—Van Nuys, Calif. 2nd Annual Jumbo Rubber Scale FF Meeet. Site: Sepulveda Basin, J. Bailey CD, 11161 Mansel Ave., Inglewood, Calif. 90304. Sponsor: **Flightmasters.**

Dec. 13—Los Angeles, Calif. (AA) SCIFS Year Ender for Old Timer Events. Site: Sepulveda Basin. J. Keller CD, 1890 Moore St., Simi, Calif. 93065. Sponsor: **Southern California Ignition Flyers.**

Dec. 27—Fresno, Calif. (A) Fresno's Monthly FF Contest. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

Dec. 27-29—Winter Park, Fla. (AA) Tangerine International RC Championships. Site: RCACF Field. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789.

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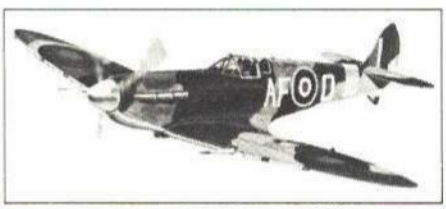

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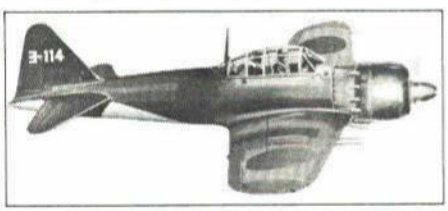

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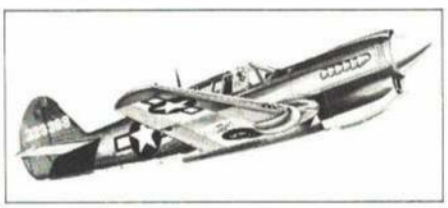

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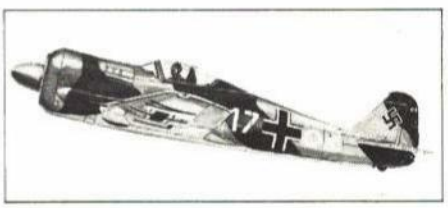

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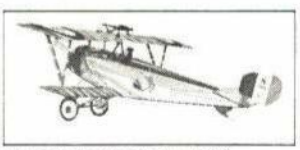

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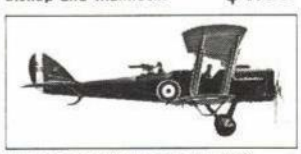

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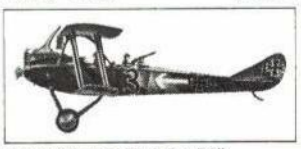

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ACE R/C

Hello!

Introducing Don Dickerson--checking out our Commander Pulse Transmitter. Don's design has been a large part of the success of our Commander Rudder Only Packages. He is meticulous in his approach to modeling and his electronics--and it shows in our production of his units. They all work--just like a transmitter should. To a manufacturer, repeatability is extremely important--and that is something Don has gotten. And it means that YOU get performance time after time after time!

We are extremely proud of the people like Don, who are on the Ace "payroll"--we have probably the highest priced engineers in the world.

Our Mini Foam wings are meeting excellent reception--model editors were most kind, and among other things pointed out that combinations of both the constant and taper sections could provide units which the modeler would do well to look into. We'll try to keep you posted on some of the more promising experiments that are going.

One thing that has definitely moved out of the experimental stage is the Skampy II design by Owen Kampen. We showed you a pic of Owen with it in our last column. We have been asked to make a plan for the foam wing 30" Skampy II available. It is just about ready. This is specifically designed for our Taper Mini Foam wing, and if you want a ball--and have some building and flying experience--here is a ship that will do everything in the book. The plans for the Foam wing Skampy II are our Catalog No. 13K101 and go for one buck--First Class mail.

We've also added the Cox series of model aircraft engines, figured that as long as we were getting into the small stuff, we ought to have the engines to match. We will also hope to carry many of the replacement parts. So if it's a Pee Wee, Tee Dee,QZ, Babe Bee, Medallion, etc., we hope to have it; this includes the Cox throttle jobs too.

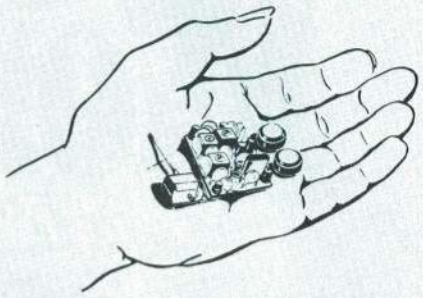
Had the pleasure of visiting with Don Dewey of RCM this summer--says he's got several designs of interest for Pulse fans coming. So keep watching RCM. Don's also cooking on another idea or two, since at the time we talked to him, RCM's Pulse Commander R/O ship had over 120 flights on it with nary a failure, and he was most enthused about our package.

While in California we dropped in for a picture taking session of the San Diego Bushwhackers--the Rudder-Only Club we've mentioned from time to time. The royal welcome these guys gave us was something. Our sincerest thanks to the whole bunch--we value our honorary membership in your club muchly. This group has Rudder-Only fun like you wouldn't believe. It's the same kind of fun you can have with Pulse Rudder Only. And pulse is the BEST way to go for the beginner.

Keep 'em pulsing,

Paul

Paul F. Runge



A HANDFUL FOR YOUR PLEASURE

For the modeler who has been looking for superhet systems which are ultra light to go into the mini and micro series of airplanes!

Weight of the receiver and the small Bentert is less than 1 ounce, and depending on your battery choice you can keep the weight well under 1¼ ounces.

This is excellent for the mini and micro plane enthusiasts, and also is finding increasing use in the boost glide phase of model rocketry.

We are listing below all of the components that are required for an ultra light weight installation, and you can select your handful of pleasure to fit your application.

The receiver is compatible with our R/O Pulse Commander Transmitter, and this may be had separately or you can add this handful of pleasure airborne package to your present R/O system.

COMMANDER MICRO GEM RECEIVER

The Micro Gem is available in two models. This is a proven design of which thousands are in satisfactory use throughout the world. The receiver measures 1 1/16 x 1 1/2 x 1/2 inches. Weight of the bare receiver less hook-up wires is .5 ounces. With light weight hook-up wire is .7 ounces. Operation is on 2.4 volts with phenomenal range; may be used with 3 volts.

The two models are the DE, which has a double ended output to feed into the Adams style actuator, and the SEB, which is designed for the Bentert type of actuator only.

No. 12K2—Commander DE Gem Rx $31.50
No. 12K3—Commander SEB Gem Rx 30.75
(For the Bentert only)
(Available all 27 MHz except 27.255.)

COMMANDER R/O TRANSMITTER

The foregoing receivers are compatible with our Commander Pulse Transmitters. Requires 9 volt battery of the M1603 type.

No. 11K1—Commander R/O Tx $42.50
(Available all 27 MHz except 27.255.)

BENTERT ACTUATORS

These are single coil units with magnetic return. Small model weighs 7.5 grams and draws 50 ma at 3 volts. Large model weighs 15 grams and draws 80 ma at 3 volts.

No. 14K1—Small Bentert Actuator $9.95
No. 14K2—Large Bentert Actuator 9.95

MALLORY MS76 SILVER OXIDE

Non-rechargeable 1 1/2V. Good for 60-90 minutes with Gem and Bentert. Only 2.2 grams; .46 x .21".
No. 38K32—MS76 Silver Oxide cell, ea. $.50

50 MA BUTTON NICAD

Rechargeable 1.25V. Only 3 grams; .606 x .230". Solder tabs.
No. 38L4—Nicad B50T Button/tabs, ea. $1.39

100 MA BUTTON NICAD

Rechargeable 1.25V. Only 8.5 grams; 63/64 x 1/4". Solder tabs.
No. 38K29—Nicad B100T/tabs, ea. $1.70

2.4V/B100T PACK

Two of above 100 ma cells stacked for 2.4V pack with tabs. Measure 63/64 x 1/2".
No. 38K9—2.4V/B100T Pack $3.65

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* FULLY PROPORTIONAL!
* LIGHTEST--2.5 oz. for Baby
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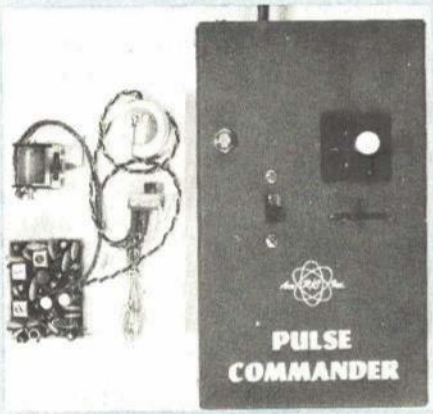
* SIMPLEST--only one moving part, noise free
* VERSATILE--arrange to suit your particular installation. You can go up in size or down in size. You can even go micro and mini, and not obsolete your transmitter or basic receiver. Simple changes of battery and actuator allow a variety of installations. Motor control can be easily added to larger units.
* EASY to install
* GREAT for Beginners--CHALLENGING to the pros.
* FUN!

WITH ALL BATTERIES!



COMMANDER R/O PULSE PACKAGES

Ideal for Beginners and Sport Flyers

Now available in four sizes!

The Commander R/O packages contain the Commander DE 2.4 superhet receiver, Commander Pulse Transmitter, Adams actuator size of your choice, and nickel cads, wired with on-off switch. AND each package saves you $10.00 over buying components separately.

The R/O Packages are available in 4 sizes for most sporting needs from the smallest to the larger aircraft--or boats. Ready for installation, completely wired and tested.

The Baby is for .010 to .020 jobs. Has two 225 ma Nickel Cadmiums and the regular Baby Adams. Airborne weight is 2.5 oz.

The Twin Baby is for hot .010 to .020 jobs. As above, except uses Twin Baby actuator. Airborne weight is 2.9 ounces.

The Standard uses the Single Adams for more power for .049 to .07 size. Uses larger capacity nickel cads. Airborne weight is 4.5 oz.

The Stomper uses the Twin Adams actuator for up to .15, or can be boosted for use with .19. Airborne weight is 4.9 oz.

(Charging equipment extra)

No. 10G15—Commander R/O Baby pkg. $69.95
No. 10G15T—Commander R/O Twin Baby 72.95
No. 10G16—Commander R/O Standard 71.95
No. 10G17—Commander R/O Stomper 74.95
Available all 27 MHz, except 27.255. Specify.

Thousands of Satisfied Users

ACE FOAM WINGS

Here are the 35" span foam wings that were the hit of the Atlanta, Oklahoma City, and Toledo trade shows. They are available in two configurations--constant and tapered. The airfoil is especially designed for small aircraft, and is semi-symmetrical.

They were developed by Owen Kampen, working in conjunction with the late Dick Adams.

The constant chord measures 35" span, and is 5½" wide for an area of 192.5 square inches. Weight is about 3 ounces.

The tapered section is 35" span, center is 5½, which tapers to 4", and has a total of 166.25 square inches. Weight is just over 2 oz.

Wings come in two pieces of 17½" so that they may be easily epoxied for the correct dihedral. May be used unfinished or finished with a polyurethane varnish; or striped with Monokote for trim.

The constant chord section may be used with the Dick's Dream with slight modifications on the fuselage (we have poop for these mods, but you MUST REQUEST it). Citabria works by adding 1/2" balsa strip. Taper section may be used with design to be published later.

Also lend themselves excellently for the home-brew builder who wants a proven and tried airfoil which will provide satisfaction and service.

Build small--witn foam; a real breakthrough! Makes planes which are ideal for the Cox Pee Wee or TD .020 engines and the Commander Baby or Baby Twin R/O packages.

No. 13L166—Ace Foam Taper Wing $2.95
No. 13L192—Ace Foam Constant Wing 2.95

COMMANDER CHARGERS

No. 34K4—Commander Baby Charger $4.95
No. 34K5—Commander Std.-Stomper Chg. 4.95

NICKEL CAD TX BATTERY PACK KIT

If you are a regular flyer of your Commander system, you have found that the transmitter battery does go down fairly fast. This is because this is a powerful transmitter. If you want to avoid the continuing expense and also assure yourself with a reliability and dependability on your transmitter that you have on your receiver pack, go nickel cad.

We have a completely assembled battery which measures 1 3/8" diameter by 2 11/16" long. Has lugs for easy attachment of wires. Made up of seven 500 MAH nickel cadmium type batteries. 8.75 volts. Will easily fit the Commander series of transmitters. Comes complete with charging jack and mounting hardware in kit. Check dimensions of your case for use in other transmitters.

No. 38H74—XL-ent K9V Transmitter $10.00
Nickel Cad. Battery Supply Kit

(If you order this at the same time as your Commander Pack, we will install. Request installation on your order, and it will be done without charge.)

PLANES JUST FOR FUN!

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

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

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

DICK'S DREAM

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

No. 13K29—Dick's Dream Plans $1.00

CITABRIA

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

No. 13K30—Citabria Plans $1.00

COMMANDER GALLOPING GHOST

Rudder, Elevator, Motor--One Actuator

No. 10G18—Commander Ghost $109.00

COMMANDER FAST PULSE PACK

Rudder, Elevator, Motor--Two Actuators

No. 10G19—Commander FP $139.00

All 27 mHZ frequencies, except 27.225.

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Our NEW Handbook-Catalog is bigger and better than ever. We specialize in equipment for the Beginner, Sunday and Fun Flyer. More items for the do-it-yourselfer; more products from most major manufacturers, in addition to many Ace exclusives. Greatly enlarged HANDBOOK section. Last year this was called "bible for R/C", "a MUST!" by R/C editors. Price is just $1.00 POSTPAID. 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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Nationals: RC

(Continued from page 19)

a 5% point spread between the first and tenth places in the finals, so you can see that it was tight competition. You never saw a more excited guy than Jim when he finally realized he had won it. Jim says this was the year that he wanted to prove that former champs can come back (he won in '63). He certainly did it—with outstanding steady flying. Of course, he only practiced four times a week for six months and every day for a month to do it! The quality of flying was exceptional at this Nats and indicates that a lot of others have been doing their homework too! The added impetus of the FAI Internats team selection in September might have had something to do with it.

Formula I and II Pylon was strictly something else—with the fastest qualifying and final times ever posted at a Nats. Would you believe qualifying times in the 1:40's for Formula II and the 1:30's for Formula I? Well, it happened and less than two min. was required to qualify for Formula I. In fact, I squeezed into Formula II with a 2:07! Dave Keats posted a time of 2:08 in Formula II and decided not to fly his remaining qualification attempts since he thought his time would surely be good enough—he almost didn't make it since he was 19th qualifier!

Formula I finalists were almost exclusively Minnows, making it mighty tough on the flaggers! The ship is fast and has outstanding turning capability. Formula II had more variety and eye appeal. K&B dominance in the field received a strong challenge from the new ST 40 ABC's, with many of the fliers using the new engines. Again—viva competition! Best finals time in Formula I was 1:36.9 for Al Sager of the S.O.B.'s, using a K&B-powered Minnow, and 1:38 for Vern Smith, using an ST-powered Minnow.

With the times that are now being turned in Formula II, it's logical to ask where we go from here. There seems to be strong sentiment to adopt FAI rules for Formula II and use zero nitro fuel. Formula I finals saw a mighty close flyoff between eventual winner Bob Smith and Al Sager. Terrific competition and a spectator treat was to see H. Goldclank coaching Al Sager around the pylons—TOIN!!!

Is there an end or limit to the lavish detail that scale enthusiasts strive for? Dario Brisighela probably wishes that he had backed off slightly on his gorgeous Hornet, which garnered top scale points but never flew.

Would you believe two B-36's in the same contest, and they flew just great? Ken Drummond received a special award for the flying of his six-engined (and flaps) B-36. Coincidentally, Ken also received a special achievement award for the same airplane at the Wright Brothers Memorial Meet in Dayton, Ohio.

Since I was unable to witness the scale flying, my appreciation goes to Bev Smith of Pettit Products for the pictures included in this report. I also want to thank Dave Corven and Bill Welker for their assistance in picture snapping.

Nationals: FF

(Continued from page 33)

the unofficial Peanut Scale and Navy Scale events. Hit of the day was Fulton Hungerford's amazing little 19-in. Ford Trimotor covered with what can best be described as spray-cast corrugated microfilm. All three tiny props were rubber powered—motors for the outboard props ran through the wings and drove the props by flexible shafts. Flight was poor, but that it flew at all was a major achievement. Beating him out in the scale judging by a mere half point was Andy MacIsaac's beautifully detailed Hawker Fury, with many specially made vacuum-formed fuselage panels.

With both scale and flying points considered, Open first place was won by Chicago's Ronald Martelet with a Micro-lite-covered Pilatus Turbo Porter, Senior was topped by Daniel Domina's Bebe Jodel, and Michael Kuehne from Bryan, Ohio, was top Junior with his Pietenpol Air-Camper. Peanut Scale was won by Clarence Mather's seemingly oversize Whittman Racer—with the span limited to 13 in., the long fuselage of the racer proved an advantage.

Many would like to see emphasis of the scale aspect of Flying Scale increased. We already have sufficient duration events, they say. As it stands, a person could enter a standard microfilm-covered Cabin model, call it a Boeing 747, collect zero scale points, put up a mediocre 12-minute flight which would not even place in the Cabin event, and win the Flying Scale event hands down on flying points alone. On the other hand, a FS model that limps along a few feet above the ground for 20 sec. isn't really "flying."

On Wednesday, first day of the outdoor competition, the wind came strong from the west, slackening and shifting only for a short period around noon.

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Thermals were aplenty up high, but were not easily found down at tow-line glider level, as evidenced by the low scores. Peter Allnut of Toronto was the only one to max out, as he did last year, and again took home the Tulsa Glue Dobbers Towline Glider perpetual trophy. The only significant difference from Peter's previous performance was that this year he didn't strip down to his track suit, as the strong wind made running unnecessary. Perhaps influenced by Peter's ability to run all over creation in search of a thermal, as demonstrated at the 1969 Nats, at least three big-time U.S. Nordic men have taken up running—Phil Klintworth, Hugh Langevin and Tom "Slim" Hutchinson. Marty Thompson and John Petchler won the Junior A/2 and A/1 events, while Donald Mackenzie of Toronto won the combined A/1-A/2 Senior event.

Wakefield and ½A Gas

On Thursday the wind was strong and steady all day, and good air was seldom found. In spite of the large number of contestants in ½A, only four maxed in all three age groups, and none maxed in Wakefield. John Petchler (Jr.), Jan Servaites (Sr.), and Frank Heeb (Open) took tops in Wake, while Stephen Klause, Grady Turner, and Dennis Kargol came off best in ½A. At times the sky was literally filled with Stardusters and Galaxies.

Scale and Helicopter

The god of the winds, Aeolus, traditionally saves up all of his energy for Nats Flying Scale day, and this year was no exception. Most entrants elected to sacrifice their takeoff points and hand-launch over the grass. Winner was Frederick Stark's beautiful Loening M-8, which also won in 1969, followed closely by Ronald Martelet's rubber-powered Bristol M-1, a racing variant of the Bullet.

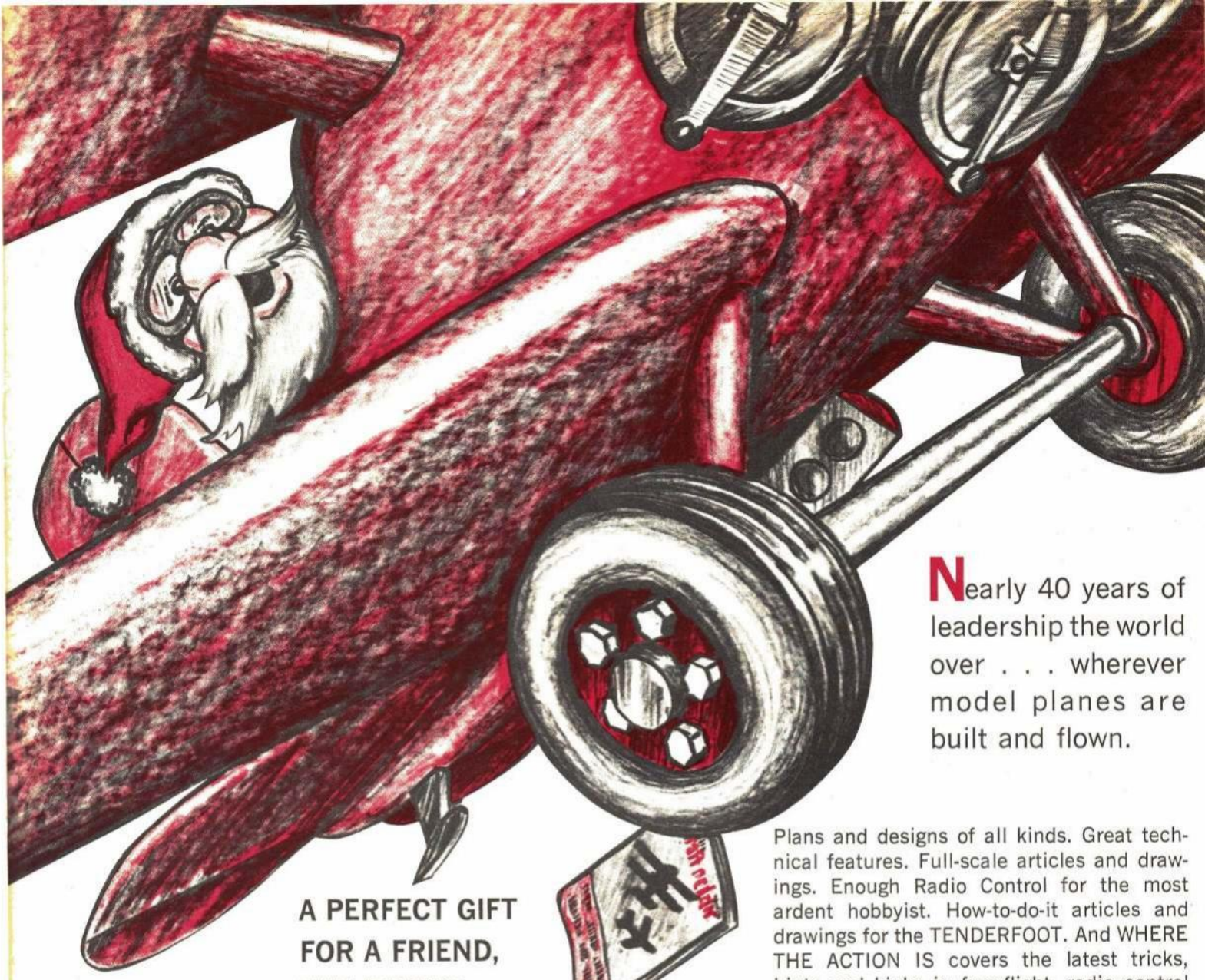
Ron's model certainly was one of the finest rubber-powered scale models ever built, having such details as valve push-rods and rocker arms. It flew superbly, having no trouble making the required 40 sec.

While Ron's model was superb for a rubber-powered model, it could not compare, in interior detail for example, with many of the gas-powered models.

In the Helicopter event, Glen Lee took tops for the third straight year, followed by Richard Wetzel and Dr. Lee Taylor.

Unlimited Rubber and A-Gas

The big Unlimited Rubber models are easily capable of five-min. flights in still air, and many felt that the three-min. max imposed at the Nats in place of the usual five would result in a hectic marathon with many flyers making endless strings of maxes, limited only by their physical endurance. Rain prevented this from happening in 1969, but on Friday the weather started out perfect. George Perryman, who salivates at the mere mention of the Mulvihill Trophy, put in five maxes in the first hour, finally hit bad air during his twelfth flight at around noon, and failed to max. Willard Smitz, flying a Bilgri Decoy, at that time had made eight maxes and continued on to complete twelve. Peter Allnut, the Nordic man, off to a late start, made seven maxes with his McGillivray Blimp, dropped out when it became clear he did not have time for five more. Perryman was assisted by Mike Bailey who, as a Junior last year, outclassed both Open and Senior fliers to take home the Mulvihill. When



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Perryman dropped out, Mike started flying his small 150-sq.-in. super-coupe, dropped his fourth max, but won in the Senior division. Mike Taibi flew his Decoy to top place in Junior.

Marty Thompson flew his traditional Cox 051-powered Starduster 350 to tops in A Gas Junior, and Brian Webster was best Senior, both earning points which would later help make them National Champions. Toronto's Andy DeMello was top Open flier. The engine on Sue Weisenbach's A Gas job tore loose and cut her knee badly, but this did not prevent her from flying the rest of her events from a chair.

HL Glider, Coupe d'Hiver, FAI Power

On the first day of the Nats the "factory team" from M & P Enterprises, consisting of sociologist "Fast Richard" Mathis, advertising illustrator "Tommy T" Peadon, and "Young Don" Chancey, set up shop on the workbenches. They just happened to have with them some of their glider kits, and sold them by the dozens to passers-by. They weren't simply peddling their wares, however, as they entered almost every event.

While it takes more skill than luck to win in HLG, a little bad luck can spell disaster, and one could not help but wonder whether their well-publicized glider act would come off or whether it would be a resounding flop. The wind on Saturday was strong from the north, requiring a relocation of the free flight area immediately downwind of a hangar, certainly not the best circumstances for picking thermals. It soon became crystal clear that the Texas Clown Act was for real, and when the scores were tallied Young Don was first, Fast Richard was tied with Charles Markos for second, and Tommy T was third!

This was the first year for Coupe d'Hiver as an official Nats event. Turnout was excellent, but high winds kept the times low. John Petchler (Hamden, Conn.) took first in the Jr.-Sr. division, Joseph Macay in Open.

It appeared that many top FAI-Power fliers were saving their hardware for the Team Selection Finals. Only Robert Watson (Morton Grove, Ill.) maxed out to take first in Open, with either his Eros or his Pussycat. Don't know which as we spent the day (1) looking for a lost Coupe, and (2) looking for car keys, later found locked in trunk. Paul Andrade (Walnut Creek, Calif.) took first in Senior with his Viking, while James Haught (Arlington, Tex.) topped the Junior list.

C Gas and Rocket

For many, the huge C Gas jobs are the ultimate in free flight. Marty Thompson put a K&B 40 on the schnoz of the 'Duster 900 with which he won B Gas earlier, and won in Junior, repeating his 1968 performance. Seniors Grady Turner, flying a Witchdoctor, and Na-

tional Champ Brian Webster tied for first, while Frank Wolff took Open.

Don Chancey won Open Rocket—gets a real power burst by wrapping the fuse around the middle fuel pellet, bringing it through a hole in the first pellet, then out the nozzle. His model flew a bit on the "loopy" side but got plenty of altitude anyhow. Atlanta's Charles Krickel and Denny Dock (Warsaw, Ind.) took Jr. and Sr.

NFFS Symposium

Despite a sudden rain and a conflict in time with the Indoor events and check-in for the next day's flying, the third annual symposium of the National Free-Flight Society was well attended.

Wrap-up was presentation of NFFS Model of the Year awards to four of the ten recipients: Frank Ehling for his Delta Dart, Sal Taibi for his Starduster, Jim Richmond for his FAI Indoor microfilm model, and Urs Schaller, Swiss Wakefield Team member, for his Wakefield, Finnegans Wake. Under Hardy Brodersen's prodding, each discussed the background and features of his model and the reasons for its success. 3-views and a write-up on all ten appear in the report.

Unofficial Outdoor Events

Payload models with their 36-in. max wingspans and 02 engines represent a very modest outlay of money and time. Flown with a three-min. max. and 15-sec. engine run, the event can be held on a small site. Despite lack of publicity either before or during the Nats, 20 entrants turned out for the event and, since there was no preregistration, that means almost 20 actually flew. William Hale of Columbus won. Only seven entered the challenging Cargo event where the name of the game is to see how much gross weight can be carried by a four-ft. model, 02-powered. Max engine run is 20 sec., min official flight time is 40 sec. Lou Willis repeated his win of last year. High winds deterred many from entering.

The Old-Timer competition was well attended—had seven events including a confusing array of combinations of antique, pylon, cabin, glow-plug engines, spark-ignition engine, and rubber power. Models flown included such famous oldsters as the Lanzo Record Breaker, Bombshell, Brooklyn Dodger, Clipper, Zipper, Lidgard's Hi-Ho, and, of course, a Korda Wakefield.

Nationals: CL

(Continued from page 25)

73 oz. plane by Bob Lampione (Astoria, N.Y.), last year's Open Stunt winner. Bob finished fourth, and his flying arm seemed to have stretched a couple of inches by the time the event was over.

Speed

The speed boys can boast a real winner in Danny W. Bartley (High Point, N.C.). Not only did Danny take first place in Senior C by breaking his own record with a 186.07 mph, three mph faster than his previous time, but he also captured the Individual Category Championship for control line with a total score of 731.49 points. Nearest competitor, Burt Dugan (Flint, Mich.), accumulated a score of 605.15 points.

Among the Open C fliers it was Roselle and Frye, with their incredible full-piped machine, who turned in a 189.40 mph in the last 20 min. of competition to take top honors. In second was the Bartley-Gainer team, using a

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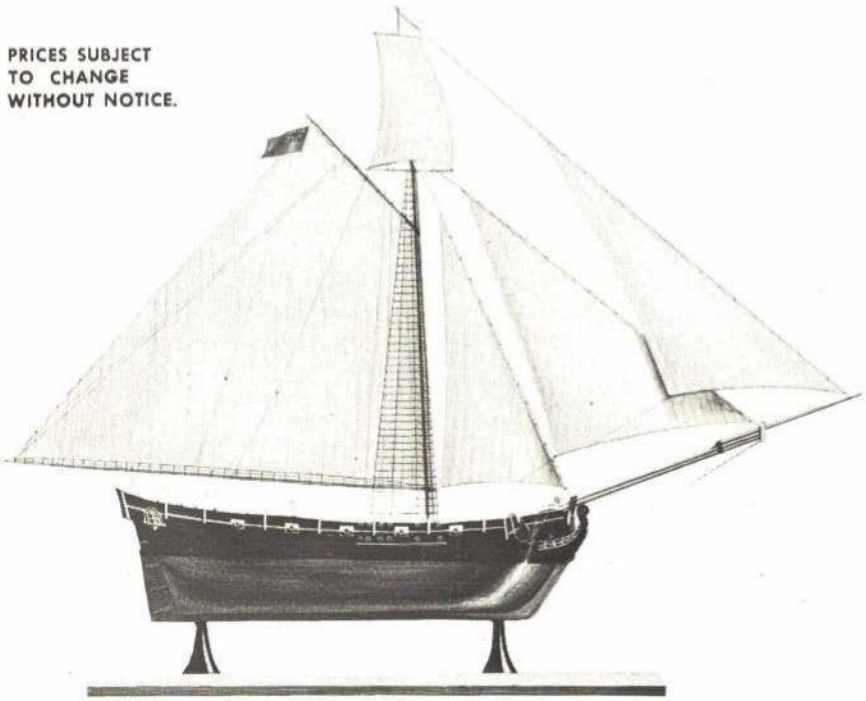

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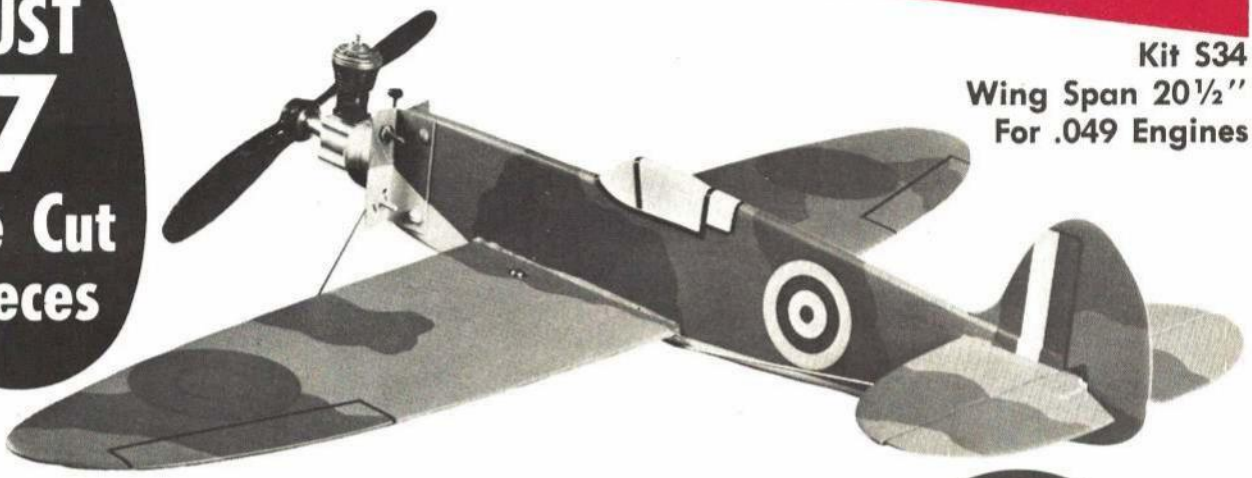

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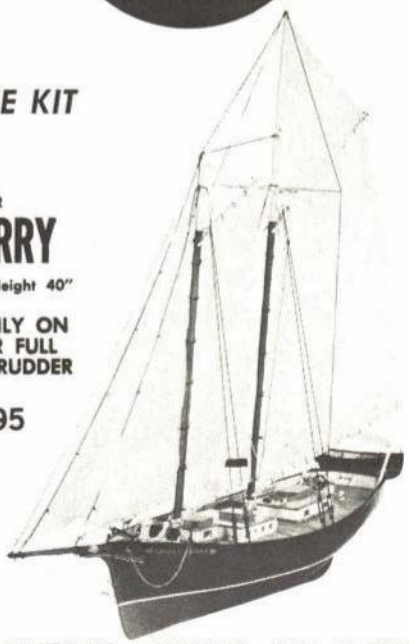

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mini-pipe turning 188.41 mph, and followed by the Garzon-Arpino team in third with a 180.47 mph, using a straight Rossi with no pipe and a regular pen bladder fuel system.

Many ships sported the full pipe, while some employed the mini or megaphone pipe. The smaller pipe, while not quite as effective as the full pipe, does increase the rpm by some 5-600 revolutions, and is much less trouble to tune.

Because of glow plug problems, not too many unusually good flights were made. Too often flights would start with what appeared to be excellent runs, only to have a sickening change in engine rpm occur about half-way through. When the engine was examined at the end of the flight, the glow plug seal had let go. This happened flight after flight. I watched Roselle and Frye test about 15—yes, 15—brand new plugs in their engine (flipping it by hand) to find one in which the seal would hold.

Junior participation was good in the ½A Speed events but was poor in the larger engine classes. Many of the speed fliers feel that the Juniors dropped out of the larger engine class events because of the change in rules requiring the Junior to fly on two-line systems. The C event had only four entries and one of those was a combat ship. Perhaps the CLCB should take another look at the rule prohibiting Juniors from using mono-line.

In the ½A events, good performances were turned in by Juniors Bruce Pailet (Brookville, N.J.), who placed first in Proto-Profile with a 74.23 mph, and Brian Pardue (Greensboro, N.C.), who took a first in ½A speed with 94.01 mph and a third in Proto Profile.

Some of the operating features that were seen: bomb bay doors, flaps, throttle control, electrically-operated canopies, revolving turrets, working compass, working intercom system, control surfaces working from cockpit control stick, lights, wheel brakes, release of wing fuel tanks and bombs, hatches and access panels that opened to expose machine guns, cannons and ammo strips feeding the guns, and many more. Finishes were varied—many camouflaged paint schemes and weathered looks were seen, with metal covering on some while others stayed with highly polished paint finishes.

All the planes were terrific on static display, but when flyoff came many had problems. Unlike last year, when almost all contestants made official flights, this year's flyoff was poor. High wind, heavy craft, and planes being underpowered made flying a delicate matter.

Dr. Linton Keith (Santa Clara, Calif.) did it again, the fourth straight year with his Avro Lancaster Bomber. It weighs a little over 15 lbs., has four engines, revolving turret, operating bomb bay doors and throttle control. Keith represented the U.S. in the Control Line Scale World Championships held in Great Britain late in August.

Senior went to John D. Glab (Chicago, Ill.) flying a P-51D Mustang, which weighed four lb., with 37-in. wingspan, and which featured flaps, drop fuel tank and throttle control.

The Junior category was won by Cathy Burnstine (Danville, Ill.) with a Nesmith Cougar. Yes, fellows, "a girl." Cathy's plane weighed three lb., had a 40-in. wingspan and throttle control.

It looks as though the ST 35 was the engine, since it was used by all three winning contestants. Junior and

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3/16 × 3	54c
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3/32 × 4	49c
1/8 × 4	63c
3/16 × 4	72c
1/4 × 4	80c
3/8 × 4	1.08
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1/16 × 6	98c
3/32 × 6	1.12
1/8 × 6	1.17
3/16 × 6	1.26
1/4 × 6	1.40
3/8 × 6	1.70
1/32 × 8	1.25
1/16 × 8	1.25
3/32 × 8	1.35
1/8 × 8	1.40
3/16 × 8	1.55
1/4 × 8	1.75
3/8 × 8	1.95

48" LENGTHS

Size	Price
1/32 × 3	43c
1/16 × 3	43c
3/32 × 3	54c
1/8 × 3	60c
3/16 × 3	72c
1/4 × 3	89c
3/8 × 3	1.24
1/16 × 4	62c
3/32 × 4	68c
1/8 × 4	80c
3/16 × 4	94c
1/4 × 4	1.05
3/8 × 4	1.38
1/16 × 6	1.35
3/32 × 6	1.46
1/8 × 6	1.56
3/16 × 6	1.68
1/4 × 6	1.87
3/8 × 6	2.20

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1/16 × 2	28c
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1/8 × 2	36c
3/16 × 2	41c
1/4 × 2	51c
3/8 × 2	57c
1/32 × 3	36c
1/16 × 3	36c
3/32 × 3	44c
1/8 × 3	49c
3/16 × 3	58c
1/4 × 3	76c
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Size	Price
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1/16 × 1/8	3c
1/16 × 3/16	4c
1/16 × 1/4	6c
1/16 × 3/8	7c
1/16 × 1/2	10c
1/16 × 3/4	12c
1/16 × 1	15c
■ 3/32 SQ.	5c
3/32 × 3/16	5c
3/32 × 1/4	6c
3/32 × 3/8	7c
3/32 × 1/2	10c
3/32 × 3/4	13c
3/32 × 1	17c
■ 1/8 SQ.	5c
1/8 × 3/16	5c
1/8 × 1/4	7c
1/8 × 3/8	10c
1/8 × 1/2	12c
1/8 × 3/4	16c
1/8 × 1	20c
■ 3/16 SQ.	8c
3/16 × 1/4	10c
3/16 × 3/8	12c
3/16 × 1/2	16c
3/16 × 3/4	19c
3/16 × 1	22c
■ 1/4 SQ.	13c
1/4 × 3/8	15c
1/4 × 1/2	18c
1/4 × 3/4	24c
1/4 × 1	30c
■ 5/16 SQ.	15c
5/16 × 3/8	20c
5/16 × 1/2	25c
5/16 × 5/8	30c
5/16 × 1	35c
■ 3/8 SQ.	18c
3/8 × 1/2	28c
3/8 × 3/4	32c
3/8 × 1	40c
■ 1/2 SQ.	27c
1/2 × 3/4	36c
1/2 × 1	45c
■ 5/8 SQ.	32c
5/8 × 1	42c
■ 3/4 SQ.	42c
3/4 × 1	52c

48" LENGTHS

Size	Price
■ 1/8 SQ.	7c
1/8 × 1/4	10c
1/8 × 1/2	16c
■ 3/16 SQ.	11c
3/16 × 1/2	22c
3/16 × 3/4	26c
■ 1/4 SQ.	18c
1/4 × 1/2	24c
1/4 × 3/4	32c
■ 5/16 SQ.	20c
■ 3/8 SQ.	24c
3/8 × 1/2	31c
3/8 × 3/4	42c
■ 1/2 SQ.	36c
1/2 × 3/4	48c

36" LENGTHS

SHAPED L.E.

Size	Price
3/8 × 1/2	28c
1/2 × 1/2	32c
3/4 × 3/4	50c
1 × 1	72c

SHAPED T.E.

Size	Price
1/8 × 1/2	17c
3/16 × 3/4	20c
1/4 × 1	26c
5/16 × 1-1/4	31c

TRIANGULAR CUT

Size	Price
1/4 SIDES(X)	17c
3/8 SIDES(X)	22c
1/2 SIDES(X)	26c
3/4 SIDES(X)	36c
1 SIDES(X)	48c

BLOCKS

3" LENGTHS

Size	Price
■ 1 SQ.	6c
1 × 2	12c
2 × 2	16c
1 × 3	16c
2 × 3	23c
3 × 3	36c

6" LENGTHS

Size	Price
■ 1 SQ.	12c
1/2 × 2	14c
3/4 × 2	18c
1 × 2	22c
1-1/2 × 2	26c
2 × 2	30c
1/2 × 3	20c
3/4 × 3	28c
1 × 3	31c
1-1/2 × 3	38c
2 × 3	42c
3 × 3	70c
1/2 × 4	30c
3/4 × 4	35c
1 × 4	40c
1-1/2 × 4	52c
2 × 4	62c
3 × 4	90c
1/2 × 6	44c
3/4 × 6	50c
1 × 6	59c
1-1/2 × 6	82c
2 × 6	92c
3 × 6	1.35

12" LENGTHS

Size	Price
■ 1 SQ.	22c
1/2 × 2	28c
3/4 × 2	35c
1 × 2	42c
1-1/2 × 2	50c
2 × 2	60c
1/2 × 3	38c
3/4 × 3	54c
1 × 3	60c
1-1/2 × 3	73c
2 × 3	89c
3 × 3	1.35
1/2 × 4	59c
3/4 × 4	67c
1 × 4	79c
1-1/2 × 4	99c
2 × 4	1.20
3 × 4	1.79
1/2 × 6	86c
3/4 × 6	99c
1 × 6	1.15
1-1/2 × 6	1.60
2 × 6	1.84
3 × 6	2.68
1/2 × 8	94c
3/4 × 8	1.17
1 × 8	1.50
1-1/2 × 8	1.75
2 × 8	2.16
3 × 8	3.10

18" LENGTHS

Size	Price
■ 1 SQ.	31c
1 × 2	63c
2 × 2	90c
1 × 3	92c
2 × 3	1.35
3 × 3	2.03
1 × 4	1.18
2 × 4	1.80
3 × 4	2.70
1 × 6	1.73
2 × 6	2.75
3 × 6	4.00
1 × 8	2.25
2 × 8	3.25
3 × 8	4.65

24" LENGTHS

Size	Price
■ 1 SQ.	44c
1 × 2	84c
2 × 2	1.20
1 × 3	1.20
2 × 3	1.80
3 × 3	2.75
1 × 4	1.58
2 × 4	2.40
3 × 4	3.58
1 × 6	2.30
2 × 6	3.65
3 × 6	5.36
1 × 8	3.00
2 × 8	4.30
3 × 8	6.20

★ SECOND GRADE SHEETS

36" LENGTHS

Size	Price
1/32 × 3	18c
1/16 × 3	18c
3/32 × 3	22c
1/8 × 3	25c
3/16 × 3	29c
1/4 × 3	38c
3/8 × 3	48c

PLANKS

36" LENGTHS

Size	Price
■ 1 SQ.	60c
1/2 × 2	85c
3/4 × 2	1.05
1 × 2	1.26
1-1/2 × 2	1.50
2 × 2	1.75
1/2 × 3	1.08
3/4 × 3	1.62
1 × 3	1.75
1-1/2 × 3	2.20
2 × 3	2.65
3 × 3	4.05
1/2 × 4	1.75
3/4 × 4	2.00
1 × 4	2.25
1-1/2 × 4	2.95
2 × 4	3.55
3 × 4	5.35
1/2 × 6	2.56
3/4 × 6	2.95
1 × 6	3.45
1-1/2 × 6	4.75
2 × 6	5.50
3 × 6	7.00
1/2 × 8	2.80
3/4 × 8	3.50
1 × 8	4.50
1-1/2 × 8	5.25
2 × 8	6.50
3 × 8	9.25

NEW BALSA ADDITIONS

SHEETS — 36" LENGTHS
5/32 × 3 × 36 50c
1/20 × 3 × 36 32c   5/16 × 3 × 36 76c
TAPER CUT SHEETS (TO 1/16" EDGE)
1/4 × 3 × 36 74c   1/4 × 4 × 36 82c
ROUNDED-EDGE PLANKING
5/32 × 1/4 × 36 LENGTHS 8c EACH
ROUNDED-EDGE (Aileron & Elevator)
1/4 × 1 × 36 40c   1/4 × 2 × 36 55c
3/8 × 1 × 36 45c   3/8 × 2 × 36 65c
WING SKINS — 36" LENGTHS
1/16 × 12 × 36 2.00   3/32 × 12 × 36 2.25

SIG SPRUCE

36" LENGTHS

Size	Price
1/16 × 1/8	5c
1/16 × 3/16	6c
1/16 × 1/4	7c
3/32 × 3/32	5c
3/32 × 1/8	6c
3/32 × 3/16	7c
3/32 × 1/4	6c
1/8 × 1/8	6c
1/8 × 3/16	7c
1/8 × 1/4	8c
1/8 × 3/8	10c
1/8 × 1/2	13c
1/8 × 3/4	17c
3/16 × 3/16	9c
3/16 × 1/4	9c
3/16 × 3/8	11c
3/16 × 1/2	14c
1/4 × 1/4	15c
1/4 × 3/8	18c
1/4 × 1/2	22c
3/8 × 3/8	24c

48" LENGTHS

Size	Price
3/32 × 3/32	7c
3/32 × 1/8	8c
3/32 × 1/16	9c
3/32 × 1/4	10c
1/8 × 1/8	8c
1/8 × 3/16	9c
1/8 × 1/4	11c
1/8 × 3/8	14c
1/8 × 1/2	17c
1/8 × 3/4	22c
3/16 × 3/16	12c
3/16 × 1/4	12c
3/16 × 3/8	15c
3/16 × 1/2	19c
1/4 × 1/4	20c
1/4 × 3/8	24c
1/4 × 1/2	30c
3/8 × 3/8	32c

24" LENGTH

Size	Price
3/16 × 3/4	15c

LARGE BUNDLE OF ASSORTED STRIPS — "SHORTS" AND "SECONDS". 89c

BIRCH PLYWOOD

FINEST GRADE — FLAT SHEETS

12" LENGTHS

Size	Price
1/32 × 6	35c
1/16 × 6	40c
3/32 × 6	40c
1/8 × 6	45c
3/16 × 6	45c
1/4 × 6	50c
1/32 × 12	70c
1/16 × 12	80c
3/32 × 12	80c
1/8 × 12	90c
3/16 × 12	90c
1/4 × 12	1.00

24" LENGTHS

Size	Price
1/32 × 12	1.40
1/16 × 12	1.60
3/32 × 12	1.60
1/8 × 12	1.80
3/16 × 12	1.80
1/4 × 12	2.00

48" LENGTHS

Size	Price
1/32 × 12	2.80
1/16 × 12	3.20
3/32 × 12	3.20
1/8 × 12	3.60
3/16 × 12	3.60
1/4 × 12	4.00

SIG BASS WOOD

18" LENGTH SHEETS
1/16 × 2-1/2 15c   3/16 × 2-1/2 23c
3/32 × 2-1/2 17c   1/4 × 2-1/2 28c
1/8 × 2-1/2 19c   3/8 × 2-1/2 35c

BLOCKS
1/2 × 3/4 × 6 6c   3/4 × 2 × 6 14c
1/2 × 3/4 × 12 11c   3/4 × 2 × 12 27c
1/2 × 3/4 × 18 16c   3/4 × 2 × 18 40c
3/4 × 3/4 × 6 7c   3/4 × 3 × 6 19c
3/4 × 3/4 × 12 14c   3/4 × 3 × 12 37c
3/4 × 3/4 × 18 20c   3/4 × 3 × 18 55c
3/4 × 1 × 6 9c   3/4 × 4 × 6 24c
3/4 × 1 × 12 17c   3/4 × 4 × 12 47c
3/4 × 1 × 18 26c   3/4 × 4 × 18 70c

SIG BIRCH DOWELS

12" LENGTHS		36" LENGTHS	
1/8 dia.	3c	1/8 dia.	6c
3/16 dia.	4c	3/16 dia.	9c
1/4 dia.	5c	1/4 dia.	10c
5/16 dia.	5c	5/16 dia.	12c
3/8 dia.	6c	3/8 dia.	15c
1/2 dia.	7c	1/2 dia.	20c

1/16 dia. available in 12" lengths 2c

SIG BALSA WINGSKINS

12" WIDE "A" GRAIN BALSA SHEETS FOR SHEETING FOAM WING CORES
1/16 × 12 × 36 $2   3/32 × 12 × 36 $2.25

SIG MODEL PINS

#8 1/2 Long   #20 1-1/4 Long
#14 7/8 Long   #24 1-3/8 Long
#16 1 Long   #28 1-5/8 Long
#17 1-1/8 Long   #32 2 Long
Pkt. 15c   1/4 lb. $1.15   1 lb. $3.95

MODEL MAKER'S "T" PINS
Pkt 15c   1 oz box 59c   4 oz box $1.95

SIG RUBBER BANDS

#8 1/16 × 7/8   #62 1/4 × 2-1/2
#10 1/16 × 1-1/4   #64 1/4 × 3-1/2
#14 1/16 × 2   #84 1/2 × 3-1/2
#16 1/16 × 2-1/2   #105 5/8 × 5
#30 1/8 × 2   #107 5/8 × 7
#32 1/8 × 3   PACKETS 15c
ALL SIZES AVAILABLE IN BULK AT: 1/4 lb. Pkg. $1.10   1 lb. Pkg. $3.95

SIG AIROLAC

OUR NEW HIGH-GLOSS CELLULOSE ACETATE BUTYRATE DOPE FEATURES TRIPLE-GROUND PIGMENTS FOR AN ULTRA-SMOOTH, GLASS-LIKE FINISH. IT'S FAST-FILLING & LEVELING — BLUSH-RESISTANT & FADE-PROOF. NOW AVAILABLE IN 15 COLORS:
Lt. Red / Medium Red / Gloss White / Lemon Yellow / Cub Yellow / Gray / Med. Blue / Dark Green / Gloss Black / Sky Blue / Brite Green / Brite Orange / Dark Blue / Brite Silver / Brite Gold
COLOR: 4 oz. 69c   8 oz. $1.19   Pint $1.79   Qt. $2.98   Gal. $8.95
CLEAR: 4 oz. 59c   8 oz. 98c   Pint $1.49   Qt. $2.39   Gal. $7.19
THINNER: 4 oz. 39c   8 oz. 59c   Pint 98c   Qt. $1.69   Gal. $4.39
AIROLAC ALSO AVAILABLE IN PINT SPRAY CANS ($1.49) IN ALL COLORS

SIG CORE BOND

NEW CONTACT TYPE CEMENT FOR BONDING WOOD OR PLASTIC TO STYROFOAM. Pint $1.95 / Qt. $3.50

SANDING SEALER

LIGHTWEIGHT; TRANSPARENT; WILL NOT FILL GRAIN LIKE "SUPERFILL"
4 oz. 59c   8 oz. 1.10   Pint 1.69

RAZOR PLANE

USES DOUBLE-EDGED BLADES $1.59

R/C FUEL TANKS

NEW SIG DESIGN HAS TWO-PIECE PLUG & LEAK-PROOF SCREW-CAP / PLASTIC CONTAINER AND FLEXIBLE PICK-UP / NON-CORROSIVE BRASS TUBING: 2 oz. $1.05   4 oz. $1.15   6 oz. $1.25   8 oz. $1.35   12 oz. $1.50

PRESSURE FUEL PUMPS

FAST, EASY WAY TO FILL BIG FUEL TANKS. AVAILABLE IN: Quart $2.89   Half Gallon $3.19   Gallon $3.49   Pump Only $2.39 / Primer Bottle 29c

COPPER WIRE

FOR BINDING C/LINES, L/GEAR 20c

SIG EPOXY

STRONGEST GLUE EVER DEVELOPED FOR THE MODELER / COMES IN 2 PARTS (A & B) — IN POLYETHELENE SQUEEZE BOTTLES, WITH SPECIAL NO-DRIP SPOUT: 1-1/2 oz. pack 89c   3 oz. pack $1.49   12 oz. pack $3.95

SIG EPOXOLITE

NEW 2-PART EPOXY PUTTY / LIGHT AS BALSA & STRONG AS EPOXY / QUICK SETTING / EASY TO WORK / LONG SHELF LIFE / EXCELLENT BUTYRATE DOPE ADHESION / CAN BE CARVED, SAWN AND SANDED.
4 oz. Set $1.69   8 oz. Set $2.95

★ BUY THE NEW 50c 224-PAGE SIG CATALOG (OVER 5000 ITEMS LISTED) FROM YOUR DEALER — OR DIRECT FROM SIG MFG. CO.

SIG CONTEST RUBBER

NEW "HIGH POWER" RUBBER STRIP. 1 LB. of 1/8" $5   1 LB. of 1/4" $5

SIG CELLULOID

.008 × 8 × 10 12c   .015 × 8 × 10 30c

FLITE-FOAM

WHITE EXPANDED BEAD FOAM (1 lb PER CUBIC FOOT) 12" WIDE PLANKS
1×12 35c   1×36 90c   1×48 $1.20
2×12 69c   2×36 $1.80   2×48 $2.40
3×12 89c   3×36 $2.70   3×48 $3.60

NEW CELASTIC

FANTASTIC NEW PLASTIC MATERIAL BECOMES SOFT AND PLIABLE WHEN DIPPED IN THINNER. MOLDS TO ANY SHAPE — CAN BE SANDED & DOPED. PERFECT FOR COWLINGS, FILLETING & REINFORCING USES. 9 × 18 SHEETS: Light 85c   Heavy $1.00

WE HAVE NEARLY ALL MODEL AIRPLANE PRODUCTS ADVERTISED

SIG FOAM BOND

NEW CONTACT TYPE CEMENT FOR BONDING BALSA TO EXPANDED POLYSTYRENE / WILL NOT ATTACK FOAM / COLORLESS & STAINLESS
PINT Can $1.25   QUART Can $2.25
THINNER: PINT Can 89c

SIG NYLON PUSHROD

COMPLETE WITH THREADED STUD & SERVO CONNECTOR, AVAIL. IN 2 SIZES: 30" Set, 79c   48" Set, $1.25
BULK PUSHROD (10 Ft. Length) $1.49
PUSHROD STUDS (Set of Three) 10c
PUSHROD KEEPER (Set of Two) 25c

SIG SHEET NYLON

USE .010 THICKNESS FOR HINGE MATERIAL 1/16" FOR BELLCRANKS, CONTROLHORN EXTENSIONS 1/8" FOR HEAVY-DUTY BELLCRANKS AND BEARINGS 1/4" FOR SPECIAL NOSE BEARING BLOCKS AND OTHER ITEMS
.010 × 3 × 4, 25c   1/16 × 2 × 4, 60c
1/8 × 2 × 4, 95c   1/4 × 1 × 4, $1.00

SIG NYLON WING SCREWS

1/4-20 × 1" Package of 4, 39c
1/4-20 × 1-1/2" Package of 4, 49c
8-32 × 1" Package of 4, 35c

SIG NYLON BUSHINGS

THREE SIZES NOW AVAILABLE — AT 15c PER PACKAGE: #4 / #6 / #8

SIG NYLON WASHERS

FOUR SIZES (Inter. Dia.) AVAILABLE AT 15c PER PACKAGE: 3/32" Dia. / 1/8" Dia. / 5/32" Dia. / 3/16" Dia.

SIG NYLON ACCESSORIES

SERVO MOUNT. SCREWS, 4 for 25c
R/C 90° BELLCRANK (with bolt), 25c
R/C CONTROL HORNS (with bolts), IN LONG OR SHORT SIZES, 25c ea.

SIG HARDWARE

BLIND MOUNTING NUTS, 4 per Pkg:
2-56 Size, 20c   3-48 Size, 20c
4-40 Size, 20c   6-32 Size, 25c
NUTS AND BOLTS, 4 each per Pkg:
2-56 × 3/8, 15c   4-40 × 1", 20c
3-48 × 3/4, 15c   4-40 × 1-1/2, 20c
4-40 × 3/8, 15c   6-32 × 1-1/2, 25c
3/8" WOOD SCREWS, per Pkg., 15c IN THREE SIZES: #1 / #2 / #3
2-1/2" METAL C/L BELLCRANK, 15c
SPADE BOLTS, Package of 4 for 25c
"J" Type BOLTS, Package of 4 for 25c
THREADED HARDWOOD BLOCKS, IN 2 SIZES, 25c Pair: 1/4-20 / 8-32
ENGINE MOUNT. SCREWS, IN TWO SIZES, 6 for 15c: #4×1/2 / #6×3/4
R/C LANDING GEAR (HARDWOOD) BLOCKS (PACKAGE OF TWO), 39c
R/C LINK, WITH 9" LONG ROD, 35c
R/C ROD COUPLERS, Pkg of 4, 15c
AIRCRAFT TAPE: 1", 20c   2", 25c
1/2A C/L DACRON LINE (60'), 25c
SOCKET HEAD SCREWS (PKG. OF 4 WITH WRENCH): 4-40 × 3/4", 49c   6-32 × 1", 55c   8-32 × 1-1/2", 59c
MASKING TAPE (18 FOOT), 20c PER ROLL: 1/8" / 1/4" / 3/8" / 1/2"
HEATPROOF FUEL LINE: ABSOLUTELY HEAT AND FUEL PROOF — SUITABLE FOR ALL ENGINES .049 THRU .61.
LARGE FUEL LINE (per foot), now 45c
MEDIUM FUEL LINE (per ft), now 35c

SIG JAP TISSUE

PRE-WAR QUALITY JAPANESE TISSUE IN ORANGE, YELLOW, RED, WHITE, BLUE OR BLACK. 18 × 20 sheet 7c

BAMBOO PAPER

HEAVIER THAN OUR REGULAR JAP TISSUE — IN YELLOW, RED, WHITE, BLUE OR BLACK. 21 × 31 sheet 15c

SILKSPAN

00 WHITE: 19-1/2 × 24-1/2 sheet 5c
GM WHITE: 24 × 36 sheet 10c
SGM WHITE: 26-1/2 × 33-1/2 sheet 15c

SIGRAY

NEW SIG COVERING MATERIAL — A BLEND OF RAYON AND SILK, IN WHITE, BLACK, RED, YELLOW AND BLUE (36" WIDTH). Per Yard $1.25

SIG NYLON

WHITE, 36×48, IN PACKAGE, $1.25

SIG SILK

FOR R/C MODELS — IN RED, BLUE, WHITE, GOLD OR GREEN (36" × 36") HEAVY $2.00   EXTRA-HEAVY* $2.25
— *EXTRA-HEAVY IN WHITE ONLY

JAP SILK

LIGHT-WEIGHT, FOR SMALL GAS, RUBBER, GLIDER ETC. — IN RED, WHITE, BLUE, GREEN, SILVER OR GOLD. 36" × 36" sheet, $2.00

SIG SUPERCOAT FUEL PROOF DOPE

BRILLIANT WHITE • DIANA CREAM • POLAR GRAY • BROWN • JET BLACK • LEMON YELLOW • TENNESSEE RED • CUB YELLOW • ORANGE • MAROON • LIGHT RED • SILVER • OLIVE DRAB • FOREST GREEN • BRIGHT GREEN • DK. GREEN • DK. BLUE • LIGHT BLUE • MIAMI BLUE • CLEAR • THINNER

PLUS 5 NEW SUPERCOAT COLORS — GOLD, COPPER, METALLIC GREEN, METALLIC BLUE, METALLIC MAROON

COLOR	CLEAR	THINNER
4 oz. 59c	4 oz. 50c	4 oz. 39c
8 oz. 95c	8 oz. 89c	8 oz. 59c
Pint 1.49	Pint 1.39	Pint 98c
Qt. 2.79	Qt. 2.19	Qt. 1.69
Gal. 7.95	Gal. 6.59	Gal. 4.39

SIG SUPERCOAT IN NEW SPRAY CANS

ALL 19 SUPERCOAT COLORS, PLUS CLEAR, NOW AVAILABLE IN THESE HANDY, LOW-COST SPRAY CANS
3 oz. 49c   6 oz. 79c   Pint 1.39

SURGICAL TUBING

THIN WALL, FOR FUEL LINE & USE WITH CLOCKWORK TIMERS 15c FT

SIG FUEL-RESISTANT DECAL SHEETS

BRAND NEW LINE OF 44 DIFFERENT SIG MODEL PLANE DECAL SHEETS
• SOLID COLORS (CHOICE OF 9): RED, WHITE, BLUE, BLACK, YELLOW, ORANGE, GREEN, GOLD OR SILVER
• CHECKERBOARD (1/4" AND 1/2" SQUARES): RED, BLUE, GREEN (ON WHITE) • RED, WHITE, BLUE, BLACK, YELLOW, ORANGE, GREEN, GOLD OR SILVER (ON CLEAR) • ORANGE (ON BLACK) • RED (ON YELLOW)
• STRIPES (1/4", 3/8" & 1/2" WIDTH ON EACH SHEET): RED, WHITE, BLUE, YELLOW, ORANGE, BLACK, GREEN, GOLD OR SILVER (ALL ON CLEAR)
• STARS (5-PT.): RED, BLUE OR BLACK (ON WHITE) • RED, WHITE, BLUE, YELLOW, ORANGE, BLACK, GREEN, GOLD OR SILVER (ON CLEAR)
TWO 4-1/4" × 11" DECAL SHEETS 45c

SANDPAPER

TEN 4-1/2 × 5-1/2 ASS. SHEETS 20c

GARNET PAPER

FIVE 4-1/2 × 5-1/2 FINE SHEETS 20c

SIG PIANO WIRE

1/32 dia.	6c	3/32 dia.	17c
3/64 dia.	7c	1/8 dia.	22c
1/16 dia.	9c	5/32 dia.	42c
36" LENGTHS		3/16 dia.	55c

SIG-MENT

OUR GREAT NEW "ONE-TUBE A & B SUPER-CEMENT" — FOR ALL MODEL BUILDING AND FAST FIELD REPAIRS — HOT FUEL PROOF, STRONG AND QUICK DRYING — FOR BALSA, PLYWOOD, HARDWOOD, WOOD-TO-METAL, METAL-TO-METAL & CLOTH
2 oz. 25c   4 oz. 49c   8 oz. 69c
Also available in Pint size — $1.29

CONTACT CEMENT

ONE COAT INSTANT BONDING FOR ALL WOODS, METAL, CLOTH ETC.
4 oz. 65c   8 oz. 1.10   Pint 1.65

R/C HOOK-UP WIRE

SIG PACKAGE OF EIGHT DIFFERENT COLOR WIRES, 3-FT. LENGTHS. 69c

SIG "PETER CHINN" MODEL ENGINE FUEL

FUEL TYPE	Pint	Quart	Gallon
REGULAR	85c	$1.50	$4.95
CONTEST	90c	$1.59	$5.95
GRAND PRIX	$1.00	$1.75	—
R/C SPECIAL	—	$1.39	$4.50

REGULAR HIGHEST QUALITY AND ECONOMICAL GENERAL PURPOSE FUEL FOR .15 - .60 ENGINES. IDEAL FOR .35 - .45 STUNT, .35 COMBAT, .15 - .45 R/C THROTTLE-ENGINES, BREAKING-IN.

CONTEST TOP PERFORMANCE, ALL-PURPOSE FUEL FOR .01 - .15 ENGINES. EXCELLENT FOR ALL MEDIUM AND LARGE-SIZE ENGINES (AFTER BREAKING-IN) & WHERE EXTRA POWER IS REQUIRED.

GRAND PRIX ULTRA HIGH-PERFORMANCE. (GIVES UP TO 40% MORE POWER) HIGH NITROMETHANE CONTENT FUEL FOR ALL COMPETITION AND RACING ENGINES. FOR F/F GAS, C/L RAT-RACING, PROTO-SPEED & SPEED. NOT SUITABLE FOR STUNT, R/C ENGINES OR BREAKING-IN.

R/C SPECIAL ECONOMICAL, "WIDE R.P.M. RANGE" FUEL FOR ALL THROTTLE-EQUIPPED .15 - .60 R/C ENGINES. GIVES ULTRA-SMOOTH RUNNING AT FULL POWER AND LOWEST IDLE — IN ALL CLIMATIC CONDITIONS. ALSO IDEAL FUEL FOR C/L NAVY CARRIER AND C/L STUNT FLYING.

MOLDED FOAM WING

FOR R/C SPORT & TRAINERS — 45" span, 8-1/2" chord, & semi-symmetrical airfoil. ONLY $3.50

SIG WINGSKINS

1/64" BIRCH PLYWOOD (THREE PAPER-THIN VENEERS LAMINATED WITH WATERPROOF GLUE) — CAN BE CUT WITH SCISSORS. PERFECT MATERIAL FOR COVERING FOAM TYPE WINGS
12" × 12", 80c   12" × 24", $1.60
12" × 48", $3.20   24" × 48", $6.40

SIG BUBBLE CANOPIES

PERFECT BUBBLE CANOPIES FORMED FROM TOUGH BUTYRATE PLASTIC — AVAILABLE IN 13 SIZES IN CLEAR — OR IN BLUE, GREEN OR AMBER
CLEAR: 4" 15c   5" 20c   6" 30c   7" 40c   8" 50c   9" 60c   10" 70c   11" 80c   12" 90c   13" $1.00   14" $1.10   15" $1.20   16" $1.25
COLOR: 4" 25c   5" 30c   6" 40c   7" 50c   8" 60c   9" 70c   10" 80c   11" 90c   12" $1.00   13" $1.10   14" $1.20   15" $1.30   16" $1.35

1970 SIG MODEL KIT LINE

Kit	Span	Price
• R/C SCALE		
D.H. BEAVER	45" Span	9.95
CESSNA 172	54" Span	14.95
PIPER CUB J-3	71" Span	21.95
CESSNA 170	72" Span	24.95
CITABRIA	69" Span	29.95
FAIRCHILD PT-19	72" Span	34.95
T-34 MENTOR	72" Span	36.95
ZLIN AKROBAT	70" Span	39.95
YAK 18	72" Span	45.95
• R/C		
R/C SPORT	45" Span	8.95
DOUBLER	37" Span	9.95
BARON'S BUGGY	34" Span	12.95
PRIVATEER Sober 15	61" Span	12.95
BUSTER RACER	48" Span	19.95
MIDGET 450 Racer	52" Span	24.95
STRATUS Class III	70" Span	29.95
SIMCO Class III	68" Span	34.95

THIS COUPON IS VOID IF PROHIBITED, TAXED OR RESTRICTED

☆ NEW SIG FREE COUPON ☆

• CLIP OUT THIS COUPON AND MAIL IN WITH YOUR ORDER ($3 MINIMUM) FOR ANY SIG MERCHANDISE — AND WE WILL SEND YOU THE FOLLOWING ITEMS AT NO EXTRA CHARGE (CHECK THE APPROPRIATE BOX BELOW):
$3-$5 Orders ☐ 8 oz. SUPERCOAT, or ☐ 8 oz. AIROLAC
$5-$7.50 Orders: ☐ Pint SUPERCOAT, or ☐ Pint AIROLAC
Over $7.50: ☐ Pint SUPERCOAT and 4 oz. SIG-BOND
or: ☐ Pint AIROLAC and 4 oz. SIG-BOND

Dec. '70 AAM

IF YOUR LOCAL DEALER IS UNABLE TO SUPPLY YOUR NEEDS, ORDER DIRECT — ADDING 50c POSTAGE (OR $1.00 FOR CANADA). MINIMUM ORDER $1.00

SIG MANUFACTURING COMPANY, INC. / 401(A) SOUTH FRONT STREET / MONTEZUMA / IOWA 50171

Senior categories were won by Jeff Davis (Orlando, Fla.) and Jonathan Drake (Freeport, N.Y.). Both used the Goldberg Voodoo, while Howard Rush (West Lafayette, Ind.) flew his original design, Nemesis II, to victory in the Open class.

While many of the combat planes featured foam wing construction, all three taking top honors had wings of built-up construction. Pen bladder fuel systems were used by almost all fliers, with the ST 35 and Fox 36X predominant engines.

Scale and Rat Racing

After watching some of those 140-lap finals, I have a difficult time understanding how the fliers do it. Over 200 entries competed for honors in the various classes of both events. Final scores showed Rat Race winners to be Stanley Simpson III (Jacksonville, Fla.) in Open, Tim Zimmer (Dayton, Ohio) in Senior, and Tom Tuma (Downers Grove, Ill.) in the Junior class. Simpson turned in a 5:30:5, which was less than one second higher than the 5:31:2 time by the Senior winner. Junior time wasn't too far behind with a 6:09:3.

Scale racing saw John Barnhart (Chicago, Ill.) emerge as a winner, while Michael Hainen (Vicksburg, Mich.) captured the Junior-Senior Category. During the action, many of the fliers and pitmen demonstrated excellent team work. Pit stop times were at a minimum and accounted for the less than a 30-sec. difference in times between the first five contestants in both Rat and Scale. In all categories of both events, less than six sec. separated first and second place winners. Most of the planes were scratch-built. Fuel cutoff devices were used by many; some fliers felt that the use of a smaller fuel tank and no cutoff device was less trouble in the long run. Supertigre and K&B engines were used most commonly. Fuels varied from store-bought standards to custom blends.

RF-101 Voodoo

(Continued from page 37)

The balance of the plane is assembled as directed. Taxi and landing lights may be added to the nosegear strut. The lights are fashioned from pieces of the kit's clear plastic tree, and the rear portions painted silver. Glue them to the nosegear strut, just below the barrier hook protrusion.

A fairing for the RF-101G/H panoramic camera is carved from balsa, sanded to shape, and then applied to the bottom portion of the new nose cone. This ½ x 3/16" fairing has two longitudinal grooves running full length on the fairing. The pitot probe, 3/16" long, is fashioned from music wire or stretched sprue and added to the nose above the camera port. Fuselage camera windows can be painted on after finishing or simulated by applying black decal sheet, cut to size and slid in place. For the F-101A/C fighter, gun bulges and the pitot probe may be made from scrap and the appropriate gun troughs cut out.

RF-101G and H aircraft are finished in the current Air Force three-tone camouflage scheme of tan, olive and dark green with light gray undersides. Interiors and sides of speed brake and landing-gear doors are gloss red, as is the inside of the speed brake on the fuselage. Landing gear and engine exhausts are natural metal, the exhausts appearing burned and blackened. The nose section is flat black. Fuel tanks are light gray underneath and dark green above. The 15-in. U.S. insignia was obtained from AIR sheet #6; the white lettering, from MicroScale sheet #72-26. The small black numbers "56" and the letters "AF" are from AIR sheets #1 and #9. Thin red bands are painted around the engine intake ports and under the fuselage just aft of the wing trailing edge.

Spray the completed model overall with a dulling agent for a uniformly semi-flat finish. After thoroughly dry, the RF-101H Voodoo can be put on display as a truly distinctive bird.

10-HI

(Continued from page 35)

10 HI is hard to beat.

Construction

Conventional construction techniques are used; however, their proper sequence is essential in the early stages. These steps are described in order of priority.

(1) Using contact cement, laminate the pylon and skid from two pieces of 1/16" plywood. This technique provides warp-free parts.

(2) Build up the center rib assembly to obtain a good fit for the pylon but do not glue it in. The wing is constructed upside down, which means the pylon must be installed after the rest of the wing is complete.

(3) Lay out and pin down the top front spar to the work table. Mark the leading edge to trailing edge centerline on the center rib and jig the center rib up on the top front spar so that this centerline is parallel to the work table.

(4) Temporarily jig up the trailing edge to match the center rib TE line at the center of the wing, with the outboard end on the work table. This provides the washout required in the finished airframe. Locate and mark the rib locations on the TE stock. Now the TE stock can be removed, notched for the ribs, and rejigged for final construction.

(5) Install the ribs, using the spar on the work table and TE to retain them. When the glue is dry, install the bottom forward spar (remember the bottom spar is actually on top during construction) and the leading edge. When dry, install the top aft spar. When the assembly is dry, remove from the work table and install the last rear spar.

(6) Add sheeting where called for. Sand liberally and apply tip fins and trim tabs prior to covering. The original model was covered with transparent

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yellow MonoKote; however, any favorite covering material will work as well. After covering, glue in the pylon engine mount, fabricate the engine mount brackets, install engine and timer and the model is ready for glide testing.

Flight

The CG location shown should be confirmed with initial hand launch glides. The first few launches should be waist high for minimum pitch impact until CG and trim are adjusted for smooth flat glide. I balanced 10-HI by epoxying flat lead sheet to the landing skid and filing it down until proper balance was obtained.

The first few engine run flights should be timed for no more than two sec. Launch by grasping the skid and giving the plane a running javelin-like throw in a horizontal plane. Adjust any pitch problems by changing the thrustline angle of the engine. The slot in the engine brackets makes this an easy task.

10-HI is not a VTO machine. It leaves the launcher's hand in a flat descending flight path, losing about two ft. in altitude while picking up speed. At an estimated 30 mph, it rotates into a beautiful climb. Gliding turn is accomplished by bending the opposite tip fin into a trail position. The radius of turn is dependent on the amount of trail position used.

10-HI is truly a Sunday flyer and is proving to be quite a test bed for flying wing enthusiasts from an experimental standpoint. Contrary to many wing designs, this plane is almost super stable. Once trimmed, it has no bad pitch or roll-off characteristics. If nothing more, it will provide hours of fun and I guarantee it will attract attention.

King Kong

(Continued from page 29)

The two spars were carried all the way out to the tips, but they probably are not needed much farther out than the plug-in tubing. Super MonoKote is best for covering the wing and tail—it's the fastest and lightest. Paint the fuselage a dark color. Our first one was light in color and could not be seen at all as the plane climbed high.

The power pod, if desired, is quickly built from plywood and fiberglass cloth. Put waxed paper over the wing and glue the pod parts together right on the wing to be sure it fits well.

Make the tow hook strong. We used a section of T-shaped aluminum extrusion and put some extra layers of glass

cloth inside the fuselage at that spot. Use plenty of cloth and resin in the nose; it takes a lot of beating on the hard landings. Almost one pound was needed in the nose to achieve proper balance.

Nylon pushrods, used in the original model, were satisfactory except for the noticeable trim change as temperature variations affected the nylon. The new Sullivan GoldN-Rods should solve this problem. The elevator hook-up, with the split elevators, is a little more trouble to make. The two pushrods are soldered together inside the fuselage and then attached to the nylon tube.

The name "King Kong" certainly doesn't sound like a streamlined, graceful sailplane, but results count and the big Kong can hold its own in any soaring competition.

Please contact me in care of this magazine if you have any comments or questions.

On the Scene

(Continued from page 12)

armory, grouped into rooting sections, voicing opinions on favorites and crying thumbs down to the losers.

Just before the contest began, Peter Tasi (Annapolis), an industrial designer, came in with a whole basket of highly original designs, all decorated exotically with peace symbols and mod splashes of color. Cheered on by his two pixie-like daughters, he soon won the cheers of all and became a favorite. It wasn't long before he was dubbed "the Pro."

However, Britt Watwood won first in design, with a futuristic craft resembling a cluster of flying culverts. Second place went to Professor Vadym Uttgoff, an academy aerospace engineering instructor, for his autogiro. Tasi's entry, which he called a "da Vinci Butterfly," was third.

Then the kids went wild, as the event they had been awaiting—distance—began. Hordes of anxious children lined up for their turns at launching planes from that five-ft. circle. Children from age three up did their thing. Even with a hearty launch, many planes barely made it out of the circle. Although stronger arms eventually prevailed, the tots were the hit of the evening.

The first girl in competition entered the distance event. Alex Potter, age 13, tried her best to top the boys who were, like boys all over the world, grimacing and guffawing, loudly implying their superiority. She showed some of them! With a lady-like pitching stance, she contorted herself with what might she could muster and sent her plane a respectable distance.

Midshipman Scott Burd took first place in distance with a remarkable 91 ft. This should be a world record, surpassing Bob Meuser, whose plane sailed 89 ft. in the **Scientific American** Contest, back in 1967. Meuser's plane, an SST prototype, was fashioned from a sheet of paper 10 x 18".

It is a shame no award was given for the shortest flight—the winner being the cutest little three-year-old you ever saw. Tiny Sharon Simon who gave her plane a shove into space for all she was worth, only to have it hit the floor at her feet, won the hearts of everyone. She showed no signs of nervousness at being the center of attraction in the crowded armory. Dwarfed by her big plane, copied from a design in **Time**, she quietly went about her role like a professional.

SUDDEN SERVICE PLANS

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

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

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

No. 1192, Ryan Mailplane — Light, F/F, with plenty of details. For rubber indoor or outdoor. Plan has scale views. **$1.50**

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

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

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

No. 0791, Pusher Galore — Bill Hannan's all-sheet, rubber pusher for Tenderfoot. Looks like supersonic transport. **$.75**

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

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

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

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

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

No. 0892, Taylor Cub F-2 — Sport, F/F, scale, .020. Stick-and-tissue. By Schreyer. **$1.75**

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

No. 1181, Junkers D-1 — Joe Tschirgi 1918 fighter, proportions for perfect R/C scale. .45 engine. Low-wing has 500 sq. in. **$2.50**

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

No. 1281, Strato-Streak '68 — Frank Heeb's ½A F/F updated version of hottest gas model of 1941 era. Simple pylon, 275 sq. in. **$1.50**

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

No. 0191, Curtiss-Wright Jr. — Robert Hawkins transformed open-cockpit pusher of thirties for single channel. First step into RC scale. Span 44". Use .049. **$2.50**

No. 0192, Skyraider — Mottin's Navy Carrier, fast, light, .40's or .60's. Easy construction. **$2.50**

No. 0193, Cutie Coupe — Coupe d' Hiver F/F by Dave Linstrum. Quick to build with all-sheet surfaces. Your first rubber contest model. **$1.75**

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

No. 0591, Small Fry Special — Mottin's C/L trainer for Tenderfoot. Easy to build. An .049. **$.75**

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

No. 0593, Manta — Howard Kuhn's Boost Glider for model rockets easy to build from sheet. A winner. **$.75**

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

No. 0692, ½A Sky Squire — Small version famous Sky Squire. 1 ch. rudder-only, or rudder, elevator and motor on Galloping Ghost. Only 22-28 oz. **$2**

No. 0693, Mustang — Rabe's great near-scale C/L stunt. Flies pattern with ease. ST 40. Over 57". **$2**

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

No. 1183, Corrigan — James Wilson's unique ½A C/L stunt model. Flies tail first! Stable like big stunt ships. Easy to build, 23". **$1.75**

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

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

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

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

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

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

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

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

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

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

No. 0202, Push-Air — For Brown's tiny CO2 engine. Simple F/F by Ehling, like Curtiss-Wright Jr. **$.75**

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

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No. 0205, Kestrel — Dave Boddington's delightful R/C rudder-only soarer with 02. **$1.50**

No. 0301, 1916 B&W — Biplane on floats was Boeing's first airplane. Beautiful R/C job by Francis Reynolds, uses a 60. Two sheets. **$4.50**

No. 0302, Bearcat — Al Rabe's stunt C/L was talk of the 1966 Nats. Aldrich customized ST 46. **$2.00**

No. 0303, Mistral — R/C by J. Swift, is fully aerobatic 50" job with 40 engine. **$3.00**

No. 0304, M. K. Sportster — Ho Fang-Chiun's cute cabin free-flight takes 049 power. **$1.25**

No. 0401, D-H 88 Comet — Scale twin by Skip Williams from Jan. '69 centerspread for .20's. Fast, stable, can fly pylon rules. **$3.75**

No. 0402, Lively Lady — World Championships winning Nordic by Elton Drew. Well detailed plan. All weather flyer. **$3.75**

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

No. 0404, Sweapea — C/L Goodyear by Williamson for club project also is tough trainer. For 35 engine. Balsa cutting guide incl. **$2.50**

No. 0501, Classic — Contest F/F for ¼A to C engines. Build any size, photo reduce plan to suit. As supplied, plan is for C class. Good detail. **$4.50**

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

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No. 0803, Thermal Dart — Enlarged and improved rubber-powered beginner's delight by Frank Ehling. **$1.00**

No. 0804, BV-141 B — Asymmetrical WW II fighter bomber in profile for 049 engine by Terry Aldrich. Easy to make, good flyer. **$2.00**

No. 0901, Sorcerer — Pee Wee 02-powered, free-flight flying saucer uses sheet wing, easy to make by Tenderfoot builder. **$1.00**

No. 0902, Cloud 9 — Intricate contest winning Wakefield by Roger Gregory. Plan shows streamlined prop/hub design. **$3.50**

No. 0903, Hawker Typhoon — Dennis Adamisin's scale-like CL stunter which won Junior Nats stunt event. Conventional type. **$4.00**

No. 0904, Antoinette — Signorino/Zundel RC. 98" wing, nearly scale, flies well on .36, like powered glider. Plans 3 huge detailed sheets. **$9.00**

No. 0905, Mini Cat — Bud Atkinson scaled down the Cat series, for pulse or light digital and up to 19 engines. Easy to make RC sport flyer. **$2.75**

No. 1001, Phantom — Well-engineered RC Dyna-Jet-powered scale fighter by Ralph Saldivar is practical but noisy model. Highly detailed plane. Jet installation shown. **$4.00**

No. 1002, Hobbit — Simplified Nordic A1 by Bob Stalick is steady on tow, all-weather flyer. **$1.50**

No. 1003, Charger — ½A powered sweptwing stunter does full pattern on long lines safely. **$2.00**

No. 1101, Autogiro—Simple 049-powered model builds fast and gives unique performance. Pusher prop or motor. **$1.25**

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No. 1103, Akromaster—RC scale/stunt model or real aerobatic plane for 45-60 engine. Fast and responsive, easy to make, simple shapes. **$2.75**

No. 1104, Tardon—Formula II semi-scale pylon racer or stunt plane for 40 engines. Won event at 1969 NATS. Groovy flier. **$3.00**

THIS MONTH'S PLANS

No. 1201, Stiletto—Unique ½A proto model uses much-extended motor shaft for clean prop thrust and speed. **$1.00**

No. 1202, King Kong—Huge flat-land soarer for competition use has 12' wing of glass, foam, and balsa. By Sarpolus. **$3.25.**

No. 1203, 10-HI—Six-foot span, 049-powered flying wing is high-performance model with sporting flair. Huge plan. **$3.50.**

Victorious in the duration event was Midshipman Tom Shields, first place with 8.3 sec.; Midshipman Leland Van Oss, second with 7.0 sec.; and third, Midshipman Jim Anderton with 6.6 sec.

It was hard to tell who was having the most fun, the contestants or the spectators. The kids, finding themselves in the spotlight, were really "hamming it up," to everyone's amusement. Older girls tried to keep their lady-like composure, while really being awkward. Older boys, who like to think they have "something on the ball" were not able to do anything right. The midshipmen did their best to show off their aeronautical wisdom by explaining away failures with such technical excuses as "turbulence caused by laughter" or "downdrafts caused by low pressure area from body heat on surrounding balcony."

When the final event for the evening, aerobatics, began, the antics some of the planes went through were unbelievable! Twenty-three contestants entered. Stalling glides, half loops, spirals—some even managed to back up, halfway through the flight pattern.

After all contestants showed their best forms, the judges narrowed the aerobatic competition down to seven finalists and wanted to have a flyoff. Final winners were: first place, Midshipman Jim Hollopeter; second, Peter Tasi; third, Midshipman Tom Shields.

Broadhurst on FF

(Continued from page 31)

model suddenly goes squirrely and one is hesitant about what adjustment to make. . . .

World FAI Records: A while back, I sent AMA's Frank Ehling a $10 check and asked for an FAI World Record Sanction. The Oakland Cloud Dusters and Capitol Condors wanted to sponsor the event in connection with their annual West Coast Free Flight Championships. Back came a note (along with my check) with words to the effect that the Nordic World Record is 4 hr., 58 min. and 10 sec.! Worse yet, the record in FAI Power is 6 hr. and 1 min. OOS! The Wakefield record is 1:41:32. After listing these times, Frank wrote cryptically: "Dear Chuck: Are you still interested?"

Later, I learned that rules governing each of these world record events are on the basis of one flight only. This raises a question as to why the FAI doesn't provide for world records based upon successive maxes, along the lines of the existing rules for the biennial international free flight championships, but eliminating the rounds system. It would seem that present records for Power and Nordic may stand forever! I was glad Frank sent my money back. . . .

Half An Eye: David Schmidt has a proposal for FAI-Power flying, which he believes would reduce considerably the complications involved in this international class, yet retain its excitement. He suggests an event designated ½AI for models weighing a minimum of ten oz. and powered by an engine of 049 displacement. Maxes would be three min.

with an engine run (hand launch) of ten sec.

Dave feels such an event would bring young blood into FAI flying. "Most beginners build a Coupe before a Wakefield and an A-1 before an A-2. With ½AI, a beginner (or an advanced flyer who hasn't flown FAI) could get the feel of FAI and its excitement." Dave's MAC, the Sky Hoppers of Orange County (SHOC), as a trial run, has scheduled a special ½AI event at the all-FAI Western Free Flight Association meet, Nov. 7-8, Taft, Calif. . . .

Stalick on FF

(Continued from page 31)

ward completion of step two.

Session 4: Complete and fly models in formal competition.

Session 5: Begin building a hand-launch glider. (The Jasco series is a good one.)

Session 6: Complete hand-launch glider structure and introduce sanding and doping techniques.

Session 7: Work on adjustments and flying hand-launch glider. Hold an informal competition. Hand out Ranger 28 (Goldberg kit) and, if possible, begin basic contruction.

Session 8: Work on structure of Ranger 28.

Session 9: Using the Ranger 28, introduce covering techniques. Also, if possible, begin doping.

Session 10: Complete Ranger 28.

After the ten-week session is completed, hold a contest for all categories of models built so far. Such a contest can be held indoors or out. Prizes should include kits, medals and ribbons or other token awards to encourage youngsters to build on their own.

Although the above sequence is sketchy, the flexibility enables it to coordinate the available resources with the abilities and interests of the youngsters.

The first ten-week sequence is followed by a second ten-weeks' program for advanced youngsters who have successfully completed all phases of the first program. The second program introduces gas model building and flight training and is an all-control-line oriented program. . . .

Nordic Wing Tongues: For A-1 and A-2 glider types, the aluminum or wire and tubing wing tongue is a standard feature of the towline glider and has saved many a wing from being broken by overly enthusiastic tow reel handlers or from gusty winds. Most of what has been written on the subject has stressed the favorable aspects of flexible wing mountings; therefore, an article, "Flexible Wings," written by British Glider expert Mike Reeves for a recent issue of **Free Flight News** (Ascot, Berks, England) comes as a surprise.

Reeves states, "I don't like them. My reasons are: on the line or off, lateral/directional stability is dependent upon correct balance between dihedral and fin area, among other things such as hook position. Therefore, if dihedral increases on tow because of flexible wing joiners and/or structure, the balance is upset and the fin is too small, resulting in a weaving tow. A flexible wing also will tend to twist under load, not necessarily in a way that is symmetrical about the model centerline. Of course, rigid wings

have disadvantages, the main one being shock rips in the top surface and a tendency for ribs to split when the model blows over on its back."

These lucid arguments against flexible wing tongues should provoke some discussion. As for me, I still plan to use them. Any rebuttals to Mike's arguments?

Tenny on FF

(Continued from page 31)

12th and 17th, and were flown by Hardy Brodersen, Ron Plotzke and Jim Jones, Jr.

Best Junior flight was Tim Noonan's 6:32.2. Clarence Mather won Open PennyPlane with 8:28. This time seems to indicate that PennyPlanes eventually will make ten-minute flights—pretty good for 18" span models which are required to weigh about .1 oz.

Whatever the ultimate PennyPlane flight time happens to be, one thing stands out when these models are flown. In stark contrast to standard indoor events, the atmosphere of a PennyPlane meet is free and easy. The PennyPlane represents a different sort of challenge—emphasizing clever design and flying skill, rather than painstaking construction and delicate ground handling. Lack of tension is evident as the fliers really enjoy themselves!

Smith on CL

(Continued from page 26)

don't have anybody out there with you. Come on in.

New 1/2A Proto Records: Jim Wade showed them all how to do it as he set two records in Jr. Proto. 91.52 is the time to beat. His backup time was 90.87 mph. In Profile Proto 1/2A he turned 82.54 mph, backup 81.90. These records were set at the second annual AAA Southern California Regional Championships, Aug. 15-16. His model in Proto was a Kirn-designed Little Pronto, with V-tail modification. The engine and prop combination in both ships was strictly stock Cox with 4¾" dia., 5" pitch at tip, 3" at hub paddle blader; Cox pan, 6 oz., single wire. . . .

Set a Record and End Up in Second Place: This is what happened to Charlie Legg. The Bartley-Garner team had turned 95.91 mph for a record time, but couldn't back it up. Charlie got a crack at it because his second place time was also a record. His backup run got him the record but also second place with his 94.65 mph. Wouldn't it be something to watch if the free flighters had to back up their records? . . .

Rev-Up Plant Burns: The prop plant of Rev-Up burned to the ground in July. Word is that all equipment was destroyed. Don't know what the rebuilding schedule is but, if you use these props, better stock up from the local balsa emporium. . . .

Thongs Used in Nats Speed Events: No complaints were heard when thongs were given to all fliers this year. They were used for every flight. Also furnished, at no cost, were Sullivan line connectors for all two-line airplanes. . . .

The Fair Sex in Speed Circles: Navy timers' eyes popped when Mary Lou Brown and Violet Hoyt picked up the handle at the Nats. Violet hails from Newton, Iowa, and flies Jet; Mary Lou, from Staten Island, N.Y., and flies all classes of speed. Both these gals are great competitors and get around the pylon with the best of them, as well as brightening up the pit area. . . .

40 Engines: K&B Manufacturing, Downey, California, is now using squish band heads on its 40 class engines. Makes 'em run a bit better. When ordering a new .40 mill from K&B, specify the chrome job. Doesn't improve performance but oh how it lasts. . . .

CL FAI Team Needs Support: Each time our CL team goes to Europe they represent us and our great country. Not only do they meet the best the world has to offer, they usually beat them. Funds are always needed to help support this group. While other countries are sending government-supported

teams, ours travels on its own. Why not run a raffle or an auction at the next club meeting and put part of the proceeds aside for the team? The AMA will handle all donations and you or your club will receive neat FAI patches. . . .

Instant Pollution During Winter Months: Snow is now on the ground or at least it's cold in most parts of the country, so some of you are running and testing engines for next spring. Make sure your test area, be it garage, basement, or whatever, has good ventilation. All fuels and exhaust gasses are harmful and/or toxic. Make sure a fan in running nearby to blow all gasses and fumes away from you. Leave a window open so these fumes can escape the test area. Could be that's why we're such a happy bunch—we may be on a permanent glue-fuel sniffing kick and don't know it. Anyway, be careful.

Blum on CL

(Continued from page 26)

to the firewall. The remaining part, which now encompasses the pushrod, is tied to the pushrod with fine copper wire. The pushrod should be positioned at the extreme limit of movement from the firewall before binding with the wire. This arrangement then forms a flexible seal and prevents excess fuel from passing through the firewall and soaking into other model components. . .

Promotes Scale-Stunt: Joe Radle speaks out enthusiastically for the retention of stunt appearance points. He feels a more detailed explanation of the appearance points catagory should appear in the rule book. In his opinion, workmanship should receive points for the actual work done. Foam wings, MonoKote, manufactured instruments, etc., would not be considered. Realism would be based on scale appearance; finish would be judged for realism as to whether it suits the aircraft. Originality would be judged on the basis of kit or builder design with possible consideration of extra controls such as kick-out rudder, retractable gears, etc.

Contributions of Stunt and Carrier: Response to this section has been good, but readers' contributions are always welcome. Good black and white photos; drawings and free-hand sketches; technical information on engine, tank, wingspan, area, weight of models; and ideas on the event or on model construction will add to the column. Send to 2417 Glen Place, Granite City, Ill. 62040.

McCullough on RC

(Continued from page 20)

on during flight but yet be easily removable.

Many a scale builder, after viewing Ellis' model and several other ships in the top five, realized that a less intricate prototype can be brought close to 100% duplication. The old belief that a Cub doesn't have a chance against a B-17 might well turn out to be the other way around. . . .

Six-Engine Stunter: With Nationals pressure over, Walt Burgin went sport flying with his B-36, did a perfect loop and several touch-and-go landings. A roll was attempted but, when the big ship looked as though it wanted to stay on its back, he quickly substituted a Split-S. This B-36 design is a natural, superbly smooth and seemingly immune to oc-

casional engine stoppages. . . .

Say Again: In a recent column on air brushes, aerosol cans were downgraded. This reference was intended only for cans of compressed gas which go whooshing at an impossibly high rate through the large airbrush under discussion. Aerosol cans of paint are most useful! . . .

Back Talk: Bill Hannan suggests that problems with residues from masking tape on models may be aggravated when the tape is soaked with thinners during spraying. In this case, any brand of tape can cause trouble. Sounds reasonable. Maybe we'll have to mask the tape with plastic sheet! . . .

Think Plastic: When some little odd-shaped doodads are needed to detail a cockpit, landing gear or engine, take a look in some of the plastic kits at the hobby shop. Many different shapes in a wide variety of subjects can be adapted, even some of the sprue is useful. If a kit is available for the particular prototype under construction, assemble several for use in checking out the appearance of markings and alternate color schemes. The highly-detailed plastic moldings also may make clear some aspect of the construction not apparent in photos. . . .

Scale Data Sources: Copies of the beautiful cutaway drawings which have appeared over the years in the English aviation magazine, **Flight**, can be obtained from the Photographic Librarian, Flight International, Dorset House, Stamford St., London S.E. 1. Prices: glossy 8 x 10", 78¢; 10 x 12", $1.02; 12 x 15", $1.50. Semi-matte surface can be had in larger sizes for framing. Dozens of rare and familiar aircraft—Lancaster, Spearfish, Mosquito, Seamew, Wyvern, Fokker D-23, FV-190, P-38, even the Graf Zeppelin. Photocopies of magazine articles on specific airplanes can be supplied also. Full list of cutaways is available on request.

McEntee on RC

(Continued from page 20)

ready for another tow.

The scheme, with a few modifications, appears to have possibilities. Braided cord should work much better; possibly two pulleys at far end spaced a few feet apart would keep the closed loop cord from twisting there. Operation over smooth ground would be a real help too. The try at St. Charles was over rough rocky ground and over the ridge of a small slope! . . .

Unnamed Modeler: The unidentified flier and his attractive glider, shown in the September column (p. 35) are Italian glider champ, Ferruccio Bogani, shown with his wife, and an original design (picture by Boris Kanneworff). Much action by RC gliders in Italy—12 meets were held in 1969, with official events for both powered and non-powered models. Top placers flew in an end-of-season meet to select overall champs. . . .

Beefed-up Cirrus Fuselage: Latest version of the popular Graupner Cirrus glider kit, featuring a sturdier fuselage, has stiffening ridges along the inside of front plastic pieces in several locations. The holes through which wing-attachment rubber passes have been strengthened, and the plastic plugs that retain

this rubber are much sturdier too. There is an external stiffening web on the tail section where it curves sharply upward to the stab holding section.

Fuselage shell areas seem to have been slightly thickened in some spots also. Newest kits have one other feature. In place of a plywood frame to hold the blue plastic canopy, a single molding of ABS is provided for this entire frame section. Earlier kits apparently had some of these changes, but only the latest have them all. . . .

Lightweight Rudder Linkage: Especially useful on very light gliders with long tails is the linkage (see sketch) Jack Perecman applied to a Jasco Nordic 72 he has flown for several years. Jack has found both glider and linkage reliable and trouble-free. Escapement is Bonner SN; 1/16" music wire torque rod had to be 4' long and showed too much twist. Thicker wire was too heavy, and a ¼" balsa torque rod didn't allow enough room at the tail to escapement rubber. . . .

Novel Eye Protector: "Sun Spotter" is a 6 x 4" rectangle of 1/8" thick green plastic to which two plastic clips have been cemented. It is designed to snap onto the lower end of the transmitter antenna, for eye protection when flying a glider near the sun, as is often necessary when following a thermal. Some fliers simply close their eyes as glider passes the sun. However, under some conditions the craft may be in the sun's vicinity for a considerable time, which means flying completely blind. With this Spotter on the antenna, the transmitter is held up high and rather near the face. One user says he sometimes can actually see thermals through the green plastic, but the maker claims only additional eye protection. Available from Willoughby Enterprises (Box 824, Tustin, Calif. 92680), $1.49 plus postage. Unit is made by Windancer in Sunnyvale.

Marks on RC

(Continued from page 20)

well. The wires were brought out for the POD servo via a small notch cut in the plastic case. The rudder servo sits quietly while changing throttle so there is no twitch as for pulse systems using a POD.

Remember: If used for landing gear, the transmitter must be on at any time the receiver is on, since the gear would retract if the airborne unit were turned on first. This is always a good idea; too often, when a flier goes to retrieve the model after completing a flight, he turns the transmitter off and sets it down while walking to the model. If there is interference, or if another transmitter on the same frequency or on an adjacent channel is turned on, the receiver is wide open and servos can be driven to one end and possibly damaged.

Stiletto

(Continued from page 23)

either end. Steel is preferred, but brass may be used if the ball end is inspected for wear before and after each flight. Thrust loading on the brass universal tends to cause abnormal wear on the ball and it may break off in flight.

The drive shaft is a 1/8 x 4" steel slot-car axle with 5-40 threads. The thrust washer is made up of a nut and washer grooved on the prop side and soldered to the shaft. The shaft is supported at the end by a 1/8" ID slot-car ball bearing in a pillow block made of brass tubing (shown in detail on the drawing). The OD of the bearing is not critical and may vary according to type. The bearing shown is 3/8" OD.

The drive mount is 1/8" plywood cut to contour and trimmed out to accept the engine, drive shaft, and pillow block. Groove out the cross ties to clear the shaft. Once the mount has been trimmed and the alignment of the engine and shaft checked for clearance and binding, drill the engine and pillow-block mounting holes and install the respective bolts, nuts and washers. Check the drive system again, making sure that the engine and shaft turn freely.

The drive system should then be epoxied to a hard balsa block hollowed out as shown. Let the epoxy cure thoroughly to insure that mounting nuts are held securely. Remove the bolts, and lift out the engine and drive line. At this point, a bit of solder or Lock-Tite on the threads will insure that the shaft or universal does not come unscrewed during starting. Reinstall the engine and drive line as it is used to check clearance for the lower fuselage half.

Airframe: Cut a 1/32" plywood sheet to the outside contour of the fuselage and glue it to another hard balsa block. This serves as a template for carving the fuselage. Hollow out the plywood and balsa block, checking with the upper fuselage for clearance and engine hole placement.

The wing is made up of two 3/32" balsa sheets epoxied together. Slot the wing for the spar and hollow out the lower left-hand side for the controls. The spar is 3/16 x 1/4 x 12" hardwood that has been slotted to accommodate the primary bellcrank. This model has been designed for two-line controls. If mono-line is desired, its installation follows normal procedure, with care to avoid interference with the cylinder head path.

Taper the spar to wing contour. Bend the landing gear wire (see drawing) and install on the spar by binding the inboard and outboard ends and applying epoxy along the length. Install the primary bellcrank and leadout wires. Then epoxy the spar assembly into the wing. When the wing assembly has cured, slot the center of the wing to match the fuselage contour from the spar forward to the leading edge and from the spar aft to within 1/2" of the trailing edge. Cut two slots in the lower fuselage allowing for width of the spar and trailing edge flange, and epoxy the wing to the fuselage. Install the primary pushrod, secondary bellcrank and secondary pushrod.

From a third hard balsa block, carve the cowl section, forming the intake duct and cooling passage. The intake duct is separated from the cooling duct with a piece of shim stock placed as shown. Glue the cowl section to the lower fuselage. Check for engine clearance before installing the cowl cover.

To the upper fuselage half, install the 1/8" balsa filler and tail sections. Cut the aft portion just behind the cockpit and glue to the lower fuselage half. Form the elevator and connect the secondary pushrod.

The entire model should then be sanded to final contours. Finish consists of Hobbypoxy Stuff for a fill coat and finish coat of three coats color and two coats clear Hobbypoxy paint. The interior is also generously coated with Hobbypoxy for fuel-proofing. The canopy and spinner are handformed, although a suitable substitute may be found for

either. The hollow section just aft of the cockpit is used to contain the fuel tank and will accommodate either pen bladder, balloon, or metal tank according to personal preference.

Flying the Stiletto does not require any special precautions. However, the plane responds rapidly to control because of the lower amount of inertia. The ball bearing and universal should be lubricated with a drop of light machine oil before each flight. A special note concerning vibration—there isn't any! The ball end of the universal acts to nullify any vibration made that may start in the shaft.

I hope that the Stiletto and its midship engine design will open a new field of Protospeed model design and also bring out new designs in other events.

Sundancer

(Continued from page 15)

When the whole frame is dry, reinforce the center joint with nylon, and set the assembly aside to cure.

Stabilizer and Fin: Make a cardboard template of the fin and trace its outline onto a piece of 1/16" balsa. Do not cut the rudder completely away from the fin; instead, cut through the top and bottom lines of the rudder, but just score the side line. This makes it easier to set the rudder for flight adjustments.

Pin down the leading edge, trailing edge, and spar of the stabilizer. Fit and cement in the crosspieces. Leave the stabilizer on the board until it is completely dry, otherwise the drying of those last two joints may cause a warp.

Fuselage: Both fuselage side frames are constructed at the same time so that they will be exactly the same. Pin down two top longerons and two bottom longerons. Cement the 3/32" balsa braces in place. Now cement the rest of the side braces to the longerons. When the frames are dry, remove the whole unit from the board and carefully split it apart with a sharp razor blade.

Cement the frames together at the tail. Using the top view, cut the crosspieces and cement two at the front. At this point, let this assembly dry at least overnight. Cement the rest of the crosspieces to the fuselage, one set (top and bottom) at a time making sure the fuselage is square before adding each set. Set the fuselage aside to dry completely.

Pylon: Cut the pylon pieces from 1/16" balsa. Cut halfway through the pylon sides (on the line), making a right side and a left side. Gently crack them and cement the pylon spacer in place. Cement the sides together at the rear. Cement this unit to the 1/16" base. Finally, add the pylon front and cement it securely. When dry, cement the toothpick dowels in place.

Noseblock: The noseblock consists of three pieces of ¼" balsa laminated (cemented) together. When cementing the pieces, alternate the grain of each piece. The first one should be vertical; the second, horizontal; the third vertical. Thus, the noseblock is stronger and less likely to split in half.

Next, drill or punch a hole through the exact center of the block, which is then carved to the shape shown on the plan. To its back, cement 3/32" balsa. See that the block fits snugly to the front of the fuselage, with the backing tight enough to keep the noseblock from falling out of the fuselage.

Bend a hook in one end of a piece of .045 wire 3⅜" long. Insert it through the noseblock, slip two small washers and the propeller on the shaft, bend the end over perpendicular to the shaft, and cement the end to the propeller. For extra measure, cement a piece of nylon over the end. Give the noseblock two coats of dope and set it aside.

Covering and Finishing: Using fine sandpaper, go over all the frames, sanding down the rough spots and lumps of glue. Predope with one coat all areas where the tissue will touch the frame. Caution: Use model airplane dope only in a well-ventilated room for your own protection.

The fin, pylon, and stabilizer platform, being all-balsa, need not be covered; but covering them is worthwhile since it does look better and adds strength. If they are not covered, give each two coats of clear dope. When doping the fin and stabilizer platform, pin them flat to the board and dope one side. When dry, flip them over, pin, and do the other side. This prevents the balsa from warping.

The stabilizer is covered with two pieces of tissue, cut to size, with a little overlap. Lay one piece on the table and spray it lightly with water. Do not soak or saturate the tissue. Put a heavy coat of dope on the frame and lay the tissue in place, carefully pulling out any large wrinkles. Rub the dope into the tissue with your fingers, using thinner. The results will look like a mess, but when dry none of those nasty wrinkles are left in the covering. Cover the other side the same way after the first side has dried.

The fuselage is covered with four long strips of tissue in a similar manner. Start laying the tissue down at the front and work to the rear on each piece. After the fuselage is covered, cement the toothpick dowel in the rear, beneath the stabilizer platform.

The fin and stabilizer platform each can be covered with two pieces of tissue. The pylon is covered with several small pieces. Do not use the wet tissue method on these parts; just dope through the tissue, rubbing it into the wood as you go.

Use the same procedure to cover the wing. Pre-dope the frame and cut tissue oversize. Just before laying tissue on

each panel, re-dope that panel only. Using the wet tissue method, start at one end of the wing and apply the tissue to the bottom of the outer panel. Next, cover the top of the same panel. Double tissue the center section of the wing between the first rib on each side of the center (indicated on the plan) by doping another layer over the first covering. This prevents the rubber bands which hold down the wing from puncturing the tissue.

Give all the tissued assemblies one coat of dope and set them aside for one complete day.

Rubber Motors: Cut a piece of 1/8" flat brown rubber 12' long. Dampen the ends and tie a knot that won't slip out under tension. Lubricate the motor with a rubber lubricant (from the hobby shop) or with a homemade mixture of half dishwashing liquid and half mineral oil (or baby lotion). In any case, do not use castor oil, which can deteriorate the rubber.

Final Assembly: Cement the stabilizer platform to the fuselage. Insert the 3/16" dowel through the fuselage and install the rubber motor. Cement the fin in place, making sure it is well-cemented and does not wiggle from side to side. Place the pylon on the fuselage and secure it with rubber bands. Attach the stabilizer, also with rubber bands. Lash the wing to the pylon firmly, but not too tightly. To prevent damage, the wing and stabilizer must be able to shift in the event of a hard landing.

Flying: If any warps have appeared, hold the structure over steam, twist in the opposite direction from the warp, and let cool. Repeat until there are no warps.

This model's unique feature is the convenience with which the pylon can be shifted for climb and glide trim, rather than adding dead weight to the nose. Dead weight, in the form of balancing clay, reduces flight duration.

Sundancer flies in a right-right pattern (right climb-right glide), so set the rudder about 1/16" to the right. Hand glide the model, moving the pylon toward the tail if the model stalls, toward the nose if it dives. If the pylon must be moved any further back than approximately 5½" from the nose, add clay weight beneath the fuselage in back of the nose block. Continue gliding the model until a smooth glide to the right is achieved.

When the model finally glides well, put about 100 turns in the motor. Before release, let the propeller run for a second or two, then launch the ship gently straight ahead. If it flies in a circle and glides down smoothly, put in 200 turns on the next flight. If the model climbs too steeply, move the pylon back about 1/16"; if it doesn't climb fast enough, move it forward. Put in only 200 turns until it flies satisfactorily at this stage.

Work up to the full capacity of turns on the motor by adding 50 at a time, and compensating for a climb or dive by moving the pylon. Test fly until a happy medium is reached. Moving the plyon too far upsets the glide trim. If the climb is still too steep, move the rudder a bit to the right, but don't fool with the rudder until all possible adjustments are made to the pylon.

The best way to put more turns in the motor is by stretch winding. Have a friend hold the model by the long dowel through the fuselage. Then pull the noseblock out of the fuselage about 30 inches and wind the motor, slowly

moving back toward the fuselage. I've managed to put about 500 turns in my motors using this method.

List of Materials:

These items can be found in any well-stocked hobby shop: medium balsa—1 sheet, 1/16 x 3 x 36"; 7 sheets, 3/32 x 3/32 x 36". Also, 3 sheets, 3/32 x ¼ x 36"; 1 sheet, ⅛ x 3/16 x 36"; and 1 sheet, ⅛ x ¼ x 36". Other materials are 1 tube Ambroid cement, 3 sheets Jap tissue, 1 4-oz. jar clear dope, 1 piece .045 music wire, 6 No. 32 rubber bands, 24 ft. ⅛" flat brown rubber, 1 piece 3/16 x 3¾" dowel, and 1 large hardwood thrust button.

Miscellaneous items are 3/32" balsa, ¼" balsa from the scrap box for fuselage and noseblock; toothpicks, and one old nylon stocking. Tools include an X-acto knife or 2 very sharp single-edge razor blades, pins, wax paper, building board, 2 pairs of pliers and 1 pair wire cutters.

Lockheed Air Express

(Continued from page 41)

everywhere and were seen by just about everyone.

Yet it wasn't just a series of stunts. There was more to it than flying into one airport after another to dazzle people with the jazzy airplane and to shock them with the playful pet. Col. Turner was as speed oriented as any pilot of his day, and records were waiting to be broken. In May 1930, he sped from Long Island to Glendale, Calif., in 18 hours, 43 minutes for a new record. It didn't hurt Turner's reputation or Gilmore's sales.

The next three Air Express completed were Wasp-powered versions: one for Texas Air Transport, one for the South American airline that was absorbed by Pan Am, and one used for sport by a succession of wealthy New Yorkers. The seventh and last Air Express (not counting two that were never completed but were sold for replacement parts to owners of originals) was ordered in 1930 but not completed until 1931. It was intended for a transatlantic flight that never came off.

This last Air Express—NR/NC-974Y—got off to a very slow and discouraging start, but picked up speed and became an historic airplane before it finally was wiped out in a Nevada desert windstorm in 1942. Hoping to be the first woman to fly from New York to Paris, young Laura Ingalls laid her tiny hands on the Air Express after the sponsoring Atlantic Exhibition, Inc., gave up, and the two became fast friends. Miss Ingalls had already made a name for herself in aviation by claiming, among other things, a couple of typical Roaring Twenty's records: 980 consecutive loops and 714 consecutive barrel rolls.

During March and April, 1934, Laura Ingalls became the first person to fly solo around South America, her 23-country flight covering almost 17,000 miles and winning her the 1934 Harmon Trophy. This was followed by a second place in the 1936 Bendix Trophy Race in a Lockheed Orion.

In 1936, the Air Express was sold to the Masakatsu brothers who hoped to fly it non-stop to Japan but never did. Two more owners and half a war later, the last of the Air Express line bit the dust.

There isn't much left now. None of the seven airplanes is known to exist,

(Continued on next page)

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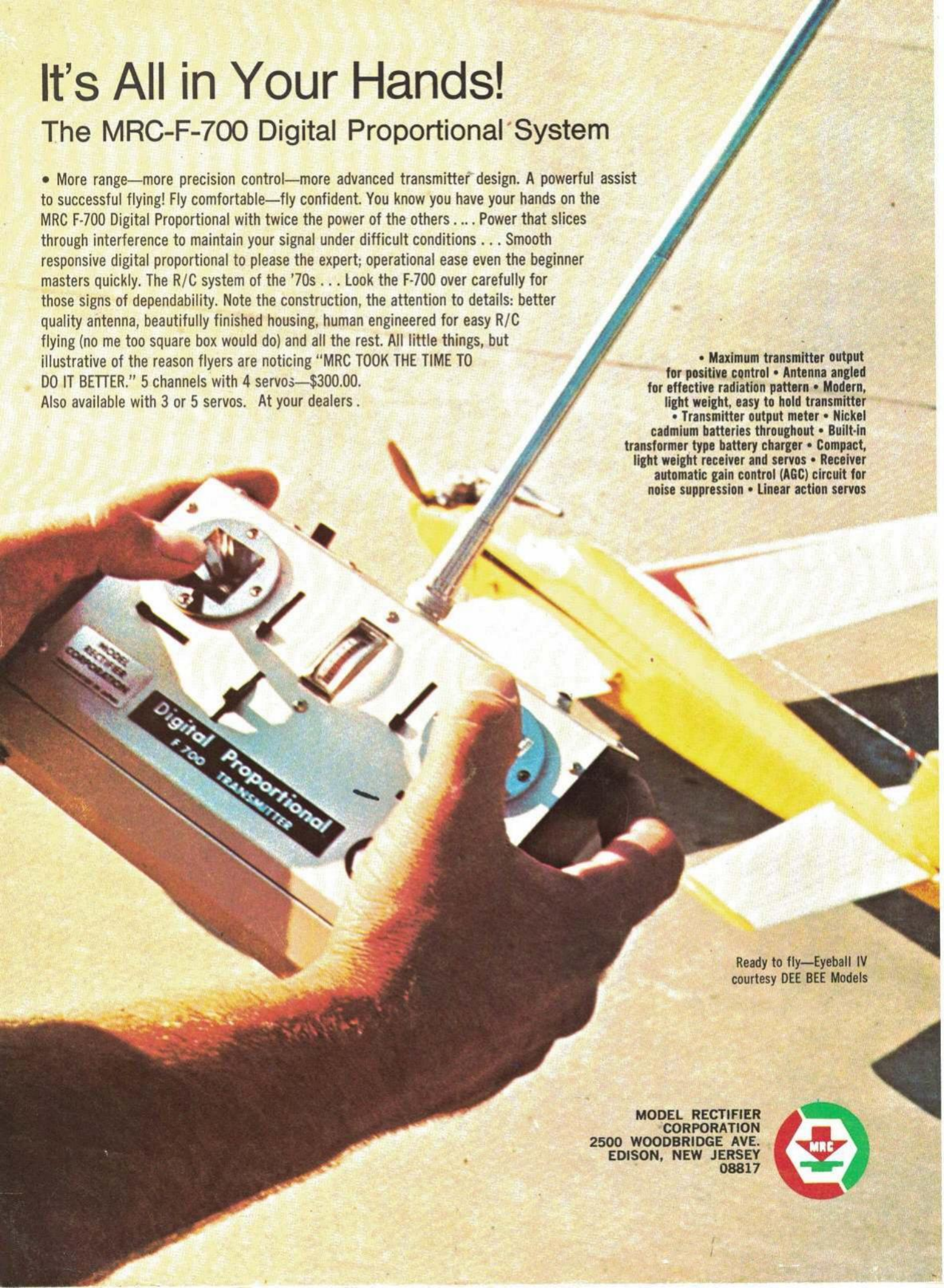

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