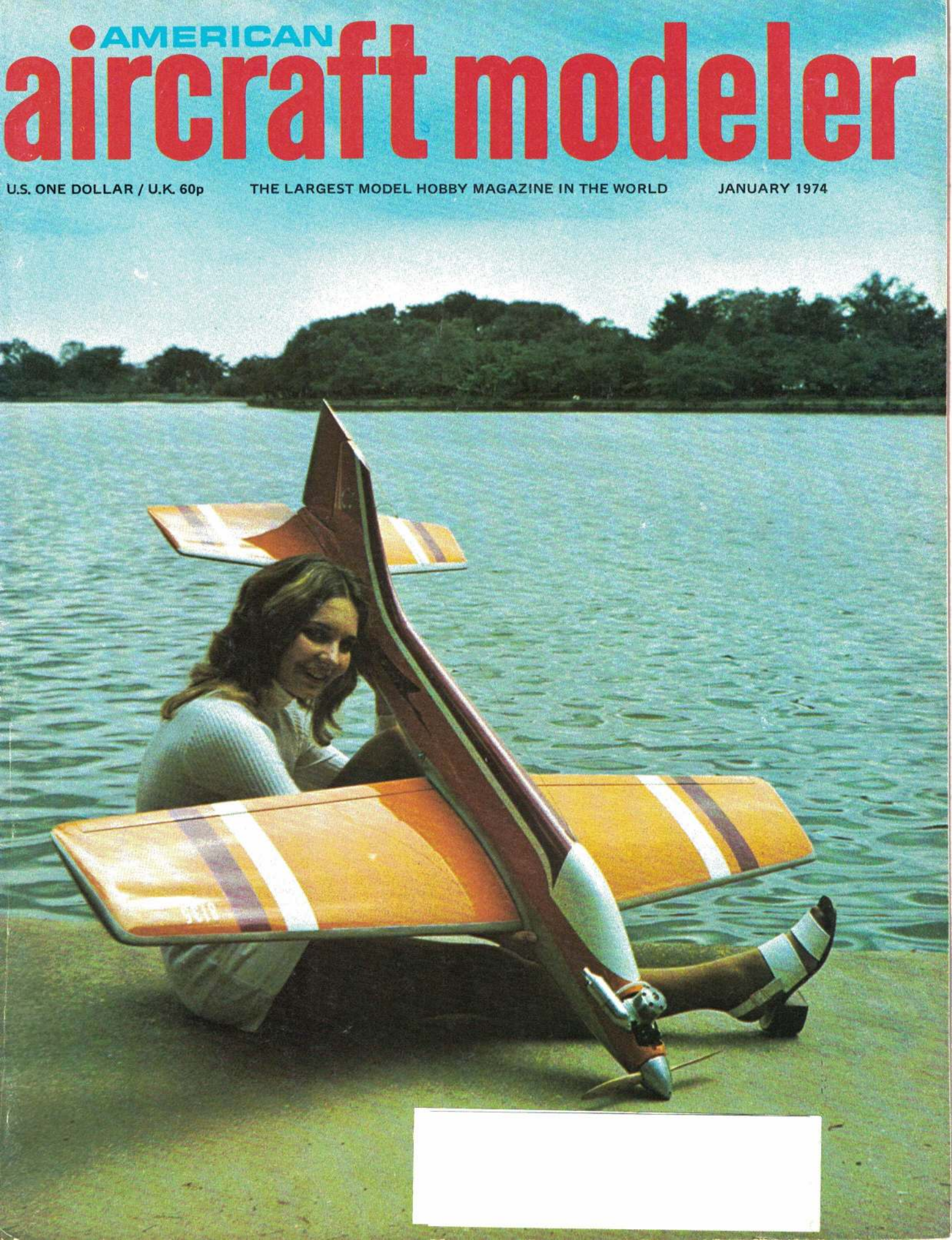
AMERICAN
aircraft modeler

U.S. ONE DOLLAR / U.K. 60p THE LARGEST MODEL HOBBY MAGAZINE IN THE WORLD JANUARY 1974



Beginners Control

SCIENTIFIC

Look like real planes!

Perfect for control-line beginners

solid balsa construction withstands hard landings time after time

Scientific Beginner Models are better than profiles...here's why:

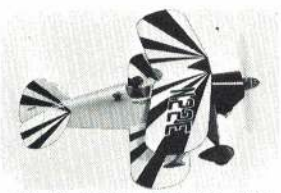
Most profile models have a plain, flat wing. Scientific's full-fuselage models have an extra-lift, one piece *air-foiled* solid balsa wing. Gives extra lift, makes flying and difficult maneuvers easy.

Scientific models have an exclusive pre-carved balsa body (not just a thin sheet of wood) which gives you a sturdier more realistic flying model.

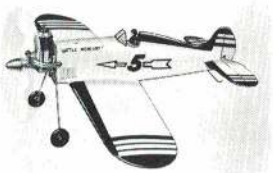
You also get these other features:

- **Extra-strength plywood motor mount**
- **Strong, formed metal landing gear and wheels**
- **Complete colorful decals**
- **Complete control assembly including formed metal bellcrank, hardware, control rod and horn**
- **Tailwheel or metal skid assembly** • **Elevator hinges**
- **Precision die-cut fin, rudder and elevator**
- **Plastic engine cowling, canopy and windshield (on most models)**
- **Complete step-by-step assembly instructions**

One look will tell you these Scientific kits are designed to get you flying F-A-S-T! Every kit is specially designed for engines .020 to .049. You're not limited to just one engine size. And they're just as easy to build as profile kits . . . but look like a real airplane. Whether you're a beginner or a pro, Scientific flying models are your best buy!



Kit 20 **LITTLE STINKER**, 18". Popular aerobatic speedster.



Kit 26 **LITTLE MERCURY**, 18". Easy to build and fly.

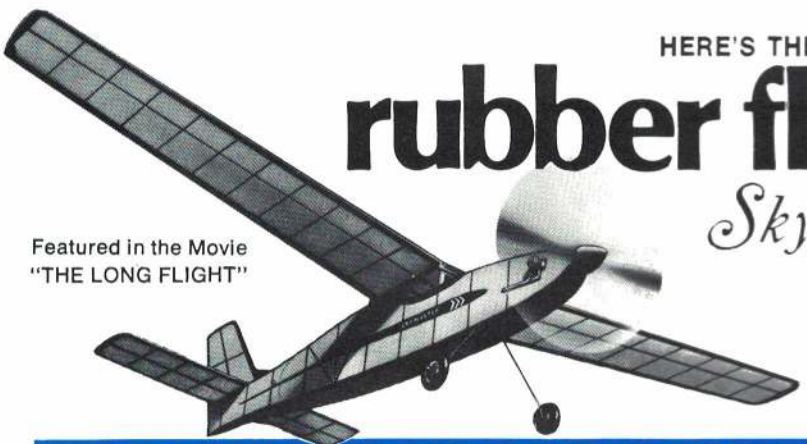
Kit 70 **F-51 MUSTANG**, 21". Famous WW II fighter.

Kit 72 **SUPER STUNTMASTER** 20". A built-up wing stunt sensation.

Kit 74 **MESSERSCHMITT ME-109**, 18". German WW II fighter.

HERE'S THE COUNTRY'S HOTTEST

rubber flying model



Featured in the Movie "THE LONG FLIGHT"

Sky Master BIG 36 INCH WINGSPAN

YOU FLY IT A MILE . . . with truly amazing performance like you never thought possible. Big deluxe kit includes Hi-Thrust Propeller. Formed Leading and Trailing Edges, Formed Wire Parts, Pure Contest Rubber Drive. Colorful Decals and Full Size (44") Easy to Follow Plans.

$4.95
KIT 160

SCIENTIFIC MODELS INC.
340DY Snyder Avenue • Berkeley Heights, New Jersey 07922

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

•Line Models

Fly like real planes!

SCIENTIFIC

21 popular models to choose from:

$4.95 each

P-40 FLYING TIGER
Kit #59. Famous World War II Fighter with 18" wingspan. Looks and flys like the real plane.

Photos of actual models

Kit 60 **STUKA DIVE BOMBER** 18" Scale model of W.W. II fighter

Kit 95 **PIPER CUB TRAINER** 18" Famous private trainer

Kit 48 **GOLDEN HAWK** 18". A great model for fun flying

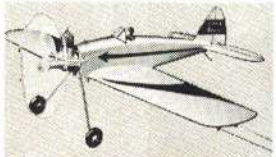
Kit 25 **STUNT MASTER** 18" One of America's most popular stunt models.

Kit 30 **RED DEVIL** 18" Great training model for beginners

Kit 6 **CESSNA BIRD DOG** 18" Scale model U. S. "Flying Jeep"

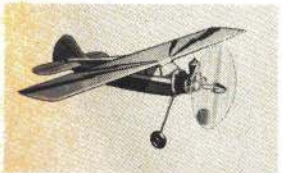
Kit 54 **CESSNA "182" TRI-CYCLE** High performance private plane

Kit 14 **PIPER TRI-PACER** 18" with popular tri-cycle landing gear



Kit 28 **LITTLE DEVIL** 18" Fast, easy to fly, great performer

Kit 7 **CESSNA** "180" 18" Model has good looks, great speed



Kit 53 **RED FLASH** 18" Model has sleek looks, good control

Kit 8 **PIPER CUB CRUISER** 18" Most famous of all Piper Cubs

Kit 65 **ZIG ZAG** 18" A stunt sensation, great looks too

Kit 18 **LITTLE MUSTANG** 18" Fast easy to fly semi-scale model

Kit 29 **LITTLE BIPE** Big 70 sq. in. wing area, 2 preshaped wings

Send for our big colorful catalog . . . only 25¢

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

AMERICAN aircraft modeler

VOLUME 78, NUMBER 1 JANUARY 1974

COVER STORY

Debbie Stouffer admires Bob Violett's beautiful RC pattern ship—SHRIKE. The Shrike is designed for fiberglass fuse, foam wing and a 60. Story begins on page 19. Cover photo by AAM Art Director Kelly Matthews.

MODEL WORLD

STUNT

DURATION

PRODUCTS

MODEL TECHNIQUES

SPECIAL INTEREST

RACING

SCALE

FOR THE TENDERFOOT

GETTING STARTED IN RC

ACADEMY OF MODEL AERONAUTICS

DEPARTMENTS

Potomac Aviation Publications, Inc.
733 Fifteenth Street, Northwest
Washington, D.C. 20005

EDWARD C. SWEENEY, JR.
Editor and Publisher

KELLY M. MATTHEWS
Art/Production Director

JEANNE M. SCHINTO
Copy Editor

Contributing Editors
JOHN BLUM
BILL BOSS
DON JEHLIK
DON LOWE
FRED MARKS
CARL MARONEY
CLAUDE McCULLOUGH
JIM McNERNEY
BOB MEUSER
WALT MOONEY
AL RABE
HOWARD RUSH
JOHN SMITH
BOB STALICK
BOB STOCKWELL

ERIC W. MEYERS
Products Editor/Photographer

DOUGLAS H. BOYNTON
Advertising Sales Manager

DAVID M. BOYNTON
Asst. Advertising Sales Manager

SANDRA B. CYMROT
Advertising Production Manager

JOSEPH R. WRIGHT
Circulation Development

GRETCHEN KNOWLES
Subscription Manager

MARK WINTER
Subscription Assistant

JOHN A. MILLER
Production Assistant

CAROLYN A. MUNSON
Art Associate

WILLIAM P. KOCHANSKI
Computer Compositer

HARVEY E. CANTRELL
Business Manager

ABDUL M. SAYEEDI
Assistant Business Manager

BEN MILLSPAUGH, M.S.
Advisor to Potomac Aviation Publications for Aerospace Education

STELLA S. REED, M.S. L.S.
Adviser to Potomac Aviation Publications for Libraries/Chairman, Board of Advisers for Child Education.

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

ADVERTISING DEPARTMENT: All advertisers orders and correspondence to 733 15th Street, N.W., Washington, D.C. 20005. (202) 737-4288. **SUBSCRIPTION RATES**: In U.S., Possessions and Canada, 1 Year, $9.00; 2 Years, $16.00; 3 Years, $23.00. Elsewhere $11.00 for one year. Payable in advance. Single copies $1.00. Six weeks are required for change of address. In ordering a change write to **American Aircraft Modeler** 733 Fifteenth Street, N.W., Washington, D.C. 20005. Give both new and old address as printed on last label. We cannot accept responsibility for unsolicited manuscripts or artwork. Any material submitted must include return postage. When writing the editors address letters: Editorial Office, **American Aircraft Modeler**, 733 Fifteenth Street, N.W., Washington, D.C. 20005.

POSTMASTER: Send Form 3579 to American Aircraft Modeler, 733 Fifteenth Street, N.W., Washington, D.C. 20005.

Second class postage paid at Washington, D.C. and at additional mailing offices.

The classic dilemma of the starry-eyed beginner.

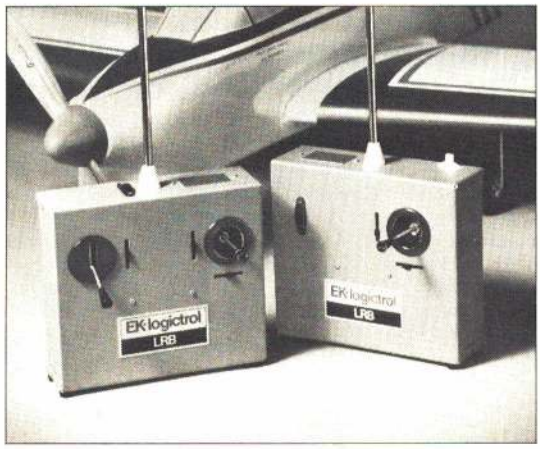
His first purchase of equipment can send the beginner spinning in circles. He leafs through a flyer's magazine; he looks around a hobby shop. Everything is so unfamiliar and confusing. He doesn't know which way to turn, what to buy. It's a formidable problem.

That's why EK-logictrol is so important to the beginner. We offer a way out—the LRB, the Little Red Brick. Put one in a beginner's hands and, given his enthusiasm, the basics of R/C flying are quickly mastered.

The LRB is "uni-packed" with two servos and receiver in the same package and includes a plug output for a third servo. The LRB has the smallest, lightest servos available anywhere.

The LRB transmitter is available with either single- or dual-stick control and has mono-ball sticks with adjustable tension—something you won't find on most units, regardless of cost.

And there is nothing like the LRB for the price: $119.95 for the two-servo unit with either one or two sticks, $159.95 for the three-servo unit with either one or two sticks.



EK-logictrol LRB. Try it. Price it. Fly it. And if you mean to stay in the air, take the controlled approach.

EK·logictrol

The controlled approach

For our full-line brochure, write: EK-logictrol, 3233 W. Euless Blvd., Hurst, Texas 76053.

Editorial

AN INVITATION TO MR. "STRAIGHT & LEVEL" BILL WINTER

Like Halley's Comet—and forgive us, dear Edmund, for dropping your name—which is drawn to the vicinity of the earth every 75 years or so (happily more frequent than the Kohoutek Comet), the writer (**JAM's** editor and publisher) finds himself swishing through the old familiar Straight and Level page. It is a kind of pleasant invitation by Edward C. Sweeney, Jr., **AAM's** bearded publisher, to tell you about a new magazine to be—**Sport Modeler.** (We'll get around to that in about the time it takes your epoxy to dry.) If you will forgive the tacky editorial "we," WE are distracted by the thought that, whereas the "Number One Son" was a byword with one competitor of **AAM's,** we now have a detente over the "Number One Beard." And, by now, the Promotion Department and Advertising Department heads—those serious fellows—are squeaking nervously in their swivel chairs. You know—this is important stuff, really. But they can wait.

The need for a magazine called **Sport Modeler** is so obvious, one almost wonders why we are explaining it. Since it is **Junior American Modeler** which fairly rapidly (beginning with the May-June issue) will evolve into a major magazine, a few findings and examples provide an introductory clue to what we are going to get into. **JAM** was aimed at the kids—from 10 to 16 years of age—the bull's-eye being 14 year-olds. It was right on. But it was acquiring more and more despairing readers of an older age—up to 82 years in fact! There were people who felt that ALL modeling was too complex and specialized. They had given up. They rejoiced to find out that they could still build and fly models. Others, looking at RC from the outside, were scared to death. But through a two-part article about getting started in radio, they found they COULD build and fly a radio job successfully—either a tail wagger or with a "brick." And then, they went hog wild. One we know of is now a good pattern flier. All this only highlights what all the magazines know—to cater to the ever-expanding numbers of the more skilled and experienced, they simply have to become highly specialized. The center of gravity of this field is radio. That's where the weight of the industry is. And that's where the overwhelming volume of ad dollars comes from—which is what pays the ferocious, rising costs. That's quite believable in these days of printing, paper, and stratospheric (still rising, too) postal and shipping costs. So let's not tee off on things that are bigger than any of us. Radio is not to blame. It's good, it's fun, and a tremendous sport. In fact, radio desperately needs **Sport Modeler.**

JAM was aimed at the kids, we said. We shall not forget them. But the main thrust of the magazine is toward the average guy, the sport flier—radio, free flight, control line. We will be adding plans and articles on radio control, also appropriate product reports and reviews—which you can read without falling off at the last curve. Although a fresh approach and new material in a distinctly different package will make it widely read and enjoyable—useful, too, of course—**Sport Modeler** will not compete directly with other magazines in the field. After all, who now speaks for the average guy, the Sunday flier, the chap who simply doesn't know how to get his feet wet?

Sport Modeler will be heavy on informative stuff, how-to-do-its in readable and easy viewing form. It will have its limits—it will not go beyond four-channel stuff in RC, and will have plenty of two- and three-channel stuff—equipment, use of, planes, and who knows, a boat or a car on occasion. In U-control, it will stop short of super-stunters; in free flight, short of the gadget man's fantasies. We are more interested in attractive, simple subjects in all areas, models which can be flown with a reasonable economy, without having to organize expeditions to find the source of the Nile. Why can't experts design small-field, fun free flights which would permit people to fly with enjoyment— rather than forcing them to stand by while the whole popular thing goes dizzily down the drain? So **Sport Modeler** presents to designers and contributors the greatest challenges in design and imagination they have ever faced. We are sure that you pencil-and-board people won't turn belly up at the radical thought that the model airplane field can stand improvement.

Good magazines take a long time to develop. About five years. We are in a heck of a rush for a better timetable than that. Within the Potomac Aviation Publications— that's **AAM, Model Dealer, RC Products Directory,** and **JAM,** at the moment—and there's machinery, talent, and avenues of communication with great deisgners and writers. So what will happen?

JAM has been 48, then 56 pages. **Sport Modeler** will still be bimonthly until the end of next year. Then **SM** goes monthly in 1975—if all goes well. Along the line, **JAM** will add more pages as we zero in.

We have seen major revolutions in the bygone days of this field. They were technical. The coming of the gas engine turned everything upside down. The field expanded. Control line gave it a fantastic push—now a guy could control his airplane, close to him. on a convenient flying site. Radio? It changed the modeling world and no one knows its limits. But now we have a social revolution. Radio made the hobby a sport—some say like baseball, golf and bowling. Why argue? Now, here is a shocker.

Recently, important, knowledgeable people conferred over the noble prospect of going into educational fields. Many people have wanted that from model aviation for two generations. The point was raised: We say models are not toys; we—all of us—have fought to put down that bad public image. But, if the models are not toys, how do we go into schools with HL gliders, ROGs, etc., for children? This is not the adult image of great projects and serious sport, as exemplified by radio control. Is this, any more, OUR responsibility? To this, the writer adds, "What have we come to?"

The **Sport Modeler** will help to maintain the balance between the monied expert and the beginner, the high-wire performer and the guy who has not even tried a tambourine. And **SM** can be enjoyable to the expert—can he keep his eyes off it?

What is a sport flier? In RC, the guy who flies pattern and the chap who hacks around the sky loving every minute of it, use the same starters, the same pumps, the same radios. We can only say that the sport flier—the novice, the guy half way down the pike—awaits a helping hand. RC is the constant beginner sport problem. But what do you call the chap who builds Peanut Scale? Who designs his won little Half-A FFs—perhaps Scale or Semi-scale? Who flies alone or with a buddy or two and not with a 200-man club on a defunct air base? Who glories in merely—not MERELY to him, brother—chuck gliders. Who experiments with the unusual? The off-beat gadgeteers? The guy with an RO Esquire or a Ringmaster? Does everyone have starters and pumps? Do they all use all the marvelous fittings and stuff? What about all the people who buy foam wings, plastic rubber props. Cox engines, who dabble at lonely workbenches? The guy who'll never impress anybody—the way the experts simply must? The sport modeler types are legion.

Yes, who can define a sport modeler. If YOU consider yourself a sport modeler, perhaps you'll write us and tell us why. And if you don't think of yourself as just a sport modeler, why not tell us who you think a sport modeler is?

"We" cordially and earnestly invite contributors to forward suggestions to me, Bill Winter, c/o Potomac Aviation Publications, Inc., 733 Fifteenth Street, N.W., Washington, D.C. 20005. Include info, a few pix, sketches, etc. Quickly.

R/C MULTI CHANNEL

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

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

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

R/C SCALE AND STANDOFF SCALE

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

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

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

R/C COMPACTS

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

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

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

SCHOOLGIRL . . . Span 32" Eng.: .020-.049 Kit RC-9 **$8.95**

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

SEMI SCALE STUNTERS

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

CURTISS P-40 TIGER SHARK Span: 42" Eng.: .19-.35 Kit S-50 $9.95

TOP FLITE

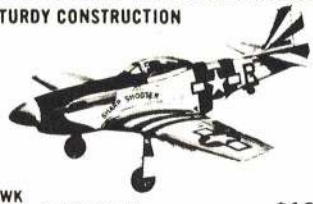
FLYING MODELS

for those who insist on the

VERY BEST!

CONTROL LINE SCALE MODELS

SUPER FORM **PREFORMED FUSELAGE SHELLS FOR FAST STURDY CONSTRUCTION**



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

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

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

½A FORM-FLITES (SCALE U/C)

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

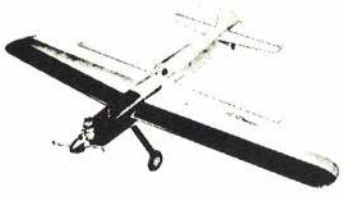
HELLCAT . . . Span: 18" Kit S-21

THUNDERBOLT . . . Span: 18" Kit S-22 $3.50

CONTROL LINE • STUNT PLANES

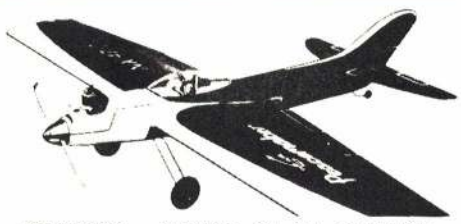
REPEATED NATIONALS AND WORLD CHAMP.

NOBLER . . . Winningest plane of all time. Span: 50" Eng.: .19-.35 Kit N-1 $17.95



NATIONAL AYSC PLACE WINNER

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



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

FAMOUS FLITE STREAK FAMILY

NATIONALS COMBAT WINNER

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

AYSC CHAMPION

JR. FLITE STREAK . . . Span: 31" Eng.: .15-.25 Kit N-3 $6.95

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

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

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

CONTROL LINE COMBAT MODELS

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

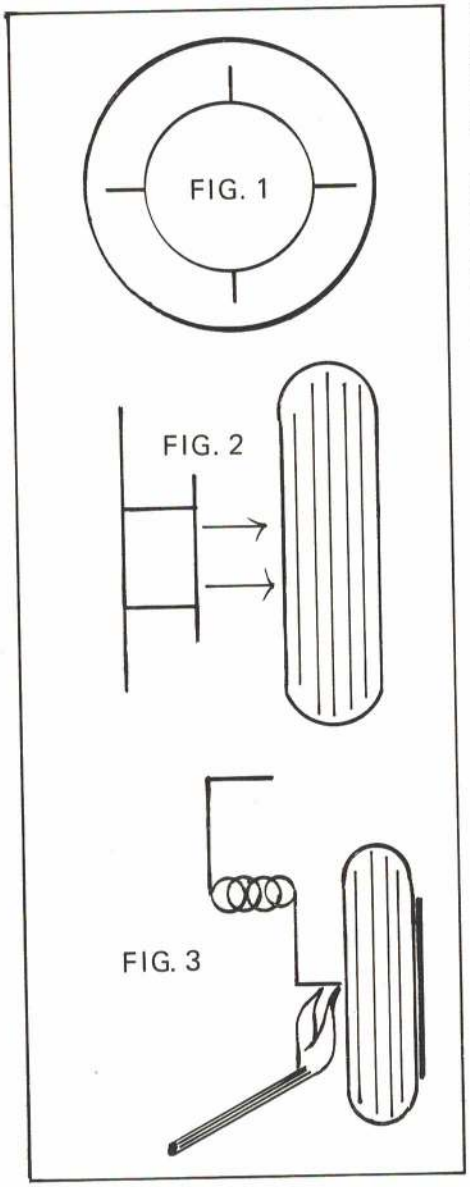
COMBAT KITTENS . . . Span: 22¼" Eng.: .049 Kit N-9 $6.50 2-models)

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

Modeler Mail

Solution to problem wheels

I've been having a rotten time with my RC plane wheels. The inner metal part always gets lost when the plane crashes. Instead of buying a new wheel, I use a plain sewing bobbin.



To do this on 1-7/8" wheels, cut four slits on the inner side of the wheel almost to the outer edge (Fig. 1). Then take the bobbin, small side in, and place it in the wheel (Fig. 2). The hole will be too small for most axles, so heat the axle and then push it into the hole and pull it off before the plastic rehardens (Fig. 3). You can then use a wheel hub (and collar if there is room).

Mike McCurdy
Stone Mtn., Ga.

The AeroMaster Saga

The AeroMaster was tooling along beautifully, looped out of level flight with 1/3 throttle, went half way through the loop and—disaster! The Supertigre 60 fell out of the plane. Spinner, prop, muffler and all went tumbling through the air.

The AeroMaster was built in 1971 from a Lou Andrews kit. It sat on the work bench finished and ready to go all through the winter of '71, '72, and even through the spring. We were trying to get a small scratch-built, low wing, 20-powered job to fly.

Then about the middle of July I convinced Jack that we should try the AeroMaster—at least start the engine and taxi it around a little. We went to Wright Field and fired up the Supertigre only to find we couldn't get a reliable idle below 3500 rpm. Back to the shop!

Jack bought a Perry carburetor to replace the stock carburetor hoping to achieve a reliable idle at an rpm which would allow the bird to land. We fired up the Supertigre again. An acceptable idle was achieved, but the throttle was backwards on the transmitter. (The Perry works in the opposite direction from the Supertigre.) We couldn't get full throttle, but did have enough rpm to give it a go.

A couple of taxi runs were made to check steering. On the second run, the tail-wheel came off the ground with no tendency to turn. I throttled back to get the tail-wheel back on the ground. But with the setup throttling back, I advanced the rpm and the AeroMaster was airborn with a good climbing attitude at 1/3 throttle.

Jack moved the throttle pushrod to the opposite side before the second flight. The engine started on the first flip. The throttle stick worked in the right direction, idle was good, frequencies were all compatible. So I taxied the AeroMaster out and took off with 1/3 throttle again. After lift off, I poured the coal to the 60 pointing the nose skyward and it climbed like a homesick angel. I rolled it inverted continuing the climb. Then, rolling it back upright, I began a series of climbing loops, and throttling back to about 500 ft., I rolled it over into a split "S."

After a few turns, rolls and chandelles, I went into another loop and that is when the engine fell off. Needless to say, the CG moved rearward rather abruptly. The AeroMaster completed that loop and another in short order. I yelled to Jack, "You're in trouble, we just lost the engine." I didn't hear his reply as my attention was concentrated on trying to figure out a corrective action other than just turning off the transmitter. I gave it a large dose of down elevator which stopped the third

loop from happening, the nose pointed down. I relaxed down elevator a little and it stalled, added more and finally established a fairly decent gliding angle. The AeroMaster responded to elevator and aileron. It was pointed away from me toward the runway so I held what I had. The glide was rather shallow so I steepened it a bit turning slightly to stay over the runway. At about ten ft., I began relaxing down elevator pressure slightly and the AeroMaster flared and sat down on three wheels very gently. It rolled to the edge of the runway and nosed over into the grass.

The only damage it sustained was a small dent in the MonoKote on the top of the vertical stabilizer from a chip of asphalt which was in the grass.

I've heard of engines falling off before, but never heard of anything but a pile of balsa splinters being recovered. I can only attribute saving this one to the excellent kit by Lou Andrews and the superb construction job Jack did on this one.

Robert Kelley, Major,
U.S. Air Force (retired)
and
Jack Parrish
Dayton, Ohio

How To Get Your FCC License

I have been reading your magazine for about one year and I am interested in radio control, but I have not bought a setup as yet. I am about 14 years old and work in the summer. How would I go about getting an FCC license? If you can help I would be grateful.

David Watkins
Williamston, N.C.

Write to the Federal Communications Commission, 1919 M Street, N.W., Washington, D.C. 20554. They will be able to answer all your questions.

—Editor

Save This Paint Job!

I recently painted a Chipmunk model with Dupont Lucite lacquer, but have now discovered that this paint is not fuelproof. I have attempted to give it a coat of fuelproof spray dope, but this only attacks the existing paint. Is there any method to make the model fuelproof without having to peel existing paint off? As it is quite a beautiful paint job, I am reluctant to do so.

Winston Liadie
71 Luke Lane
Kingston, Jamaica, W.I.

CARL GOLDBERG

FOUR YEARS AGO HE BEGAN WITH A FALCON 56 — TODAY HE'S NATIONAL CHAMP !

SKYLANE 62

Semi-Scale Beauty in a Great Flying Model!

Tough, Roomy Cabin and Front End, For 2 to 4 Channel Proportional. Steerable Nose Gear. Span 62". Weight 4½ - 5 lbs. . . . For .35 to .45 Engines. **$42.95**

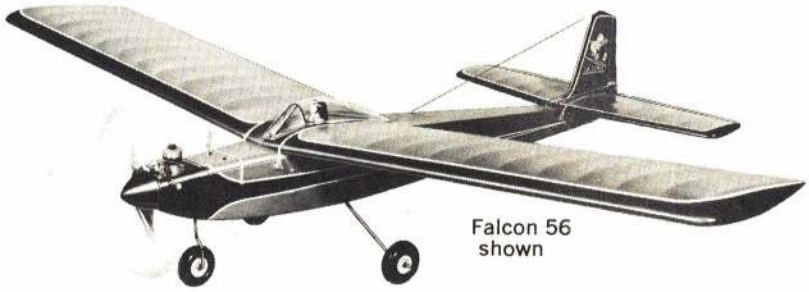
FEATURES:
- See-through cabin, with die-cut plywood cabin sides
- Shaped leading edges plus sheeting
- Cleanly die-cut parts that fit
- Clark Y wing section, hardwood struts
- Steerable nose gear, formed main gear

½A SKYLANE

For Single or 2 Channel, Pulse or Digital. Span 42". Weight 22 oz. For .049 to .10 Engines. **$10.95**

RHETT MILLER

At the age of 11, Rhett Miller saw a model he thought was flying on extremely long lines. It turned out to be an RC model performing its fascinating maneuvers! So Rhett, like many others, started RC with a Falcon 56. With the help of his parents and flying friends — including the great Jim Kirkland — he progressed at amazing speed. Soon he was into precision aerobatics. Finally, at the age of 15, he did the unbelievable. At the 1973 National Championships, he beat the toughest competition in the U.S., and took 1st place! Congratulations, Rhett, on an extraordinary achievement!



Falcon 56 shown

SKYLARK 56 — $25.95

1-Piece Full-Length Sides

Now With 1-Piece Full-Length Sides. Takes 2 to 4 Channel Proportional. Span 56". Weight 3½-4½ lbs. For .15-.19-.35 Engines.

FEATURES:
- Semi-symmetrical wing section
- Coil-sprung nose gear . . . formed main gear
- Shaped and notched leading and trailing edges
- Cleanly die-cut ribs, fuse sides, formers, etc.
- New simple "Symmet-TRU" wing construction

JR. SKYLARK

For Single or 2 Channel, Pulse or Digital. Span 37". Weight 18 oz. For .049 Engines. **$9.95**

THE FLYING FALCONS

More Falcons have been built and flown in the past 10 years than any other R/C. For values and features in a functional, rugged airplane, your best bet is a Falcon. Every design element engineered for simplicity and fast-building.

FEATURES:
- All Deluxe, with top quality fittings
- Coil-sprung nose gear . . . formed main gear
- Shaped and notched leading and trailing edges
- Cleanly die-cut ribs, fuse sides, formers, etc.
- New simple "Symmet-TRU" wing construction

FALCON 56 $22.95

The Medium-Size Trainer. Takes Single to 4 Channel Proportional. Rudder-Only or Multi-Training. Span 56". For .15-.19-.35 Engines.

SR. FALCON $42.95

The Standard Big Trainer. For 4 Channel Proportional. Span 69". For .35 to .60 Engines.

Junior FALCON $8.95

The Small Trainer. For Single or 2 Channel, Pulse or Digital. Span 37". For .049 Engines.

Shoestring $34.95

The Goodyear Racer With Enough Area and Stability So **You** Can Fly It! For 4 Channel Proportional. Span 54"; Area 540 sq. in.; Weight 4½-5 lbs. For .19-.40 Engines.

FEATURES:
- Shaped leading edges plus sheeting
- Symmet-TRU wing construction
- Full-length sides, sheeted trailing edges
- Cleanly die-cut ribs, formers, etc.
- Formed spring aluminum landing gear
- Semi-symmetrical wing section.

RANGER 42 - $19.95

The Versatile Almost-Ready-To-Fly Fun Model. Takes Single to 4 Channel Proportional. Also Free Flight. Span 42"; Weight 26 oz. For .049-.10 Engines.

All Carl Goldberg Models Come With Full Size Plans, Illustrated step by step, and Folder on How to Set Up and Operate R/C Models.

AVAILABLE IN CANADA

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

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

Name_____

Address_____

City_____

State_____ Zip_____

CARL GOLDBERG MODELS INC.
4735 WEST CHICAGO AVE. • CHICAGO, ILLINOIS 60651

SPECIAL! **Solarfilm Sale!** *Price in effect until January 30, 1974*

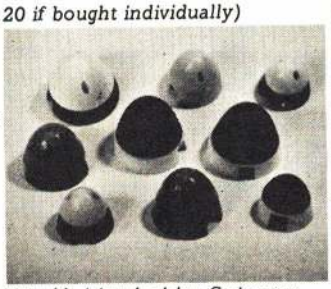
26" wide rolls, 6 feet long. No limit.

- OPAQUE COLORS—Bright Red, Dark Red, Orange, Yellow, White, Silver, Tropic Blue, Midnight Blue, Black. List Price $6.60 per roll. **SALE PRICE $3.88 per roll.**
- TRANSPARENT COLORS—Transparent Red, Transparent Orange, Transparent Yellow, Transparent Blue. List Price $7.50 per roll. **SALE PRICE $4.88 per roll.**
- METALLIC COLORS—Metallic Red, Metallic Green, Metallic Gold. List Price $9.00 per roll. **SALE PRICE $5.88 per roll.**

NEW IDEA! **Hobby Lobby SPINNERS**

"Bag" of 8 Spinners **$5.99**

(regular price $9.20 if bought individually)



The HOBBY LOBBY SPINNERS are pretty good spinners - I mean - what can you say about a spinner? These are nicely molded, the colors are reasonably attractive (red, white, black), the nose piece attaches with a couple of screws so it can't spin off when you pop an electric starter to it, AND, Hobby Lobby Spinners are CHEAP! So, there!

The "BAG" of Spinners is just a come-on, really. By selling you 2 spinners of each of the 4 sizes (1 ¾", 2", 2 ¼", 2 ½") and by assorting the colors

YOU will;

A. never run out of spinners,
B. be able to "customize" a spinner -- like a black base with a red top, etc.,
C. save $ because we're discounting the bag, and

WE will;

A. sell more spinners.

You'd expect to pay over four hundred dollars for such a radio.

RC MODELER MAGAZINE SAYS . . .

"Our (Hobby Lobby 5) has performed flawlessly under all conditions and its performance has equalled or exceeded systems selling for twice the price.

. . . If you want an extremely precise system that will offer you years of reliable service, then we seriously recommend the Hobby Lobby 5 to your consideration."

- **Unsurpassed Reliability**
- **Extremely Long Range**
- **Smallest, Lightest Servos Made**
- **Extra servos cost only $12.00 each.**
- **I.C. FULL-POWER servo amplifiers**
- **Full 90 day Warranty—backed by the manufacturer and by Hobby Lobby**
- **A complete system: Transmitter, Receiver, 4 servos, all n-cads, charger, 27 or 72 mhz.**
- **PRICE: About HALF of what you'd expect to pay for a top quality 5 channel system.**

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

Series III

HOBBY LOBBY 5 Digital Proportional $209

Please call or wite for FREE brochure, or, better yet just order the radio—they're in stock.

YEAR END SALE...SAVE $10.00

Until Dec. 31, 1973

Series III Hobby Lobby 5 **$199.00**

SAVE $$ ON THESE MATCHED COMBINATIONS

Midwest SWEET STIK and **K & B Stallion 35 RC Engine**

Total list value $55.90

SALE **$38.00**

Du Bro "Whirlybird" HELICOPTER and **K & B 40 RC Engine**

Total list value $162.00

SALE **$109.00**

Sig KADET

3 channel trainer, 57" span and

VECO 19 RC Engine

Total list value $56.95

SALE **$43.00**

Sig PIPER CUB J-3

71" Span, 4 Channels and **McCoy 35 R/C Engine**

Total list value $49.90

SALE $39.00

ACE HIGH Glider

70" span, 1 or 2 channels and

Cox Babe Bee .049 Engine

Total list value $21.20

SALE **$16.00**

V-K CHEROKEE "BABE"

53" span and

Fox 29 RC Engine

Total list value $56.90

SALE **$39.00**

Midwest CESSNA CARDINAL A-R-F *All Foam and*

Fox 15 RC Engine

Total list value $41.90

SALE $29.00

World Engines HAWK 460 Foam A-R-F

52" Span, 4 channels and **Fox 36 R/C Engine**

Total list value $49.90

SALE **$35.00**

HOBBY LOBBY BRAND X WHEELS

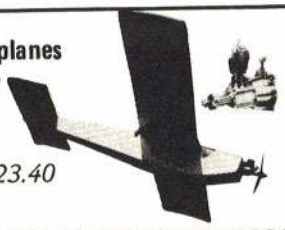
2" pair	$1.40
2¼" pair	$1.55
2½" pair	$1.65
2¾" pair	$1.75
3" pair	$1.95

CHEAP!

Southwestern Sailplanes "HONKER" *and* **Cox Babe Bee. .049 Engine**

Total list price $23.40

SALE **$17.97**



Sterling's Control-Line RINGMASTER *and* **K & B Stallion .35 Engine**

Total list price $23.95

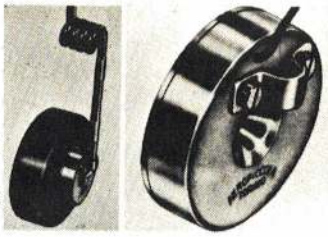
SALE **$17.99**

TRY US OUT: D. G. did:

"...your service is excellent...shipments are processed fast...all postage is paid so your discounts are really discounts whereas other places have discounts but after you pay postage there is no discount involved..."

D. G., Lynnfield, Massachusetts

Aeropiccola ELECTRIC BRAKE $7.95



The current rage for retractable landing gears has tended to down-play one of the more enjoyable aspects of RC flying; that aspect is Ground Handling – taxiing and stopping, landing and stopping and so on.

There is a satisfaction that can't be topped in accomplishing a smooth landing that's followed by a hard-braked stop, and then taxiing back to the "hanger" and executing a controlled stop at your field box. And, needless to say, this performance DOES dazzle the spectators!

ONE Aeropiccola brake on the nose wheel will give you controlled positive stopping action even on an 8 pound plane.

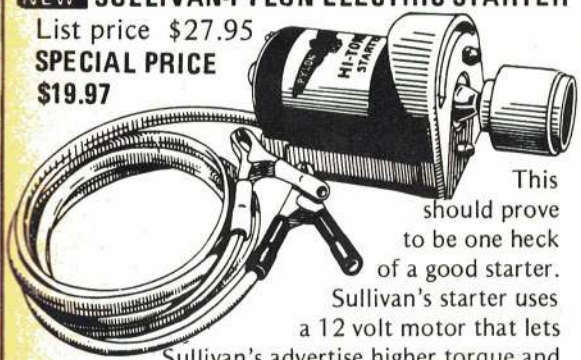
The advantage of an Electric brake is that it's the easiest kind of brake to hook up. It requires a micro switch, a bit of wire, solder, and a couple of pencell batteries. It doesn't require what mechanical brakes require; accurate positioning of a pull-line, a super-strong elevator servo, or elaborate tubing installations to route a pull-line to the servo.

We've drawn up a simple little hook-up diagram that shows you how to install the Aeropiccola Electric Brake and we'll throw the diagram in for free when you buy the brake.

Aeropiccola Electric Brake	*$7.95*
Micro switch	*1.95*
Solder	*.95*
Hook-up wire	*.10*
Servo mounting tape for switch - 2" -	*.10*
2 alkaline pencells (70 ¢ each)	*1.40*

NEW! SULLIVAN-PYLON ELECTRIC STARTER

List price $27.95
SPECIAL PRICE
$19.97



This should prove to be one heck of a good starter. Sullivan's starter uses a 12 volt motor that lets Sullivan's advertise higher torque and RPM's than any other starter. The starter has a strip switch and a pressure grip to enable you to shove the starter hard against a prop even when your hand's oily.

Starter cone has surgical rubber insert like Penford, but the plastic parts are nylon, which is a nice durability feature. Starter has a 2 year guarantee.

NEW! Volume II HOBBY LOBBY ILLUSTRATED CATALOG $2.00

Our Volume 2 catalog has more items, more pictures, and better pictures and descriptions of R/C and control-line stuff than we've seen in any other catalog.

We had a lot of guys tell us that our previous catalog was well worth the two bucks it cost them. Volume 2 is even better.

SEND YOUR KIDS TO CAMP IN A

Senior Telemaster

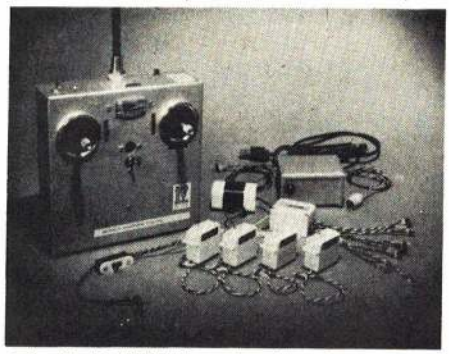
- 95" wingspan
- 14" chord
- 1330 square inch wing area
- average wing loading 9 ozs. per sq. ft.

I'm taking my life into my hands by advertising these kits because a lot of our customers have had these on back order. NEVER have we run into such terrible supply problems as we've had with this kit. However, Alex Engel, who makes these kits for us in Germany, tells me that he's sending a super shipment that'll arrive here in November or December. He was (I think) cold sober when he promised this.

I think the best way for you to order this kit is to let us send it C.O.D. or charge it to one of the two credit cards we honor. This way, if there is a delay on the kit, you're not out any $ until it's shipped. Hopefully, this shipping delay won't be so bad this time.

NEW! *Blue Max* MARK IV 6 Channel Digital Proportional *SEMI KIT.*

$179.00
(assembled radio shown)



The new Blue Max MARK IV system is almost exactly the same outfit as the brand new WORLD radio system featured in the RC MODELER Magazine kit construction articles. These construction articles will be running for many months, but you can QUICKLY complete the much-easier-to assemble MARK IV SEMI-KIT and have a radio of comparable quality to the WORLD system NOW!

The MARK IV Semi-kit has the same new transmitter/R.F. section as the WORLD outfit, a new transmitter case design, and has EXACTLY the same airborne portion (receiver-decoder, servos, batteries) as the new WORLD system.

This new MARK IV outfit is by far the least expensive way for you to acquire a top quality 6 channel digital propo. ALL the difficult soldering of miniature electronic components to the printed circuit boards has been done at the factory, and then these sub-assemblies have been TESTED, and then given a full factory guarantee. And, to further entice you to buy this outfit now, the factory has FULLY ASSEMBLED the four tiny S-9 servos!

This MARK IV SEMI-KIT is a project that we feel we can recommend to ANYONE -- even if you have never tried electronic assembly before, and even if you know nothing about the technical theories that make a radio control system work.

The MARK IV SEMI-KIT as sold by Hobby Lobby includes: SEMI-KITS for Transmitter, Receiver-decoder, all rechargeable nickle-cadmium batteries for transmitter and airborne, AND four FULLY-ASSEMBLED S-9 mini servos, plus World Engines' full WARRANTY on all factory-assembled sub-assemblies and servos.

HOBBY LOBBY INTERNATIONAL

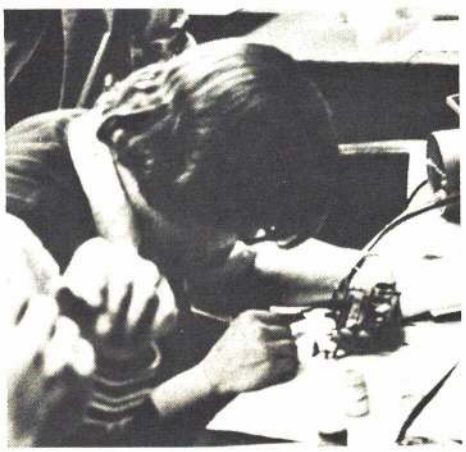
Route 3, Franklin Pike Circle, Brentwood, Tennessee 37027 - 615/834-2323

DROP YOUR ORDER IN THE MAIL BOX, THEN JUMP BACK BECAUSE WE SHIP FAST! We pay postage (in U.S.) on all orders accompanied by check or money order. Satisfaction guaranteed or money refunded. Phone 615/834-2323 Store Hours: 9 a.m. - 5 p.m. except Sundays.

Uplift

MINI AIR EXPO '73 / A GROUP OF CLUBS WORKING TOGETHER

JAMES BROWN, MINI AIR EXPO, INC.



ABOVE: Henry Fisher, Marriott Inn's general manager, inspects Jenny with Jim Brown. RIGHT: Any type of workshop at a show will usually draw a crowd. BELOW: Brown was always ready to answer any questions.

Something exciting happened on Thanksgiving 1972 at the Marriott Inn in Minneapolis, Minnesota. With the all-out support of the manager, Henry Fisher, and the commitment and enthusiasm of three local model aviation clubs, Mini Air Expo '72 was born.

It was their idea that all aircraft modelers, regardless of their various interests, share the common objective of promoting model aviation to the public. The public showed their support as over 5000 people eagerly streamed through the banquet rooms which housed the displays during the two-day event. Thousands more read of the show and of model aviation in the Minneapolis and St. Paul newspapers and viewed highlights of the show on local television. There was plenty to see as close to 1000 models were laid out some even hanging from the ceiling! Many people indicated through random polling that they would like to see another show. With the success of Mini Air Expo '72 behind them, the same bunch of guys are going to do it again, bigger and better than last year with Mini Air Expo '73 by the formulation of the non-profit service organization, Miniature Air Expo, Inc.

Miniature Air Expo, Inc. is unique in that it successfully combines different model hobby groups into a single active service organization. To help understand the growing pains the organization went through, let go back to the summer of 1972. Mr. Henry Fisher, general manager of the Marriott Inn of Minneapolis, and Bob Nelson of the Twin City Aero Historians came up with an idea, in one of those "creative" bull sessions. "Let's fill up the Marriott with model airplanes and open it to the public." Maybe these exact words never were spoken, but the idea was born. Bob contacted as many of the local model aviation clubs as he could, and the question was put, "Do you wish to take part?" Free flight, radio control, U-control, non-flying scale and other interest groups gave their answers: "No! Too much work!" "We'll be taken for a ride!" "Our group can't work with that group!" "What's in it for us?"

Nevertheless, three clubs said "Yes," maybe not with 100% enthusiasm, but they were willing to try. The Minneapolis Piston Poppers, an AMA sanctioned U-control club of about 50 members, the St. Paul Model Radio Controllers, Inc., an AMA sanctioned radio control club of about 100 members and the Twin City Aero Historians, a non-flying scale club of about 50 members, went to work to put together a show. Henry Fisher supplied 500 sq. ft. of display area in the Marriott, 19 trophies to be awarded to the exhibitors, additional prizes, the services of his public relations firm, free of charge to the modelers, and Miniature Air Expo '72 became reality.

These three clubs started working and planning. Specifically, representatives from each club formed the working committee to plan the upcoming show. The date was set and then Bob Nelson

(Continued on page 89)

$12.

SUPER DETAILED WORLD WAR 2 3/4" SCALE FIGHTERS AND DIVE BOMBERS

(USE .049 TO .09 ENGINES)

KIT 1001
REPUBLIC P47-D THUNDERBOLT
30¾" wing span

KIT 1003
DOUGLAS SBD-3 DAUNTLESS
31¼" wing span

KIT 1002
GERMAN JUNKERS
JU-878 STUKA
34¼" wing span

KIT 1004
VOUGHT F4U-4 CORSAIR
30¾" wing span

GUILLOW

OFFERS THE FINEST SCALE MODEL KITS

All models are ideal for gas or rubber powered free flight. The eleven World War 2 models can also be flown by control line. Each of these eleven kits contains a bell-crank, control horn, pushrod, control handle and Dacron flying lines.

Guillow's

KIT 2001
LOCKHEED P-38L LIGHTNING
40" wing span
3/4" SCALE
$18.00

AVAILABLE IN CANADA

SHOWING CONSTRUCTION DETAIL

$7.

FABULOUS WORLD WAR 2 3/4" SCALE DETAILED MODELS

(USE .020 TO .07 ENGINES)

KIT 402
NO. AMERICAN
P-51 MUSTANG
27¾" wing span

KIT 406
FOCKE-WULF FW 190
25¾" wing span

KIT 403
SUPERMARINE
SPITFIRE
27⅝" wing span

KIT 401
MESSERSCHMITT BF 109
24⅜" wing span

KIT 404
MITSUBISHI ZERO
27⅝" wing span

KIT 405
CURTISS P-40 WARHAWK
28" wing span

$5.

DRAMATIC 1914-1918 AUTHENTIC SCALE WAR BIRDS

(USE .020 ENGINE)

KIT 204
FOKKER TRIPLANE
20" wing span

KIT 201
THOMAS MORSE
SCOUT
24" wing span

KIT 202
BRITISH SE5A
24" wing span

KIT 205
DeHAVILLAND 4
27" wing span

KIT 203
NIEUPORT 11
24" wing span

KIT 206
RUMPLER C-5
24" wing span

$3.

POPULAR LIGHT PLANES... LOOK AND FLY LIKE ORIGINALS

(USE .020 ENGINE)

KIT 301
AERONCA CHAMPION 85
24" wing span

KIT 302
CESSNA 170
24" wing span

KIT 308
BEECHCRAFT
MUSKETEER
20" wing span

KIT 307
PIPER
CHEROKEE 140
20" wing span

KIT 303
PIPER SUPER CUB 95
24" wing span

KIT 309
CESSNA 150
24" wing span

PAUL K. GUILLOW, INC.
Dept. A, WAKEFIELD, MASS. 01880

Hobby stores have Guillow models. Check the Yellow Pages for the one nearest you, or send direct to factory adding $1.00 handling in U.S.A., $1.50 outside U.S.A. Send 10¢ for catalog.

Your BANKAMERICARD welcome here

WE HONOR master charge THE INTERBANK CARD

CHRISTMAS SPECIAL

Take advantage of this SPECIAL when making any purchase from this ad, get our new catalog for $1.00!

AMIGO II

Graupner

Graupner's sailplane for tow and powered glider conversion. 78" span. Die and printed balsa and plywood. Decals and parts.

XMAS SPECIAL

Sug. Retail $39.95 **$29.99**

CIRRUS Hobby Shack SIX

COMPLETE 6 CHANNEL SYSTEM W/ 4 SERVOS

6 channel transmitter and receiver, Ni-Cads, switch, harness, charger and four mini-servos.

$209.00

FULL 90 DAY WARRANTY

Veron FOKKER DVIII & Taipan 15 RC

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

CHRISTMAS SPECIAL

$36.88

$54.98 Value

Lanier SPRINT 25 & Taipan 21TBR

-S RC

$55.74

Fly with rudder, elevator and throttle. Ailerons opt. ARF - 50" span and Taipan's .21 TB R 'S' Schneurle port. Together retail $92.90, Save 40% ! ! ! !

CIRRUS Hobby Shack SPORT III

You just can't buy a better 3 ch. radio system

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

72 MHZ will be available in December.

Sport III w/ 3rd servo $115.00

Sport III **$89.99**

add $10.00/72mhz

INSTANT R/C READY MIX · INSTANT R/C-PAK

1 Hour Assembly and Fly!

Total Pak instant r/c

(1 HOUR TO ASSEMBLE & FLY R/C)

HERE'S THE DEAL! XMAS SPECIAL

RADIO, ENGINE AND PUSH RODS ARE ALL FACTORY INSTALLED!

PLANE: 50"span — ARF, assembled !!! RADIO: EK 'LRB' 3 channel complete with 3rd servo !!!, ENGINE: is the . . FOX 25/R/C mounted in place! + installed; tank, prop, push rods, landing gear & hinges, wing covered.

Christmas Special

instant r/c

$199.00

HEAT GUN & 2 ROLLS OF FLITE-KOTE

RED, LT BLUE, DK BLUE, BLACK, YELLOW, ORANGE, WHITE

Christmas Special

$19.99

$33.85 TOTAL VALUE

Christmas Radio SALE

Blue Max (Includes new, 4 S-9 small servos.)

Semi-Kit Mk IV 6 Channel

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

WORLD ENGINES BLUE MAX
6 Channel 2 Stick Assembled $340.00 . . . $219.00

EK LRB (LI'L RED BRICK)
3 Channel w/ 2 Servos Brick $129.95 . . . $106.00

EK CHAMPION SERIES 73'
6 Channel 2 Stick System $349.95 . . . $256.00

AIRTRONICS ACROSTAR

50½" span .40-.60 disp.

Christmas Special

Retail $75.00 **$59.99**

SPINKS & McCOY 40RC

$70.90 VALUE!

Hobby Shack's Spinks Acromaster 4 channel 54" span "stand-off scale" mid size sport thriller and McCoy's 40 R/C power plant!

Christmas Special

$39.99

One of the best radio buys in America

World Engines PYLON '5'

5 Channel 1 Stick and 4 Servos

Complete system with all Ni-Cads, switch harness, and new RS-5 servos.

Only **$189.00**

CARDINAL SQUIRE & McCOY 40R/C

RETAIL $81.90

New 74" span, balsa covered foam wing and stab plane / Midwest + McCoy .40 R/C!!

XMAS SPECIAL

$56.66

6475 KNOTT AVENUE BUENA PARK, CALIFORNIA 90620 TELEPHONE 714 522 4921

Hobby Shack

THE REAL THING

If you're not flying the REAL THING . . . you must be flying something else!

46" wing span, 318 sq." .049 to .10 engines for 2 to 3 channel radios.

Only $11.99

GRAUPNER CIRRUS GLIDER

Molded fuselage shells.

3 channel Giant scale glider.

XMAS SPECIAL

suggest retail - $82.50 **$49.99**

NEW BLACK WIDOW

Sale $6.99

Graupner BELL 212tj

Complete Kit.

Our Price **$399.00**

The BELL 212TJ can be flown with or without collective pitch of the main rotor. The fuselage is of epoxy-glassfilled, and not polyester-fiber. To complete the model only the factory pre-assembled building components are needed; no other individual parts have to be assembled, glued or put together. All components are tested, pre-adjusted to the highest degree. The transmission unit does not require any oil; no service whatso ever is needed. Engine is a specially designed HB 61 STAMO with fan, fan housing. Special muffler is included and already factory installed

VERON KITS

VERON is one of the longest established and finest kit manufacturers in the whole world. Veron, from England.

Hawker Tomtit

52" Span, for .23 to .40 engines and small full-house multi. Includes die-cut balsa and ply, pre-bent wing and undercart struting, scale plastic motor (Mongoose), scale vintage wheels and spinner. Authentic decals.

$59.99

1-Half Struter Sopwith

48" Span / very near to scale, for .15 to .25 engines. 750 sq." wing area, 3 channel operation. Includes vacuum-formed cowl, scale vintage wheels, all wire struting, die-cutting, and vinyl decals. Truly a superb kit. Circa WWI: 1917/18 scale

$34.99

RF-5 Fournier

R/C GLIDER = 6 foot span. complete hardware, cock pit

$32.88

Fokker D-VIII

2 CHANNEL

46" span / .15 power, ultimate in stability.

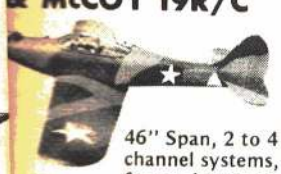
$24.99

Springbok

Powere R/C GLIDER = 6 foot span. (.09 to .15) for 2 channel gear.

$26.88

SURE FLITE P-39 & McCOY 19R/C



46" Span, 2 to 4 channel systems, foam wing cores

WWII semi-scale 'Sport flying' $57.90

Christmas Special

$38.88

GRAUPNER 110¼ SPAN

2 to 4 channels

CUMULUS glider

Suggest retail . . $185.00

Christmas Special

$119.00

C.O.D. OR CHARGECARD

WE'RE OPEN 7 DAYS A WEEK AND EVENINGS TOO !

SHOWROOM STORE HOURS

MON. thru FRI. . . . . 9am -9pm
SATURDAYS . . . . . 9am -5pm
SUNDAYS . . . . . 10am -3pm

Rember we are open Monday through Friday from 9a.m. to 9p.m.; Saturdays from 9a.m. to 5p.m.; and Sundays from 10a.m. to 3p.m. For those of you back East that's 12:00 Midnight your time. If you want some one to take an order call us, . . . we specialize in it. ★★★★★★★★★★★★★★★★★★★★ ☐

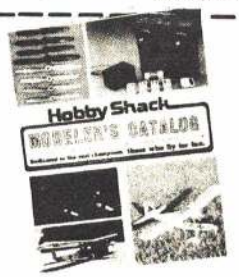
This Christmas, Shop At Any Of Our Over 50,000 LOCATIONS !

If you look real close around your town, you'll notice that Hobby Shack has many locations near your home. Shopping by mail is fun and easy and you can make your easy chair the ordering desk! Look for the Hobby Shack direct line (the red, white and blue steel box on most street corners), nearest you for fast and efficient service.

Phone In ORDERS

Phone AREA: (714) 522-4921

HOBBY SHACK



Over 100 pages - fully illustrated! Many pages are in FULL COLOR plus Beginner's information —on radio and plane selection, and gas model engine starting. The largest selection of goods found in ANY mail order catalog! Big money $ saving prices thru-out the catalog!

We beleive that our catalog is the finest that has ever been made for you, the hobbiest. Our Modelers Catalog is easy to read, easy to order from and is a fully illustrated

☐ I enclose $2.50 for your fully illustrated Modeler's Catalog, please rush it to me today.

MAIL THIS COUPON and check or money order to:

HOBBY SHACK
6475 KNOTT AVENUE
BUENA PARK, CALIFORNIA 90620

Name _____

Address _____

City _____

State _____ Zip code _____

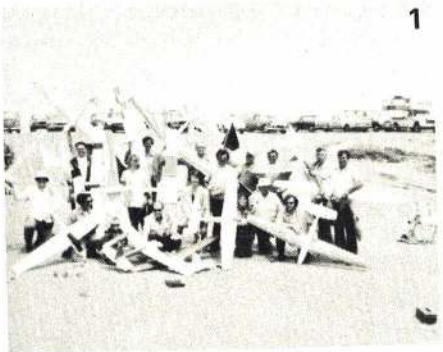
POSTAGE & HANDLING CHARGES.

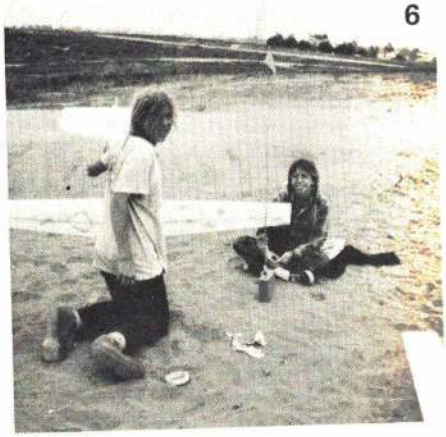
California Residents please add the 5% State Sales Tax ☐

Orders to $ 5.00 add	$ .90	$20.01 to $30.00 add	$2.50
$ 5.01 to $ 8.00 add	$1.00	$30.01 to $50.00 add	$2.75
$ 8.01 to $15.00 add	$1.20	orders over $50.00 add	$3.00
$15.01 to $20.00 add	$1.60		

ON THE SCENE

AT TORRY PINES: A ONE-OF-A-KIND PYLON RACE / by Paul Denson





(1) Hail, hail, the gang's all here. (2) Buck Faures' plane after loss behind the parking lot. Notice its new "bulldog" style nose job. (3) Weigh-in time at registration. Models could not be heavied up for speed or lightened for duration. (4) Before smitten by the cliff and a mid-air collision, it was beautiful. (5) It needed fixing afterwards. It was your author's plane. (6) Junior Gulls. Both Anette and Neeley Faure were contestants sharing the glider. (7) Irv Stafford's Smiley with a new nose. We think it is Bluenose, The Friendly Flyer.

A few months ago, the Contest Director of the Torrey Pines Gulls RC Soaring Club stood up at the monthly meeting and announced, "I have an idea for a new Pylon contest." This statement was met with the usual derogatory comments from the thermal group and a scattering of applause from the slope contingent. From the remaining members, it drew very little interest or comment. Then he dropped the bomb. "We are going to have a Pylon race with as many entrants as there are frequencies and it is going to be a one-of-a-kind contest."

"Fifteen planes in the air at once?" "How are you going to control frequencies?" "What about mid-airs?" He then explained, "Everyone is going to buy a 'foamy' and we are going to have a destruction derby."

You all know the advantages of the Sun-X Sweitzer 1-26 all-foam ARF glider, fondly known as the "foamy" or "flying ice chest." It builds quickly; it needs no finish; it doesn't destruct on a hard landing; it is inexpensive, and repairs easily. (More about these aspects later.) It also takes all kinds of flight packs. Before he knew what he had started, 20 fliers had promised to buy a kit. Arrangements were made with one of our local hobby shop dealers and he ordered the planes for us.

In order to make the race fair, it was decided that a few rules were necessary. The rudder could be enlarged up to 100%. Dihedral could be added. Maximum weight could be 45 oz., plus or minus 10% intention, weight for balance only, not speed. Three coats of paint with light sanding between; no fillers, no MonoKote, no solarfilm—in other words, they couldn't be slicked up for speed. They had to be painted the same colors as the frequency of the transmitter.

Some of the fellows discovered that contact shelf paper did not fit into the category of MonoKote or solarfilm, so they used various colors for trim; It was further discovered that the two hours allotted by the rule for building was highly unfair.

Testing started almost immediately at the glider park at Torrey Pines. The fliers who didn't put in the extra dihedral discovered they had a rather squirrelly plane. They also discovered that 5-minute epoxy would join the two pieces into which the fuselage broke when it bombed in from 100 ft. or so. Already one plane had a completely new nose carved from high density blue foam. (Rule infringement?) Time came and the contest was about ready to start.

Fifteen planes beautifully decorated in their frequency colors are circling high over the blue Pacific. The audible clock in the background is counting the seconds—14-13-12-11.

Now just picture what is going to happen. There is a window that opens into the pylon course. No one is allowed to enter that window until the clock says zero. Of course, to get a good start on the rest of the 15 fliers, you must pass through that window just as the

(Continued on page 95)

Season's Best
to you from Heath

Build either of our great 8-channel systems and it's Christmas all year round. Order transmitter, receiver, battery pack and four servos as a package, and you save another $34.70 off the already low kit-form prices.

There are eight independent channels in a package no bigger than conventional full-house transmitters. Exclusive Heath-designed IC encoder circuitry does the trick. There's an IC decoder in the matching receivers, too, that trims weight there. Choose either single or dual-stick control in 27, 53 and 72 MHz operation — with adjacent frequencies at no extra cost.

Both transmitters have a two-position switch for landing gear, finger adjust tabs for auxiliary channels; trainer link jacks and "buddy button"; external charging jack for simultaneous charging of receiver transmitter and receiver batteries; eight range controls for adjusting servo travel.

Systems include: 8-Channel Transmitter (select either GDA-405-S Single Stick or GDA-405-D Dual Stick). Receiver (specify GDA-405-2). Battery Pack (GDA-405-3). 4 Servos (GDA-405-44, GDA-505-44, or any combination equaling 4).

Complete Single Stick System, 10 lbs. **269.95***

Complete Dual Stick System, 11 lbs. **249.95***

And both systems include all batteries.

This year give yourself a super-slim Heathkit GDA-1057 3-channel System. Then next Christmas make it 4-channel. All you'll need is the GDA-1057-4 Modification for transmitter and receiver. There are three special system prices to make this one of the nicest holiday packages ever.

The Heathkit GDA-1057 System uses the flight proven circuitry found in the popular Heathkit GD-19. The GDA-1057-1 3-Channel Transmitter comes with a 2-axis stick assembly. Add the GDA-1057-4 modification and put 3 channels on the stick with the fourth controlled by a thumb tab. The GDA-1057-1 Transmitter is available on all R/C frequencies, and is housed in a slender new case for positive one-hand action during launch or engine adjustment.

SPECIAL SYSTEM PRICE #1 — GDA-1057-1 3-Channel Transmitter, GDA-1057-2 Receiver, GDA-405-3 Receiver Battery, two GDA-19-4 Standard Servos, 8 lbs. . . **139.95***

SPECIAL SYSTEM PRICE #2 — Same system as above, substituting GDA-405-44 Miniature Servos, 8 lbs. **149.95***

SPECIAL SYSTEM PRICE #3 — Same system as above, substituting GDA-505-44 Sub-miniature Servos, 8 lbs. **149.95***

Kit GDA-1057-4, 4-channel modification for both transmitter and receiver, 1 lb. **19.95***

Specify frequency when ordering.

SEE THEM AT YOUR NEAREST HEATHKIT ELECTRONIC CENTER...OR SEND FOR FREE CATALOG

HEATHKIT ELECTRONIC CENTERS
Units of Schlumberger Products Corp.

ARIZ.: Phoenix; CALIF.: Anaheim, El Cerrito, Los Angeles, Pomona, Redwood City, San Diego (La Mesa), Woodland Hills; COLO.: Denver; CONN.: Hartford (Avon); FLA.: Miami (Hialeah); GA.: Atlanta; ILL.: Chicago, Downers Grove; IND.: Indianapolis; KANSAS: Kansas City (Mission); LA.: New Orleans (Kenner); MD.: Baltimore, Rockville; MASS.: Boston (Wellesley); MICH.: Detroit; MINN.: Minneapolis (Hopkins); MO.: St. Louis; N.J.: Fair Lawn; N.Y.: Buffalo (Amherst), New York City, Jericho; L.I.: Rochester; OHIO: Cincinnati (Woodlawn), Cleveland; PA.: Philadelphia, Pittsburgh; R.I.: Providence (Warwick); TEXAS: Dallas, Houston; WASH.: Seattle; WIS.: Milwaukee.

FREE

World's largest selection of electronic kits

HEATH
Schlumberger

HEATH COMPANY, Dept. 80-1
Benton Harbor, Michigan 49022

☐ Please send FREE Heathkit Catalog.

☐ Enclosed is $_____, plus shipping.

please send model(s)_____

Name_____

Address_____

City_____ State_____ Zip_____

* Mail order prices; F.O.B. factory. RC-104

DON LOWE ON CL

What's It All About: Over the past couple of years a number of fliers have asked me for instruction and suggestions on how to improve their competition flying. Some have pointed out that there are articles from time to time instructing beginners, but nothing for the intermediate flier who is struggling to become an Expert.

Since I've been flying in the Expert category for many years and have had a modicum of success, maybe that qualified me to offer suggestions on how to improve your flying and your scoring. As I previously reported in this column, Dave Brown and I attempted to do just that at a judges and fliers school at Chardin, Ohio, earlier this year. What I will try to do is take off on some of those suggestions and see where we land.

First of all, there is no such thing as an instant Expert flier. Competition these days is simply too keen. There are many good fliers around—young and old—and they are getting better all the time. Now don't get discouraged because of this. Look at the phenomenal success of 15-year-old Rhett Miller. He has been competing for only a few years and won the NATS in '73. But, he worked at it! There is no substitute for competitive experience and practice. Practice alone won't do it because you've got to get into the heat of the battle and learn to control your nerves. Many fliers can put in barn burners at the local field, but freeze up in competition. The competitive edge required these days to win in C or D Expert is very keen with very small differences between top fliers. You've got to learn to do 8, 9 and 10 point maneuvers consistently every flight without missing one due to engine failure or whatever. When you're scoring 8s, 9s and 10s, the difference is in the judging and you've got to fly for the easy judges when your turn comes.

Just a few thoughts on preparation for flight. First of all, know your airplane. Fly your number one airplane all the time, in practice and in competition. Before you go to the line, be sure it's fueled. (Ever forget?) By all means, check the glow plug. I prefer to simply pull the engine through and let it "bump" a few times. This checks the plug and clears the cylinder so that it will usually start on one or two flips. I rarely use a starter and only then out of sheer desperation. If you can get the frequency clothespin before you fly, check the operation of your equipment, including the retracts. You may have time to make a quick adjustment or repair before your turn to fly. Check your prop for tightness. How many time have you seen a prop fly loose and the poor flier frantically retightening and rushing to beat the clock? Try not to get in that situation—keep things cool by being prepared—you'll have enough problems with normal nervousness. If you get yourself in the situation of rushing through the pattern due to a delay in starting, you're not going to do much good on that flight. So be prepared! You've simply got to give yourself every advantage and allow sufficient time in the flight to set up maneuvers carefully without rushing.

Yours truly trudges in after a flight with my four-year-old Phoenix V at Chardon, Ohio.

Scene at Chardon, Ohio. The most photogenic model on the field: Ramona Schultz, with hubby Don, commands her Kaos to do its thing. Ramona is seriously competing in Class A and is getting better all the time.

OK, let's assume that you're well prepared, have practiced long and hard and are ready to put in that winning flight. We'll go through a Class C pattern and try to point out some suggestions along the way. (Now Ed S. isn't going to give me enough space in this issue to finish the whole thing, but we'll start and finish in succeeding months.)

OK, let's taxi out—do it like the book says: Taxi at least 50 ft. turn into the takeoff

(Continued on page 104)

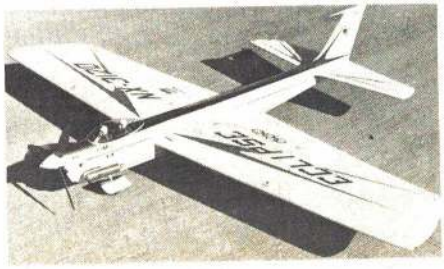
AL RABE ON CL

The End Of The Trail: This is my last column. Without good, usable contributions it has become increasingly difficult for me to meet my monthly deadline. Next month, Lew McFarland takes over. If you and I don't support him, in six months to a year, he will also quit. Then what will happen to our column?

Stunt Engine Heat: Last spring and summer, I spent many frustrating hours experimenting with various modifications on my ST 60s in an effort to make them develop more torque at their normal stunting rpm of about 8500. During this time, the combined effects of high ambient temperature, low nitro-low oil fuel, muffler operation, excessively tight internal clearances and an occasional clogged filter gave me many opportunities to observe (and repair) the effects of excessive heat on the engine's internal parts.

From watching these engines run in flight, and from analyzing the internal damage from hot runs, I have formed a theory. In a running engine, heat collects in the piston and piston ring causing them to expand. As a piston expands, it fills the bore of the sleeve reducing clearances. As a piston expands, it fills the bore of the sleeve reducing clearances. As a piston ring expands, it grows primarily in length and this closes the gap between the

Bob Gialdini is originator of "jet style" stunt ships. This is Bob's Eclipse, winner of 1965 Open Stunt and Walker trophy.



Miscellaneous stunt ships sitting pretty on finals day. Ship in the middle is Lew McFarland's Ackromaster.

ring ends. After a period of running, these parts become saturated with heat and stabilize dimensionally (quit expanding).

If the piston of a lapped piston engine stabilizes, after expansion, with operating clearances remaining, then the engine will four-cycle steadily until it runs out of fuel. On the other hand, if the piston begins to touch and drag against the sleeve wall before the expansion stops, the engine reacts by picking up speed. As friction heat is added to combustion heat, the piston continues to grow and the engine runs faster and hotter until it either stabilizes at a high rpm and temperature—sags—or seizes from internal friction drag.

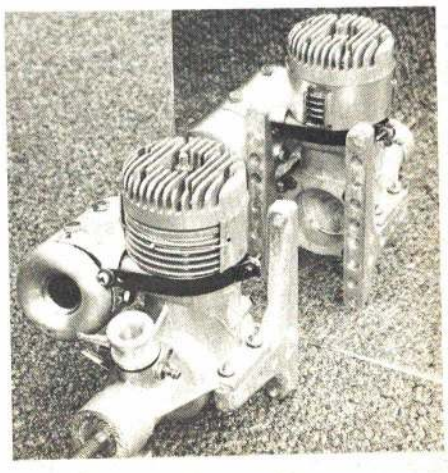
In the ring engine, I think the process is much the same, but controlled this time by the growth of the ring. If the expansion of the ring stops before the ring end gap closes and the ring ends touch, the engine will four-cycle steadily until fuel exhaustion. If the ring continues to expand after the ring ends touch, the ring, like the lapped piston, will begin to grow in diameter, and will bear against the sleeve wall with increasing pressure and friction. Again, the engine reacts by running faster and hotter until the ring engine also sags, seizes, or finally stabilizes, hot and fast.

Typically, the problem stunt engine runs OK until about the round or square eights. By then, enough expansion has taken place so that friction drag is beginning to occur. From this point on, the engine rpm begins to build. A mild heat problem may go unnoticed if the rpm builds slowly, and the engine runs out of fuel, or stabilizes, before its speed becomes unacceptable. A severe heat problem results if the engine goes lean suddenly after the first few maneuvers.

Inspection of heat damaged parts usually reveals definite characteristics. Lapped pistons will have a bright, shiny band around the top of the piston. Piston rings are usually "in plane" in that the ring will still lay flat, but will show light between the ring and sleeve when the ring is fitted into a sleeve without a piston for inspection. In other words, the warp is away from the sleeve wall—inward toward the piston. The resulting permanent gap between the ring and sleeve ruins the "seal" and power output until a new ring is lapped into place. Connecting rods are usually not damaged unless the heat was severe enough to break down the lubrication. In that case, one rod end, or both (particularly un-

(Continued on page 105)

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



The Shrike

Bob Violett's Pattern ship brings something extra in style and a few innovations to aerobatic flying. And it's a sure winner.

Photo by Fred Marks

Designing a model aircraft is a super challenge. To draft on paper and then transform into balsa, foam and fiberglass what one envisions is perhaps a model builder's fantasy portrayed. Certainly you have a dream machine that you secretly think about and picture zinging past an enthusiastic crowd admiring your genius. The Shrike is mine. This design represents an effort towards an aerobatic craft that has a little extra something in style and a few innovations.

It did not evolve from a long line of prototype airplanes. As a matter of fact, I've only designed and built two such airplanes previously: One is called the Virginian, and a modification of that is called Scorpio. They were little known outside the local area. Only the wing section of the Shrike bears any resemblance to these former aircraft.

So Shrike just happened one day at the drafting table. I'm in favor of stealing good ideas and improving on them. And if someone thinks that the profile

The Shrike

ABOVE: In the DCRC club, Bob is one of our most active fliers. His arrival at the field one day with the Shrike stopped everyone. This plane coupled with Bob's flying ability commanded the sky. It is fast and smooth and besides, he likes big maneuvers and low inverted passes (all within safe flying considerations). As Editor, I knew we had to have this project for AAM. There's magic about the way it flies and, if Bob goes Pattern flying with it, he's going to be a winner, too. RIGHT: To have the plane he wanted, Bob even had to invent and manufacture what's called the "Flying Fork." It is available from Violett Aero, 9176 Red Branch Rd., Columbia, Md. 21045.

looks kind of like Tony Bonnetti's machine, I'm proud because I always did admire and remember the image of that fine aircraft.

The canopy and nose section is sort of Super Star, so it's terribly difficult to be original these days. Pattern aircraft have just been around too long.

My competitive work in pattern flying has for the most part been confined to local area meets. Therefore, I'm no expert in this field. Next to pylon racing, the most fun I've had flying these toys has been attempts at formation flying with Jim Martin and his Banshee. We've worked at this enough to realize that it could be done quite professionally. It is certainly an airshow crowd pleaser, far better than pattern and possibly as good as racing.

One of the obvious design features of the Shrike is the low thrust line with the wing centerline just below and the stab just above. This simulates the good flying characteristics of a mid-wing airplane without the additional belly pan. The molded lip on the front of the wing saddle provides a solid wing mount and saves you from making the usual balsa fairing. The thick fin provides smoothness about the vertical axis as well as good rudder response. This is because it presents an airfoil to the relative wind instead of the usual thin slab. Sweeping the hinge line of the rudder doesn't seem to produce any noticeable elevator effect. The slow rolls are a thing of beauty and the figure M is surprisingly easy to accomplish.

Perhaps the flying stab is the Shrike's most controversial feature. An airplane operating with a flying stab has several aerodynamic advantages since the tail plane is actually flying through its various angle of attack changes instead of acting as a deflection and drag device.

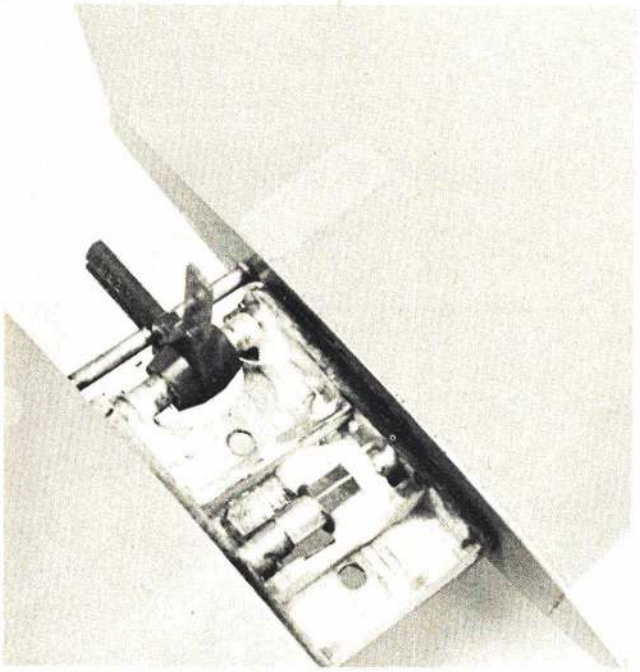
Inherent characteristics of the flying tail are zero decalage trim available at your transmitter, minimum drag, smooth transition from slow to fast flight, and soft but positive control response. Their success in full-scale airplanes prompted me to go this route. All we really needed was a good device to activate it.

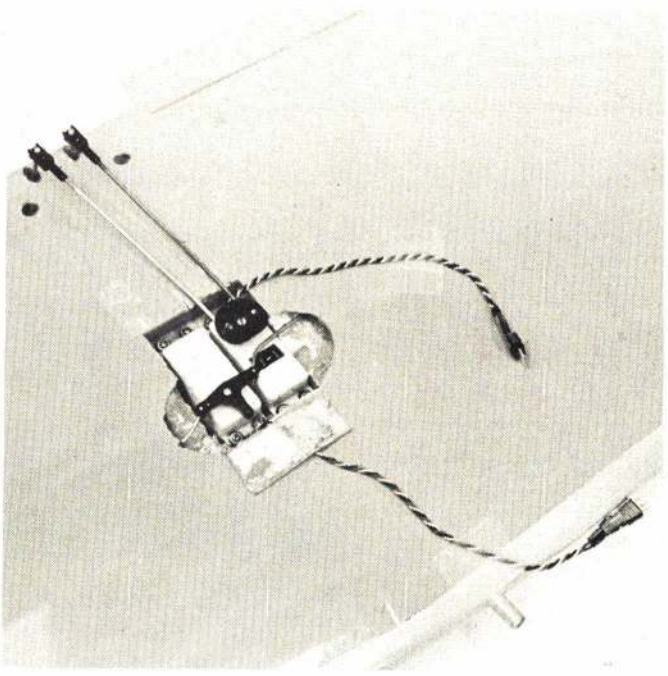
Bill Harvey and I put our heads together one night and tried every conceivable linkage we could think of. It appeared that the more complex the system got, the farther away from the desired product we drifted.

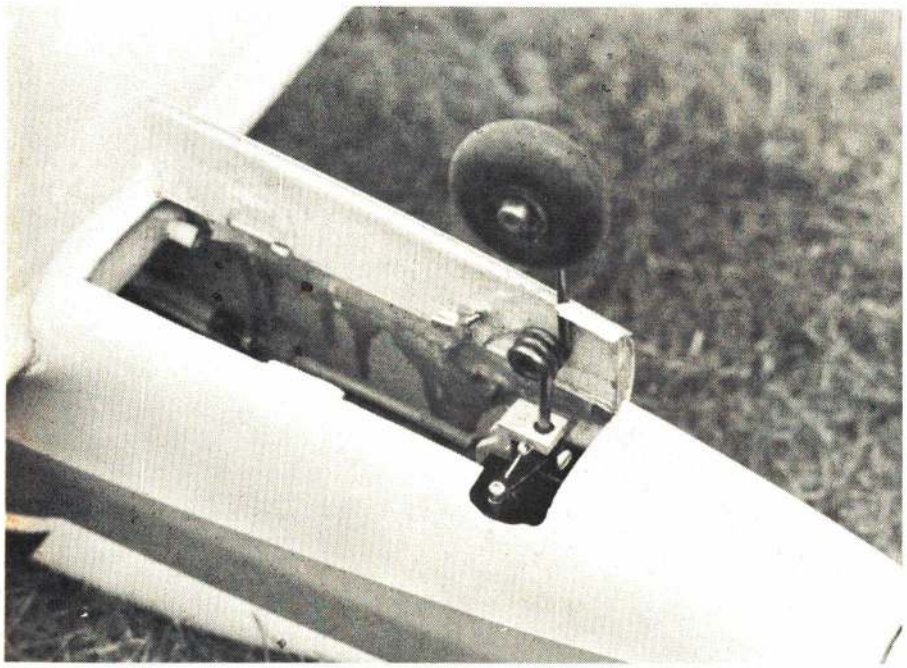
Simplicity gave birth to the Flying Fork as we dubbed it. At the risk of commercializing, let me explain why this is so good.

The unit is a Geneva mechanism that pivots from a different fulcrum than the stab itself. By locating this pivot point aft of the stab pivot, we achieved the desired throw reduction and gained aerodynamic and mechanical stability. A neutral stability condition exists if

Plan on page 24
Text continues on page 78

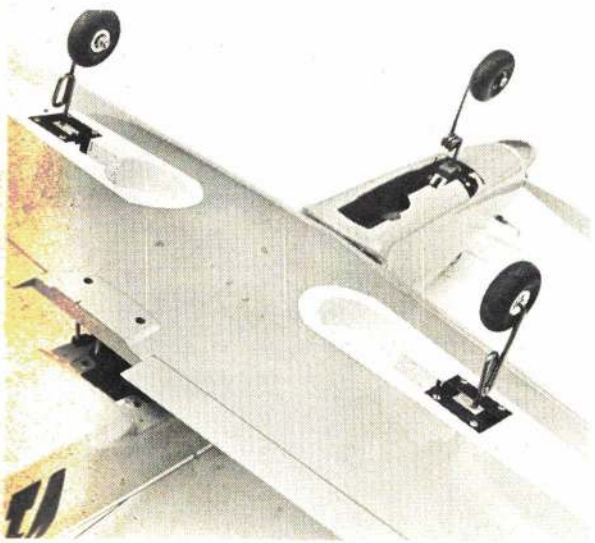


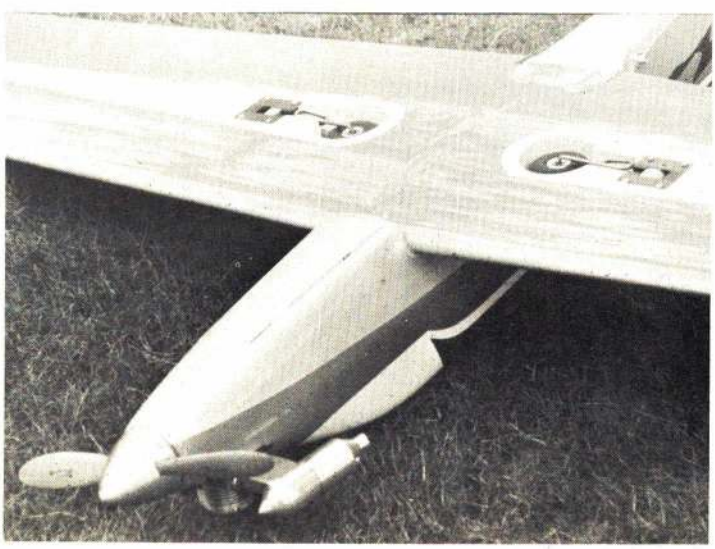




TOP LEFT: All-moving tail gives the plane its smooth elevator response. There are two tubes through the stab: The forward tube is the pivot; rear tube is for positioning for control. TOP RIGHT: Aileron and retract servos side by side in wing's centersection. LEFT: What good is a nosewheel door? About 15 mph. Apparently, it is an exceptionally high drag area on our models. Clean it up with a door. Wheel leg opens and closes it mechanically. BOTTOM LEFT: The Shrike, before the nosewheel door was added. Naturally, the plane uses Violett Aero retracts. BOTTOM RIGHT: Many engines have been on the model and all are excellent. Currently, a Ross powers the Shrike and a Sonic Systems actuator moves the retracts. Main wheel doors are not really needed because the area is outside the high speed prop wash.

This airplane is designed to be made in fiberglass. It does not lend itself to easy balsa fuselage construction. The exclusive source for the Shrike fuselage is: T and L Glasflite, 20408 71st St., Sumner, Wash. 98390.





TOWER

P.O. BOX 543 CHAMPAIGN,

RC POWER KITS ....

AERO PRECISION:	RETAIL	TOWER
Focke-Wulf	$39.95	$27.50
AT-6 Texan	38.50	27.00
Piper Vagabond	32.50	24.00
Touchdown: 42" Wing	21.95	15.50
48" Wind	21.95	15.50
AIRTRONICS:		
Acro Star	$74.95	$59.75
ANDREWS:		
Aeromaster	$44.95	$31.95
Sportmaster	44.95	31.95
Trainermaster	36.95	26.25
Minimaster	30.95	22.25
H-Ray	21.95	16.00
S-Ray	18.95	13.75
A-Ray	29.95	21.50
AIRBORNE ASSOCIATES:		
Tiger Tail	$84.95	$72.00
Tiger Tail Deluxe	115.00	97.50
Nutcracker	64.50	54.75
Banshee	64.50	54.75
Hi-Lo	99.50	84.50
Cosmic Wind	64.50	54.75
Troublemaker	64.50	54.75
BRIDI:		
RCM Sportster	$34.95	$26.75
RCM Basic Trainer	29.95	21.95
RCM Trainer	49.95	38.25
Super Kaos	57.95	42.50
Kaos	49.95	38.00
(All wing and fuse kits in stock)		
BUD NOSEN:		
Aeronca Champ	$89.95	$79.95
GOLDBERG:		
Senior Falcon	$42.95	$29.50
Skylane 62	42.95	29.50
Skylark 56	25.95	18.25
Falcon 56	22.95	15.95
Shoestring 54	34.95	24.50
Ranger 42	19.95	13.95
Junior Skylark	9.95	7.95
Junior Falcon	8.95	7.15
(all wing kits in stock)		
DAVE PLATT:		
Spitfire	$54.95	$42.50
GEE BEE:		
Islander	$39.95	$31.95
Mallard	39.95	31.95
HOT LINE:		
Me-109	$59.95	$38.00
Comanche	55.00	35.00
Mooney	55.00	35.00
Sierra Trainer	46.95	29.75
Mini-Comanche	29.95	19.50
Cricket	16.95	11.75
Cassutt Racer	29.95	19.50
JENSEN:		
Das Ugly Stick	$49.95	$39.00
J & J:		
Troublemaker	$59.95	$42.00
Eyeball	54.95	38.00
Banshee	54.95	38.00
J-Craft	45.95	32.00
1/4 Midget Mustang	34.95	25.00
KRAFT:		
Wing Master	$29.95	$23.95
LANIER:		
Sprint 25	$42.95	$31.15
P-51 Mustang	49.95	36.25
Caprice	56.95	41.25
Apache	49.95	36.25
Hawk	29.95	21.75
Cessna	38.95	28.25
Transit	39.95	28.95
Jester	56.95	41.25
Comet II	49.95	36.25
Slo Comet	49.95	36.25
Pinto	44.95	32.50
Midget	52.95	38.50
Invader	59.95	43.50
Dart	52.95	38.50
(All Lanier are almost ready to fly)		

SOUTHERN R/C PRODUCTS

TIGER TAIL

Span 68"

Engine .60

STANDARD TIGER TAIL KIT
RETAIL $64.95 TOWER $55.00

DELUXE TIGER TAIL KIT
RETAIL $94.50 TOWER $80.00

BOBCAT

Span 52" Engine .29 - .40

RETAIL $48.50 TOWER $41.00

"POLYTHERM"

ELECTRIC HEAT GUN

A Must For Monokote & Solarfilm

- Adjustable Flow
- 1000 Watts of Heat
- Focused Heat Beam

Retail Value $36.00

ONLY $28.00
TWO FOR $54.00

SWEETATER

Span 66" Engine .60

STANDARD SWEETATER KIT
RETAIL $64.95 TOWER $55.00

DELUXE SWEETATER KIT
RETAIL $94.50 TOWER $80.00

FOCKE–WULF TA 152

Span 58" Engine .30 - .45

RETAIL $39.95 TOWER $27.50

SEALECTOR SEALING IRON

Adjustable From
300°F To 550°F

DELUXE MODEL:
RETAIL $14.95 TOWER $11.50

WITH SUPER SHOE:
RETAIL $17.95 TOWER $13.50

CUSTOM MODEL:
RETAIL $16.95 TOWER $13.50

AERO PRECISION AT-6 TEXAN

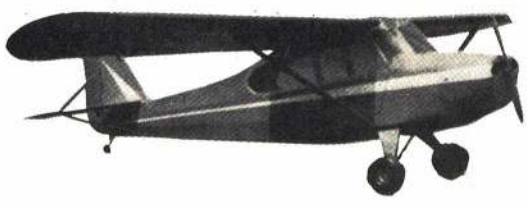
Span 53" Engine .29 - .40

RETAIL $38.50 TOWER $27.00

TOUCHDOWN

Span 42" or 48" Engine .15 - .25

RETAIL $21.95 TOWER $15.50



9' Span ¼ Scale AERONCA "CHAMP"

Engine .60 and up. Area 1500 sq. in.

A SUPERSIZE STAND-OFF SCALE THAT FEATURES ALL WOOD CONSTRUCTION AND HARDWARE. A BUD NOSEN KIT.

RETAIL $89.95 TOWER $79.95

MACO:		
Jet Star	$54.95	$35.00
Vaga	52.95	34.00
MODEL DYNAMICS:		
Gryphon	$34.95	$28.50
Shriek	55.00	44.75
Power Pod	6.50	5.75
MIDWEST:		
Cardinal Squire	$54.95	$37.95
Mach I	54.95	37.95
Chipmunk	24.95	17.00
Cardinal	23.95	16.50
Little Stick	24.95	17.00
Sweet Stick	35.95	24.75
Tri Squire	19.95	13.95
Lil Tri Squire	13.95	9.75
Lil "T" Glider	18.95	13.50
RC KITS:		
Hawker Hunter	$49.95	$42.50
F-86		Discontinued
ROYAL PRODUCTS:		
Cessna 206	$54.95	$46.75
Focke-Wulf 190	69.95	59.50
Corsair	69.95	59.50
Phantom F4J	54.95	46.75
Cessna 182	54.95	46.75
Cessna 182 Junior	34.95	29.75
B - 25 (Twin)	74.95	63.75
P - 38 (Twin)	74.95	63.75
Spirit of St. Louis	49.95	42.50
Pitts Spicial	64.95	55.25
Hein Senior (Tony)	54.95	46.75
Hein Junior (Tony)	34.95	29.75
Hayabusa (Oscar)	64.95	55.25
Cessna 310 G (Twin)	74.95	63.75
Zero	69.95	59.50
Spitfire	69.95	59.50
Aquarius	59.95	50.95
Super Cherry II	84.95	72.25
SOUTHERN RC:		
Tigertail Standard	$64.95	$55.00
Tigertail Deluxe	94.50	80.00
Sweetater Standard	64.95	55.00
Sweetater Deluxe	94.50	80.00
Bobcat	48.50	41.00
TIDEWATER:		
Pronto	$18.95	$16.00
Super Pronto	24.95	21.25
TOP FLITE:		
P-51 Mustang	$49.95	$33.50
P-40 Warhawk	52.50	35.50
P-39 Airacobra	52.50	35.50
Kwik Fli III	52.50	35.50
Contender	39.95	27.00
R/C Nobler	32.95	22.75
SE 5a	52.50	35.50
Headmaster	19.95	13.95
VK:		
Cherokee	$41.95	$28.35
Navajo	41.95	28.35
Cherokee Babe	28.50	19.95
Super Corben	34.95	24.00
Fokker Triplane	49.95	33.75
Nieuport 17	47.95	32.40

SUPER MONOKOTE

6 FOOT ROLLS

		ONLY
OPAQUES: Red, White, Orange, Yellow, Clear, Aluminum, Gray, Blue, Dark Blue, Black, Chrome, Olive Drab	Retail $8.10	$5.00
TRANSPARENTS: Yellow, Red Orange, Blue (NEW!)	Retail $9.00	$5.60
ALL NEW FLAT FINISH: Olive Drab, Dove Gray, Aircraft Aluminum	Retail $9.00	$5.60
METALLICS: Plumb crazy, Green, Blue	Retail $10.50	$6.50

HOBBIES

ILLINOIS 61820 PHONE 217–356-4294

RC GLIDERS . . . .

	RETAIL	TOWER
AFI (ASTROFLITE):		
ASW-17	$69.95	$53.00
Monterey	34.95	24.75
Fournier RF4	29.95	21.50
Malibu	25.95	19.25
AIRTRONICS:		
Olympic	$44.95	$35.95
Grand Esprit	124.95	97.50
Mini Olympic	21.95	18.50
Questor	29.95	23.75
GRAUPNER:		
Cirrus	Tower Price $55.00	
Cumulus	Tower Price $120.00	
JP MODELS:		
Dart	$55.00	$47.00
Dart II	64.50	55.00
Javelin	49.50	42.00
MARK'S MODELS		
Windward	$25.95	$19.50
Windfree	34.95	24.50
Windfree R.T.C.	write for information	

OTHER R/C PRODUCTS . . . .

In addition to all of the items listed and shown in this ad, TOWER HOBBIES carries all of the following lines: Austin Craft, DuBro, Goldberg, Robart, Rocket City, Sonic-Tronics, Su-Pr-Line, and Tatone ACCESSORIES; Ambroid, Devcon, Hobby Poxy, Southern RC, and Titebond ADHESIVES; Tower Hobbies BALSA WOOD; Eveready and Tatone BATTERIES; A-Justo-Jig, Dremel, and X-Acto BUILDING EQUIPMENT; Perry CARBURETORS; Coverite, Royal Silk, and Southern RC COVERING MATERIALS; Kavan and Sonic-Tronics ELECTRIC STARTERS; K&B FUEL; Sullivan FUEL TANKS; Fox and K&B GLOW PLUGS; DuBro, Hegi, Kalt, Kavan, RC Helicopters Inc, and Graupner HELICOPTERS; Complete selection of MUFFLERS; Aero Gloss, Hobby Poxy, and K&B SuperPoxy PAINTS; Badger PAINT SPRAYERS; Top Flite and Tornado PROPELLORS; EK, Kraft, MRC, and Tower Hobbies RADIOS; Goldberg, Rom Air, and Sonic Systems RETRACT SYSTEMS; Tower Hobbies RUBBER BANDS; JP SCALE INSTRUMENTS; Williams Bros. SCALE PILOTS; Midwest, Tatone, Tower Hobbies, and Williams Bros. SPINNERS; DuBro, Goldberg, and Universal WHEELS.

All are in our new FALL '73 fully illustrated catalog - at the lowest prices, of course!

TIDEWATER
PRONTO
Span 48" Engine .09 to .23

RETAIL $18.95 TOWER $16.00

SUPER PRONTO
RETAIL $24.95 TOWER $21.25

BRIDI
RCM SPORTSTER
Span 50" Engine .09 to .35

RETAIL $34.95 TOWER $26.75

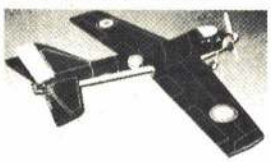
DAVE PLATT
SPITFIRE
Engine .40 to .60 Span 65"

RETAIL $54.95 TOWER $42.50

MACO VAGA
Span 56" Engine .35 to .45

RETAIL $52.95 TOWER $34.00

RC KITS
HAWKER HUNTER
Engine .60 Span 60"



RETAIL $49.95 TOWER $42.50

ROYAL PRODUCTS
CORSAIR
Engine .60 Span 61½"

ALL BALSA – ALL SCALE
RETAIL $69.95 TOWER $59.50

KRAFT
WINGMASTER
Engine .40 to .60 Span 56"

RETAIL $29.95 TOWER $23.95

LANIER
COMET II (A.R.F.)
Engine .50 to .60 Span 63"

RETAIL $49.95 TOWER $36.25

RC ENGINES. . . .

	RETAIL	TOWER
COX:		
Tee Dee .010	$14.00	$10.50
Tee Dee .049	14.00	10.50
Tee Dee .09	16.25	12.25
Medallion .15	17.25	12.95
Medallion .09	14.00	10.50
Medallion .049	11.50	8.65
Golden Bee .049	8.15	6.15
Babe Bee .049	6.50	4.95
ENYA:		
.09 III TV	$18.98	$14.25
.15 III TV	21.50	16.25
.19 V TV	24.50	18.50
.19 BB TV	37.98	27.75
.19 V TV MARINE	27.50	20.75
.29 IV TV	27.98	21.00
.29 BB TV	35.98	26.00
.35 III TV	29.50	22.25
.35 BB TV	36.98	26.75
.45 BB TV	51.50	37.00
.60 III BB TV	76.98	50.50
FOX:		
.15 RC	$17.95	$12.75
.19 RC	21.95	15.50
.25 RC	21.95	15.50
.29 RC	26.95	18.50
.36 RC	26.95	18.50
.40 RC	29.00	19.75
.60 RC Eagle	59.95	39.75
.78 RC	74.95	49.50
H.B.:		
.61 RC w/muffler	$100.00	$64.00
K&B:		
.15 RC Schneurle	$40.00	$27.75
.35 RC Stallion	19.95	14.95
.40 RC s/Perry	40.00	27.75
.40 RC Schneurle	70.00	49.00
O.S. MAX:		
Pet .099 RC	$12.98	$11.00
.10 RC	17.98	14.25
.15 RC	22.98	18.50
.20 RC	24.98	20.50
.25 RC	26.98	21.75
.30 RC	29.98	23.95
.30 RC Wankel	87.50	75.00
.35 RC	29.98	23.95
.40 RC	44.98	33.95
.50 RC	52.98	36.95
.60 RC Goldhead	69.98	55.95
.80 RC	95.98	77.50
ROSS POWER:		
In Line Twin Cylinder .60 Black Anodized	$145.00	$125.00
Opposed Twin Cylinder .60 Aluminum Finish	125.00	107.00
Opposed Twin Cylinder .60 Black Anodized	145.00	125.00
SUPERTIGRE:		
G 20/23 RC	$26.98	$21.50
G 21/46 RC	34.98	27.95
ST .60 RC	54.98	43.95
G .60 RC Bluehead	69.98	55.95
G .71 FI RC	69.98	55.95
VECO:		
.19 RC	$33.00	$23.75
61 RC w/muffler	74.95	52.50
WEBRA:		
.40 RC Blackhead	$99.95	$63.75
.61 RC Blackhead	130.00	83.00
.61 RC Schneurle	147.50	95.00

NOTE: ENYA AND WEBRA PARTS IN STOCK!

SOLARFILM
6 FOOT ROLLS

OPAQUES: Dark Red, Bright Red, Dark Blue, Light Blue, Orange, Yellow, White, Black, Silver — Retail $6.60 **ONLY $4.00**

TRANSPARENTS: Yellow, Orange, Blue, Red — Retail $7.50 **$5.00**

METALLICS: Green, Gold, Red — Retail $9.00 **$6.00**

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SATISFACTION ALWAYS GUARANTEED AT TOWER HOBBIES!

C O D PHONE ORDERS

CALL 217–356-4294
for IMMEDIATE
COD SHIPMENT.

WEEKDAYS: 10:00 A.M. TO 9:00 P.M.
SATURDAYS: 10:00 A.M. TO 5:00 P.M.

HOW TO ORDER BY MAIL

Add $1.00 to each order for Full Insurance, Postage, and Handling. Money Order or Check only. Foreign Orders add $10.00. Excess refunded.

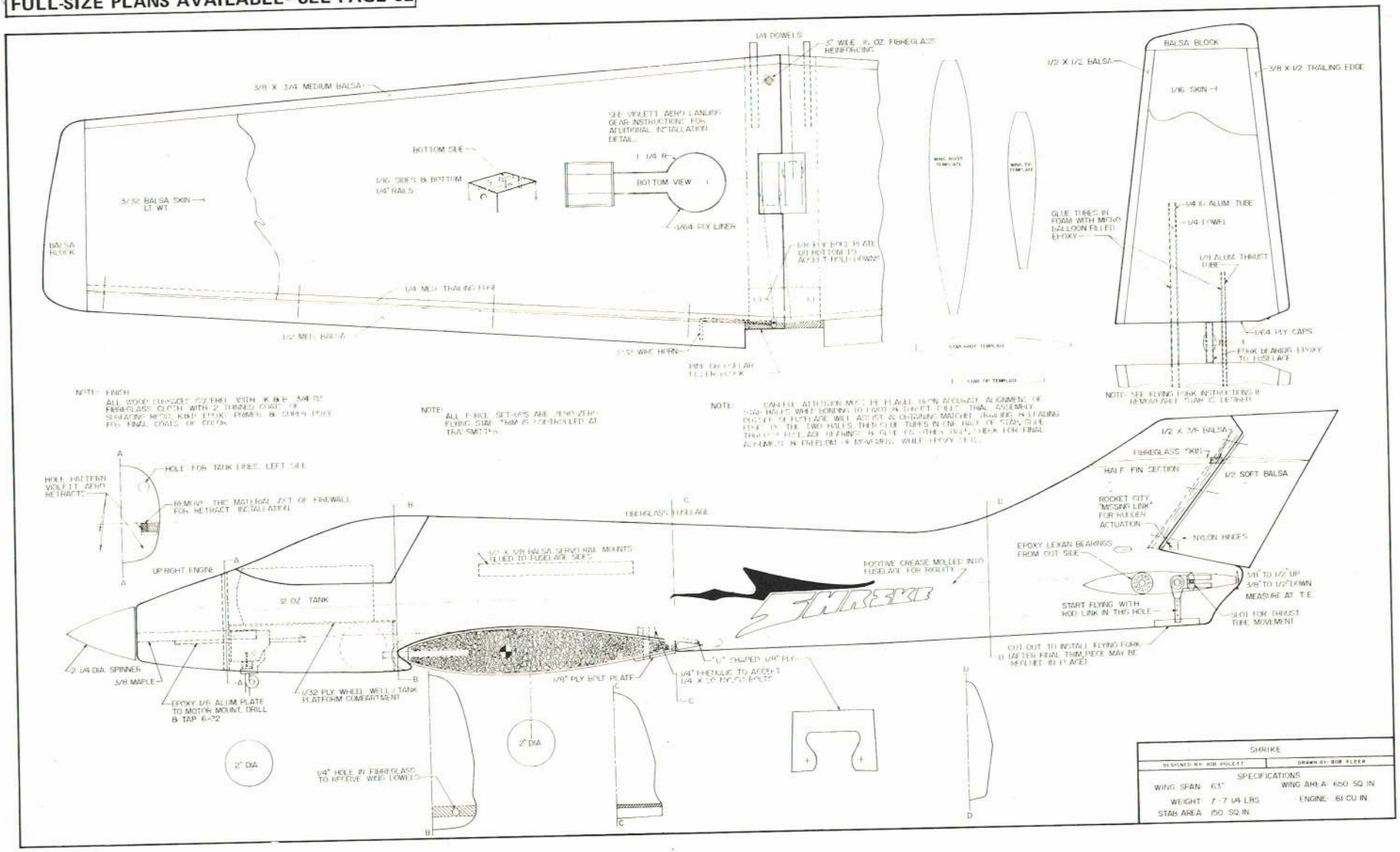
JUST RELEASED FALL '73 CATALOG

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

FULLY ILLUSTRATED!

The Shrike

FULL-SIZE PLANS AVAILABLE—SEE PAGE 92



HOBBY PEOPLE

PRICES GOOD TO JANUARY 20, 1974

ACCESSORIES

DUBRO	LIST	SALE
MU-795 Universal Muffler		7.47
MU-595 Mini-Mufflaire		5.47
Dev-tube 2-in-1 syringe	1.50	1.29
Devcon 5-min. epoxy	2.25	2/2.99
Badger Press and Paint Air brush – can of propellant – mixing bottles and paint		8.88
SOLAR FILM Your choice (Opaque Colors)	6.60	4.47
SEALING IRON	14.88	12.99
ROBART Super Shoe		2.98

TATONE	LIST	SALE
Hinge it	2.95	2.76
Flight Control Handle	1.95	1.67
Engine Testing Unit	5.25	4.99
Glow Plug Starter & Charge	8.25	6.47
V.K. Pilots (Allied or German)	3.50	2.99
AME Heat Gun	32.88	21.88
MILLER Deluxe spray set with compressor, air brush and mixing bottles		44.97

master charge THE INTERBANK CARD

your BANKAMERICARD welcome

Jerobee COMANDO KIT 1/12th racer 2 Channel List 100.95 **$64.88**

CHECK OUT THESE GREAT SPECIALS!

Hot Line COMMANCHE List $55.00 SALE **$36.88**

Midwest SUPER CHIPMUNK List $24.95 SALE **$16.99**

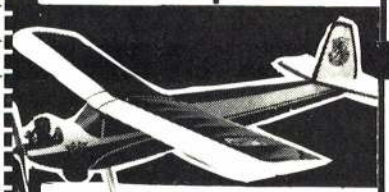
YOUR CHOICE . . . $9.99

GUILLOW-TESTORS SPECIAL!

1 TESTORS .049 ENGINE – FREE! – WITH THE PURCHASE OF ONE OF THESE GREAT GUILLOW KITS!
1001–Thunderbolt; 1002–Stuka; 1003–Douglas Dauntless
1004–Corsair F4U-4. Scale 3/4" = 1'.

FOR QUICK C.O.D. SERVICE
CALL (213) 233-4484
MON.-SAT. 9a.m.-4p.m.

Top Flite P-51 MUSTANG List $45.95 SALE **$36.88**



Bridi BASIC TRAINER List $29.95 SALE **$24.47**

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

☐ CHECK/MONEY ORDER ☐ MASTERCHARGE ☐ BANKAMERICARD

ACCOUNT NO.

NO. OVER NAME EXPIRATION DATE SIGNATURE

POSTAGE & HANDLING: To $5.00, ADD $ .80; $5.01-$8.00 ADD $1.00; $8.01-$15.00, ADD $1.20; $15.01-$20.00, ADD $1.60; $20.01-$30.00, ADD $2.50; $30.01-$50.00, ADD $2.75; OVER $50.00, ADD $3.00.
CALIFORNIA RESIDENTS PLEASE ADD 6% SALES TAX!

HOBBY PEOPLE'S WAREHOUSE STORE
130 EAST 33rd STREET, LOS ANGELES, CALIFORNIA 90011
TELEPHONE: (213) 233-4484

PLANES R C

MIDWEST	LIST	SALE
Lil T Glider	19.00	12.47
Das Lil Stik	25.00	16.88
Super Chipmunk	24.95	16.99
Mach I	55.00	35.47
Sweet Stik	32.95	22.99
STERLING		
Stearman PT-17	64.95	44.88
Fokker D-7	62.95	42.88
Lancer	31.95	22.76
Fledgling	29.95	19.88
Lancer SL-62	41.95	29.47
Citabria	29.95	19.88
V.K.		
Corben Super Ace	32.50	24.47
Cherokee	39.95	29.99
Fokker Triplane	42.95	37.87
Cherokee Babe	27.50	19.99

BRIDI	LIST	SALE
RCM Trainer	49.95	37.76
Basic Trainer	29.95	24.47
Super Kaos	57.95	43.88
Sportster	34.95	29.88
HOT LINE		
Comanche	55.00	36.88
Dreamer	44.95	29.76
ME-109	59.95	39.88
LANIER		
Sprint 25	45.95	34.88
Comet II	51.95	38.44
Cessna	42.95	32.47
Transit	39.95	29.88
TOP FLITE		
P-39 Air Cobra	49.95	39.99
P-40 Warhawk	49.95	39.99
P-51 Mustang	45.95	36.88

U-CONTROL PLANES

DUMAS	LIST	SALE
Brave	10.95	7.77
Smoothie	17.25	12.47
Thunderbird	20.95	14.47
Crusader	11.95	8.88
MIDWEST		
Magician .35	14.00	9.99
Messerschmidt .35	14.00	9.99
King Cobra .15	9.00	7.76
Messerschmidt .15	9.00	7.76
Magician .15	9.00	7.76
STERLING		
Ringmaster	8.95	7.47
Ringmaster Jr.	5.95	5.47
Flying Fool	9.95	8.88
Beginner's Spitfire	3.50	2.99
Beginner's Ringmaster	3.50	2.99

ENGINES (Std.)

U CONTROL	LIST	SALE
VECO		
.19 Standard	28.00	19.87
K & B		
.35 Stallion	15.00	9.99
.40 Front Rotor	34.00	24.76
MC COY		
.19 Standard	14.95	9.99
.29 Standard	15.95	10.76
.35 Standard	16.95	11.76
.40 Standard	17.95	12.47

RUBBER POWER

E-1 Curtiss Jenny	7.95	6.47
E-2 Fokker Triplane	7.95	6.47
E-5 Citabria	7.95	6.47
E-7 Cirrus Sailplane	11.95	9.99

ENGINES (R C)

VECO		
.19 R/C	33.00	24.76
K & B		
.35 R/C Stallion	19.95	14.76
.40 R/C	40.00	29.99
.61 R/C	74.95	49.99
MC COY		
.19 R/C	22.95	14.88
.29 R/C	23.95	15.67
.35 R/C	24.95	16.99
.40 R/C	25.95	17.76
TESTORS		
.049	5.95	3.99

R C CARS

JEROBEE		
1/12 Comando Built-up 2 Channel	115.95	99.99
1/12 Bandero Built up 1 Channel	66.60	49.88
1/12 Comando Kit 2 channel	100.95	64.88

RACE CAR ACC

RACE CAR ACC	
660 Remote tank kit	2.95
640 Brake Kit	1.95
630 Wing	2.95
620 Heat Sink	2.50

DURATION

CARL MARONEY ON RC

First Of Its Kind: Written in plain English and intended as a tool for designers who don't want to have to learn aerodynamics before they create their first successful, high performance glider, is the *Sailplane Designer's Handbook*. This book was written by an aeronautical engineer whose hobby is building and flying RC sailplanes. Being especially designed for modelers, this publication covers airfoil sections, optimum wing layouts, stable wing/stab combos, and many useful design charts, curves and tables to assist the designer. Copies of this book are available direct from the author, Eric Lister, 953 Klockner Road, Trenton, N.J. 08619 at $4.95.

NATS Champion: Competing against 131 fliers, twelve-year-old Jeff Mrlik, flying an original design 13 ft., five-lb. sailplane won the Grand Champion award of the fourth RC Sailplane Nationals. Placing third in 10-min. duration, fifth in two-min. precision and sixth in the 15-min. precision duration task gave Mrlik the highest points (6342) out of a possible 7000. Past winners from the LSF tournaments, ECSS championships, soaring Nationals winners and contestants from 21 states and Canada were left in amazement of Jeff's precision piloting to achieve eight out of nine spot landings. Mrlik returned to Birmingham, Michigan with a 20-in. silver trophy and a 10-speed Schwinn bicycle bringing honors to fellow club members.

The contest was held on July 23-25, 1973 at Lewis University, Lockport, Illinois, under near perfect weather conditions. The facilities provided four mowed runways, each measuring 1500 by 200 ft., air conditioned dormitories, dining area including a banquet room and excellent on-the-field parking which was acclaimed by contestants as the finest ever.

Best Senior Open Team award went to the Torrey Pine Gulls of California—Rod Smith, Mark Smith and Bob Thacker. This is the third year for this perpetual trophy, previously going to teams from Illinois and Michigan. New this year was a Junior Team Award that was won by the Rocket City Radio Controllers of Huntsville, Alabama.

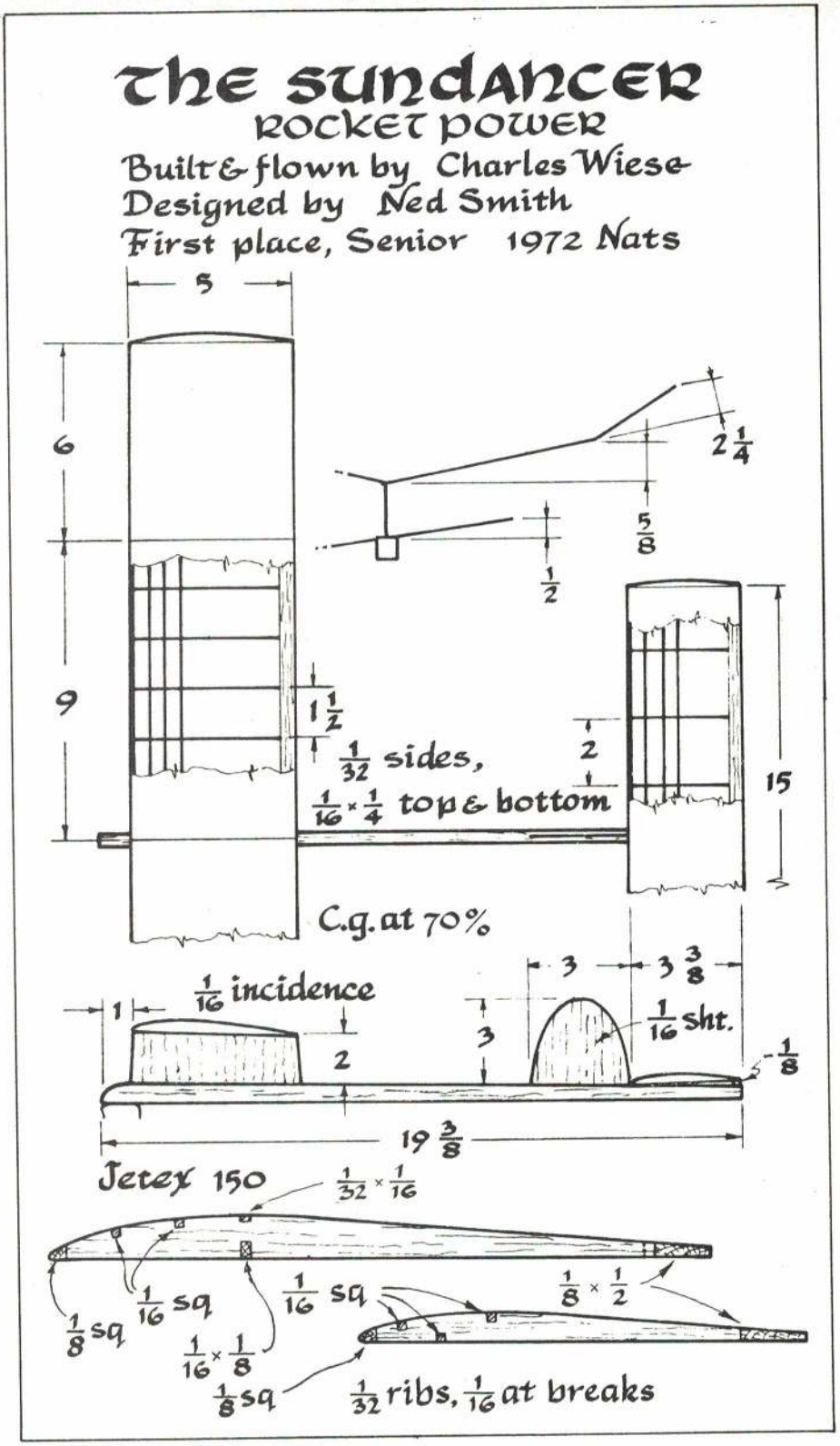
This year preregistration was mandatory due to the large number of entries experienced last year. The Silent Order of Aeromodeling by Radio Club (SOAR) that hosted this fourth and previous year's NATS has found this requirement a necessity for contests this size. The flight group concept for call-up was utilized, whereby contestants with assigned numbers would be called to the ready area. Four impound areas located directly behind four winches permit contestants to move from the ready area to the flight line very quickly, eliminating time delays. At each winch area were two winches spaced five ft. apart to allow the winch boss to cycle the launches by permitting one line to be in the process of being returned while the other was being used for launching. This method decreases cycle time to approximately one min. which was the reason why three rounds were completed by mid-afternoon.

Flying a Glassflugel 604, Hugh Stock of California took top honor in the Scale event. Max Geier of Chicago received the highest points in the static judging with his Grunau Baby, a German Training Glider of Pre-WWII.

The East Coast Soaring Society (ECSS) Best Original Design Award was won by Jerry Mrlik of Michigan with his Astro-Jet model. Spanning 13 ft. and considered above average size, Mrlik developed a simple disconnect design having spring-loaded spoilers, rudder and flying stab.

Best Technical Achievement Award provided by LSF was won by Otto Heithecker, for his unique linkages for flaps coupled to spoilers. Knuckles having slip fittings in the flaps allowed for wing flexing still permitting their actuation.

Finality of the three-day event was concluded by AMA President Johnny Clemens who personally presented the AMA President's Sportsmanship Award to the Great Detroit Soaring and Hiking Society for their club efforts in assisting SOAR with operations.



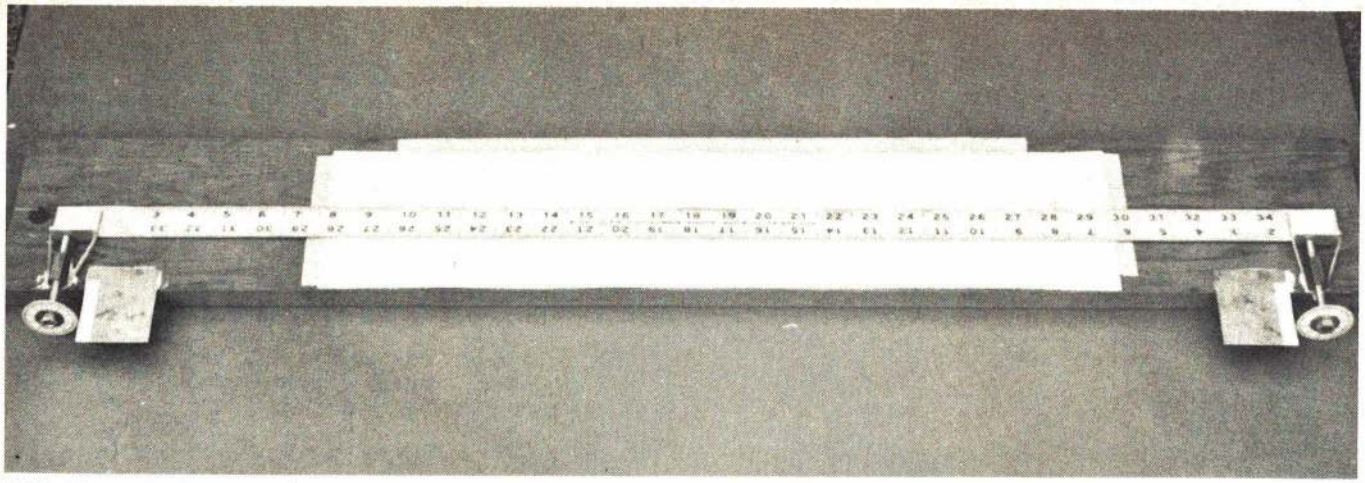
BOB MEUSER ON FF SPORT

Balsa Strippers: If odd-size balsa strips, tapered strips, or standard-size strips of soft balsa are needed, the modeler must strip them himself. Some modelers position a metal straight edge on the wood by eye or with simple gauges (see Bud Tenny's column, June 1971 **AAM**), and cut along the straight edge with a razor blade. But for convenience and accuracy, many prefer a stripper of some sort.

Some strippers have no straight edge, and guide a blade at a predetermined distance from the edge of the balsa sheet instead. (See Tenny's column cited above.) X-acto sells one of this type for $1.50. There are two types of strippers that employ straight edges. On one type, the sheet balsa is fixed, and the straight edge is moved to a new position for each cut. On the other, the position of the straight edge is fixed, and the balsa is repositioned for each cut.

Either of the straight edge type strippers may be used to cut tapered strips. The fixed-straight edge type is best suited for making large quantities of strips of identical size, and especially for widths greater than 1/16". A stripper of the fixed-straight edge type has been recently introduced in two versions: One for strips up to 18 in., the other for 36-in. lengths. They sell for $9.95 and $12.95 respectively, and may be purchased directly from Jim Crockett Replicas, 1442 N. Fruit Ave., Fresno, Calif. 93728.

The moving straight edge type is best if only a few strips of a particular size are needed, and is especially handy for indoor-model sizes of strips. I recently built one guided by designs that have appeared in Indoor News and Views, and in Free Flight, the



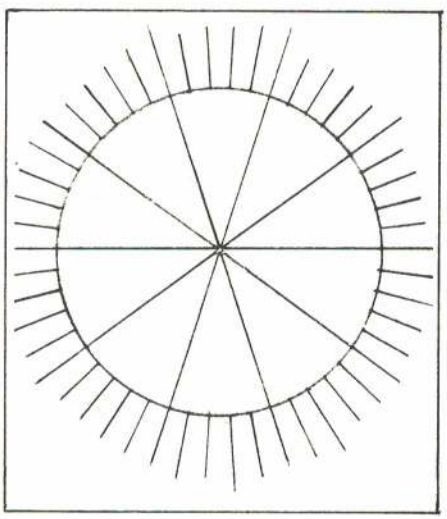
NFFS Digest. Erv Rodemsky's, shown in the NFFS Digest, employed two micrometer heads. They are convenient and accurate, but rather expensive. Instead I used a common 1/4-20 machine screw and nut. That gives 0.050" per revolution instead of 0.025", but a large dial is used so that 0.001 corresponds to about 1/8" on the dial. I checked the accuracy of my nut-and-bolt micrometers against a precision dial gauge and found that mine tracked—strip to strip—to better than 0.0002". The following description applies to a stripper using an aluminum yardstick; the cheap ones are too flexible.

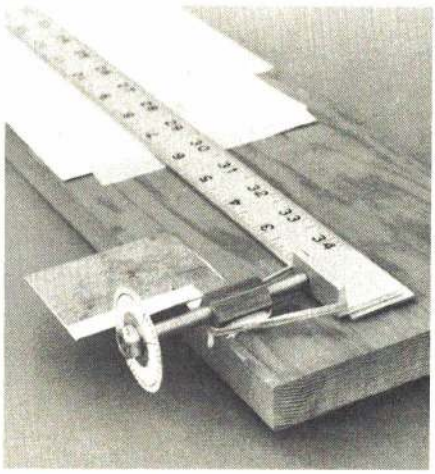
The baseboard is a piece of ½" plywood about 5 x 40". Two 1¾" discs are cut from aluminum sheet, and a 1/4" hole is cut in the center of each. A 50-division protractor scale is cemented to each disc. The heads are removed from two 3 in.-long 1/4-20 machine screws leaving a 3-in. length of threaded stock. One of the discs is sandwiched between two nuts at one end of each screw. Two hex nuts are threaded onto each screw and positioned 3/4" apart. The screws and nuts are positioned on one edge of the baseboard on 34-in. centers, and the nuts are epoxied to the baseboard. In place of standard nuts, I used a long nut tapped from hex bar stock on each screw, but two standard nuts would serve equally well. A 2 x 4" piece of sheet metal is epoxied to the baseboard adjacent to each screw to act as a pointer for the dial. Scales graduated in 0.050" increments and cemented to the sheet metal pieces are convenient for cutting wide strips, but are not essential. Two pieces of 3/4 x 3/4" aluminum angle one in. long, or equivalent pieces bent from sheet metal, are cemented to the straight edge on 34-in. centers. The straight edge is laid on the baseboard with the angle pieces aligned with the adjusting screws, and rubber bands are hooked around the nuts and over the angle pieces. The rubber bands must be sufficiently tight to remove the backlash in the screws and to hold the angle pieces in firm contact with the ends of the screws.

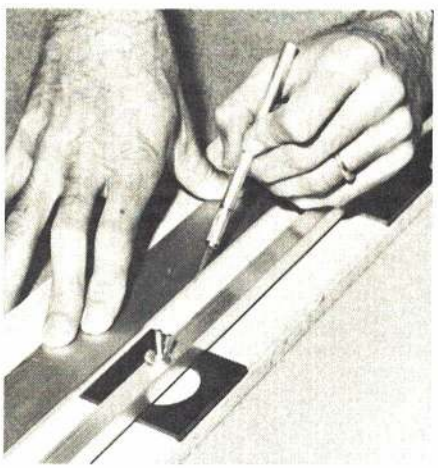
To use the stripper, first tape a piece of thin cardboard or bristol board to the baseboard. Then tape the sheet balsa to the cardboard. Using the adjusting screws, position the straight edge near the edge of the balsa sheet, and make a truing cut. Back off the screws. whatever distance you wish the strip width to be, and cut the strip. Continue in similar fashion for each strip.

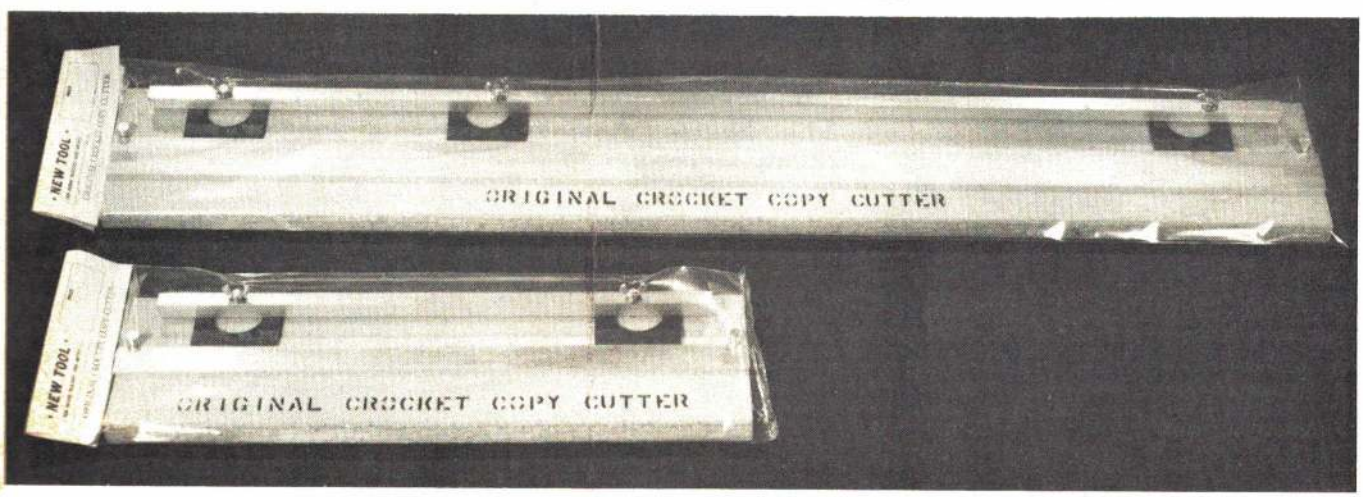
Rocket Power FF: The Sundancer, designed by Ned Smith, was one of the highest climbing Jetex 150-powered models at both the 1972 and 1973 NATS. At the 1972 NATS, Senior Charles Wiese of the Cloudbusters of Michigan missed making a max on his first flight because of a warp, but maxed easily on the following two flights. That earned him first place and a national record. (The record was subsequently rescinded because of an administrative technicality.) On his last flight a thermal carried the model almost out of sight overhead. It dethermalized on schedule at three min., but took seven min. more to

(Continued on page 76)









FAIRY UNLTD.

REID A. HULL

Cleaving the gentle air to ride on high
Freed from earth's bond now for a time
To venture where enchantment is still nigh
Only to return again from skies sublime.

If you've become a little disenchanted with a screaming, vicious, greasy little model plane power source, try rubber power and relax for a while. Rubber power makes for a good change of pace, even if you are a diehard power flier. In any case, here is an uncomplicated, well-proven and inexpensive ship that you will find a pleasure to fly.

Fairy is only a Wakefield size, fairly light ship, but one powered with a king-sized powerful bundle of rubber bands which, when hooked to a relatively high pitch propeller, gives 50 sec. plus wind down time. Also, this ship has experienced many refinements which include propeller changes, fuselage stretching, wing airfoil and dihedral modifications; and the tail was replaced with a lighter one having smaller fins. Much refining, literally hundreds of flights, along with all its winnings should be enough to convince even the most skeptical modeler of the design's worth. In any case, this little ship seems to stack up OK when flown against the 300 sq. in. monsters. A small compass along with a little luck is credited with making it possible for this one ship to collect all 12 trophies shown in a period of about three years.

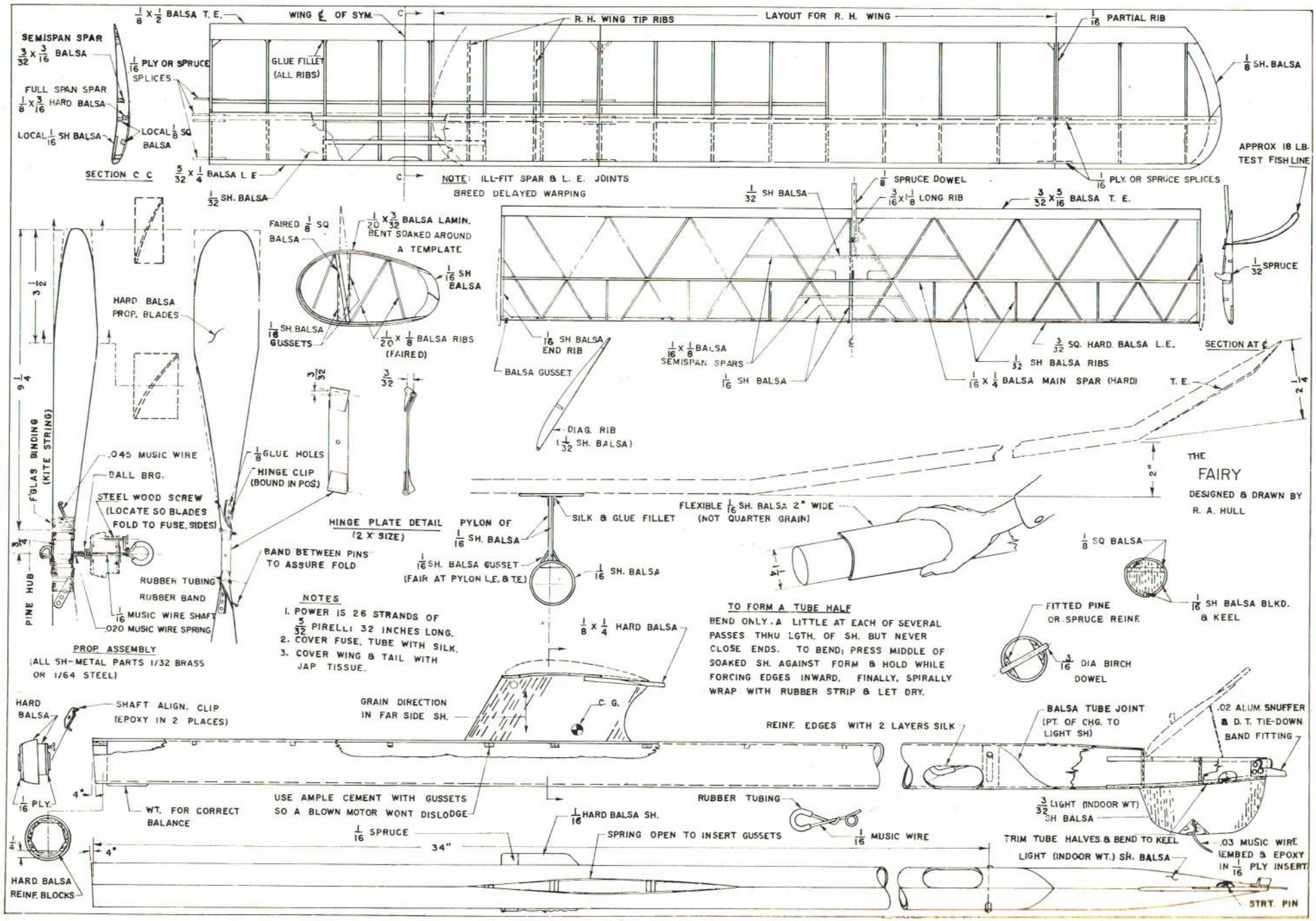
Though this ship is built on the light side, it has been flown enough so that almost all of its Achilles' heels have been located and eliminated. As a result, it won't break up every time an unscheduled event, such as a wire fence landing, occurs.

If you've come this far, spend a few more minutes and read all about building and flying the Fairy.

Choose balsa strips for the wing and tail that are fairly hard and as straight as you can lay your hands on. It is virtually impossible to get top notch consistent flying from a ship with warped wing or tail surfaces, so better choose top quality straight wood for these. The wing and tail are constructed directly over the plans laid down on any accurately flat surface into which you can force straight pins. Ribs for the wing are cut out oversize from medium 1/16 sheet balsa and sanded in a stack so they all become identical in size and shape. Be sure though, that the airfoil shape is not altered during this sanding in a stack. It is easier to cut spar slots while ribs are still in a stack. So do this, numbering the ribs so you can keep them in the same order in the wing as when the slots were cut. The spar slots will align better in the wing if you do this.

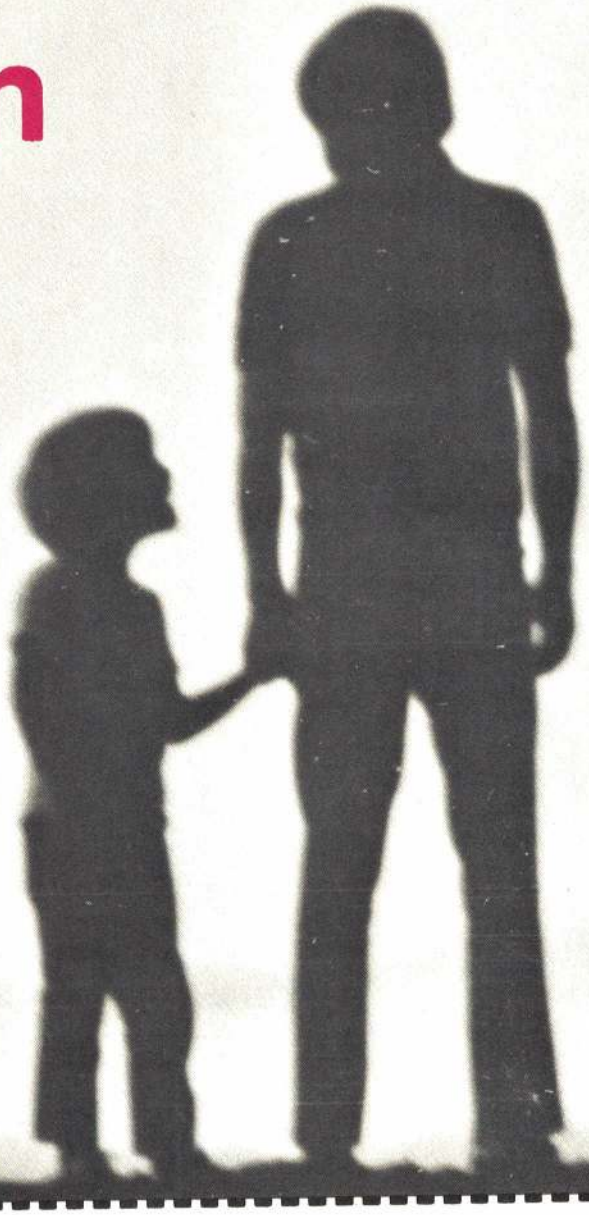
When assembling panels of the wing, be sure that the leading and trailing edges and all spar joints are accurately fitted. Preferably, cement these joints with some non-shrinking cement such as epoxy. Delay planking the wing till the

(Continued on page 91)



FULL SIZE PLANS AVAILABLE - SEE PAGE 92

Make it a Father & Son Christmas



Give one or both– it's a great gift idea and we'll send a gift card to go under the tree.

COMPLETE COUPON AND MAIL TO: SUBSCRIPTIONS / POTOMAC AVIATION PUBLICATIONS, INC.
733 Fifteenth Street, N.W., Washington, D.C. 20005

☐ NEW ☐ RENEWAL

☐ AMERICAN AIRCRAFT MODELER $7.50
$1.50 off regular subscription price.
Add $2.00 for foreign orders.

☐ NEW ☐ RENEWAL

☐ JUNIOR AMERICAN MODELER $3.75
75 cents off regular subscription price.
Add $1.00 for foreign orders.

GIFT FROM _____

SEND TO: _____

ADDRESS _____

CITY/STATE/ZIP _____

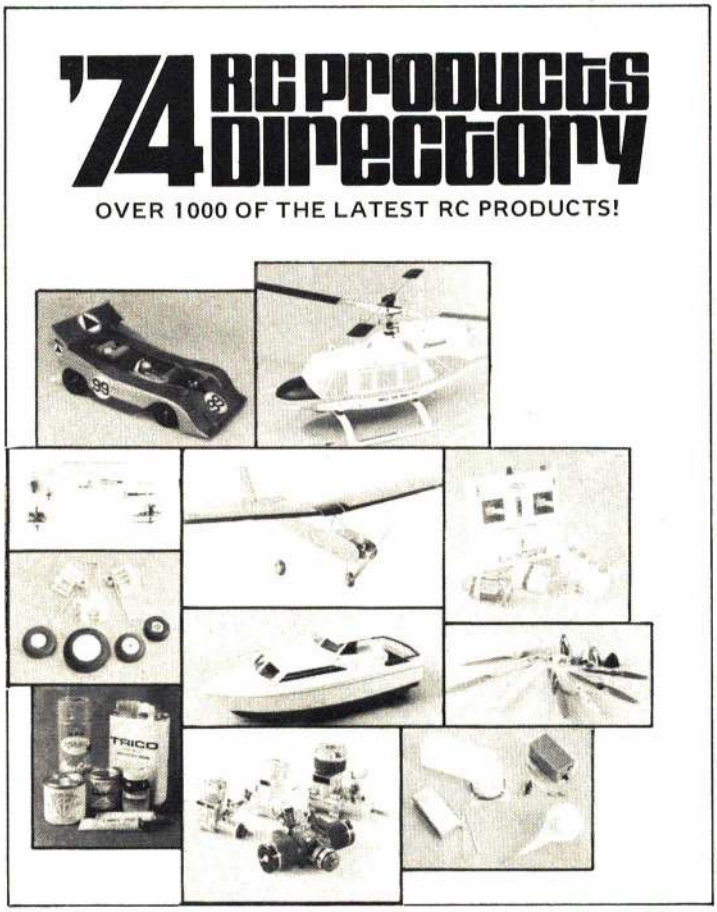
OFFER EXPIRES DECEMBER 31, 1973

CAN'T FIND IT?

NOW YOU CAN!

The ALL NEW Radio Control Products Directory is here!

- MORE THAN 1000 PRODUCTS (Many more than last year)
- BIGGER BOOK
- INDEXED AND CROSS-INDEXED BY MANUFACTURER
- COMPLETE SPECS AND PICTURES (Including Prices)
- LISTINGS INCLUDE: PLANES / BOATS / HELICOPTERS / CARS / ENGINES / RADIOS / HARDWARE & ACCESSORIES



AND A FREE MID-YEAR SUPPLEMENT

It will include all the new product information from the show of shows—TOLEDO—and it comes as part of the Radio Control Products Directory.

WHEN YOU BUY THE DIRECTORY, YOU ARE READY TO RECEIVE THE UPDATE FREE.

ONLY $2.75 EACH POSTPAID

CUT OUT A PIECE OF THE ACTION!

1974 RADIO CONTROL PRODUCTS DIRECTORY
733 15th Street, N.W., Washington, D.C. 20005

Please send me____ copies at $2.75 each postpaid.

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

FOR FOREIGN ORDERS PLEASE ADD 25 CENTS

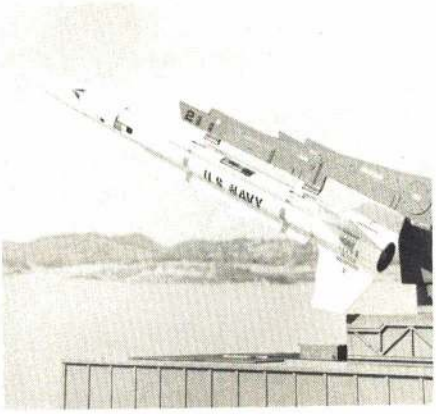
A-1

PRODUCTS

TELL THEM YOU SAW IT IN—

NEW PRODUCTS CHECKLIST

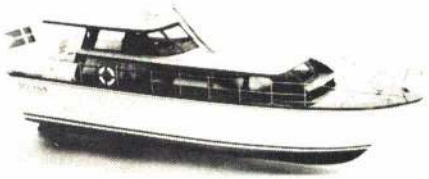
ERIC MEYERS



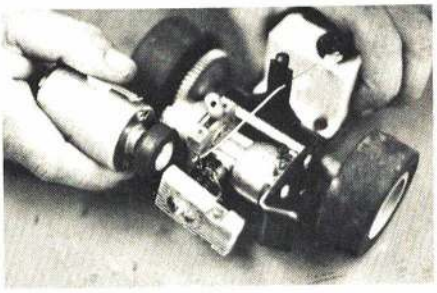
Centuri/Nomad. Modeled after a U.S. Navy anti-aircraft rocket, this plane measures 18 in. in height. The kit includes a large two-color decal sheet, die-cut fins and realistic chrome spec plates. Model reaches speeds of over 250 mph in vertical flight. $2.50. Centuri Engineering Co., Box 1988, Phoenix, Ariz. 85001.

Span-Aero/Three-In-One. A revised version of the huge 8 ft. J3 Cub from Span-Aero, the kit can now be built as the Piper J3, a Clipped Wing Cub or a PA-18 Super Cub. Kit includes fiberglass cabin section and cowl, aluminum wing spars and over 24 sq. ft. of plans. This model is a great Stand-off Scale subject as it is a very realistic flier with 60 to 80 power. $94.50. Span-Aero Products, Wildwood Lane, Norwalk, Conn. 06850.

Top Flite/Heat Gun. A specifically designed heat gun for use in shrinking large areas with no contact between gun and surface. The MonoKote heat gun insures a uniform covering that saves a lot of time especially with large airplanes and eliminates scratches from regular irons. Heat gun can also be used to oven-dry model parts and to set glues, resins, and paints. $24.95. Top Flite Models, Inc., 2635 S. Wabash Ave., Chicago, Ill. 60616.



Kayeff/Sea King. Although Billing is known for its wooden boats, this new Sea King sports a totally new form of construction using a durable vacuum formed polyester hull for simplification and ease of construction. This 28-in. long cruiser includes wood frame, deck and cabins. Model is not operable. $40. A set of brass fittings sells for $16 additional. Available from Kayeff, Inc., 511 Campesino Rd., Arcadia, Calif. 91006.



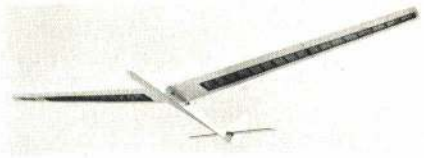
Bolink/049 Starter. Now available to start 049 engines in 1/12 scale cars, this starter uses a rubber tire to contact the engine's flywheel. Motor has a full length brass switch and comes with a 15-ft. cord, an optional cigarette lighter plug or alligator clips for 12 volt battery (battery not included). A handy item to prevent sore fingers and frustrated racers. $14.95. Bolink Industries, P.O. Box 80563, Atlanta, Ga. 30341.

Fox/New Oil. Fox's popular Missle Mist fuel now contains a synthetic oil replacing the original castor oil. Seven of the top 20 Pattern fliers at the NATS used this fuel because it boosts most Pattern or sport fliers' engine performance without high temperature rises. Fuel comes in pt., qt., and gal. sizes for $1.50, $2.60 and $8.90 respectively. Fox Mfg. Co., 5305 Towson Ave., Ft. Smith, Ark. 72901.

Robart/Super Stand. A handy, cheap way to carry an airplane out to the field. This all-foam stand and carrier will accept almost any size airplane and has built-in tray areas for tools or equipment. For compactness, stand will fold into a small unit. The base measures 10 x 21". $3.98. Robart Mfg. Co., P.O. Box 122, Wheaton, Ill. 60187.

M&P/Nemesis. This year's Open National Combat winner was the new Nemesis kit from M&P Enterprises. Ship has a 40-in. span and weighs 18 to 19 oz. It was designed for high speeds and maneuverability with hot 35 motors. Kit has selected wood for low weight and proper grain for warp and crash resistance. $7.98. M&P Design Group, P.O. Box 338, Lone Oak, Tex. 75438.

Pro-Line/Challenger Series. An all new set for the sport modeler, this medium priced system uses D&R sticks, and has a built-in charger and PLS-15 or PLC-11 servo-mechanics. The set features five channels with retract gear switch, trainer system compatible with Competition 6 systems, dual connector blocks and dual AGC. System sells for $379.95. Pro-Line Electronics, Inc., 10632 N. 31st Ave., Suite 10, Phoenix, Ariz. 85029.



Terry Plane/Titan 120. A 120-in. all-balsa slope flying glider, this kit features machine-cut parts, and all hardware and balsa is included. Disassembly is achieved through plug-in panels in the wing. For two-channel, elevator—rudder control. $38.50. Terry Plane, Inc., P.O. Box 2429, Orchid, Calif. 93454.

Dremel/Variable Speed. The ever-popular Moto-Tool is now available in a new form with a variable speed rheostat built into the tool itself. Tool comes with a plastic carrying case and 34 attachments. Two models available—370 and the 380 with ball bearing construction for higher rpm and extra long life. Sets sell for $49.95 and $59.95. Dremel Mfg. Co., Inc., P.O. Box 518, Racine Wisc. 53400.

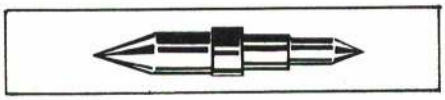
Orbit/Battery Holder. The "booster keeper" houses a four amp NiCad cell in a rubber boot and is unique in that it comes with a six-in. wire with connector with two plugs—one for the glow clip and the other for charging purposes. Plug is designed to be used with Orbit chargers to save the expense of an additional charger. Price is under $10. Orbit Electronics, 1641 Kaiser Ave., Santa Ana, Calif. 92705.

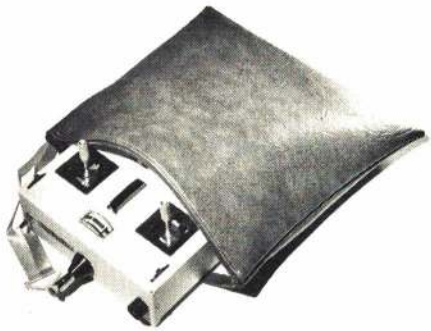
Sig/Kwik-Bilt. This P-51 Mustang is another in the series of new Sig Kwik-Bilt RC models. Construction uses a 1/2" balsa profile structure with a molded plastic fuselage shells to complete the contour. This saves much time in building. Kit includes foam wing cores, plastic tips, cowling plus all necessary balsa and complete hardware pack. 64-in. wingspan for 60 engines. Price to be announced. Sig Mfg. Co., 101 S. Front St., Montezuma, Iowa 50171.

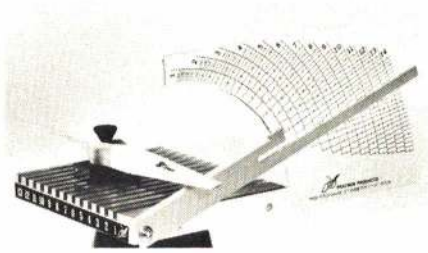
Williams Bros./Dummy Cylinders. Add that "real aircraft" look to almost any kind of a sport model with this new cowl kit designed for airplanes with up to 40 size engines. Kit features five cylinders with ignition leads, exhaust stacks, intake tubes, and a streamlined cowling for radio control and U-control use. $6.95. Williams Bros., 181 B St., San Marcos, Calif. 92069.

A&L/Resin and Acetone. The Francis Products line of kits and building and surfacing resins is now available through A&L. This resin is terrific for finishing balsa airplanes quickly and easily. A&L also has resin brushes in 1/2", 1" and 1½" widths for $.24, $.28 and $.32 respectively. Resin sells for $3.95 per qt. A&L Manufacturing, 16509 Santicoy St., Van Nuys, Calif. 91406.

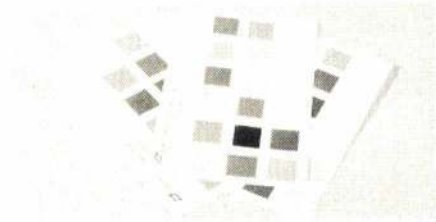
FH Wheels/Spoked Wheels. For miniature free flight models, there are now two types of spoked wheels available—dacron and silk in ½ to 3-3/8 in. wheel dia. The wheels are well-constructed and will support much more weight than it would seem by their small size. Silk spoked wheels sell for $3.85 and dacron spoked wheels sell for $6.45 to $8.25. A time-saving item. FH Wheels, 1770 Lilac Circle, Titusville, Fla. 32780.





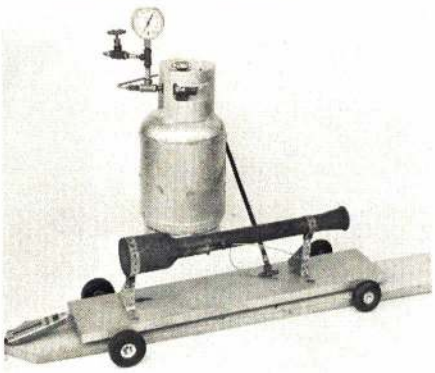


Prather/New Accessories. Prather now has a flush fitting wing hold-down screw in ¼-20 size. They are ideal for Scale or Pylon Racing subjects for the minimum in drag and best appearance. Roundheads are also available. $.59-.69 a pair. A revised prop balancer now has a graduated dia. so that it will fit props for 15 to 60 engines. This balancer is held in between the fingers for easy use and accuracy. $1.98. For those using hatch covers and cheek cowls, Prather makes a flush fitting camloc. This new style is easy to install and sells for $.98. Prather Products, 1660 Ravenna Ave., Wilmington, Calif. 90744.



Dave Platt/Color Charts. A scale modeler's dream come true, Dave Platt is now producing a three-card set of color charts for the United States, England or German WWII color schemes. A chart consists of actual mixed paint chips instead of printed colors for that added touch of precision and accuracy necessary in Scale competition. Each card consists of 14 different colors. $1.49. Dave Platt Models, Inc., 1300C West McNab Rd., Ft. Lauderdale, Fla. 33309.

THERMO-JET J3-200
R. E. ROJSLAVEK



The J3-200 Thermo-Jet engine is a product of Thermo-Jet Aircraft Engine and Industrial Heater Co. of Kerrville, Texas.

The J3-200 is a valveless pulse jet engine. Basic dimensions are: 21 in.—overall length; three in.—max. dia.; and one lb.—dry weight.

Stainless steel type 321 is used throughout in the engine construction. The Thermo-Jet engine is unique in that it contains no rotating or vibrating parts. The engine uses propane fuel, and requires no lubricants. Batteries and compressed air are not needed for starting. The specific fuel consumption of the J3-200 engine is 5.5 lb. of fuel per hr./lb. thrust of the engine. That's approximately 16.8 lb. per hr.

Other than your plane and fuel, the only device needed to start and operate your engine is a small propane or butane torch.

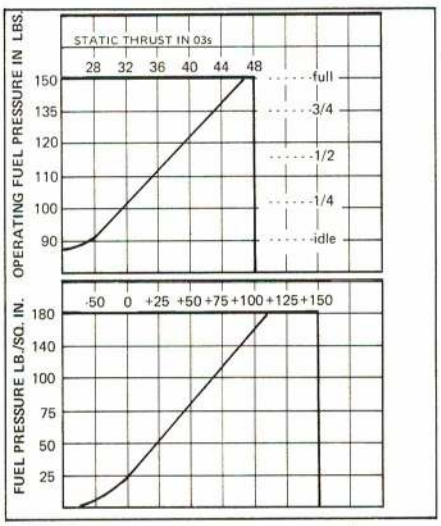
It is difficult for me to recall any engine or machine which has performed so closely to the manufacturer's claims as has the Thermo-Jet J3-200 engine. Be advised that success depends entirely upon compliance with the instructions.

The amount of internal pressure is in proportion to the fuel cell temperature. Most important fact is that below approximately 65°F we will have less than 100 lb. tank pressure, and this is not enough to operate the engine under ordinary conditions. Maximum thrust is obtained at approximately 150 psi fuel pressure. Five different size fuel nozzles are available from the manufacturer. If you plan to fly all year, having a complete set is a must; the cost is nominal.

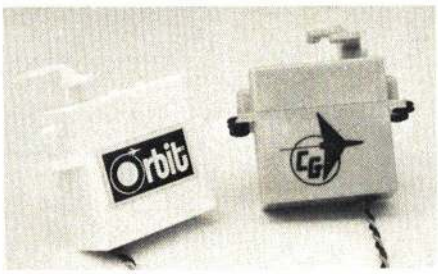
Installation in a model plane sets the fuel tank in a slanted, top down position so that during normal flight attitudes, the engine is fed liquid fuel, NOT vapor.

To start the engine, simply tip the nose down and open the fuel valve, ever so slightly, permitting only vapor to enter the engine; pointing the flame of the propane torch into one of the air inlets will start the engine. Upon starting, a low rumble will be heard. Open the fuel valve a bit more until the sound is more definite. This run was 10 to 20 sec. to

(Continued on page 108)



GOLDBERG AND ORBIT SERVOS
FRED MARKS



We have chosen to review these two servos together because, interestingly, they use the same servomechanism, but completely different modes of operation. The mechanism is manufactured for C.G. by Orbit.

The Carl Goldberg Models Servo: Uses servomechanism having output gearing of graduated thickness up to about 3/16 in. at output gear. Servo is part of complete retract system for sets that must use fourth channel for auxiliary operation of retract servo. Uses two alkaline energizer pencells in plastic holder, two s.p.d.t Micro-Switches on molded switch plate with actuating mechanism, and the servo mechanism for less cost than buying a digital 180° servo.

Servomechanism features use of "diode steering" to permit use of two cells rather than four. Mechanism measures 1-15/16" long including mounting lugs, by 2-1/16" high including special three-arm output for retract gear, by 3/4" wide, 16 mm Furuichi motor used.

Performance: Four-lb. thrust at 7/16 in. radius for 1.75 in.-lb. torque on three volt supply. Transit time is three sec. An excellent way of obtaining retract operation from four-channel gear.

Criticism: One must hold full low throttle and full low throttle trim for full gear extension time three sec. Recommended procedure is to extend gear well before final approach.

The Orbit 180° Servo: Uses mechanism described above. Orbit/Texas Instruments IC servo amplifier features feedback pot modified to produce saturated output until 180° limits are reached. Not positionable between. Requires a digital channel for operation.

Performance: The Orbit servo produced 5¾ lb. thrust at 7/16 radius for torque of 2.5 in. lb. Transit time is three sec., no load. No tendency for gear strippage, test was taken to complete stall.

Criticism: The output arm abruptly collapsed at 4½ lb. thrust and tests had to be continued using stiff output wheel. Would appear that both test servos would be slightly marginal in this respect. Suggested beefing of output arms if retract gear loads higher than 4½ lb. are encountered.

FLITEGLAS MODELS "GLADIATOR"
DUANE LUNDAHL

General: This subject kit is a fiberglass fuselage, foam wing with balsa skin model of Ralph Brooks' Gladiator. The kit is available from Fliteglas Models, P.O. Box 98851, Des Moines, Washington. It is available both as a basic kit, which includes the fiberglass fuselage and foam wing cores, or in a deluxe version, which includes all materials including hardware and balsa for wing skins which is the version we received to test. The kit was very complete, requiring only the usual fuel tank, engine, and wheels for completion. Absolutely all other hardware was included in the kit.

Construction: The stab and rudder are of built-up balsa construction rather than solid wood to give low weight. This is important because this particular design has a very long tail moment. The wing tips are of molded fiberglass and fit perfectly, making a very clean and smooth wing. The design is a semi-mid wing and a molded fiberglass belly pan is included. Again, this part fits like a glove.

The engine bulkhead comes marked for motor mount installation and the instructions point out that if a Tatone mount is put in the position indicated, and the engine then mounted prior to bulkhead installation, that one simply has to slide the bulkhead into place and center the propeller shaft in the front opening of the fuselage and all alignment will be taken care of. I was doubtful it would be that easy, but when I tried it, everything came out perfectly. This indicates, along with the way the wing tip and belly pan fit, that the fiberglass molding is of top quality and a lot of care has been taken in making sure that things are in correct alignment.

At this point, a word of caution regarding the final assembly of the airplane. The plans make a very distinct point of specifying a zero-zero wing stab relationship and suggest that the model be blocked up for alignment of the stab when installing it on the fuselage. This I did and found that I had to shim the trailing edge of the stab approximately 3/16" above the fiberglass fuselage at the trailing edge. The first flight of the airplane was not satisfactory and, in fact, I found that it was necessary to go back and remove the rudder stab and re-install it precisely on the mold line of the fiberglass fuselage. Flight is now completely satisfactory and I wish I hadn't measured things.

Incidently, you may think I made a mistake the first time around, but before I took it apart, I rechecked my measurements and verified that indeed the wing and stab were precisely zero-zero. After re-installing the tail as I indicated, the airplane flies very nicely. The point is to ignore the problems of going through the measurements—just follow the mold line that the manufacturer have built into the mold and you will have no problems at all.

The aircraft is a very large one as can be seen by statistics below, and installation of any radio system would be extremely simple.

Flying: The airplane obviously has the inherent ability to be a contest aircraft, since it has been a consistent winner for Ralph Brooks and two were flown in the Masters' Tournament last fall in Huntsville. I am not a contest flier, but I can assure you that the aircraft is an extremely stable, easy to fly airplane which is obviously capable of doing any of the maneuvers required. I was very happy with the quality of the kit and feel that the plans were more than adequate for this type of an aircraft.

Specifications: Wingspan—68 in. **Wing area**—730 sq. in. **Length**—54½ in. **Weight**—7 lb. 15 oz. **Wing loading**—25 oz./sq. ft. **Engine size**—60.

CARL GOLDBERG

FOR RUGGEDNESS, SIMPLICITY, AND VERSATILITY, YOU WANT C G RETRACTS

For years, experts knew that retracts were great and really helped performance. The only problem was they were troublesome and expensive. 2 years ago CG Retracts arrived, and at unbelievably low cost. The question became, "How can they be any good at that price?" Now the answers are clear:

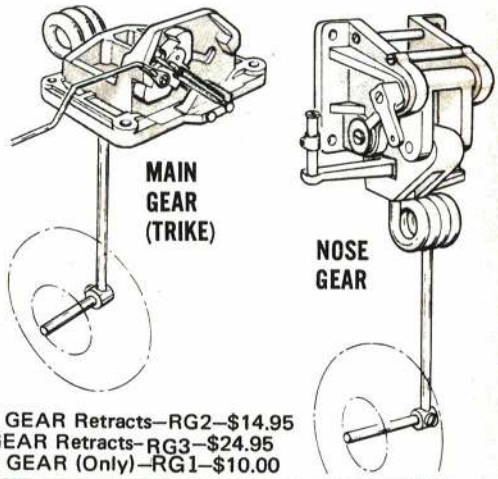
More CG Retracts are in use by experts and average flyers than all other brands put together because they work and they last. No other retracts have such tremendous proof of performance.

CG Retracts stand up to a crash better than your airplane and radio — and far better than any retracts with sheet metal. No other retracts have such ruggedness.

CG Retracts have fewer parts, which means less to watch and maintain, less to go wrong and cause trouble. No other retracts have such simplicity.

CG Retracts have adjustable axles so you don't have to bend your own. And you get low overall height, and light weight. No other retracts have such versatility.

ASK YOUR DEALER TO SHOW YOU HIS BEST SELLERS — HE'LL SHOW YOU CG RETRACTS!

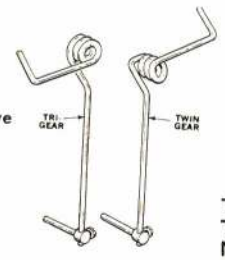


TWIN GEAR Retracts—RG2—$14.95
TRI-GEAR Retracts—RG3—$24.95
NOSE GEAR (Only)—RG1—$10.00

LONG STRUTS & ADJUSTABLE AXLES

Versatile—and you don't have to bend your own axles. Can also be used in older model CG Retracts.

Twin Gear set RS2—$3.00
Tri Gear set RS3—$4.50



UNIQUE SNAP-LINK! Patent 3711134. Now for the first time—you can buy a truly safe link—the SNAP-Link!

- Tiny 45° shoulder snaps through arm, prevents accidental opening. So unique it's Patented!
- One-piece design—no separate pieces that might come apart.

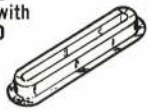
Snap-Link, Regular, with rod SL1
Mini-Snap-Link, with rod MS1
Snap-Link SL2 or Mini-Snap MS2, less rod 2 for 40¢
} 29¢ ea

NEW—MAJOR R/C FITTINGS SETS

Here's the economical way to buy the major fittings for your multi-ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material—and at a saving.

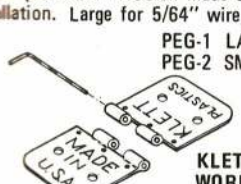
R/C Fittings Set No. 1 for ship with standard ailerons. RFS1 **$3.50**
R/C Fittings Set No. 2 for ship with strip ailerons. RFS2 **$3.50**

NEW! KLETT PUSHROD EXIT GUIDES



To protect your fuselage and insure smooth operation of your pushrods. Precision made of tough nylon. Easy installation. Large for 5/64" wire, small for 1/16" wire.

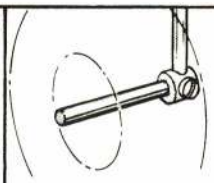
PEG-1 LARGE 4 per pkg. **75¢**
PEG-2 SMALL 4 per pkg. **75¢**



KLETT HINGES — WORLD'S FINEST!

Designed and manufactured by Roy Klett, originator of world-famous RK hinges. An exclusive with Carl Goldberg, these hinges are made with exceptional care and attention to detail. The small RK2 hinges are so thin all you need is a knife slit. The regular size RK3 hinges are the slickest you've ever seen — try holding one leaf and waving the other! And both have **removable music wire pins.** Ask your dealer for the best — Klett hinges.

RK2-7	7 for **$1.10**	RK2-15	15 for **$1.95**
RK3-7	7 for **$1.25**	RK3-15	15 for **$2.35**



5/32" ADJUSTABLE AXLE

Adjustable axle allows you to easily have the strut length you want. Both the axle and screw are hardened steel. Just file a flat on the strut, and tighten axle in place. AA1 **75¢** ea.

STEERABLE NOSE GEAR

Versatile — steering arm can be to either side, or slightly up or down, or mounted on bottom with extra collar in slot. Steering arm is nylon, stiff enough for good control, yet can flex under shock to protect servo. Collar is hardened steel — won't strip like brass. Screw is hardened steel, too. You can really torque it and get good grip on music wire strut without a flat.

Complete steerable nose gear with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers G16N **$2.50.**

NYLON STEERING ARM

Hardened steel collar and screw SA1 **75¢.**

NYLON BEARING

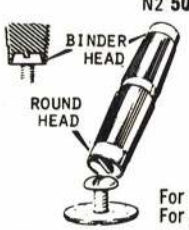
One-piece design mounts to firewall without alignment problems. Includes blind nuts, screws and washers NB1 **75¢.**

CONTROL HORNS

Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right size for 1/16" wire; nut plate for simplest mounting. Long horns CH1 or short horns CH2, with screws—**50¢**/2.

NYLON REINFORCING TAPE

This nylon reinforcing tape is extremely tough when applied with epoxy around the center when joining wing halves. 2½" wide x 5 ft.—N2 **50¢.** ¾" wide x 5 ft. N1 **25¢.**

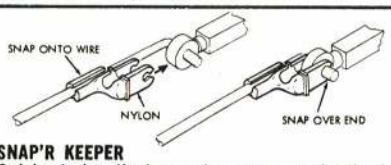


NEW KLETT SAFETY DRIVER SOCKETS DOWN ONTO SCREW HEAD — CAN'T SLIP OFF AND DAMAGE YOUR WING!

Takes Round Head Screws and Binder Head.

KLETT SAFETY DRIVER

For ¼" Nylon Screws SD1
For #10 Nylon Screws SD2
} 98¢ ea

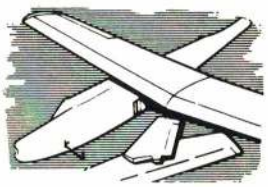


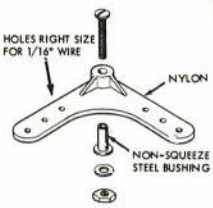
SNAP'R KEEPER

Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Works on wire 3/64 to 5/64" diameter. SK1 **50¢** for 4.

REPLACEMENT FOAM WINGS, ETC.

To go with your own design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly — **$3.95.** Stab and vertical fin, set **$1.95.** Assembled Ranger 42 fuselage. plus bearers, nosegear, etc., **$9.95.**





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—AB1 **50¢** for 2.

½A BELLCRANK and HORN

Made of nylon, this new set provides smooth ½A control line operation. Easy on dacron lines, too BCH1 **25¢.**

SHEET METAL SCREWS

Like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers—#2 x 3/16 SMS2 **30¢** for 10; #4 x 3/8 SMS4 **30¢** for 8.

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

MANUFACTURERS—All our accessories are available at excellent O.E.M. bulk prices.

Available in Canada

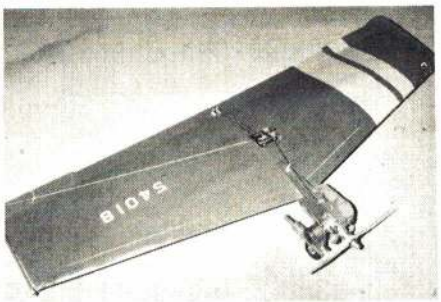
Carl Goldberg Models Inc.
4735 W. Chicago Ave., Chicago, Ill. 60651
I am sending 25¢ for 8 pg. Illustrated Catalog with Basic Explanation of R/C Equipment and Radio Control Definitions.

Name_____
Address_____
City_____
State_____ Zip_____

CARL GOLDBERG MODELS INC.
4735 WEST CHICAGO AVE. CHICAGO, ILLINOIS 60651

AAM TESTS

KRAFT WINGMASTER
JIM McNERNEY



The Wingmaster marks Kraft Systems' debut in the airplane kit market. It is designed as a simple, relatively low-cost and docile airplane for two or three RC channels. The simplest form uses two-channel "brick" with the Kraft elevon linkage and an unthrottled 40 engine.

The test model used three channels with a throttled Supertigre 61. This necessitated addition of a pound of lead near the trailing edge to obtain a proper CG.

Construction is ultra simple. Pre-cut foam wing cores are covered with cardboard skins, hollowed out for radio installation and mated using epoxy glue. The joint is reinforced with fiberglass tape and polyester resin. Balsa trailing edge tip blocks and elevons are added and covered with heat-shrink mylar. Tip plates made of 1/4 in. plywood are epoxied in place and the hardwood crutch for the engine, nosegear and fuel tank is mounted using resin and microballoons. The model is then ready for the finish. The test model was painted with K&B Superpoxy. Wheels, engine and radio are installed and the bird is ready to fly.

Flight characteristics with a 60 installed are very similar to a mild-mannered pattern bird such as the KAOS. The bird won't spin; it will fly extremely slowly and lands easily. Be careful of crosswind takeoffs. The nosegear is coupled to the aileron. Follow the instructions for position of CG. Desensitize the controls as much as possible for the first few flights—you'll find there's plenty of control. With the sidewinder engine mount and muffler, most of the engine dirt stays away from the externally mounted servos. However, you might want to build a fairing to cover them and keep the bugs off. If you use a 40, the CG will be pretty close. If you use a 60, you might shorten the fuselage crutch about 2½". This will limit fuel tank size.

Here are a couple of construction hints we have found useful. Before you install the cardboard doubler on the leading edge, paint a coat of contact cement on the leading edge itself. First, place the doubler in place. Then draw a line along the edge of the doubler on the wing skin, top and bottom. Use these lines as guides. Do not cement aft of the lines because it will be difficult to paint over the cement. Spray contact cement on the back side of the doubler and install. When you install the tip plates, drill two 3/16" holes through the plates and about four in. into the wing tips. Epoxy dowels into the holes. Without this added support, the tip plates will shear off in a hard landing. Attach a screw eye at the CG on the bottom of the crutch. Attach a crepe paper streamer by means of a monofilament line and a swivel. We found the landing gear wire to be a bit soft for a 60 so we bent a new one out of 5/32" wire. Kraft has a new universal elevon linkage for use with any Kraft servos. So now you're not restricted to KPS-12s or the brick for the elevon version.

The Wingmaster Junior is the little brother of this bird. It is designed for 15 to 40 size engines. Construction is identical to the Wingmaster. With a 40 up front, it's a very quick machine.

The Wingmaster can be built easily in a couple of nights and replacement cost is low. It's a lot of fun to fly.

Specifications: Wingspan—56 in.; **Area**—868 sq. in.; **Weight**—four to six lb.; **Radio**—two or three channels; **Engine**—40 or 60.

YS 60 RC
DON JEHLIK

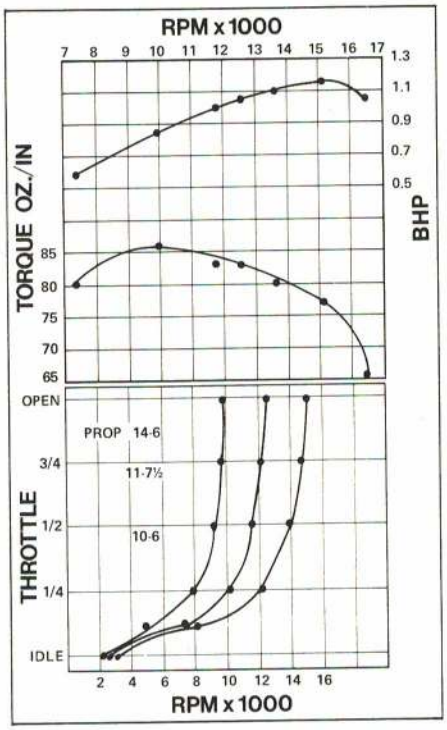
Yamada Mfg. Co., Ltd. has entered the engine manufacturing-export business with an RC engine that incorporates a pressurized fuel system with a pressure regulator. The fuel system works so well that I believe the regulator will be used almost universally where metered or constant fuel flow are desired.

Except for the fuel system, the engine is of conventional design with steel sleeve, baffled aluminum piston and single ring. The bolt on front plate includes the throttle body and upper portion of pressure regulator cast in one piece. The venturi hole in the carburetor barrel is almost 1/2" dia. This shows the added potential of the new fuel system: Venturi opening allows this engine to achieve its highest designed power in RC form. All other fully throttled RC engines have operated at less than full power due to restricted air flow through the carburetor.

I began the test by thoroughly reading instructions and diagrams. It's important to do exactly what the instructions say. The crankcase pressure line to the fuel tank uses a "reverse-flow limiter" inside the tank. It is simply a piece of flexible fuel tubing with slits to allow the pressure from engine to enter the tank. The slits close to prevent back flow to the engine when it is stopped. Fuel goes from tank to a fitting on the regulator. This dumps fuel into the regulator reservoir.

Top and bottom of the regulator work as follows: Top chamber has an air hole to crankshaft port for timed crankcase pressure, plus the fitting for air pressure for the fuel tank. Next comes a flexible plastic diaphram with an aluminum button in the middle. Next is the bottom housing that contains the fuel reservoir, regulator valve (like a small piece of wire with a soft plastic gasket), valve spring and adjustment screw.

(Continued on page 108)



CORBEN SUPER-ACE
BILL NESBITT

This Stand-Off Scale model kit from VK Model Aircraft Co. has excellent materials and plan. All wood parts should be marked, as die-cut parts have markings outside the required parts. Recommended additions to the kit are making a one-piece bulkhead of T1 and B5 backed up by T1, adding an additional 3/32 x 1/4" stringer at the break of curve on either side of the turtle deck from the cockpit to B7. These items make the covering stick and improve looks.

The strut arrangement, dummy shock absorber and landing gear work fine, but I would recommend wrapping the wing struts with nylon or silray for strength since most modelers tend to grab the struts in handling.

For balance, it is recommended that 1/8" sheet bottom be added to the tank mounts and a hole cut in B-1 so that the batteries can be moved forward under the tank compartment for balance.

The plans recommended a 25, 40, or 46 cu. in. engine, but I used an old Merco 49 which brought the total weight to 4¾ lb. At this weight, it still floats and comes in slowly.

For those who want action in the air, they should increase the aileron throw to maximum obtainable since that shown on the plan will not allow the plane to roll.

It was expected that trouble would be had in takeoff due to narrow tread of the landing gear even though I added a steerable tailwheel, but on the first takeoff, the tail rose in three ft. and with rudder control, the plane can be steered in any direction with no tendency to ground loop. Landings are also straight.

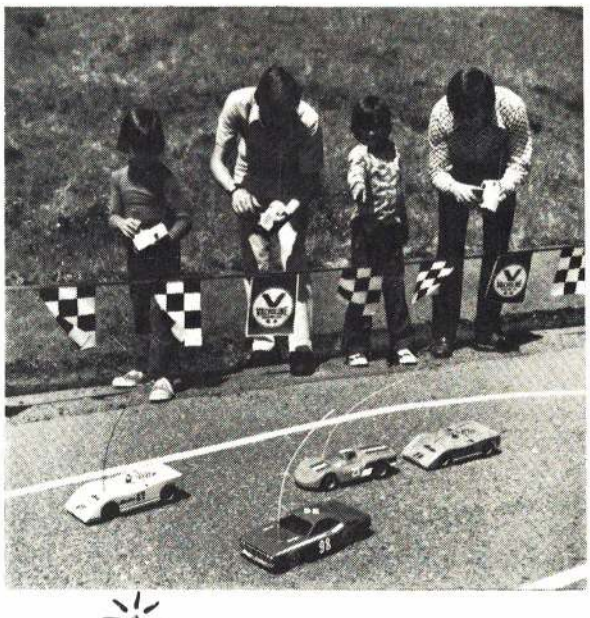
Hints: All wing spars should be cut from the left wing plan; the right wing plan is slightly short. Bulkhead B-4 is two pieces about one-in. wide and 4½-in. long tapering to 1/4" at bottom. Four each of S-2 and S-3 are required, but kit furnishes only two each. Front and rear wing anchor blocks should be installed as they are trimmed later to get proper wing incidence. Use outside battery charging plug and leave plane assembled at all times.

With aileron throw as shown on plan, the rudder is much more effective than ailerons and will give snap rolls. Regardless of aileron throw, rudder must be used in landings and takeoff for effective control.

Regardless of minor changes, I feel this is another excellent kit from VK and Vern is to be commended for its looks, materials and the excellent flying ability.

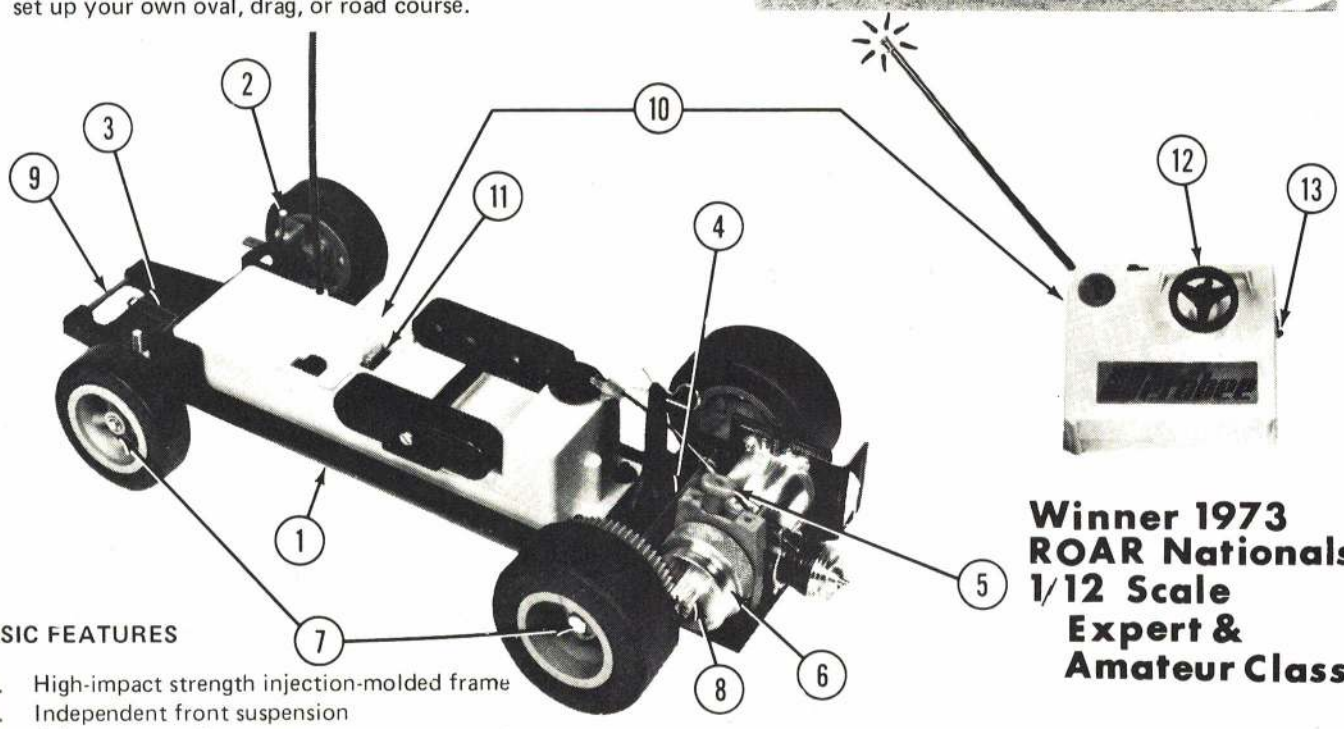
Specifications: Wingspan—56 in. **Wing Area**—505 sq. in. **Engine**—35-49. **Weight**—3¾-4¾ lb. Four-channel radio required or coupled. Ailerons for three-channel equipment.

WHETHER YOU ENJOY ROAD OR DRAG RACING... try "Radio Control"



LET Jerobee PUT YOU BEHIND THE WHEEL

of a gas-powered racing car . . . with all the sound, action, speed, thrills and spills of the track . . . right in your own driveway! *It's just like the real thing* as you weave your car through the pack . . . open her up in the straightaway . . . slam into the turns . . . whine down the stretch for the checkered flag!! It's *unbeatable* excitement! Just install batteries, fuel up, and *go!* You can race six cars at a time on any concrete or asphalt surface; it's easy to set up your own oval, drag, or road course.



Winner 1973 ROAR Nationals 1/12 Scale Expert & Amateur Class!

BASIC FEATURES

1. High-impact strength injection-molded frame
2. Independent front suspension
3. Ackerman steering
4. Heavy-duty rear axle
5. Recoil pull starter
6. Centrifugal clutch
7. Realistic "Mag"-type wheels
8. Steel drive gear and high-strength molded main gear
9. Precision-molded, high-strength Cycolac body — tilts forward for easy removal
10. Radio power under 100 milliwatts — no FCC operator's license required — fully proportional
11. Easily interchangeable radio crystals
12. Steering wheel with trim knob
13. Throttle lever (Comando radio only)

SPECIFICATIONS

Speed	25 plus actual mph 300 plus scale mph
Turning radius	4 ft.
Engine	0.049 cu. in.
Wheel base	7-1/2 in.
Track	4-3/4 in. front and rear
Tires:	
Front	2 x 5/8 in.
Rear	2-1/4 x 7/8 in.

MANY MODELS TO CHOOSE FROM
AVAILABLE FROM BETTER HOBBY SHOPS, DEPARTMENT STORES, AND AUTOMOTIVE SPEED SHOPS
MANY ACCESSORIES AND MORE THAN 20 BODY STYLES AVAILABLE TO ADD TO YOUR ENJOYMENT
FOR MORE INFORMATION CONTACT:

JOMAC PRODUCTS, INC. **12702 N.E. 124th KIRKLAND, WASH. 98033**

MODEL TECHNIQUES

FRED MARKS ON RC

Sport and Pattern Installation: Good advice for any mode from *The Victory Roll*—Ken Reber reports the following:

"After years of making sport and pattern installations, I found that setting up a pylon plane is a whole new ball game. When I was ready to try the new racer, Mike Helsel said, 'Bring it over and we'll set it up.' So I did, and found out why this guy is so consistent; he pays a great deal of attention to the small things that can make or break the average guy.

"So being average, I took notes on what he did to prepare the plane. These are ideas that are good to use on any plane so I'm passing them on to you. I knew most of these before, but never put all of them together in any one plane. You can bet my installations' quality will go up—possibly keeping the planes up, too.

ENGINE INSTALLATION: (A) Mount with allen screws—better able to torque down. (B) Clean all surfaces of sawdust. (C) Needle valve extension not too long as breaks off easily, no bends or hit cowl. (D) Fuel cutoff—positive action no kinking.

FUEL TANK INSTALLATION: (A) Replace worn or used stopper with new one. (B) Use plenty of foam to insulate tank. (C) Solid fuel lines from tank. (D) Where outlet pipes pass through firewall, use rubber grommets. (E) Use shortest amount of fuel line possible.

RADIO INSTALLATION: (A) Check servo action—slowest on motor, fastest on aileron and elevator. (B) Check for equal return speed on servos and possible binding. (C) Cover on-off switch with a protector. (D) Wrap battery pack in 1/2 in. foam, but not tight—use masking tape, not rubber bands as they compress the foam too much. (E) Wrap receiver same as battery pack, but do not let antenna wire exit through same area as power and servo wires—cut down range. (F) Wrap receiver and battery in plastic baggie to prevent fuel from getting in.

SERVO INSTALLATION: (A) Use commercial nylon mounting boards. (B) Draw screws just snug to the grommets; do not over tighten. (C) Mount servo board to rails using grommets—cut down on vibration.

SPINNER: (A) Perfectly true, no warped backplate. (B) A tight fit on the crankshaft insures minimum runout of spinner and less vibration. (C) 'Make-do's' won't do here. Better to buy a new one than watch everything vibrate apart."

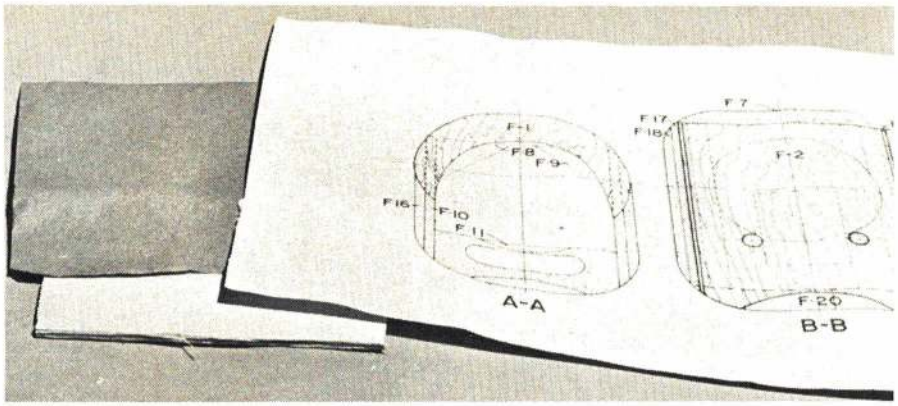
Easy Way To Trace Parts From Plans: The traditional method has been to cut out the item from the plan, thus ruining the plan, or to take a pin and poke at intervals around the outline. We've also seen some rather expensive vellum or mylar sheet recommended elsewhere. Our method is shown by the photos as follows: 1. Use a piece of transfer paper (carbon paper) over the wood stock. 2. Position the drawing of the part to be cut over the transfer paper and trace to transfer the drawing to the wood. 3. Cut out the part using a coping saw, jigsaw, or knife. 4. Sand to final shape.

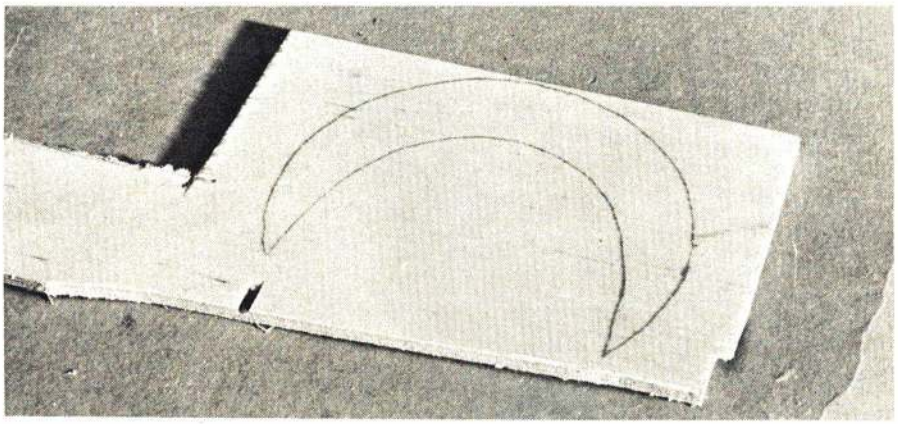
As she was typing this, my secretary Kathy Mahoney said, "Aha, there's a better way!" She tells me that there is a kit sold at sewing stores that consists of the transfer paper in several colors and a device called a "Dritz Wheel" which is used to do exactly the same thing. It is used to transfer patterns to cloth. Sells for about $.39. Thanks, Kathy!

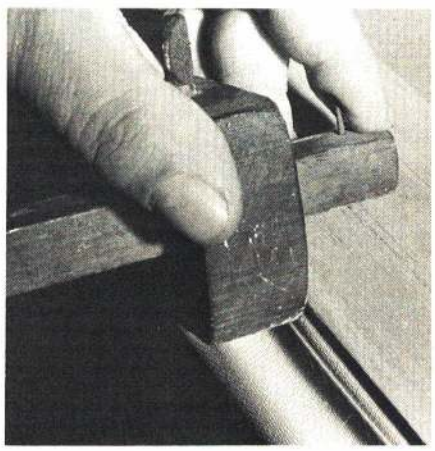
A Marker Gauge: Simple but effective. An inexpensive marker gauge available at hardware stores is an excellent tool for models. It can be used to mark sheet for cutting by scribing both sides, then snap the sheet. Or simply score sheet for bending over formers. When setting up for hinges on a control surface, set the scribe to the center of the surface edge, mark the hinge locations. Voila! All lined up properly and in the middle. There are other uses too numerous to mention.

From *The Coffee Airfoiler*, Lee Webster writes: "Well, my worst fears were realized at our annual RC contest. After flying perfectly on Friday before the big meet, my flight attempt in the Scale event with the Fokker triplane was a nightmare—couldn't really control it once it lifted off the ground. And finally, after a big struggle, I lost it on a turn

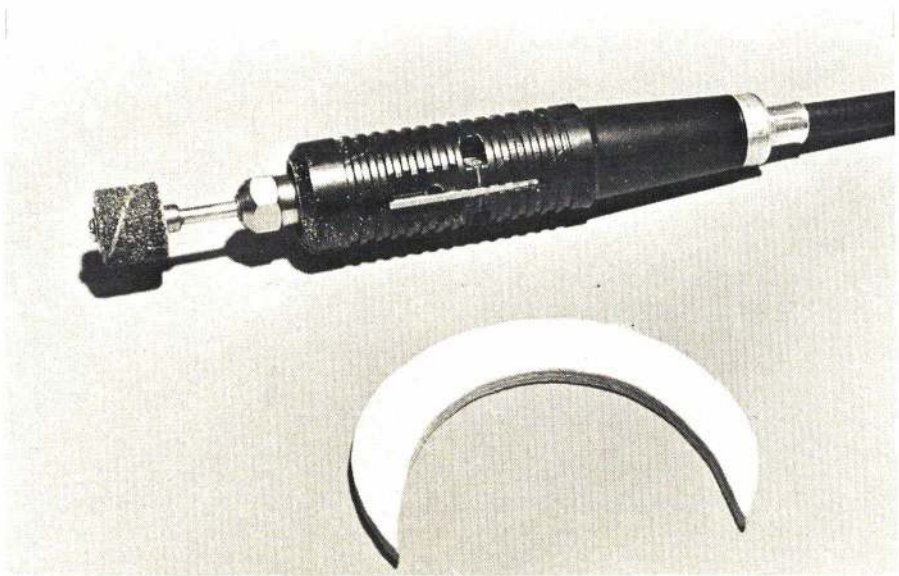
(Continued on page 88)





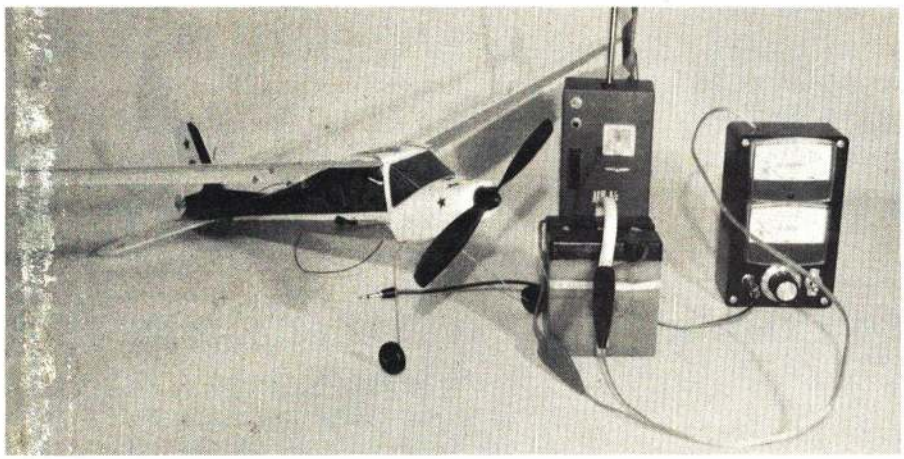


TOP: Lay transfer paper over wood; position plan over it. ABOVE: Blue transfer paper makes clear drawing on wood. RIGHT: Wood marking gauge is convenient tool for stripping balsa, marking for hinges, and many other uses. BELOW: Use jigsaw to cut final part. Finish with sanding drum.

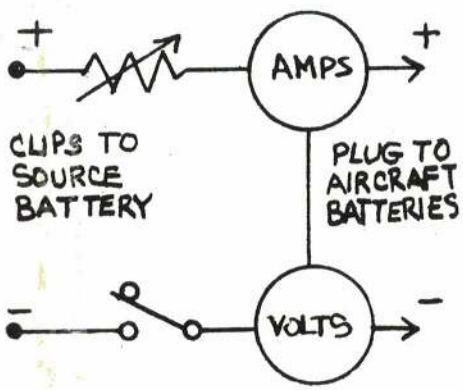


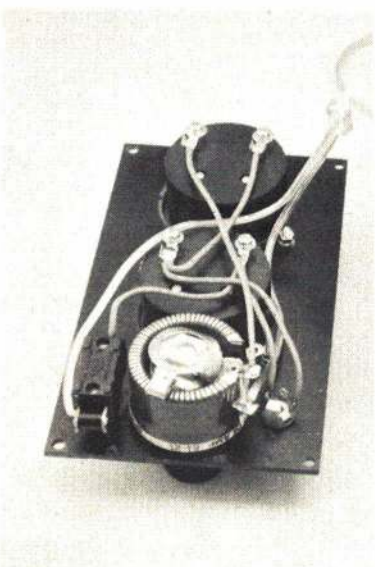
DC to DC Charger for Electric Flight

Simple and inexpensive charger is essential for the rapidly growing activity in battery powered flight. / by Ed Sweeney



ABOVE: Seen here with an RC version of the Mattel SuperStar plane, the charger is working from a six volt, six amp motorcycle battery. RIGHT: Charging an Astro 10 battery takes a 18 volt source. Any electric flight system can be accurately charged with this unit. Here you see on the meters that we are charging the 500 mah cells in the Mattel unit at 1¾ amps and showing three volts. We are hooked to only one of the three batteries of the 18 volt source. When the voltmeter indicates a rise, the current is closely monitored and reduced accordingly to reach peak charge condition. BELOW RIGHT: Any brand of box, meters, pot and plugs will do. The wiring is simple; there's not much to do.





Having played with several types of electric power systems in some real fun flying planes, I have found one important part of electric power to be missing. This is a simple, manual, infield DC to DC charger. There are now about six electric systems on the market using various battery sets and motors. Some are intended for duration type planes, others for fast stuntable ships. The planes are as specialized as the power systems. Presently, there is no great excess of power for the weight of each system, so the aircraft is tailored to use the power most efficiently. The infield charger assures that batteries contain a really full charge for each flight without guess work and without having to fully discharge the batteries before each recharging.

The circuit almost speaks for itself. No wiring diagram should be needed so only a photo of the wired charger and its schematic is shown. Any brand of meters, plugs or potentiometer will do; just be sure of the required meter ranges and pot ohmage. For charging all electric systems, a 0 to 20 volt voltmeter is suitable. A 0 to 10 amps ammeter is fine. Be sure the scale is physically large enough for accurate reading. The pot must be of at least 25 Watts capacity; 6 to 10 ohms is adequate.

While in use, you may hook the charger up to a 6 volt, 12 volt, or 18 volt motorcycle or auto battery. For charging two NiCads of 2.4V size, charge from only a 6V source. For higher voltage airborne packs, charge from the higher source according to the manufacturer's instructions with each particular electric flight system. For example, an Astro 10 from Astro Flite needs an 18V source.

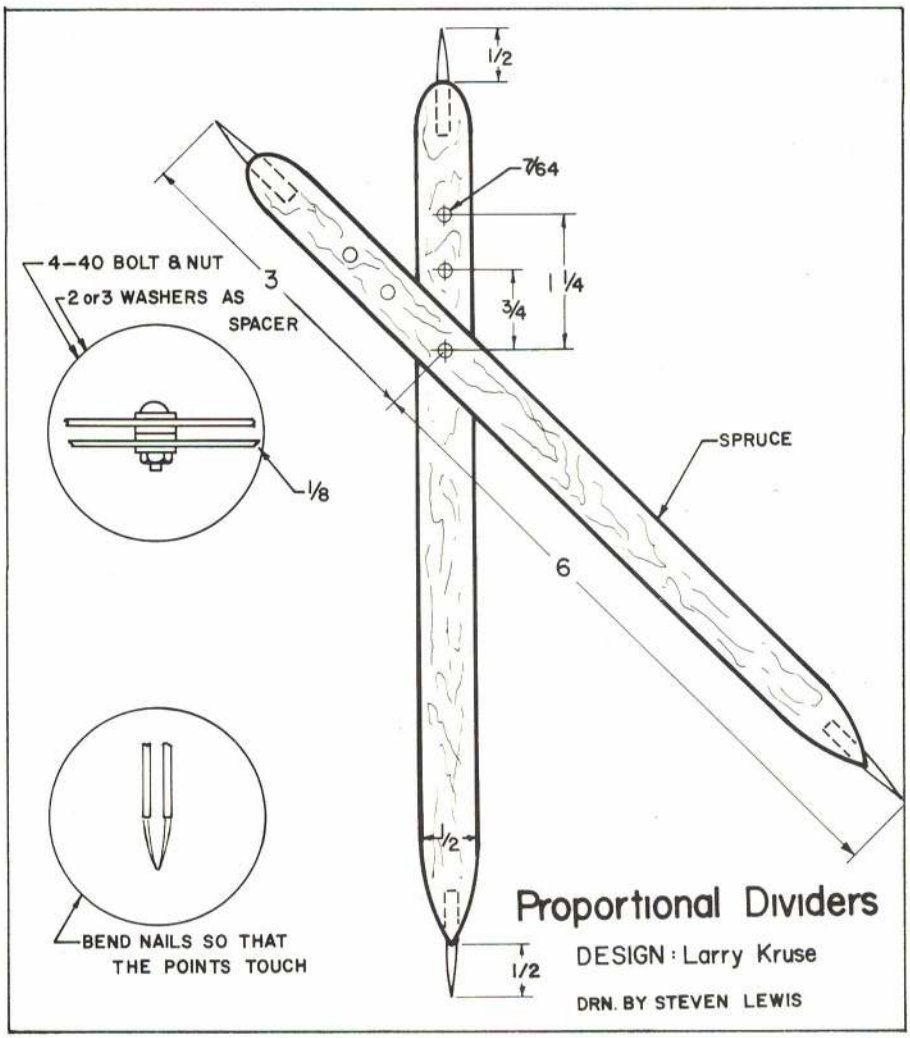
Here's how to use the charger. A nickel-cadmium pack will nominally read 1.2V per cell during most of its discharge cycle. At the very end of the discharge cycle, the cells will go below this voltage. When fully charged and at the time of full charging, these same cells will read about 1.41V per cell. Before the rise above 1.2V, these batteries can be given a high rate of charge. BUT, when the cells show the voltage rise above 1.2V per cell, watch the voltmeter very carefully and slowly turn down the charge rate (ampers). This is done by simply switching the charging source in and out of circuit and observing the voltage of the battery when not charging. Whatever you do, don't keep charging at high rates after the cells have reached peak voltage: They can explode at these charging rates. If you are not about to go flying immediately after finishing the charging cycle, turn off the charger. Peak 'em up with the charger just before launching.

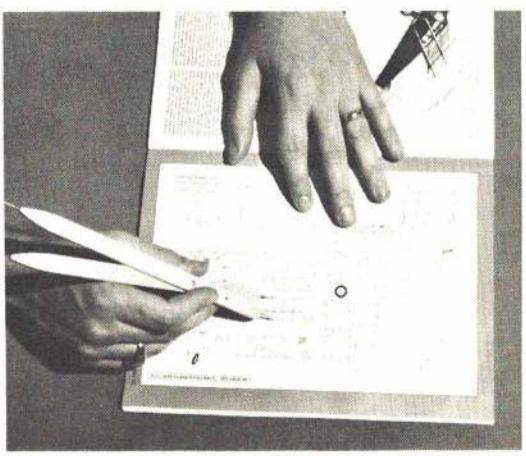
Is fast charging of this kind hard on the cells? Yes and no. If you slow charge, it is more likely that you won't be interested in electric flight (want to wait 14 hours between each flight?) and you might get 1000 rechargings over a period of many years. At the high rates, you can fly every 15 min. or even more frequently. Your batteries will easily handle several hundred rechargings as

(Continued on page 109)

EL CHEAPO! Peanut Proportional Dividers

LARRY KRUSE





How many times have you run across an old three-view that would make a perfect Peanut Scale project, oniy to be stymied by the thought of having to enlarge the dimensions using a ruler and the multiplication tables? Or perhaps you have some old Cleveland or Megow plans that would be show-stoppers rendered in Peanut Scale, but reducing 13/32" by three-fifths never was your idea of a fun way to spend an evening.

If you've found yourself in either of these situations, the solution to your problems is just 25 cents away.

The materials needed are four finishing nails, one 1/8 x 1/2 x 36" strip of Sig spruce, one 4-40 bolt and nut, several small washers, and a dab of epoxy. Cut two pieces of spruce to size, clamp them together and drill the proper holes. The only concern you should have is to make certain that the holes are drilled accurately. Additional holes can be drilled for scales other than those shown. Sharpen the finishing nails to needle points (no, a nail file will not work, dummy!), and bend them in accord with the drawing so that the two points on either end will meet. Then epoxy the nails into holes drilled in the ends of the spruce pieces, and the two pieces can be bolted together at whatever scale you wish to use. To change scales, merely change the location of the bolt.

The tool is simplicity itself to use. Just set the dividers at the scale you've determined to be necessary.

Let's suppose that you want to enlarge a three-view four times its original size. Place the bolt in the holes closest to the top and set the small end of the dividers on the dimension you want enlarged. The other end is automatically four times the original dimension. The reverse ratio holds true if you want to reduce drawings to suitable Peanut size. The other ratios shown in descending order from the top are 3 X and 2 X or 1/3 X and 1/2 X respectively.

Apologies are almost necessary for proposing such a cheap solution to a universal problem. So if you feel reluctant to take the cheapy way out, the same sort of instrument is available commercially from about $5 on up. However, in the age of spiraling inflation, economy is what Peanut Scale is all about. These dividers are truly proportional in that respect. Enjoy, enjoy.

DU-BRO PRODUCTS, Inc.
480 Bonner Road • Wauconda, Illinois 60084

MUFF-L-AIRE™

Patent Pending
MADE IN U.S.A.

Sound Reduction Engineering

FINE MODEL PRODUCTS BY DU-BRO

IDEAL FOR R/C PLANES . . . BOATS . . . CARS

MW-750

WEBRA. 60 RC ENGINE
MUFFLER

A PERFECT COMBINATION FOR YOUR WEBRA.

EASIEST OF ALL TO INSTALL, THE **MW-750** ATTACHES WITH TWO HARDENED STEEL SOCKET HEAD SCREWS DIRECTLY THRU THE ENGINE LUGS. . . . NEAT

ONLY **$7.50**

- ***EXTREMELY COMPACT!***
- ***FULLY ADJUSTABLE NOISE LEVEL AND BACK PRESSURE FOR BETTER PERFORMANCE!***
- ***ADAPTS TO ALL ENGINES FROM 29 TO 60***
- ***QUIETER THAN OTHER TYPES OF MUFFLERS!***

• . . . . . Varying the number of plates takes only minutes and controls noise level and back pressure to your desire. The ugly monstrous old fashioned muffler is now past history.

U N I V E R S A L
MUFFLER

THE **UNIVERSAL MUFFLER** IS HERE FOR THE .29 TO .60 CLASS. DESIGNED FOR INSTALLATION ON A WIDE VARIETY OF ENGINES, THE **MU-795** UNIVERSAL IS THE ULTIMATE IN LOOKS AND PERFORMANCE

ONLY **$7.95**

MU-795
Shown mounted on H.P. 60 engine.

MINI-MUFF-L-AIRE™

MM-595

NEW FOR '73

MINI-MUFF'L'AIRE IS MADE WITH THE SAME HIGH QUALITY STANDARDS AS THE LARGER MUFFLERS. DESIGNED TO FIT ONTO ALL ENGINES FROM .09 TO .25, **MINI-MUFF'L'AIRE** COMES COMPLETE WITH ALL NECESSARY PLATES, ADAPTERS, FITTINGS AND INSTRUCTIONS FOR EASY MOUNTING. NOISE LEVEL AND BACK PRESSURE CAN BE VARIED TO SUIT YOUR ENGINE

$5.95

MU-795ST
FASTENER KIT ONLY
$1.00

MU-795ST
OWNERS OF SUPER TIGRE .60 BLUE HEAD ENGINES WILL FIND THIS ATTACHING KIT THE IDEAL WAY TO INSTALL THE DU-BRO MU-795 MUFF'L'AIRE . . . COMPLETE KIT WITH INSTRUCTIONS

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

MAIL ORDERS F.O.B. FACTORY

SPECIAL INTEREST

JOHN BLUM ON NAVY CARRIER

Kits Still Scarce: To say scarce is almost sacriligious. Practically nonexistent is closer to the truth! Every other phase of the hobby has a wide selection of kits available (except Speed) but Navy Carrier. There is a Class II selection, but Class I demands either extreme modification to a kit or scratch building.

Now, building from scratch should offer the ultimate end result, since one would have what one wanted. T'ain't necessarily so! The more experienced modelers and competitors build from scratch as second nature. Unfortunately, most of us take this aspect for granted. Example: how many scratch-built profile Carrier models do you see? Very few, since suitable kits are available.

With Scale Carrier, however, it's a different problem and the number of competition fliers is most likely related to the available model kits and/or ambitious ability of a likely Carrier modeler. So, the need for several good kit designs, especially for Class I, is evident.

Which Way To Run?: Since no one is sure of the perfect size for a Class II model, we can only compare to successful models and what we think works. Practically all the successful Class II models have fallen into the 30-33 in. span category. Let's use the 30 in. in this discussion to make it easy and see what happens on several selections.

The AF-2S Guardian shows a scale span of 47 ft.; the P-51 Mustang has a 37 ft. span; the Bearcat a 35¾ ft. span; and the Aerobonita has a span of 35 ft. If we want a model of near 30 in. span we would need to use the scale in. per ft. of 41/64", 13/16", 27/32", and 55/64", respectively. All of which are somewhat awkward, unless, of course, the modeler has a calculator, or slide rule, can convert the fraction to the decimal equivalant and calculates all other pertinent dimensions, ultimately progressing from a three-view to a working drawing.

So, why not build from plans available through the magazines? What about interpretation of the plans? Transfer of dimensions? Construction of curves and developments? We offer plans, sketches, three-views, and text, and assume that all can use the material. Next month we'll start with basics.

BOB STALICK ON FF GLIDERS POWER, RUBBER, INDOOR

What You Might Not Know If You Didn't Read This Column Dept.: What you might not know about tissue trim. For those old-fashioned types like me who enjoy silk or tissue and dope coverings for free flights, there comes the moment of truth for cutting out tissue trim. Here's a hint. Draw the

Cutting out tissue trim using the cut-through-the-newspaper method.

Applying tissue lettering to the model.

numbers or designs on a piece of newspaper, slide a wrinkle free sheet of tissue between the pages under the drawing and cut away with your X-acto (a sharp blade helps). When cutting tissue pin-striping, cut in the direction of the grain using a heavy straight edge to guide the blade.

What You Might Not Know About How High Is High: Joe May wants to know how high a 5-7½ oz. model will get in ten sec. And that depends, Joe, on engine performance, airfoil, size of wing, trim, etc. But probably a reasonable expectation for a model such as a Mini-Pearl with a good TD 049 is around 500-600 ft. If anyone can supply more specific data, this writer is interested.

What You Might Not Know About Washing Out and Gliding Better: This column recently carried a picture of Wayne Drake and his A-2, The Sky Spangled Star Banger. Wayne had some problems with this model straying out of lift and was about to junk it until he tried washing out (warping up) the stab trailing edge tips slightly. Then the model flew so well, he ended up in first place at the Northwest FAI Semi-Finals on Labor Day weekend. He even lost his model on his last official flight with a DT malfunction, even though it was kept in sight for 24 min. Now, he is washing out all of his new stab tips. Want to try it on a model you have already built? Just hold the stab tip over an electric hot plate and gently twist it up. When you feel it "give," take it away from the heat and cool it quickly by touching it to your pants leg. If you warp too much, you can always reduce it using the same process. This system works as well as building the warps in at the start.

What You Might Not Know About Super Glues: The new Cyanoacralate adhesives, like Hot Stuff, are just what the doctor ordered for midnight oil burning night before the contest builders because of their tremendous strength and under-minute-drying time, but where these glues really come into their own is for structural repairs on the field. At the Northwest Semi-Finals, I suffered from a bad case of firewall separation on my power model—a little cleanup on the offending parts and a couple of drops of super glue and no more problems.

What You Might Not Know About Going To A Contest Prepared: Murphy's Law—"Whatever can go wrong, will!"—is a good axiom for the Free Flight contest goer. I use a checklist which I have developed over years of forgetting which, when I use it, helps me to know that I'm at least physically ready. You might check your flight box to see if you have the following: Flight Equipment—Special. Gas-powered: Fuels, spare balanced props, plugs, needle valves, engine mounts, bolts, nuts, batteries, timers, fuse, engine starter, fuel tubing. Towline Glider: Extra tow reel, line, flag, towhooks, timers. Hand Launch Glider: Small rubber bands, KeilKraft fuse, spare DT string. Jetex: Extra engine, fuel, wick, fuse. Rubber-powered: Extra motors, lube, spare props or prop blades, winder, winding hooks, stooge, winding pin, winding tube. Flight Equipment—General. Screwdrivers (Small jeweler's type and a thin shank long standard blade type), allen wrench, other wrenches, rubber bands, plane cleaner and clean rags, ground cloth, thermal streamer and poles, shim stock, washers, tachometer, stopwatch. Repair Equipment. Pins, clothespins or clamps, tissue, dope, brush, thinner, balsa, plywood, spruce five-minute epoxy, Hot Stuff, fast drying model cement, magic mending tape. And, Oh yes, don't forget the models.

I'm sure that there's more, so add your own to the above. Just remember that when all is said and done, there is a logical follow-up to Murphy's Law when applied to free fliighters, and that is: "Whatever you left at home will be the item you need the most." So, be prepared and go out and chase yourself a max.

What a typical flight box looks like after a hard day's flying.

More From The Readers—Adult Beginners Dept.: John Abma of Springfield, Ohio asks some questions of interest to all who fly rubber-powered models:

Q: Where can I get hold of a torque meter suitable for monitoring rubber torque while winding?

A: From Wilder's Model Machine Works, 2010 Boston, Irving, Tex. 75060. As far as I know, Wilder's is the only source for ready-to-use torque meters suitable for outdoor models. Drop a line to Bob Wilder for the latest info and price list.

Q: I have trouble tying my rubber motors. The knot comes loose when a little lube gets on it—and that's hard to prevent.

A: There are several ways to tie knots in rubber, but here is the method I use: I wash the rubber completely and let it dry. After weighing it off, I will wet the two ends to be tied and tie them into a very tight square knot. Then I tie another square knot and snug it up tightly into the first knot. After the moisture evaporates, I will lube the motor and it's ready to break in. So far, I have not had any failures using this system. To retie a motor that has already been lubed, the motor will need to be thoroughly washed to get rid of any excess lube. Tying a motor after it has been lubed is a more difficult chore.

Q: On a Coupe, I use a Sig 16-in. prop, with the designation 400 x 400 written on it. Six strands of ¼" rubber hardly turn the prop enough to maintain altitude! What gives?

A: This prop nominally is a 16 in. dia. by 16 in. pitch (400 mm x 400 mm). First, sand the prop down to a thinner airfoil shape. Try to reduce the undercamber as near to a flat bottom airfoil as possible. Next, reduce the blade area by narrowing the blades around 10%. The pitch could also be reduced a bit by bending the hinges, but this would produce other problems. Cutting the diameter down slightly would also help. Finally, wind the model up as close to 100% of total winds as possible. Ten grams of Pirelli should take 378 turns without too much trouble. Your rubber might take more or less. Wind one outside the model until it breaks. That'll give you an idea of where to stop when you wind for actual flying.

Q: Where can I find plans for a "winding stooge"?

A: I'm not sure that plans as such exist. However, I would refer you to the August and September 1968 issues of **American Aircraft Modeler** (available from **AAM**), for an excellent series of rubber models by Frank Heeb. The stooge I use is simply a short piece of 2 x 2" fir with a piece of ¼" plywood extending up on opposite sides. I have drilled a hole through the plywood to take the holding wire which goes through the fuselage. The entire rig is mounted through the trunk latch on my car. Works fine.

Q: Any special tips for trimming small models to fly?

A: On any rubber or gas-powered model which lacks stability, the easiest way (short of rebuilding) is probably to cross-control the trim. This means that the model is trimmed to fly under power in one direction, under glide the other. To set up a ship which should climb to the right, a typical trim method would be: (1) Downthrust—from 2-10° (2) Rightthrust—usually 2-5° (3) Washin the right wing panel—on a 5-6 in. chord, the washin would be anywhere from 1/8 to 3/16" (4) Use left rudder, if necessary—left rudder becomes a problem with higher speeds. Probably a neutral rudder setting is best in this instance. (5) Use stab tilt for glide—if necessary.

The effect is not too efficient, but it does give the kinds of control which keep a model from spinning in. Obviously, a model which should be trimmed to fly to the left under power, such as many scale ships, should have just the opposite trim settings.

Where the Action Is columns are what you readers are doing, making, or flying. Support your columnist with articles, photos, and ideas. Sketch your neat gadget. We'll draft it for presentation. Each item earns you a $5 bill. Submit to the writer, c/o AAM.

RC Helicopter Nats

In Static Judging, Gene Rock's original design scale Boelkow BO 105, (TOP) was easily the winner. Note the cockpit is entirely free of mechanical components. It has collective pitch and is a real performer, too. Second place went to Dario Brisighella's smart Kavan kit Bell Jet Ranger (ABOVE). It is also a fine performer and shows Dario's fabulous workmanship.

More than 20 modelers competed in the five events with a good variety of designs. Flying was excellent in spite of very windy conditions. / by Gene Rock

ABOVE: Walt Schoonard's big, attractive Cobra which placed third in Scale, has one of the nicest civilian color schemes seen on a Cobra. RIGHT: Along with his fabulous scale model, Gene Rock brought along his SSP-5 to fly in some of the Maneuvering events. BELOW: Al Doucette's magnificent CH-21C Tandem. The model works, has a Wankle engine and all control systems are scale, but even after five years of work, the radio is not yet installed. He plans to learn to fly choppers with a kit before trying his scale model.

Photos by John Burkam and Gene Rock

The Second Annual RC Model Helicopter Nationals were held at Fond du Lac (Wisconsin) Airport on August 9 and 10. Fond du Lac proved to be an excellent site. It was only 15 minutes from Oshkosh, where the Model Airplane Nationals were being held, it was easily accessible, it had good motel accommodations, and the wind was from across the field. In fact, the weather, quite similar to last year's, was warm, sunny and windy.

Originally the contest was to be a set of precision maneuvers but, due to a lack of qualified judges, it was changed to a race against the clock in four events. The first was a ten-ft. constant heading square with a landing at each corner. The second was a cargo pickup in which each contestant was to pick up a hoop and carry it to a landing pad 30 ft. away. Third was a Figure Eight around two pylons 50 ft. apart crosswind. Fourth, was Solo Pylon Racing with two pylons 100 ft. apart placed with the wind and one pylon crosswind on the left. A fifth flying event (not against the clock) was Expert's Choice with each pilot listing his maneuvers and performing them in sequence. All events had a five-min. time limit.

Twenty-one pilots turned out to pit their models against the hazardous first four events. This flying tends to eliminate models and/or pilots when a wind of 15 mph or greater is blowing. Toward the end of the second day, the field of models thinned considerably. Luckily, there were no crashes that proved fatal to any models involved.

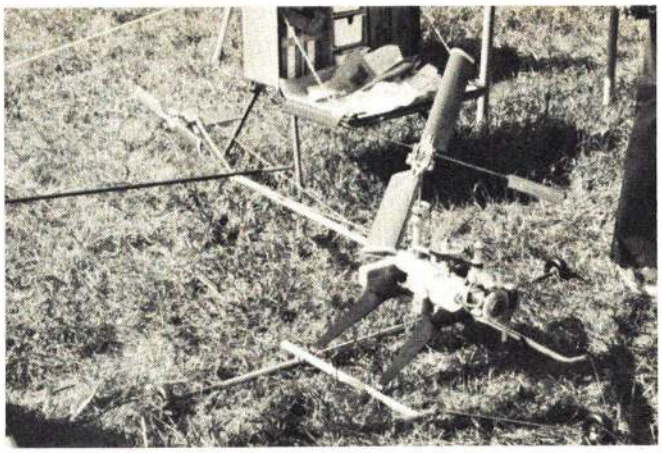
The first event, constant heading square, was very heated. Everyone was fresh; eight of the entries were under 30 sec. Ernie Huber's Schuco-Hegi Huey Cobra came out on top with an amazing time of 19.7 sec. Bob Bentley flying a Du-Bro Hughes 300 came in second with 23.5 sec. and Dave Keats' Hughes 300 was awarded third place with 24.1 sec. When any part of the landing gear was on the pad, time was called provided the model stayed there. This was the easiest and the least frustrating event, though the wind gave some models problems. In this first event, it became evident that the Hughes 300 in its scale configuration has a tail wagging problem. The reason for this is the very small scale sub rudder. Though this can be a problem for the beginner, it can be resolved by substituting a rudder of approximately three times the area.

In the next event, four hoops were placed downwind from the landing pad. The pilot was to pick up one hoop and carry it to the pad. If one was knocked down, he proceeded to the next; if all four were knocked down, the pilot would land while the judges set the hoops up again. I know one pilot who took the whole five min., knocked down at least 16 hoops and did not score! I won't mention my name.

Dario Brisighella with a Kavan Jet Ranger would have turned in good times if his model had not slid out of the landing pad for both attempts. A high speed rigid or spring-loaded rotor seems almost a must for this event. Faye Peoples

(Continued on page 101)

1



2

3

(1) Dave Youngblood's original design model is an exceptionally easy to fly model even in strong winds.

(2) Fay Peoples' much modified 2B placed first in the Non-scale Static event.

(3) Steve Darlington's Kalt Huey Cobra with the rigid head flew smoothly for him even in the strong winds.

(4) Closeup of Schoonard's Cobra. Imagine operating one of these for civilian use without armament, heavy protective skins, etc.

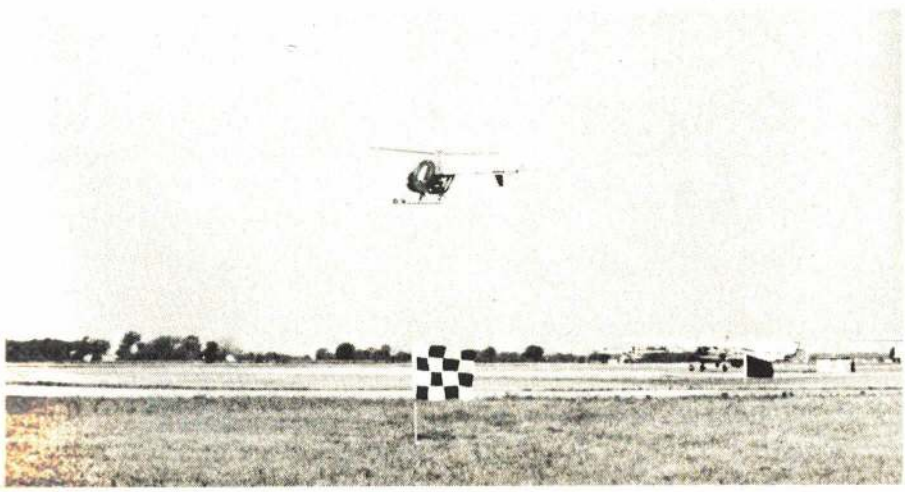
(5) Tom Herr, youngest contestant, displayed respect for his model and good sportsmanship by not flying in events in which he felt he was not competitive. We all thought he flew quite well in other events.

(6) Hughs 300 by Du-Bro (one of many Du-Bro versions) in the Figure Eight event.

4

5

6

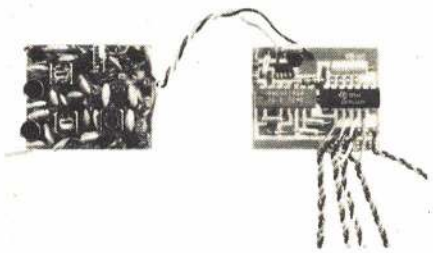


NEW! NEW!

1 TO 8 CHANNEL CAPABILITY!

ACE R/C digital commander KITS

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



digital commander (1-8)

RECEIVER-DECODER KIT

Up to 8 Channel Capability!

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

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

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

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

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

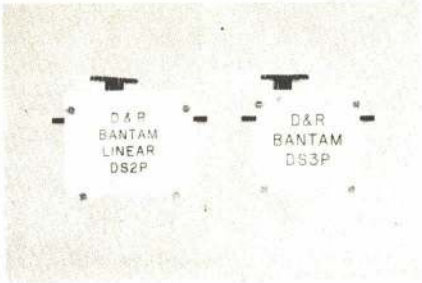
May be used with the Ace Digital Commander servos or any positive pulse servo. Provisions for three or four wire output from the decoder.

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

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

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

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



digital commander SERVO KIT

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

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

No. 14G20—Digital Commander Servo Kit $21.95

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

digital commander (1-8) FLITE PAK KITS

Offered in Two Versions

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

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

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

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

Flite Paks compatible with most existing transmitters.

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

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

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

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

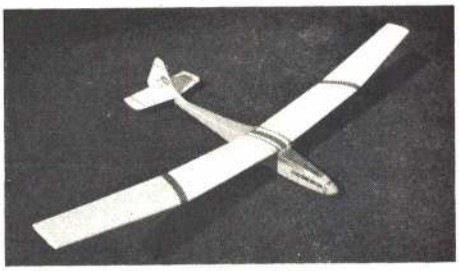
Please specify frequency

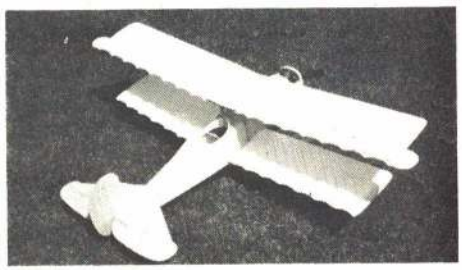
ALL STAR

BIPLANE KIT BY ROMAN BUKOLT

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

131200—All Star Deluxe Biplane Kit $21.95





Dear Friend:

Good things keep happening to the Ace Mini Foam Wings. Undoubtedly you noticed the Tall Texan in the December issue of RCM, and the Whizard by Owen Kampen in the January issue of RCM. The Tall Texan uses the 2T wing kit, the Whizard is a complete kit by Ace and is listed elsewhere in this ad.

The photos above show Sunday Flyer Ken Willard's two latest designs. The first is the Sunday Glier, and this will be published in American Aircraft Modeler.

The Sunday Fighters are made in one of two versions--Heinschmidt or Spadport. The Heinschmidt is illustrated.

We do offer the Sunday wing sets, which contain four panels of the constant chord wing with dihedral angle correctly cut for the Sunday Flyer series by Ken Willard. This is our catalog No. 13L65, and is offered at $6.50. If your hobby shop does not handle this, it is available directly from Ace Radio. Please add $1.00 postage and handling charge.

Our Pulse Commander is setting some sort of sales records. Sales have literally zoomed, and keep on zooming.

In the RCM survey we note that single channel (pulse rudder) is third in popularity, and it outranks 2 and 3 channel digital sets. There must be a reason!

If you aren't in on the fun of pulse rudder-only, investigate this seriously, because you're missing something.

Our 1-8 channel digital receiver/decoders with our servos are also going strong, because word is spreading from satisfied customers that this is an ultra reliable piece of gear and operates in many sections of the country where others are having problems.

Our revised 1974-75 Catalog is in the works, and should be out shortly after the first of the year. We still have $1.00 price tag on it, but the dollar price tag includes a $1.00 merchandise certificate, which is refundable on the first order of $10.00 or more.

1974 looks like a very promising year for radio control and for Ace R/C products.

Keep watching our ads--we'll try to keep you informed.

Yours sincerely,

Ace Radio Control, Inc.

Paul

Paul F. Runge

OUR 21st YEAR

ACE R/C INC.
HIGGINSVILLE, MO. 64037

R/C EXCLUSIVELY

pulse commander
Price Reduction!

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

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

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

THE SIMPLE SYSTEM--

--From 2.5 oz.

--WITH Nicads and Charger

RUDDER-ONLY PULSE IS:

* LIGHTEST WEIGHT--2.5 oz. for Baby.
* LOWEST COST--WITH airborne nicad batteries and charger--begin at $59.95!
* SIMPLEST--only one moving part, easily serviced and maintained; noise free.
* VERSATILE--Arrange to suit your particular installation. You can go up or down in size without obsoleting receiver or transmitter. Simple changes of battery pack and actuator allow change.
* FULLY PROPORTIONAL
* INTERCHANGEABLE--Plug-in wiring allows quick switching of receiver from plane to plane.
* INEXPENSIVE--Initial cost of system, airplane, and engine is low; one transmitter and receiver can be used for many different styles and sizes of planes.
* SIMPLE--Easy installation; actuator has one moving part. Minimum maintenance.
* GREAT for Beginners--FUN for Experts.

TOTAL Flite Pak Weights--

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

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

pulse commander R-O Systems

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

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

26.995, 27.045, 27.095, 27.145, 27.195

Please Specify Frequency

SELECTION OF PLANES FOR R-O PULSE

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

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

ACE WHIZARD KIT

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

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

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

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

Will perform virtually every maneuver in the book!

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

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

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

Top Ace quality.

No. 13L105—Ace Whizard Kit $17.95

(Available December 1973)

ACE DUAL CHARGER

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

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

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

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

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

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

Canadian Commander Customers

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

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

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

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

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

ACE RADIO CONTROL, INC. * BOX 301 * HIGGINSVILLE, MO. 64037

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

Master Charge or
BankAmericard No.

Add $1.00 shipping-handling for direct mailorders except catalog

1973 ROAR NATS

ABOVE: Side-by-side for the race of the year are top experts (L to R) Del Fisher, John Thorp, Mike Morrissey, Arturo Carbonell and Roger Curtis. RIGHT: The Concours field awaits judges. Caged stock car placed second overall. BELOW: Ted Gradt's Concours winning L&M Porsche.

As RC car racing grows, the NATS get bigger and the track gets longer.
by J. R. Blanchfield

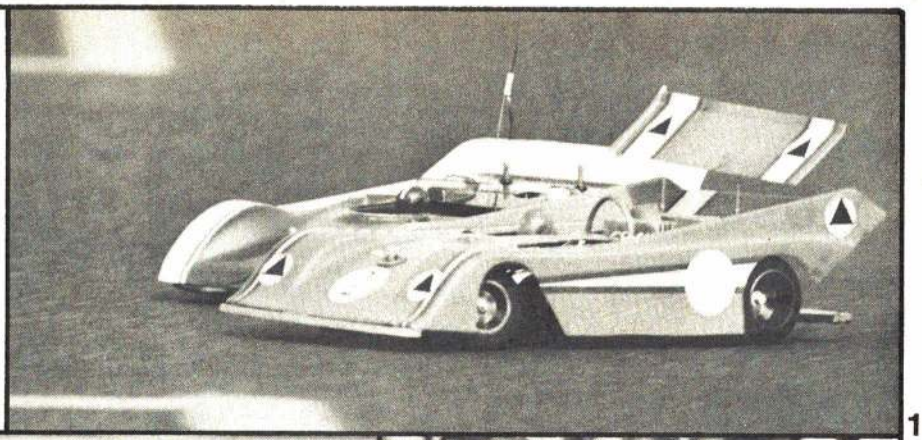
A new dimension was added to the historical relationship between Indianapolis and U.S. auto racing with the running of the 1973 ROAR National Championship RC Car Races. From August 23-26, 119 RC car enthusiasts from 19 states and four foreign countries met and competed for fun and fame. When the smoke cleared, Mike Morrissey had earned the top honors in the Expert class and Ken Morton had captured first position among the Amateurs. Each has the honor of being the 1973 ROAR Grand National Champion for his respective class.

Winning the championships required superior performance in three of these four categories of racing: 1/8th Road, 1/8th Oval, 1/12th Road and 1/8th Drag. Scores in the separate events were combined to determine the overall contest standings. The Road Race events required a full sports, GT or Can Am bodied car, while the Oval Race events required an open-wheeled car. Either type was eligible to compete in the Drag Racing events which offered two additional classes for funny cars and rail type machines. A Concours event was held, however, points earned did not count toward the championships.

The meet was hosted by the Indy 500 RC Car Club. They did a fine job of preparing for the running what was surely the best RC Car NATS yet. The track layout was huge and it took most of the competitors by surprise. Few had expected such a large facility. Each lap around the oval course measured 660 ft. and the road course, laid out inside the oval, was 880 ft. long. Around the outside of the oval a foot-high plywood barrier provided security for the bystanders as well as for the cars. About 40 percent of the track was overlooked by temporary bleachers erected for the convenience of spectators—and there were thousands of enthusiastic on-lookers throughout the four-day event, cheering when the competition was close, booing when someone cut a cor-

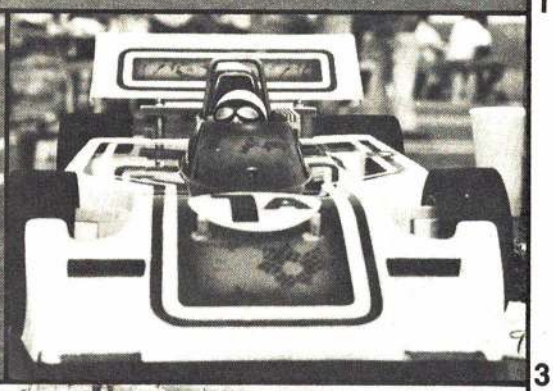
RADIO OPERATED AUTO RACING INC.

ROAR



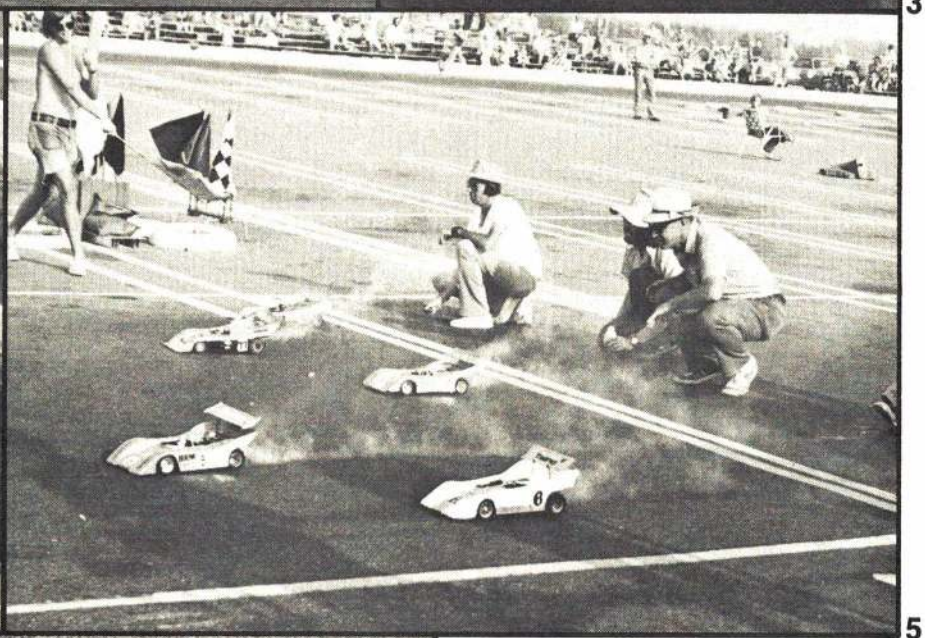
1

2

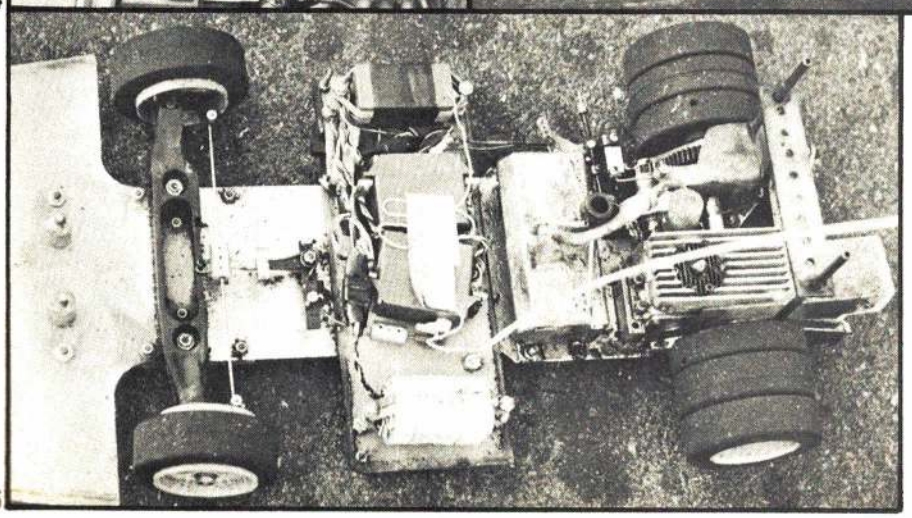


3

4



5



6

(1) Neither willing to back off, two racers sweep through a turn door-to-door.

(2) One of the most confusing aspects of the circuitous race course was the constantly intersecting, painted parking lines. These were hard to ignore at first.

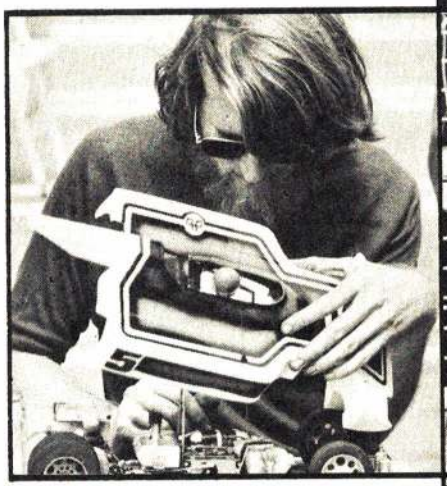
(3) Miniature driver calmly waits for his race to be called. Nicely painted.

(4) The hard-working scorers recorded times for every lap of every car.

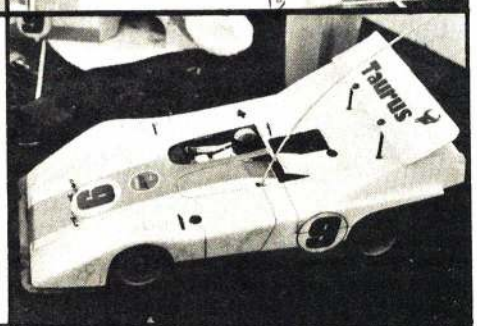
(5) Five expert class cars get off the grid in Road Race heat. At speed only, the different colors will make them look distinctive—all are McLarens!

(6) Chassis of super-quick expert road car: Mike Morrissey's McCoy-powered Taurus.

ABOVE: Spectators watch an Oval heat as two cars head down the 165-ft. back straight. Note that most of the track is surrounded by bleachers—spectators were welcome and well-treated. RIGHT: A Zebra striped Ferrari? What would Enzo say?



ABOVE: Mike Morrissey, a good sportsman, checks out a competitor's car. ABOVE RIGHT: Race official completes tech inspection form. Car on the scale must meet the 5-lb. minimum weight. RIGHT: Morrissey's winner looks quite well-raced. Note air scoop just ahead of the antenna exit for engine cooling. BELOW: Bill Rattey's McLaren at speed. Note the sweep of the antenna. The back straight was long enough to allow machines to reach their maximum speeds.



ner, and gasping at some spectacular crashes.

In the far extremes of the track, the cars looked mighty small. A driver with less than eagle eyes was at a real disadvantage. A five-ft. high driver's platform provided an improved perspective which was especially helpful in unraveling the complexities of the road course. A pit area was provided at the base of the driver's platform while the scorers and the Race Director were positioned adjacent to the platform. For each car in a race there was a spotter and a recorder responsible for timing and recording every lap. The spotters called out each time their assigned car crossed the start /finish line while the recorders wrote down the number of elapsed seconds. Every lap for every car was recorded in this manner, so that any race could be reconstructed should the need arise. A light-operated timing system was utilized to time individual laps and car separations, so that the Race Director who doubled as announcer, could keep the spectators and the competitors informed about especially fast cars, or about cars closing the gap on the race leaders.

Bob Stevens should write a Race Director's Handbook. He handled the event and its narration in a highly professional manner and, thanks to his efforts, the sport won many new friends during the contest. In general, the spectators needed to have some explanation of what they were seeing and narration over a PA system was the only way to reach them. It was a delicate task to provide interesting information about the racers and the race without sounding corny or like a carnival salesman. Bob Stevens showed it could be done and clubs would be well-advised to look into narrating their events if they wish to draw and hold spectators—a prime source of new members.

Thursday and Friday were for practice. Contestants added their names to waiting lists under their frequency and then waited for their turns. Each was allowed one tank's worth of practice at a time. Tires, gear ratios, carburetors, and the chassis could be changed or adjusted in the pit area, but no fuel could be added. Upon completion of a practice run, a contestant could again enter his name on the waiting list. An equal number of hours was allowed for oval and road course practice with official sessions running until 11 PM under the parking lot lights. Some competitors reportedly stayed even later using their full-size cars' headlights to illuminate the track.

As the track was used, the oily residue from the engines caused a major change in the coefficient of friction between the cars and the track surface. More bite was available and most cars underwent a series of readjustments to maintain the desired steering characteristics. More than one of the Expert drivers, wise in the ways of RC car racing, deferred making any tire or suspension changes until the course was "right," knowing that to do so would be wasted effort.

New FUTABA PROPORTIONAL SERIES

FP-6DN

6-CHANNEL RADIO CONTROL

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

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

4/450mAH nickel cadmium battery package

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

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

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

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

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

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

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

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

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

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

BOB STOCKWELL ON RC

Words Recalled: In my story about the 1973 NATS, where I reported with meticulous accuracy exactly what happened, it seems that I ruffled the feathers of K&B Manufacturing rather drastically. Based on my own unsatisfactory experience with the '73 Schnuerle-ported K&B engines as compared with my own extremely satisfactory experience with the '72 engines, there was quite a dramatic failure of the '73 to come up to the standards set by the 100 engines that were to have been the prototypes and test run of the '73 full-production version. I made a facetious comment that, "It seems as if a Ford or Chrysler type recall to modify the engines would be in order." When that was published, a large number of you proceeded to call the Brodbecks and ask when the recall was going into effect. Unfortunately, you jumped the gun a bit. I never said there was going to be such a recall, nor indeed will there be one.

I still don't think the best '73 engine will beat the best '72, but we'll never really know. Practically all of the '72 engines, in their original form, are worn out or crashed and original parts can no longer be obtained. If you still have a '72 engine and if the NMPRA/AMA play fair and still allow the engines to compete in 1974 (once an engine has been declared legal, it ought to continue to be legal even if newly manufactured engines have to be produced in quantities of 1000), you should send it to one of the top custom engine men and try to keep it in top form.

In spite of that view, however, I must say that the 1973 engines, especially those worked on by Clarence Lee or Jim Nightingale (P.O. Box 603, Vista, Calif. 92083), are really fine engines. Unless Supertigre does something a lot more spectacular than what I've seen so far of the X-40, all the competition is going to be between K&B engines. It's going to be competition between Nightingale reworking, Lee reworking, Aldrich reworking, Telford reworking and so on. Occasionally, a "stock" engine will find its way into the winning circle. Let me give you a piece of free advice: You're better off with one engine that has been properly reworked than with three that are out of the box. **If you're an ordinary flier, however, without special engine savvy, and you want to compete in Formula I without total frustration on your engines, you'd better get competent help.**

If I haven't said it before, I'll say it now: It's what's up front that counts. You can fly a DARA or a Dallas or a Pellet or a Minnow or a Ricky Rat or a Shoestring or a Bandido, and as long as you have it trimmed well and provided that you built it straight in the first place, the difference between your speed and that of the competition is all in the engine and the propeller. Propellers should no longer be a mystery. Prather Products has just put out a beautiful pitch gauge, and along with it, you get a clear and informative booklet on how to carve racing propellers written by Terry Prather.

Apparently I made John Brodbeck, Jr., mad enough with my comments about the '73 engines that he has decided to come back into racing himself and prove that he can beat anything around by running engines taken straight off the shelf. At the October 13-14 race conducted by the Valley Fliers at Oxnard Air Force Base, Johnny beat almost everyone in sight. The event was won by Terry Prather with an X-40. In the race against Brodbeck, however, it was clear that only Terry's superior piloting skill pulled him through that race. Brodbeck had a fly-off for third with Bob Smith: Smith had all along been using his '72 engine, but for this race he put a Lee '73 into his DARA. Again Brodbeck was clearly faster, though he blew the race with a couple of bad turns (in fact, he had a half lap lead after three laps with a simultaneous start). Brodbeck will certainly have another chance to prove that '73 engines are better: Whit Stockwell will be flying a '72 at the Tournament of Champions—an engine which Ed Hotelling (NMPRA Newsletter Editor, winner of the Western States Pylon Championships, and second place winner at this Valley Fliers race), sold to Whit to give us a chance to prove our contention. No one else would sell us one (or even loan us one for one race) at anytime resembling a reasonable price for obvious reasons. But Hotelling is a man of honor and conviction: He thinks the '73 is better, and all he wanted was the price of a Lee-reworked '73. Whether it turns out that we're right or wrong, we're indebted to Ed Hotelling for giving us a chance to test our theory.

I'm afraid that I'm finding that there are a lot of prima donnas associated with racing. That's not surprising: It is an incredibly demanding, high-tension sport. Anything I say that resembles criticism of an individual or an organization creates nothing but flak. There are a number of gentlemen in the game—Terry Prather, Bob Smith, D.C. May, Cliff Telford, Chuck Smith, Ed Hotelling, Jack Stafford, Ed Rankin, Glen Spickler, Jim Jensen, Joe Foster, Ron Sheldon, to name a few—but there are also a number who forget that their feet, too, are made of clay. Fortunately, that number is small, and on the whole we have to say that the quality of the friends we've made in racing is one of the most salutary aspects of this great sport. Among those whom we treasure most highly are the Brodbecks, and we would hope that our honest if feeble attempts at objective reporting and criticism will not damage that relationship.

JOHN SMITH ON CL

The Oshkosh, M'gosh, Nationals: Speed week '73 started by not starting. Due to field regulations/weather/others (take choice of two), things were delayed until 1 PM. By that time many people who said they would time had left, leaving the Event Director with only enough timing help for one circle. But things got started—finally.

Phil Bussell got things heated up by having the wind take his ½A Proto ship over the top, which started one of the biggest Crash and Burn weeks in modern NATS history. Due to the late starting time, the event ½A Proto and Jr. Profile Proto was extended to 6 PM. Even so, many didn't get all their flights in. The best competition of the day was in Jr. Profile where the winning time was 67.42 mph and the fifth place was 76.67. At 6 PM, as it was every day all week, all flying came to an end, (official flying stopped at 5 the rest of the week, except Wed.) the field was cleared and the runway, an ILS runway (Instrument Landing System) was open to full-scale aircraft.

Wednesday dawned a bit overcast and the winds were at about 800 mph, well it seemed that fast, blowing directly across the runway. At 1 PM a few drops of rain fell, then came the buckets full. Many, after cleaning up the tool boxes, had plans in mind for building an Ark. Somewhere between AMA Headquarters and the Speed circles, Garcia got the note wet and the message said that when the tower light (Control tower) went on, flying was done for the day. Well, the light went on, guys packed up, the rains continued to fall, and everyone went their separate ways. About 3 PM the sun came out and some of us, still trying to get a couple of flights in, went back to the site to find things being set up again. I know many didn't return, due to the earlier message that was passed on, but things ran this day til 5:30 PM. So even with ½A spread over two days we had lost over six hours of flying time.

Open Rat King John Ballard poses reluctantly with his winning craft, Color Me Gone.

The sun came out on Thursday, but the winds continued. "A" Day got a full schedule in with FAI times in the 134-136 mph area. Bartley-Garner-Huff took 1st in A Open with a 168.95 run. Jr.-Sr. Rat race was also run on Thursday, open the day before. All Rat Race was run two to a heat, with not a tangle during the flying. It seems as if this NATS change to two-man heats really worked. Jr. R.E. was taken by Jeff Ackerman, with a 5:22.5, the fastest of all the classes.

Friday was "B" and "B" Proto Day. Again wind and the crashing and burning continued. In B Proto only seven open guys got official flights! Tom Upton topped 'em all with a fine 156.59 run in open while Michael Bussell, Phill's son, took Jr. with 138.35, a new record and Mike Langlois was tops in Sr. with 142.40, one of only two Srs. flying. (This is the NATS?) Open B was taken by Johnnie Shannon at 188+, a new record. His buddy, Dud Jett was right behind with 186+. Their engine was featured in a previous column. Over in Scale Racing (Goodyear, Formula I or whatever), Open was taken by Harris of Bethany, Ok., at 6:50.4, Jr. by Doug Harris of Bethany, Ok., with 7:18.0 (Father and son?), and Sr. was John Huntsverge of Centerville, Oh., with a time of 8:31.2.

"C" day was windy again (why break the pattern?) and again an unusually large number of people, young, old, big, little, acted as if this was the first time they had ever flown. Schedule of many called for: Start engine, takeoff (or hop dolly), fly two or three laps, then crash and burn. Don't know if anybody kept track, but there must have been as many crashes as official flights. Bartley-Garner-Huff again took top place in C with a 188.60 flight. Make Langlois took Sr. honors with 181.93. This equalled the second place open time of Frank Garzon. In Junior, Max Snyder set a new record of 160.08 mph. This was with a 40. In Jet, the Juniors and Seniors again fought for the lower places. I don't know why when some RC events have trophies to 20th place, we can't give our Jrs. and Srs. a fair shake and let them compete with each other in Jet. In other Speed events some Jrs. got trophies to fifth, while in others the trophies were cut off at third place. When I asked about this at AMA they told me the trophies were in proportion to the number of events/entries. But I noticed a number of trophies in other events were not claimed and were being taken back to Washington to be stripped of the NATS plate and would be sold to local clubs. (Information from an AMA Officer.)

If someone "up there" thinks Jet is too noisy/dangerous for Jr. Sr. and they will quit if they have to fly against the big guys, look again. If we advertise 500 trophies, let's give them out. After all, they have been paid for by advertisers.

On Sunday, FAI Team Race, there was a good turn out. J.E. Albritton-Jim Joy won it, and looked like a shoo-in for the FAI Speed-TR. Team. A couple of guys had problems there too, not wind, but engines. The aluminum ring on the crank shaft of the late model ST diesels expanded and broke "aluminizing" the insides of the engines. One flier reported that he ran three of the engines and all three came apart. Pit stops, for the most part, were quick, and J.E. Albritton even threw an extra one in on his win.

More Observations: Over all, everything seemed to run smoothly considering this was an all AMA NATS (no military help). Having spent almost all week in the Speed area, I saw only one AMA officer in the area. One time on business. But RC had them in large numbers, maybe we should all carry transmitters. Note to Bev Wisniewski and Co. Maybe you guys did such a good job they left you alone. You did, too. Only next year please beg, threaten, or have AMA steal you some bull horns. Even California voices only

Inspection of racers at an M.A.R.C.S. Quarter Midget race. Although the planes are all simple and engines must be stock, there's plenty of speed. If this is your thing, be sure to read Bill Cooper's invitation to join Quarter Midget Association within NMPRA.

last so long. To Glenn Lee, congrats for the fine new pylons. Again, though, someone tried to save a buck and used too thin a plywood for the base. Jim Wade almost lost his Jet ship as he did the Oshkosh-Two-Step when the pylon started to whip on him. A number of models were lost or damaged on C Day when they ran off on the grass during launch. Trying to fly C with 70' of wire on a 145' wide runway is a bit much. It sure keeps a pilot on his toes during launch and landing. And it also makes for a very dangerous situation for the paying customers who stood close to the runway "to see the toy airplanes."

The "shrapnel screens" in front of the timers were a blessing too, as they were used by about 50 guys when the C model of an Australian entrant pulled him through the pylon. He had both feet off the ground at one point. The model finally flew apart of the flight with the lines wrapping around the pylon, and getting shorter, with each lap. Someone did spring with all new stop watches this year. Thanks much, for that one. The fiasco of the week occured when a few speed fliers were shot down for having lines .0002" undersized. One guy was .0001"! All when the CLCB had already voted "yes" to allow a minimum undersize of more than that for the new '74 rulebook. (The manufacturers' tolerances were discussed in a previous column.) Then the "no fly" decision for these undersized lines didn't come from the CLCB chairman, or even the AMA Tech. Director, but from Sec. Treas., Earl Witt! My lines, by the way, measured .0085". So you can see the variation in sizes.

It was a wet, windy, warm week. Where to next year? If the many speed fliers I talked to have anything to say about it, any place but Oshkosh.

More NATS Notes: GIRLS IN THE CIRCLE! Women's Liberation! It really happened. Linda Wheeler (Mesquite, Texas), wowed 'em all as she placed 4th in Open Scale Racing. She turned a 7:29.4 to get her name on the winners' list. Congratulations, Linda.

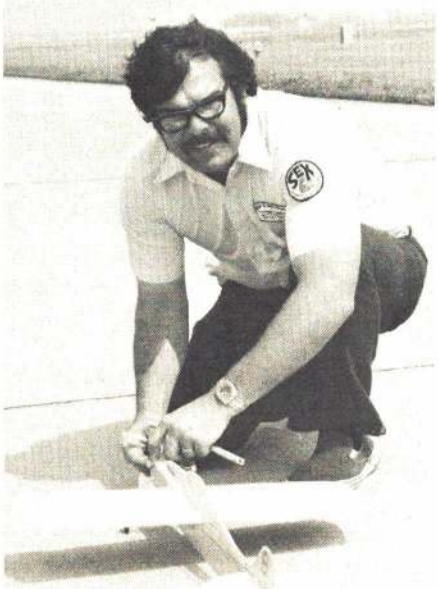
More On Rules For '74: As this is written, many of the rules proposals submitted for CLCB consideration have passed the next to final vote. Some rules pertaining to Speed fliers: Allow the entrant (Open) to either fly or launch the airplane. Put Srs. and Jrs. on 40 size engines for C. Fly A on 60-ft. wire. (Maybe we should think of reducing the wire size to .018" on this one, too.) Two min. to get in the circle, three to fire up. Clear canopy on B Proto. One and a half laps to get into the pylon on Proto. Of course, the two to a circle in Rat will stay. It looks like backup models will be allowed in Speed. Jet engine mounts will have their own pull test. (That will separate the men from the boys!) Sport speed will be dropped. Timing will be done across the circle on Proto (180° from launch point). So when the new rulebook comes out, hopefully much easier than last year, spend some time looking over your section.

RAF Is Alive And Well And Living In Fort Smith: Duke Fox has taken over RAF engines from Jack Frye. Any one who had ordered engines from Jack or has questions regarding the engines should contact Duke at Fox Manufacturing Co., 5305 Towson, Fort Smith, Ark.

Parting Shots: I met a fellow in Oshkosh who says he is a regular reader of the column, but has never seen his name mentioned. So to my one, for sure, regular reader: Hi there, Bob Mathison!

John Ballard (Louisville, Ky.) tells how he won Open Rat at the '73 NATS.

Mike Wheeler, GoodYear flier at the '73 NATS, didn't place, but his wife Linda won 4th place in Open GoodYear.



A Message to All Quarter Midget Racers

by Bill Cooper

As the racing season for the majority of the country draws to a close, I'd like to reflect on some of the happenings this year in Quarter Midget.

We started off by adopting a set of rules which were drawn up at Toledo by Quarter Midget fliers from all over. At this point, we affiliated with NMPRA as an integral part of, but as a separate entity within, the structure of the organization. The impact of this is that the area VPs and I, as Executive VP for Quarter Midgets, have the final say in all matters regarding QM in NMPRA. There were many who said that our event would be taken over by and absorbed by the Formula I fliers and the original officer structure within NMPRA. This is far from true. Ed Rankin, as the president of NMPRA, appointed the original QM officers and turned the entire program over to me as its head. From now on, any changes, for better or for worse, so to speak, will rest on the shoulders of this group of men. Our terms of office will end next year, and we will then select from the QM contingent of fliers from around the country, a new group to be voted on. We must keep a rigid selection process regarding the individuals who will guide QM activity if we are to retain the intent rule—low cost, low key, stock event.

My first few months in office consisted of a flurry of letters from all over, telling me how bad our rules were, and how they should have been written. I personally answered each and every letter and tried to transmit the message that much thought and work had gone into the final formulation of these rules. Cliff Weirick, a complete outsider to our event, monitored our six-hour meeting, and recommend that AMA and NMPRA adopt them. At this time, as Quarter Midget enthusiasts, we voted to ask NMPRA to recognize our event, to act as our governing body, and to select from our group an official structure which would operate within the sanctions of the parent organization. My point here is that we, as racing enthusiasts, choose as our official governing body the largest organization of it's type in the world—one which has close associations with AMA and a good track record with almost everyone in racing. They didn't just grab our event as a lot of folks think.

I would strongly recommend that every QM flier join NMPRA and support the organization that will lead this to the largest single event in RC flying history. I have received a lot of flak about having to pay $10 more just to race and that, ladies and gentlemen, is a lot of bull! You, as an NMPRA member, are supporting your organization that will govern your event for your benefit. I hope that there are no present members who belong because they feel they have to in order to race. Ten dollars is a drop in the bucket compared to your total investment in the sport.

One final word on the rules. By and large, they are working. The biggest gripe now concerns the course, and some still say it's too long, others say it's too short. The rule was written so that it can be changed if area conditions dictate, so use what you find best. Our records will be based on the two-mile course until AMA changes it, and this was the only reason we picked that distance originally. That's not to say it's right, but we had to have some compromise in that six-hour meeting.

Stock engines are being enforced in most places by engine tear downs and rpm ratings. Stock props are bad, but maybe the manufacturers will come around soon. I hope so, for this is the one area that, all other things being equal, means the difference between winning and losing—and it requires a special piece of equipment called a prop gauge, which the average flier doesn't need at $25 retail. I own one, and think it's a great luxury item for the RC flier, but it is contrary to the intent of Quarter Midgets. My dream (and it's really just that) for next year, is that I can go to the hobby shop, spend $60 on an engine and airplane which will be flying in two weeks or less, with no special equipment, and will fly the two-mile course in two min. or thereabouts. Sound impossible? Yes? But if everyone who reads this will write to all manufacturers of QM products and demand superior products (or even standard workmanship) we will, in time, have the stuff to do our thing.

Please write to me (Bill Cooper, 1700 Lynn Way, Louisville, Ky. 40222), or your area VP if you have a gripe or suggestion. Without communication, we can't answer your concerns.

Till then, good flying! Turn left!

QUARTER MIDGET AREA VPs

Exec. VP, Bill Cooper, 1700 Lynn Way, Louisville, Ky. 40222

Assoc. VP, NE, Bob Penko, 21151 Westport Avenue, Euclid, Ohio 44123

Assoc. VP, NCE, Bob Browning, 2445 Hamilton Drive, Elk Grove, Illinois 50005

Assoc. VP, NCW, Doug Ferguson, 5126 Read Street, Omaha, Nebraska 68152

Assoc. VP, SCE, Gail E. Jacobson, 2205 Britley Terrace, College Park, Georgia 30349

Assoc. VP, SCW, Chuck Cunningham, 5333 Wooten Drive, Fort Worth, Texas 76133

Assoc. VP, Calif., Mel Santmyers, 10550 Western, No. 153, Stanton, Calif. 90680

President, Ed Rankin, 6072 Wonder Drive, Fort Worth, Texas 76163

NEW! DUMAS DEEP VEES

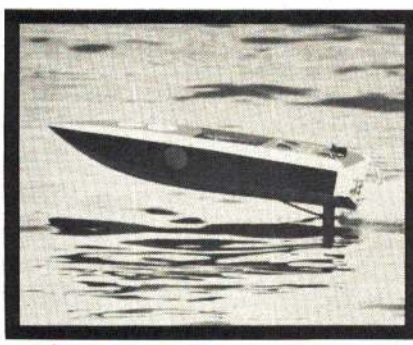
The new class that's got class... a great new way to enjoy RC boating

Dumas Deep Vee 60's point the way in Hennessy Cognac Miniature Grand Prix.

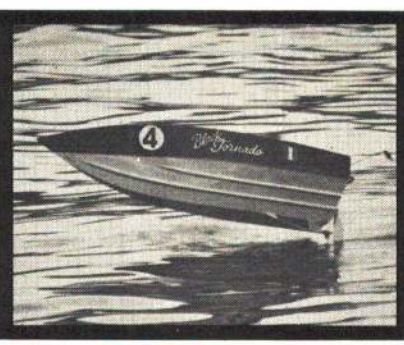
The three new Dumas Deep Vees are the fun answer for the new RC model boater. They're easy to build, easy to drive . . . and real easy riders when it comes to rough water.

It's easy to see why they're the fastest growing class with serious RC model boat competitors, too. In The First International Hennessy Cognac Miniature Grand Prix, Dumas boats swept to victory with 1st Place Overall, 1-2-3 in .20, 2-3-4 in .40, 1-2 in .60 and the .60 Scale Award.

Dumas Deep Vees are living up to their "for show or go" reputation. They win on speed, endurance and realism.



Dumas Deep Vee 40
Kit DV-40F $49.95 (glass)
Kit DV-20F $39.95 (glass)



Dumas Deep Vee 60
Kit DV-60 $39.95 (wood)
Kit DV-60F $59.95 (glass)

Pit crews are kept busy at Miniature Grand Prix with fixin', fuelin' and fun.

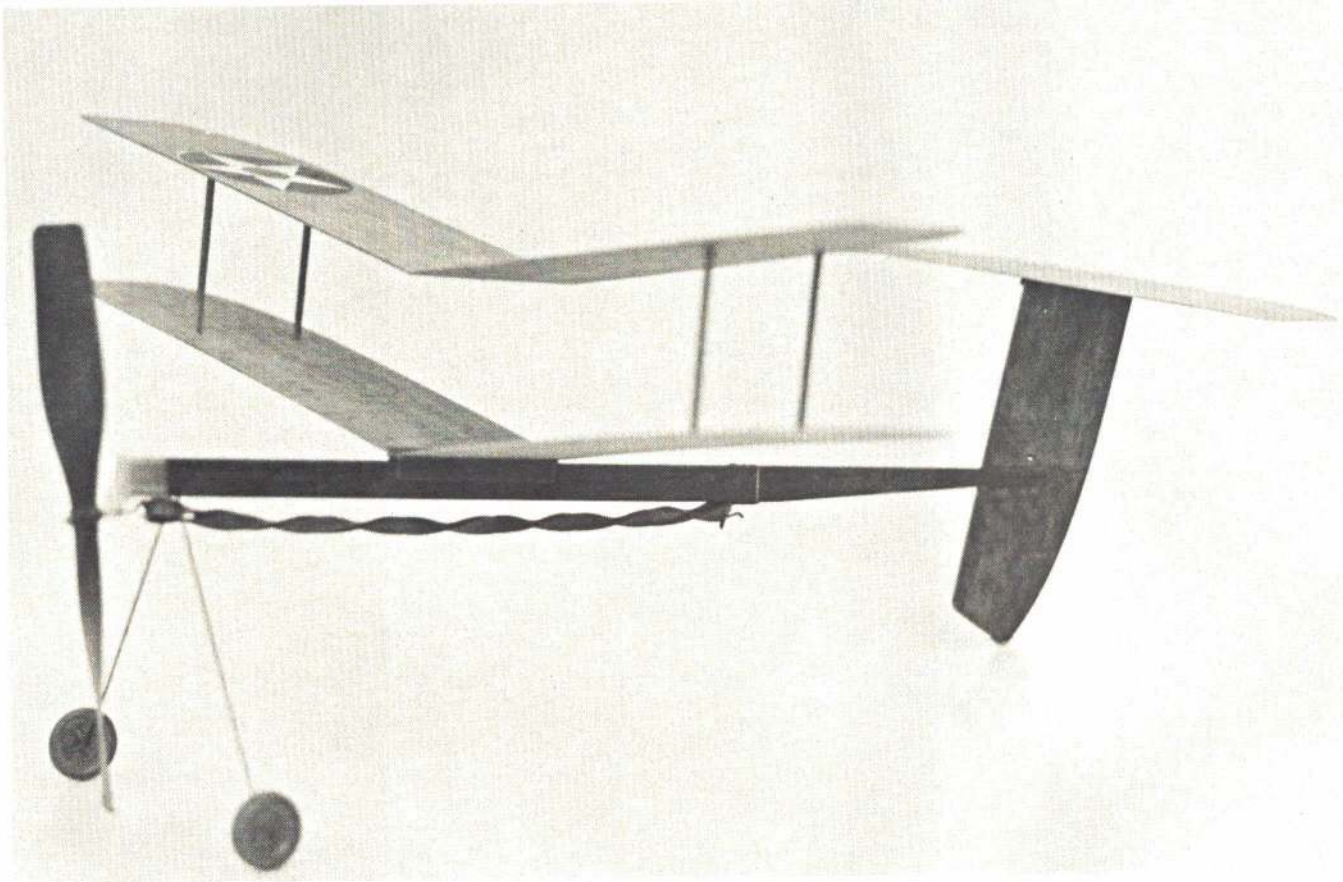
Be sure you're ready for the coming season of deep vee racing including the big Hennessy Races now being scheduled. See your hobby shop right away and get your Dumas 20, 40 or 60. If he can't get your boat, write direct to Dumas, adding 10% for postage and handling.

dumas boats

Dumas Products, Inc.
790 South Park Avenue
Tucson, Arizona 85719

The Tenderfoot TEE-BIPE

LLOYD V. HUNT



With lots of wing area, this bipe gives good long flights. You can even make it by customizing from two dime store planes.

Their first glance at the Tenderfoot Tee will bring back memories to some readers as it resembles the old type of stick model design from back in the 30s. The model can be built in a few hours, but before you do any building, read the plans and construction details in the article. You will note that most of the model is constructed from 1/32" sheet balsa (use light quarter grain balsa if possible). The detail parts such as the wing clip and prop bearing are from a North Pacific stick model. If the wing clip has been lost or cracked, one may be constructed from 1/16" sheet with a cross section of a channel to fit over the motor stick. Cement the bottom wing to the top of the clip after the dihedral angle has been added to the bottom wing.

Construction

Wing: Begin construction of the wings by cutting two pieces of 1/32 x 2 x 14" and transferring the tip pattern on to the panel. Lay this panel over the other blank, punch the strut locations, locate the center of the wings and cut the tips to outline and finish with one coat of clear dope. When the wings are dry, sand smooth to finish. After you have cemented the 1-1/16" dihedral angle to the top wing panel, put it to one side to dry. Cut the bottom wing apart and slip it into the wing clip. Next cut the four wing struts as shown on the drawing. Put a drop of cement in all the holes (eight). Press the wing struts into the top wing first and then the bottom. Be sure the struts are cut the same. Lay the assembly down on the building table with the leading edges down and support with pins while the cemented parts are drying.

Rudder and Stabilizer: Cut the rudder and stabilizer to the outlines on the drawings Next cut the two 1/16 x 1/8" supports and cement to the sides at the top of the rudder. Dope one coat of clear and sand smooth. Pin the stabilizer to the table and locate and cement the rudder in place. Allow this assembly to dry before cementing to the motor stick. The motor stick is cut to

POWER: ONE LOOP OF 3/32" PIRELLI OR 1/8" BROWN RUBBER.

RUDDER POSITION

LUBRICATE RUBBER MOTOR WITH CASTOR OIL, USE JUST ENOUGH TO WET. RUB-IN BETWEEN PALMS.

MOTOR STICK - 1/8"X3/8" HARD BALSA

TAPER AS SHOWN

STAB. POSITION

.032" DIA. WIRE REAR HOOK

1/16"X1/8" SUPPORT

CEMENT & WRAP WITH THREAD

FOR THE TENDERFOOT

1/16" SHT. BALSA RUDDER

PLASTIC WING CLIP (NORTH PACIFIC) DO NOT CEMENT TO MOTOR STICK

FINISH: 1 COAT OF THIN CLEAR DOPE. SAND SMOOTH

OF WINGS

THIN SOFT WIRE TAIL SKID

1/32" SHT. BALSA WINGS

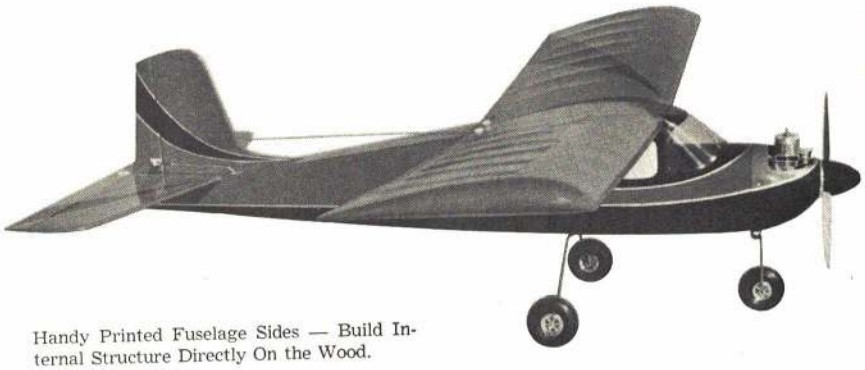
CUT TOP WING AT ℄ AND CEMENT HALVES TOGETHER, ELEVATE TIP 2-1/8" FOR DIHEDRAL

PUNCH HOLES THRU TOP & BOTTOM WING PANELS FOR STRUT LOCATION

4-14-71 2

INTRODUCING A NE

SIG KADET



Handy Printed Fuselage Sides — Build Internal Structure Directly On the Wood.

Molded Plastic Engine Cowling.

Formed Nose Gear with Shock-Absorbing Coil.

Torsion Bar Main Gear.

Hardware Package Includes Nylon Nose Gear Bearing, Nylon Control Horns and Molded Nylon Surface Hinges.

Die-Cut Plywood and Balsa Parts.

Top Quality Balsa and Hardwood.

Full Size Plans.

Complete Illustrated Building and Flying Instructions.

Designed by
CLAUDE McCULLOUGH

FOR .19-.29 ENGINES

SIG
KIT RC-31

$23.95

WING SPAN: 57"
LENGTH: 42"
WEIGHT: 4 LBS.

UP TO 3 CHANNEL RADIO EQUIPMENT

EASY TO BUILD

Sturdy, built-up balsa construction and light wing loading combine in the Kadet to produce a perfect sport or beginners' model. The flying performance of the high-lift, flat-bottomed airfoil is responsive to control and inherently stable. A tricycle landing gear helps ground handling, take-off and landing characteristics. We predict that this compact bundle of dynamite will quickly become THE standard RC Trainer.

Send $1.00 Today for

SIG'S BIG NEW CATALOG!
The Modeler's Wishbook"

NO POSTAGE REQUIRED WHEN ORDERING CATALOG ALONE

IT'S READY! SIG'S ALL NEW WINTER CATALOG FOR 1973-1974! Over 248 pages devoted to model airplanes, kits, supplies, tools and related items. Many pages are in full color. This big new catalog features the famous SIG LINE of kits and supplies, plus practically all other lines available.

For sale at your local hobby shop or send $1.00 today for your copy. NO MODEL BUILDER CAN AFFORD TO BE WITHOUT IT!

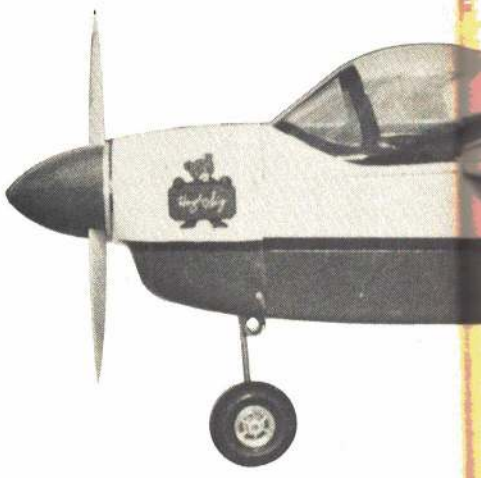
ORDERING INSTRUCTIONS

SEE YOUR DEALER FIRST ! If he will not supply you, then order directly from our plant. We will ship promptly. To Order, please add $1.00 for postage and handling in the U. S. Canadian orders please add $1.50. Minimum order is $1.00. Please remit by bank draft, check or money order. Print your name and address plainly. Sorry, No C.O.D. shipments. All prices subject to change without notice.

SIG MANUFACTURING CO., INC
401 S. FRONT STREET
MONTEZUMA, IOWA 50171

SIG

THE AILERON T



Developed in an Actu

PRECISION CUT FOAM WING
SLEEK BUBBLE CANOPY With Molded Framing
JET STYLE MOLDED PLASTIC COWLING
HANDY PRINTED FUSELAGE SIDES AND BOT
Build Directly On the Wood.
SHEET BALSA WING COVERING
SHEET BALSA TAIL SURFACES
PRE-BENT TORSION-BAR LANDING GEAR
RUGGED 5/32" FORMED NOSE GEAR
STEP-BY-STEP INSTRUCTIONS With Isometric
SIG QUALITY BALSA AND PLYWOOD

COMPLETE HARDWARE PACKAGE CONTAINS
Molded Nylon Control Hinges
Nylon Control Horns
Nylon Nose Gear Bearing
Nylon Nose Gear Steering Arm
Tuf-Steel R/C Links
Aluminum Motor Mounts
Nylon Screws for Bolt-On Wing Attachment

BUILDS

W SIG STAR FOR '74

KOMANDER

TRAINER THAT DOESN'T LOOK LIKE A TRAINER

ual Beginner's Training Program

SIG®

KIT RC-32

$29.95

WINGSPAN: 62"
LENGTH: 44"
WEIGHT: 5-1/2 LBS.

ENGINE SIZE:
.35 to .50 cu. in.

FOR 4 CHANNEL
R-C EQUIPMENT

Our Sig Kadet has become the standard trainer for the beginning flier. To this fine performer we are now adding the Komander, specially designed for the novice RCers who want to move up from simpler models or who prefer to start with an aileron-controlled airplane.

The unique lines of the KOMANDER are a blend of practical construction features and an aerodynamic set-up especially selected to produce a model with a lot of built-in stability, yet retaining maneuvering and aerobatic capability.

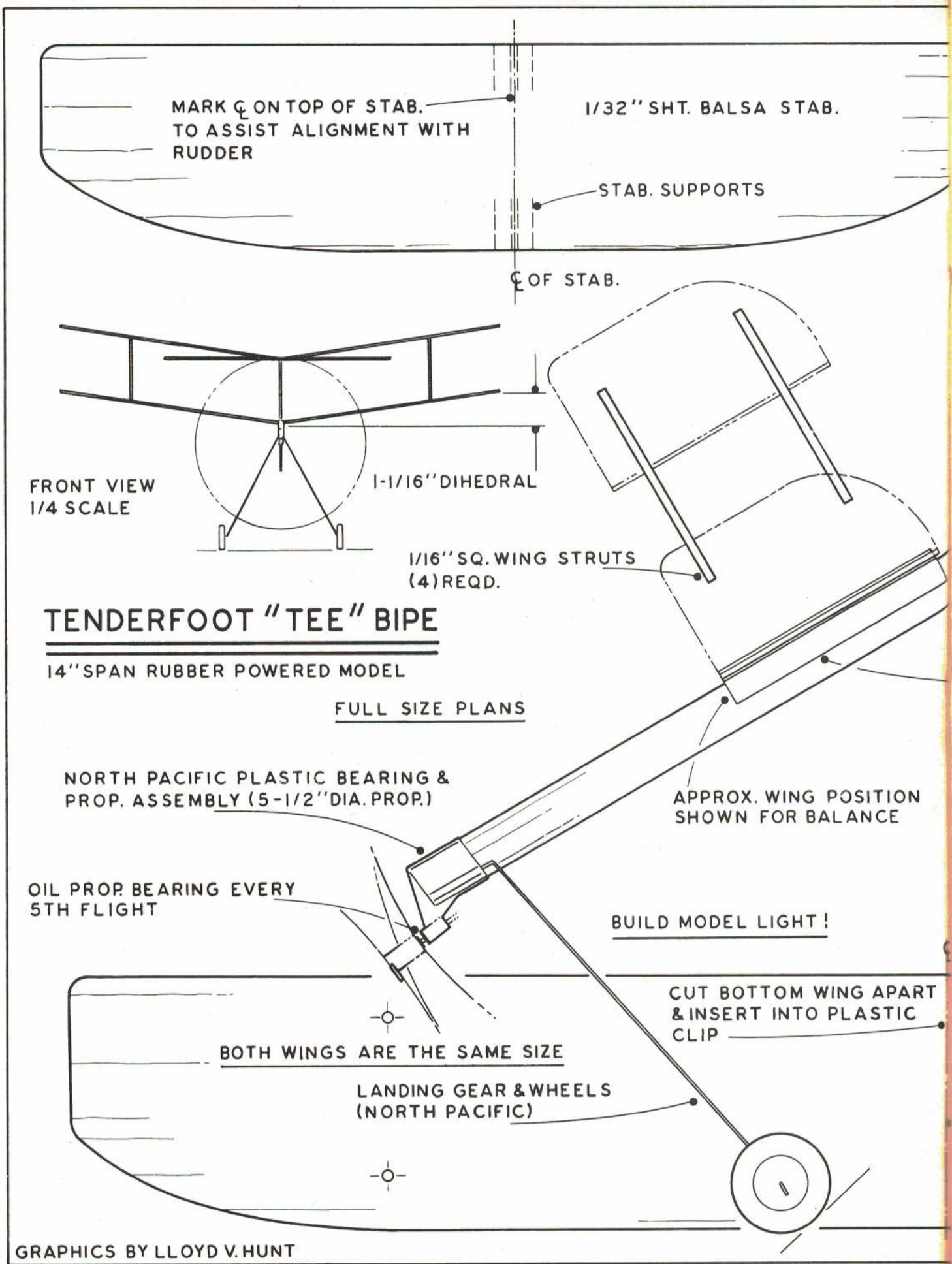
Construction is simple, strong and assembles quickly. A removable fuselage top allows easy access to the fuel tank and battery storage area.

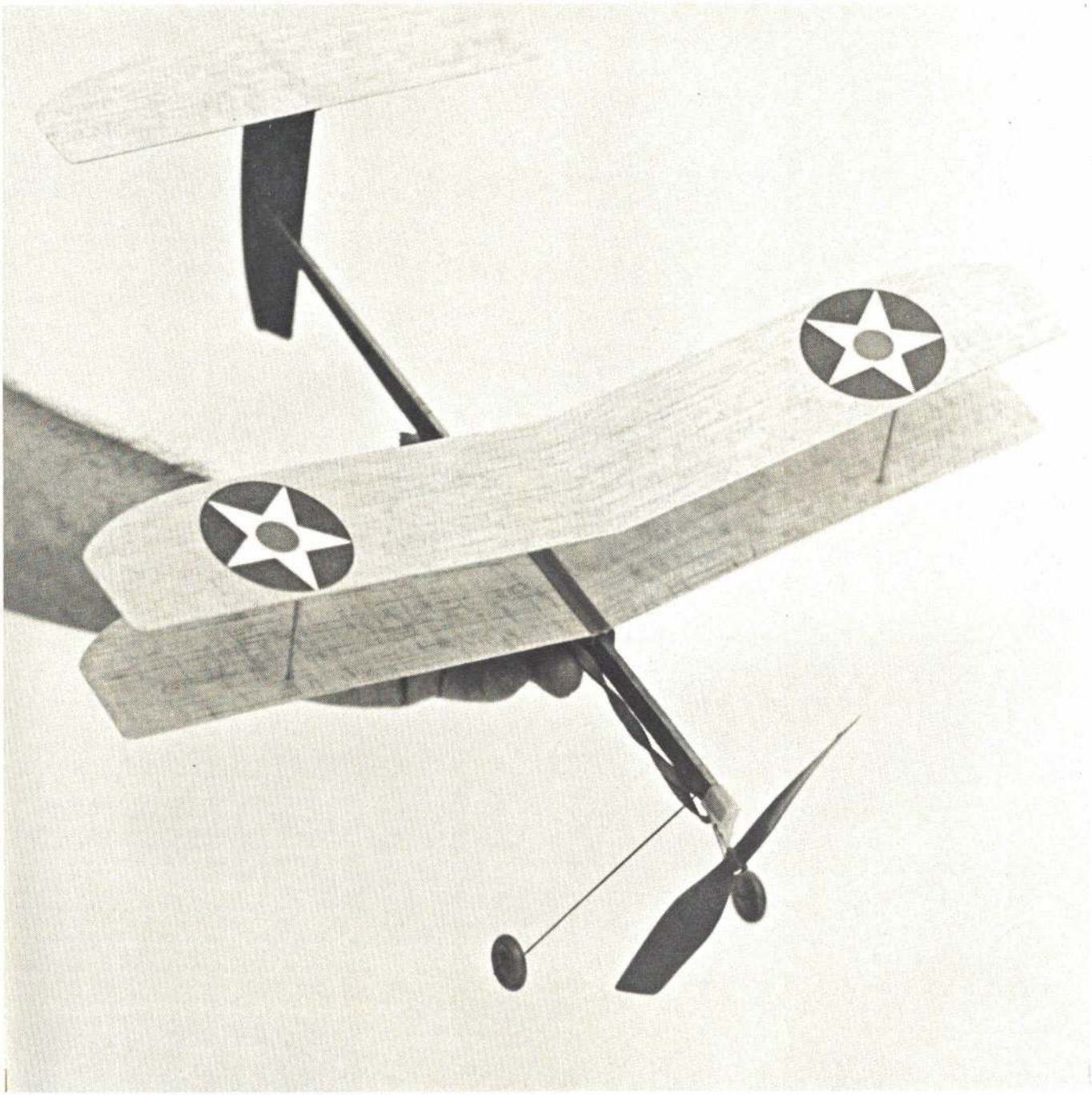
The wing-mounted landing gear provides shock-absorbing action that rides over rough ground and through grass.

TWICK!

Designed by
CLAUDE McCULLOUGH

A FINE SPORT MODEL!


MARK ℄ ON TOP OF STAB. TO ASSIST ALIGNMENT WITH RUDDER
1/32" SHT. BALSA STAB.
STAB. SUPPORTS
℄ OF STAB.
FRONT VIEW 1/4 SCALE
1-1/16" DIHEDRAL
1/16" SQ. WING STRUTS (4) REQD.
TENDERFOOT "TEE" BIPE
14" SPAN RUBBER POWERED MODEL
FULL SIZE PLANS
NORTH PACIFIC PLASTIC BEARING & PROP. ASSEMBLY (5-1/2" DIA. PROP.)
APPROX. WING POSITION SHOWN FOR BALANCE
OIL PROP BEARING EVERY 5TH FLIGHT
BUILD MODEL LIGHT!
CUT BOTTOM WING APART & INSERT INTO PLASTIC CLIP
BOTH WINGS ARE THE SAME SIZE
LANDING GEAR & WHEELS (NORTH PACIFIC)
GRAPHICS BY LLOYD V. HUNT



Nose, prop and wheels from a dime store model are ideal. Several brands can be used, but the North Pacific assemblies are the lightest.

length and tapered as shown. Bend the motor hook and cement and wrap to the stick as shown and add the prop bearing and landing gear assembly. After this has been completed, the rudder assembly can be cemented to its location. Be certain that the assembly is placed on the center of the motor stick. If it's to one side, this will build in an offset trim that could make the Tee do things that are not for real. Slip the wing assembly on to the motor stick and locate approximately as shown. If the model stalls, move back approximately ½". If you have built the rudder assembly too heavy, add a little weight to the top of the prop bearing for a flat smooth glide.

Flying

Check your Tee for warps. Also make a mark on the motor stick for references of the correct wing location. Be sure to oil the prop bearing for a smooth motor run. To trim for a right turn, bend the prop bearing with your fingers to the right until the model will fly off to the setting and roll out for a left circle. Start with a loop of 1/8" rubber and put approximately 75 turns into the motor. Fly the model in a calm wind or better yet (if there is room), test fly inside. This will allow you to check for trim and to get to know how to adjust your model. For better flights, try different sizes of rubber and use a winder.

WALT MOONEY ON FF

A Little Bad News With A Moral: For many years the San Diego Orbiteers have enjoyed the hospitality of the City of San Diego and the U.S. Navy and have been allowed to fly on the city sanitary fill which was in, but below, the traffic pattern for Miramar Naval Air Station. This great arrangement is no more. Someone (a non-member), known but unnamed here, put up a 12-ft. span RC glider to an altitude of more than 1200 ft. for a period of hour or more at the flying site while the Week End Warriors were practicing landings. As might be expected, four of the Crusader Pilots complained of having something that big pass over their heads while they were trying to keep ahead of their own birds flying the pattern.

Soon a detachment of Marines was sent out and all model builders were instantly and permanently evicted. Now, all the RC pilots out there know this is a no-go. Further, the guy flying the model was a Navy man so he knew better. In addition, the non-RC flying members of the Orbiteers are not completely guiltless either. Some of them witnessed the flight, but did not force the culprit to bring the model down to a reasonable altitude.

Perhaps someone can learn from this collection of errors. If you see someone doing something dangerous, tell him about it for his own sake. If you are going to pay the price for his folly, make him stop.

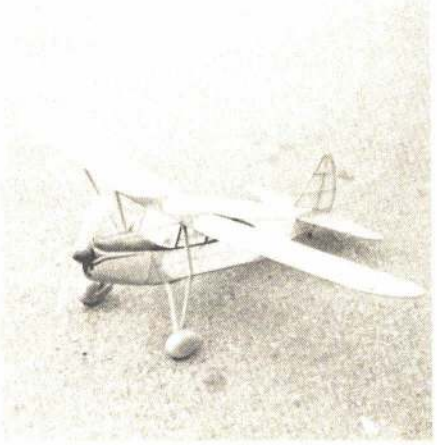
Needless to say, the Orbiteers are making a large effort to find another suitable flying site which is not easy in Southern California.

Contest Results: Editor Warren C. Hoaglund mailed me a copy of *Balsa Chips* the newsletter of the Grand Junction (Colorado) Model Club. Issue No. 12 gave the results of their annual contest. They ran 17 events and had 122 entries total for all events.

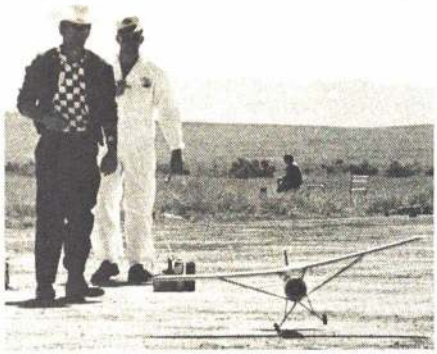
G.R. Kirkham of Grand Junction, flying a Stinson 0-49, won Gas FF Scale. Noal Hess of Salt Lake City took first in Rubber Scale flying a Taylorcraft. George Swanson, also of Salt Lake City, flew a Peanut Scale Pilatus Porter to third in Rubber Scale.

It's impossible to list all the winners in all the events. After the flying on Saturday, however, the members wives provided a real feast, so surely all the contestants were winners Saturday night.

The Flightmasters' Seaplane contests have been given coverage from time to time. FF Scale seaplanes turn out to be quite a challenge, especially if scale floats are used. The picture of my 28-ft. Latecoeuer 283 shows one that will successfully take off using scale floats. Its batting average is about 250. Since its sidewheel steamer antics caused it to capsize during three out of four takeoff attempts, the floats were modified by adding a 3/32 x 3/16" wedge step halfway from the float nose to the scale step. This is almost unnoticeable, but what an improvement! Instead of taking a 25 or 30 ft. run to get off, the model now jumps off the water in two or three ft. The batting average has gone up to about 800. The model requires 12 strands of 1/8 flat rubber for power. Best time so far is about 30 sec. ROW.

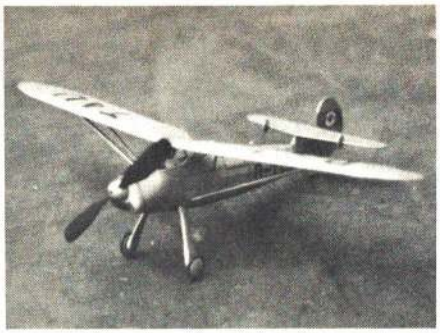


Rubber-powered, 18-in. Fairchild 24 is an Earl Stahl design and a Paul McIlrath construction. Plans available from John Pond.



Grand Junction modeler "Kirk" Kirkam watches his Stinson 0-49 lift off for a winning flight in Gas Scale.

ABOVE: Curious Spratt Flying Boat constructed and flown by Jim Adams. BELOW: George Swanson, Salt Lake City, Utah, placed third in Rubber with his Peanut Pilatus.



Focke-Wulf "Stosser" rubber-powered model by Jim Wright of the San Diego Orbiteers.

The Northrop Flying Wing Contest: Scheduled for November 25, this annual contest is a real challenge and has been drawing more entries each year.

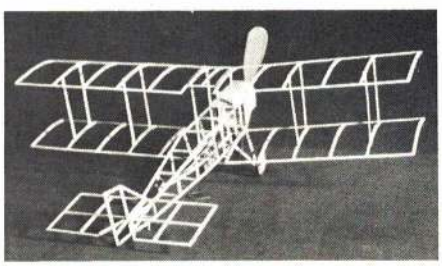
More Contests: December 9 is set for a large and small of it All-Balsa Contest at Lake Elsinore. The Rockwell International Flightmasters are sponsoring a Jumbo and Peanut Scale Contest on the dry part of the lake.

Peanut Scale News: There is a new high time record for Peanut Scale, at least as far as the San Diego Orbiteers are concerned. At their last monthly Scale contest, several of the Peanut entries made flights of over two min. and it looked like the competition was going to be a hard fought one. Then Clarence Mather put up his Peanut Cougar and it proceeded to thermal up for nine and a half min. before it finally went out of sight overhead. Probably a loss like this (or was it a win like this?) doesn't please Clarence very much. The rest of the competitors, however, were kind of glad to see it go. It always did too doggone well. Fortunately their respite will not be of long duration. Clarence is sure to come up with another good one in a fairly short while.

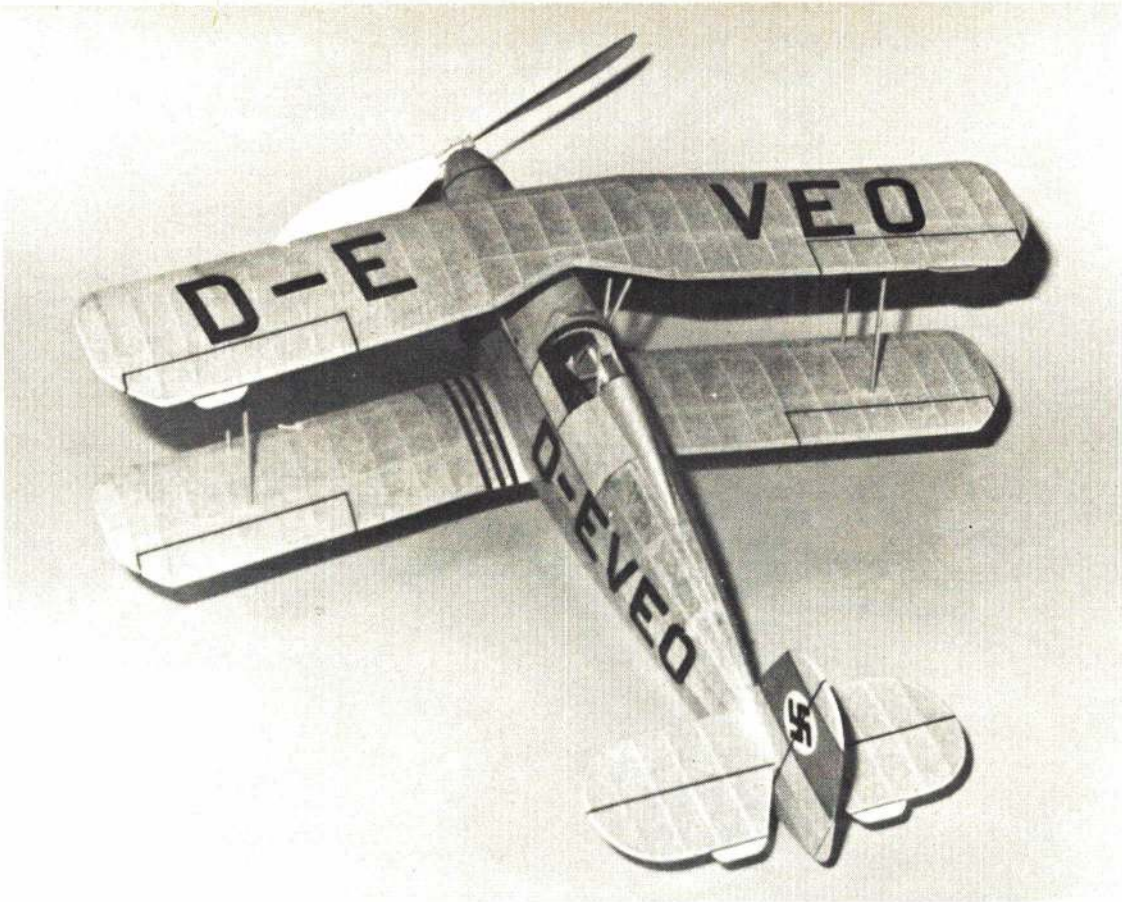
Paul McIlrath of Cedar Rapids, Iowa, has built a really neat 28-in. span Fairchild 24 from Earl Stahl's plans. As Paul put it, "It is hard to beat the fine designs of Earl Stahl." They still provide a standard of excellence in rubber-powered scale.

The Rockwell International Flightmasters: Their annual Scale Seaplane contest and Picnic was a great success. Once again the weather was perfect for Free Flight Scale at the lake. Flying seaplanes is always challenging, but it gets better every year. Hal Cover showed us all how once again in Rubber. In CO-2, Walt Mooney's Dornier won again. It was the only CO-2 to qualify and it just kept making flight after flight like there was nothing to it. After a smooth takeoff and a circling climb, it gradually straightens out and cruises down to a landing which is followed by about five yards of taxiing on the step.

ABOVE: Aeronca LW electric-powered model, by Lloyd Brickner. BELOW: Douglas Mooney's uncovered, Peanut Scale DH 6.



CO-2 motor characteristic of gradually slowing down, rather than the abrupt stop of a gas



Bucker Jungmeister by Ed Coleman of Canada, 2nd place Biplane Class.

engine, makes for realistic and pleasing flights and landings.

Unfortunately, the lake has dried up somewhat and the telephone poles and lines that used to be out in the middle of the lake and completely out of reach were very near to the takeoff sight. This situation evoked a few sighs at some near misses, and some groans when a RC Spectra hit the wires.

The picnic held at Fernando Ramo's place was superb as usual. Fernando has a two-level model building shop filled with interesting projects. In addition to scale of all kinds, he also has a full-scale biplane under construction and upstairs there is also a great HO gauge railroad. Press a button and you can hear the whistle blowing. Too bad the ecologists are all striving for less noise or he could set up the roar of an aircraft engine button operated on the lower level.

A couple of weeks later the Flightmasters held their Rubber Speed Contest in San Marcos. Flying was scheduled at the high school field, but was rescheduled at the last moment for the Palamar College field. Nevertheless, no one got lost—everyone gathered at Russ Barrera's model museum before the contest. This is a great gathering place and was the site of a get-together after the contest when Bill Warner showed slides taken at the Oshkosh NATS. A small percentage of the audience ignored the slides, however, in favor of Russ's large collection of aircraft, modeling books and magazines from all over the world. If Russ doesn't have a three-view of it, it probably doesn't exist.

Rubber Speed has reached the place where they seem very fast. Unlimited was a hard fought contest between Bill Warner and Bill Hannan with Warner eventually winning with a speed of 67.5 mph. His all-sheet model called the "Hot Gnat" spanned about eight in. and had a plastic propeller no more than four in. in dia. Several of the models were in the region of 60 mph. Bill Hannan's was timed at 61.8 mph.

Scale entries were limited to models of closed course racers. These were notable for much lower speeds and longer flights. Bill

(Continued on page 99)

CLAUDE McCULLOUGH ON RC

Save Those Extra Wings: One of the most interesting developments of the 1973 flying season was the Omaha-Council Bluffs area National Multi-Wing Championships. Reactions of those attending and many more planning airplanes for this affair seem to indicate that the meet has the potential to develop into a blockbuster success along the lines of Rhinebeck.

Further encouragement of the swing to wings is now added by Jerry Nelson's proposed Aerobatic event for biplanes. Jerry's role in getting Pylon Racing going makes his ideas in this new field carry a lot of weight. He has been working on the project for several years. Since refining the details, he has a final version ready for trial use in 1974 after which it will be proposed to the AMA Contest Board as a provisional event.

Rules call for following full-scale procedures and maneuvers as much as possible. Any non-combat biplane made after 1925 may be used as a prototype and the model must pass a Sport Scale type of stand-off judging from 10 ft. away using three-view or photos. No points will be awarded for scale, but models deemed not a reasonable representation of an actual specific airplane will be disqualified.

Obviously something more than a scale color scheme with two wings will be required. In the initial period of trial and organization, rejected airplanes will be allowed to compete with a 10% deduction from their final score. FAI limitations apply—.61 cu. in. maximum engine size and 11 lb. total maximum allowed weight. Mufflers are required and the engine must be at least half cowled. To keep the event to fairly standardized types, it will be required that the bottom wing have at least 30% of the total wing area. For engines under .40 cu. in., the fuselage must be at least 3½ in. wide and six in. deep. Over .40 cu. in. requires five-in. width and seven-in. depth.

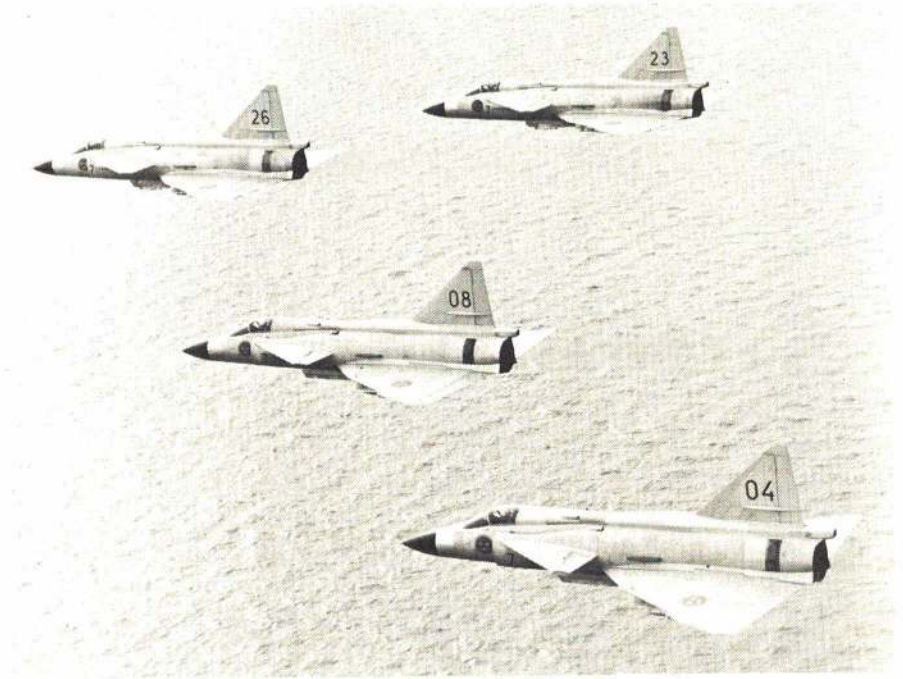
Flight judging will be done under four classifications of difficulty: Sportsman, Intermediate, Advanced and Unlimited. Maneuvers required in each group are of increasing difficulty, much like the present pattern divisions. Advanced will have a one-minute free style, contestant's option, period; Unlimited will have a two-min. period. An interesting requirement adapted from full-scale practice is a "frame" in which all flying including turnaround will take place, measuring 400 ft. high and 800 ft. long. In addition to usual points for each maneuver performed, a 0-10 award is made for presentation of the flight. This includes the whole effect of the performance, from the appearance of the model to the manner of calling maneuvers for the judges.

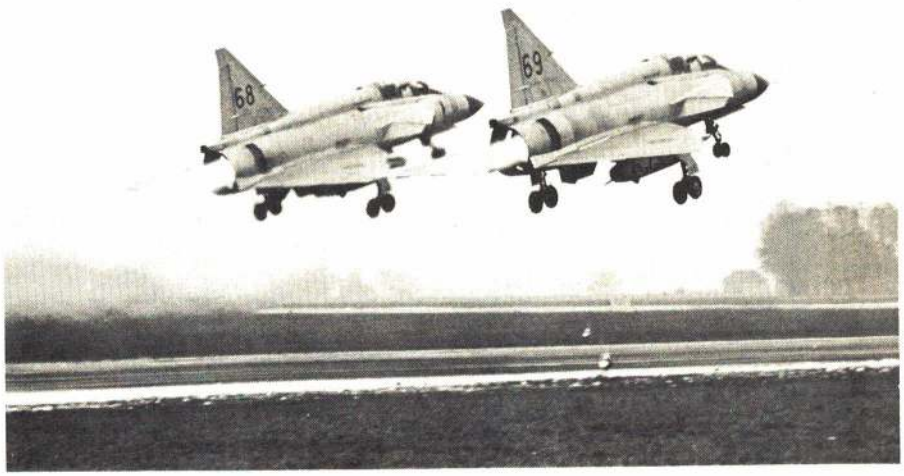
To this basic new Stunt event is added a further fillip—a setup for a championship style meet in which the same airplanes are flown in two other events: Sport Scale and Pylon Racing. Since a certain amount of compromises are required for the best outcome in

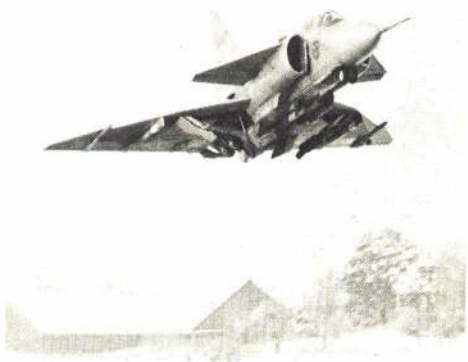
(Continued on page 100)

Dick Graham won 1st place in Sport Scale at the National Multiwing Championships. His Liberty Sport Bipe is an ideal subject for Jerry Nelson's proposed, Sport Pattern event.

THOR'S NEW HAMMER







TOP: Saab 37 Viggen multi-purpose Mach 2 STOL combat aircraft. ABOVE: Removal of some electronic gear and the forward fuel tank provided the second seat for the Viggen trainers. Belly tank contains additional fuel. RIGHT: In order to retract smoothly into the thin wing, the extra strong main landing gear units are tandem. During 1640 ft. "no flare" type landings, the tandem arrangement provides an added shock absorber. The thrust reverser, triggered by switches on the landing gear, can be preselected in the air.

In days of yore, when governments first began assembling their air forces, aeronautic one-upmanship depended on a wood and wire technology. Designer/builders knew that the few thousand dollars (pounds, rubles or drachmas) required to produce a military aircraft wouldn't bust the national economy.[1] It was a simplistic era during which the major concern was to find an engine—any engine, of almost any acceptable horsepower—that would run for 60 minutes in succession.

When the call to war sounded, the world's first military aviators had but one mission—to scout. Aboard the state of the art, gentlemen pilots plied their gentlemanly trade while waving at one another in the clean, fresh air above the littered trenches. Then came the moment one saluted, not with his hand but with a side arm.

As the technology that supplied those first little scout rolled merrily along, development and production costs took off—jet-propelled. Until the advent of the Korean War it was still possible (although not always practical) for most nations to "keep up with the Joneses." And, conceivably, individual aircraft companies could independently develop an airplane from scratch on a (relative) shoestring.

Since then, however, military aviation has been at the sufferance of each nation's budget considerations and individual national priorities. Because of the sheer complexity of today's military aircraft, the old-time day- or night-fighters and the specialized bombers (per se) are giving way to the military aircraft "system."

Sweden, long a neutral nation, alert to its own defenses and historically sympathetic to less technically developed countries, has produced such a system in its Aircraft 37. Nicknamed *Viggen* (Thunderbolt in English), it's basically a flying platform that is adaptable to various primary and secondary mission requirements.[2]

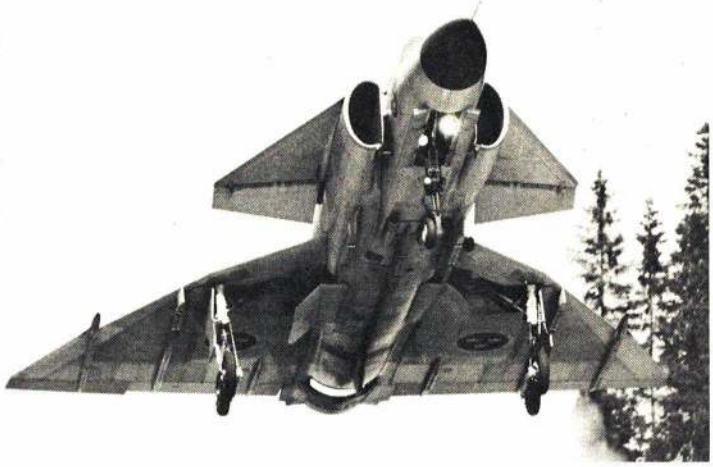
Both the AJ 37 Viggen (a fighter/bomber whose primary mission is that of attack and secondary mission is as a fighter), and the SK 37 Viggen (a two-seat trainer that is also combat adaptable), are currently operational.

In the prototype test or developmental stages are two strike/recche versions. Their differences are mainly internal, and both the SF 37 (intended for land reconnaissance), and the SH 37 (destined for sea surveillance duties), will carry the appropriate punch.

Scheduled for delivery in early 1975 is the JA 37 fighter/interceptor, a planned follow-on to the current AJ 37. The JA 37, with a more powerful engine and additional avionics, will differ little from the present model, except for an

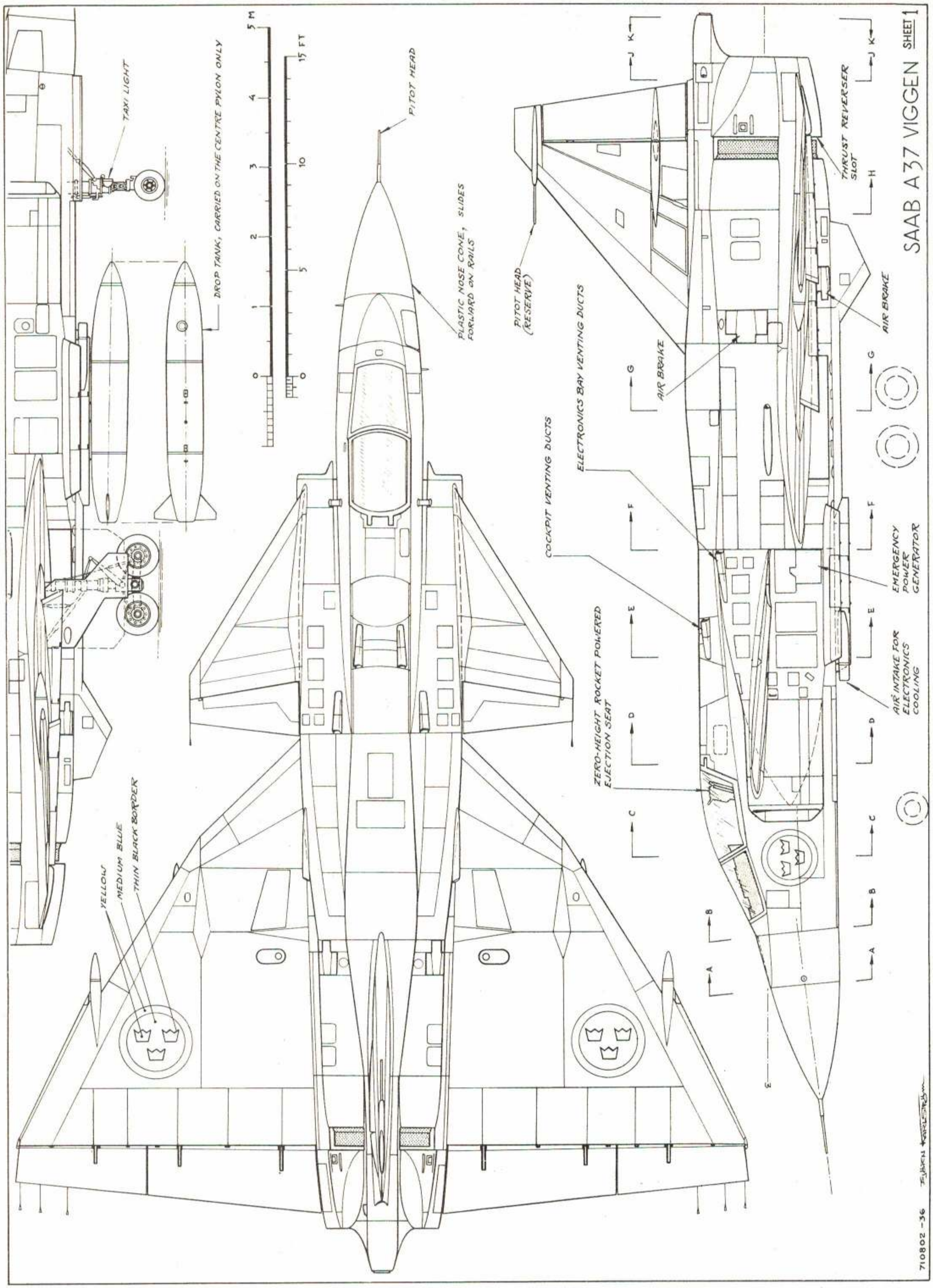
Karlstrom Drawings Pages 24 & 25

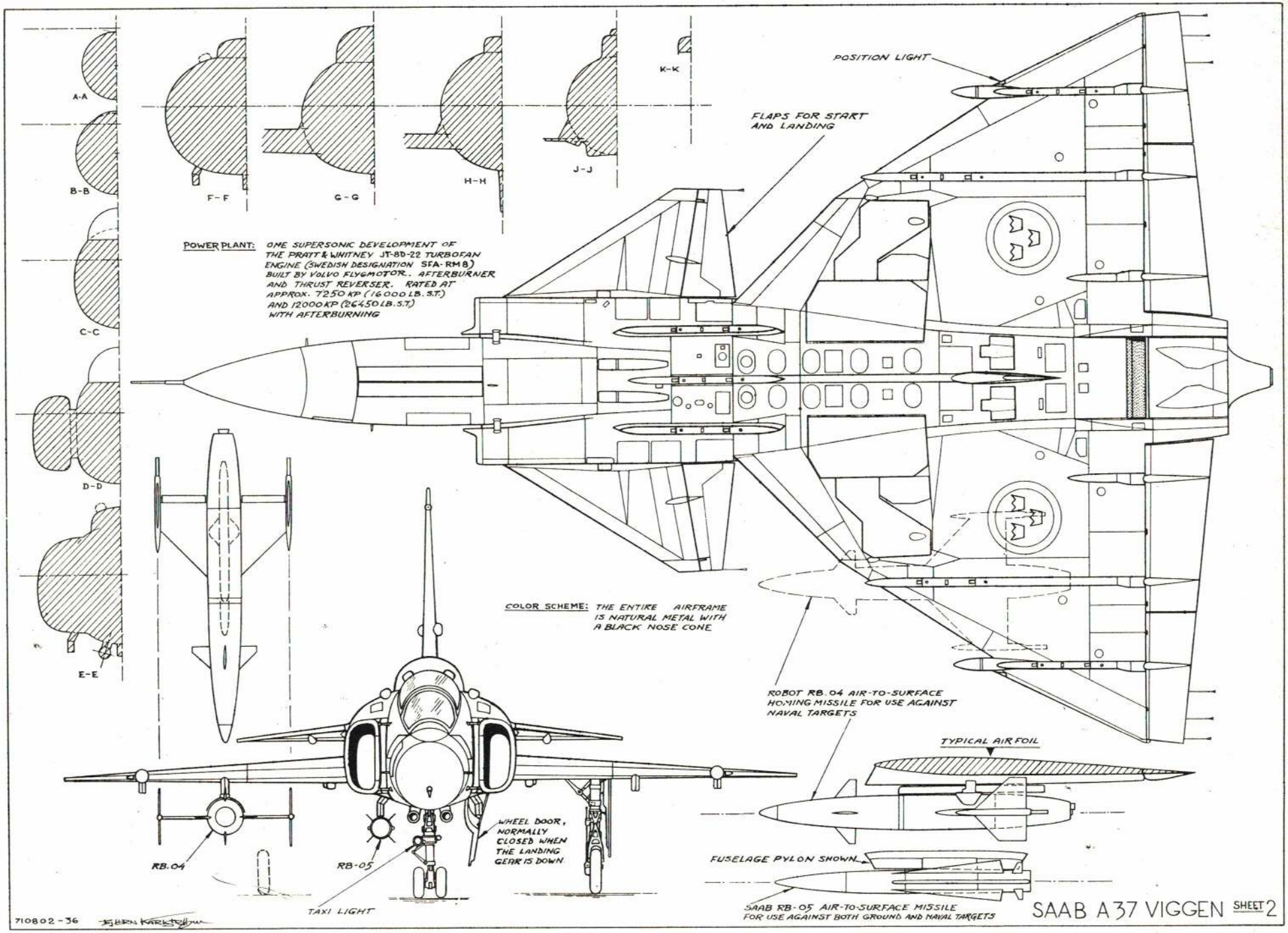
Text continued on page 76



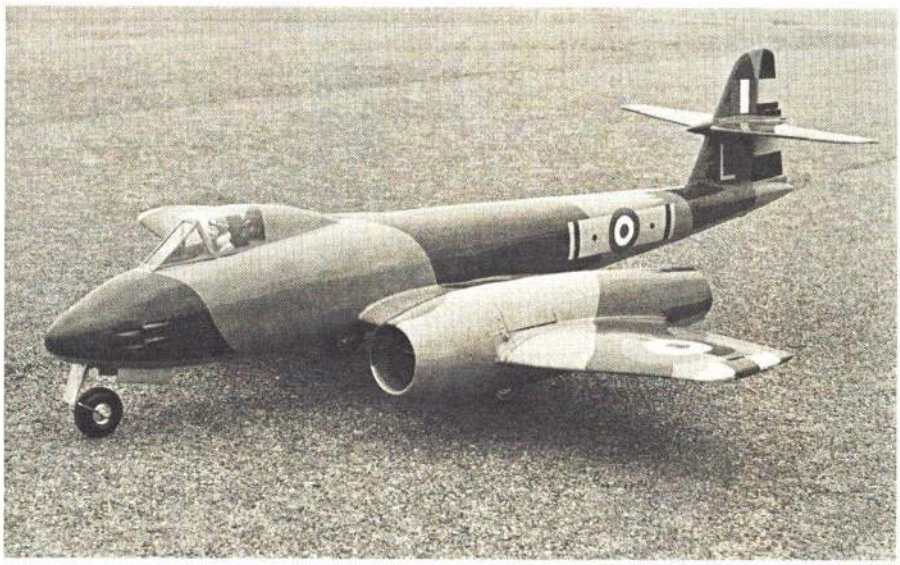
ABOVE: To reduce scramble time, the Viggen can stand at continuous alert, supported by a single electrical power and air conditioning unit which is ejected during start-up sequence. If no ground unit is available, the Viggen can start on its own. ABOVE LEFT: Capable of a 1310 ft. takeoff run, a Swedish aluminum overcast departs one of their Air Force's strategically located road bases. ABOVE: Cockpit of Saab 37 Viggen. LEFT: From brakes off to 36,000 ft. takes two minutes. Landing speed is about 137 mph.

Photos courtesy of Saab Scania.


SAAB A37 VIGGEN SHEET 1
THRUST REVERSER SLOT
AIR BRAKE
EMERGENCY POWER GENERATOR
AIR INTAKE FOR ELECTRONICS COOLING
ZERO-HEIGHT ROCKET POWERED EJECTION SEAT
COCKPIT VENTING DUCTS
ELECTRONICS BAY VENTING DUCTS
AIR BRAKE
PITOT HEAD (RESERVE)
PLASTIC NOSE CONE, SLIDES FORWARD ON RAILS
PITOT HEAD
5 M
15 FT
DROP TANK, CARRIED ON THE CENTRE PYLON ONLY
TAXI LIGHT
YELLOW
MEDIUM BLUE
THIN BLACK BORDER
710802-36


A-A
B-B
C-C
D-D
E-E
F-F
G-G
H-H
J-J
K-K
POSITION LIGHT
FLAPS FOR START AND LANDING
POWER PLANT: ONE SUPERSONIC DEVELOPMENT OF THE PRATT & WHITNEY JT-8D-22 TURBOFAN ENGINE (SWEDISH DESIGNATION SFA-RM 8) BUILT BY VOLVO FLYGMOTOR. AFTERBURNER AND THRUST REVERSER. RATED AT APPROX. 7250 KP (16000 LB. S.T.) AND 12000 KP (26450 LB. S.T.) WITH AFTERBURNING
COLOR SCHEME: THE ENTIRE AIRFRAME IS NATURAL METAL WITH A BLACK NOSE CONE
ROBOT RB.04 AIR-TO-SURFACE HOMING MISSILE FOR USE AGAINST NAVAL TARGETS
TYPICAL AIR FOIL
RB.04
RB-05
WHEEL DOOR, NORMALLY CLOSED WHEN THE LANDING GEAR IS DOWN
TAXI LIGHT
FUSELAGE PYLON SHOWN
SAAB RB-05 AIR-TO-SURFACE MISSILE FOR USE AGAINST BOTH GROUND AND NAVAL TARGETS
710802-36
SAAB A37 VIGGEN SHEET 2

METEOR F MK8



TOP: It is a most inspiring model made up of three cylindrical shapes. Someone could easily make these in fiberglass. Many pleasing color schemes apply to this plane. ABOVE: How nice to see a jet that doesn't fake it with a propeller. The model is a fine CL Scale ship, but also suitable for RC—almost as is. Imagine the sound it must make—a roaring whoosh.

The Gloster Meteor first flew on March 5, 1943 and was Britain's first Jet Fighter. Meteor Mark 1s took part in the final stages of the war against Germany. By 1948, the design had progressed to the F. Mark 8 and this Mark was Britain's No. 1 Fighter for five years. It also served with many other nations well into the 1960s taking part, for example, in the Korean war in the hands of the Royal Australian Air Force.

The model presented here was scaled from original drawings kindly supplied by Hawker Siddeley Aviation Ltd., with additional information and details from Profile Publications No. 12 and *The Gloster Meteor*, a Macdonald Aircraft Monograph by Edward Shacklady. The only deviation from scale outline concerns the jet pipe diameter which has been enlarged.

Experiments carried out on a Mig 17 using restrictors in the tail pipe to cut down the effective diameter proved that with this power unit setup 3¼ in. dia. was the smallest allowable without encountering a serious loss of thrust. A tail pipe diameter which is the same as the fan would be ideal, but would rule out 99% of possible subjects. By the same ruling, the intake area should be greater than that of the fan. Again, this is not practical, so additional intake area must be incorporated by providing cutouts forward of the fan covered with mesh to make them less conspicuous.

Construction

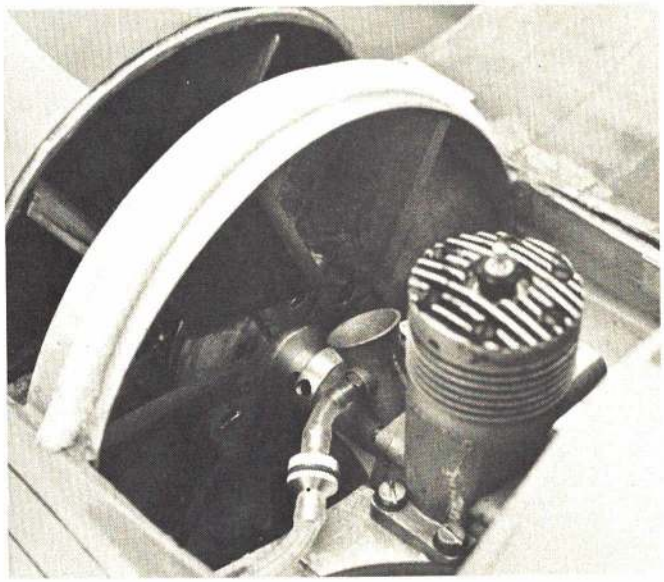
It is assumed that only the experienced modeler will tackle a model of this type. Although the structure is more or less conventional, a more than usual amount of time and patience is required.

Special construction techniques described on the plans apply mainly to the nacelle and fan construction. I am convinced that the thought of having to make a fan propulsion is the reason most modelers are reluctant to try ducted fan propulsion. It is a great pity because the fans are very easy to construct, and both fans plus a spare can be completed in a couple of evenings' work. Who knows? If you persevere, you may even come to enjoy building them. In fact, it can be fascinating to experiment with different blade shapes, numbers of blades, pitch, etc.

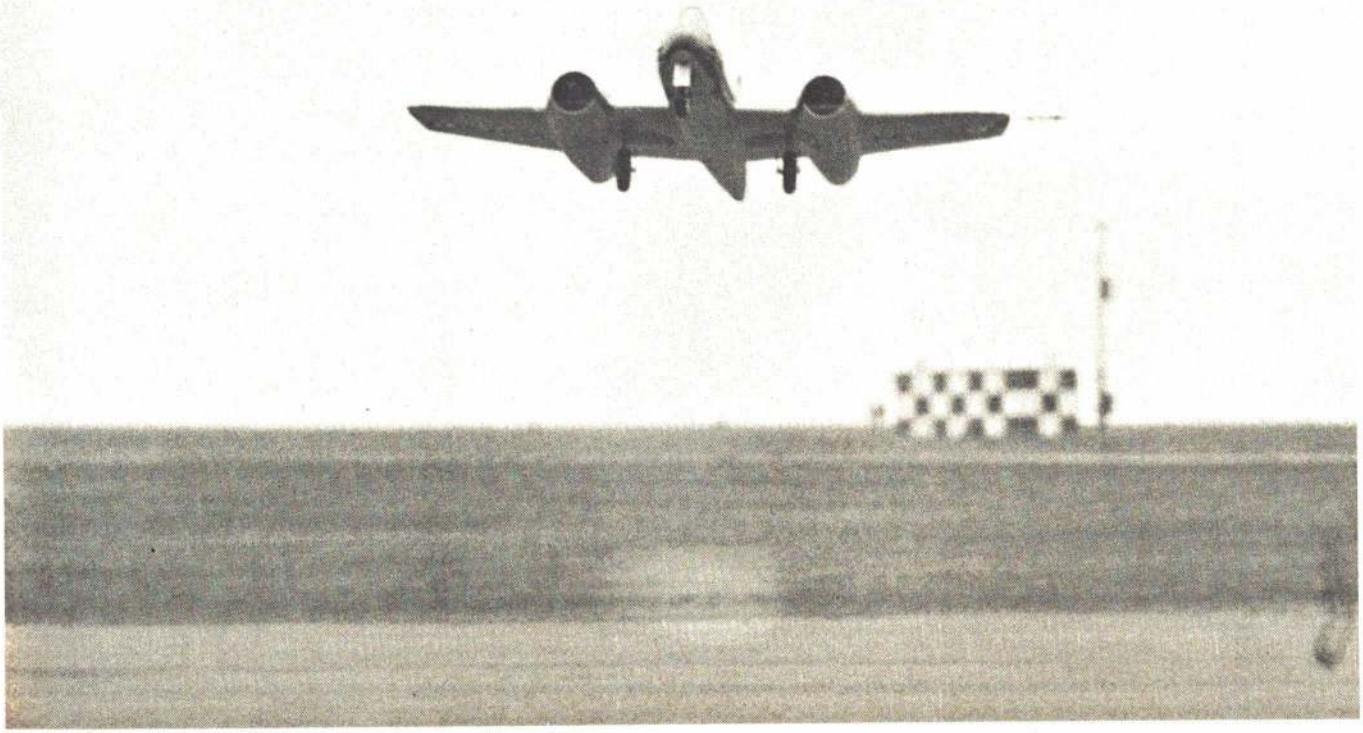
Although the plans describe fan construction, it may help if the material used for the blades is described more fully. It is a laminated, cotton fabric, phenolic resin-based, plastic sheet called Tufnol. The grade I use is Carp brand. It is available in the U.S., but queries about your local engineers' sources of supplies should unearth a homegrown equivalent in other countries. Try asking for Conolite, Phenolite or Tayloron to specifications NEMA LI 1-1965 LE.

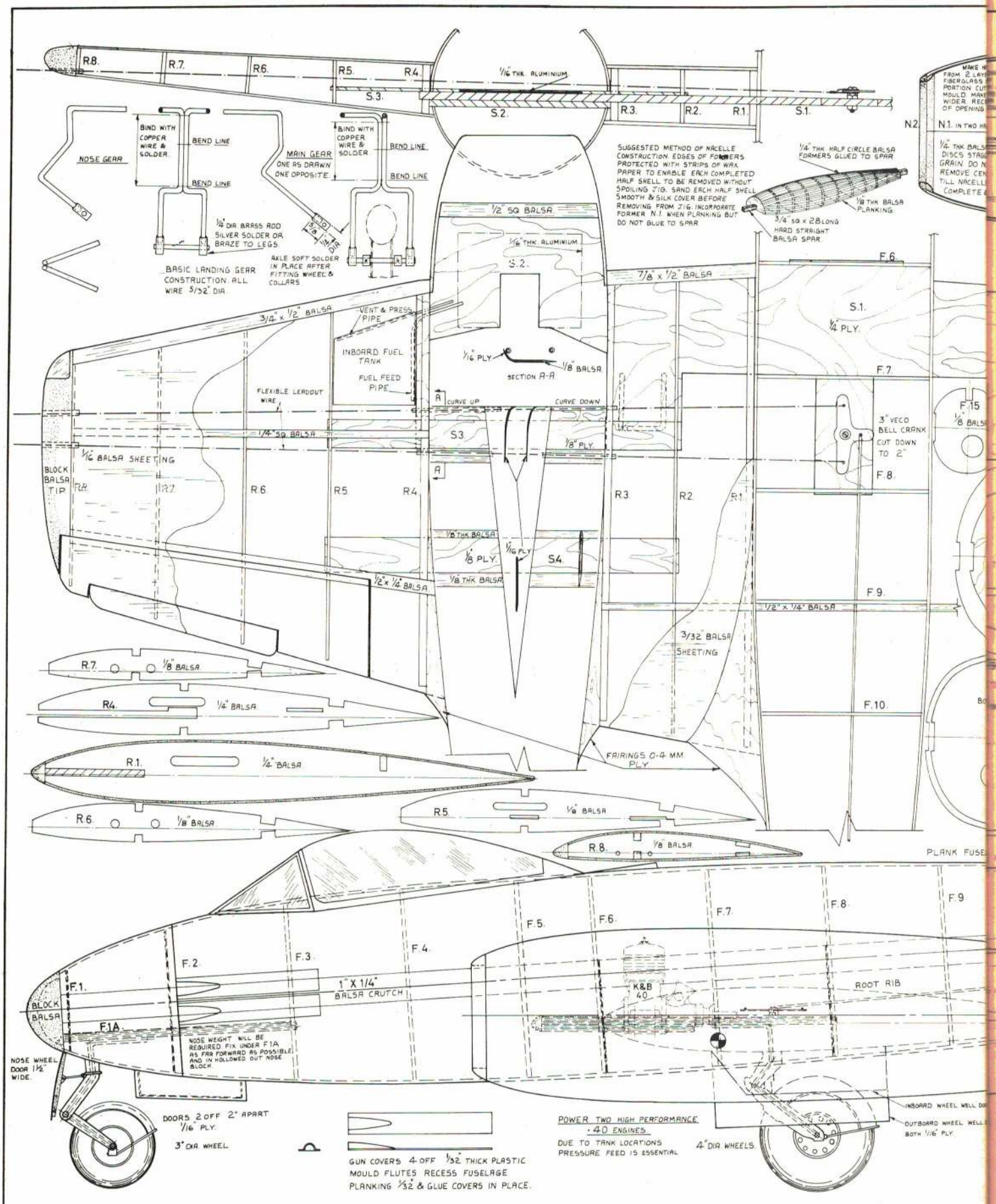
To bend the curve into the blade, grip the short edge in a vice about 1/8".

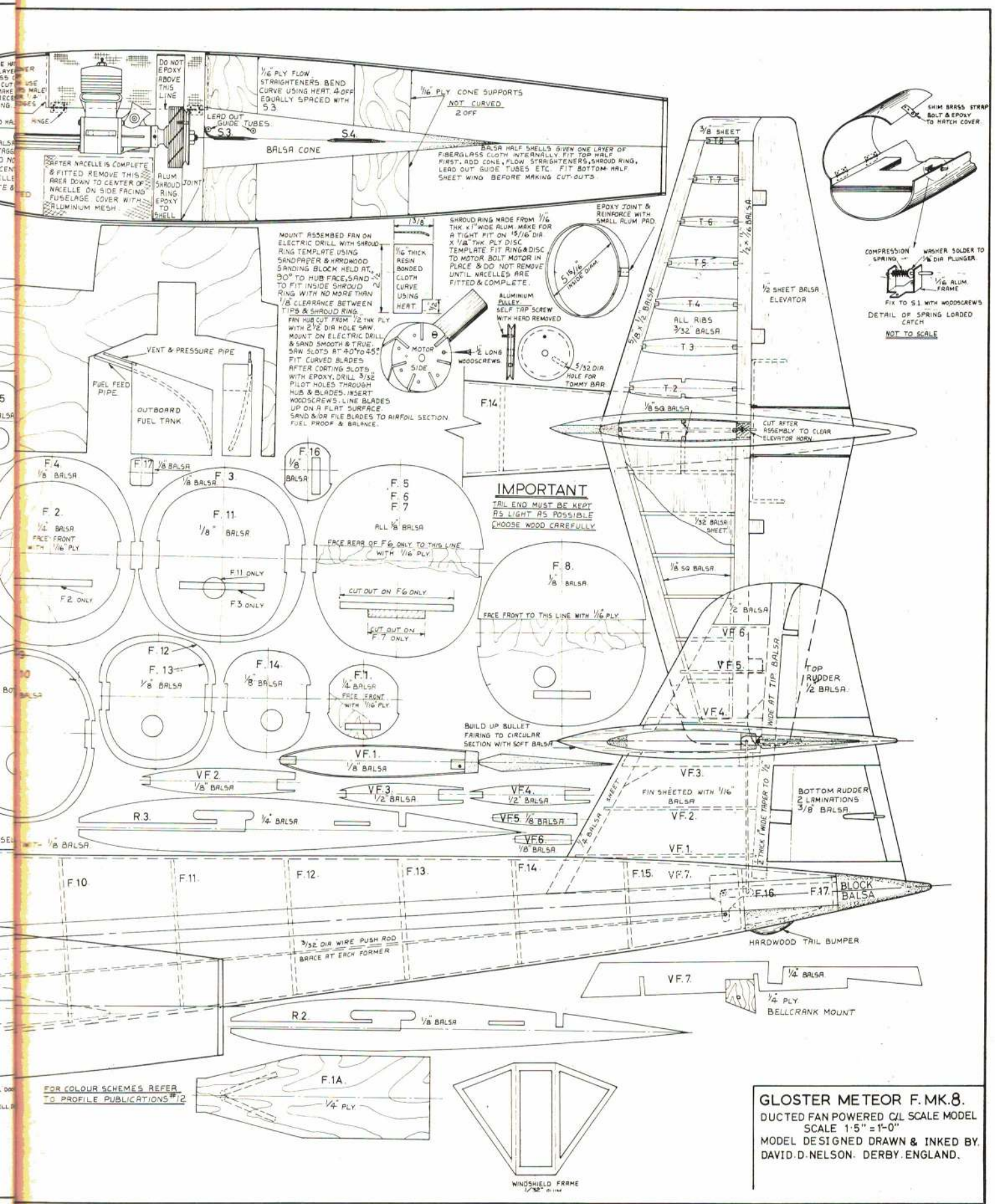
Ducted fans fascinate many modelers, and soon there will be commercially available fan systems. Here's one of the best aircraft for DF propulsion and a practical model for you to build. Takes two strong 40s. / by David D. Nelson



ABOVE: The heart of the matter is the fan system. The author has been working with DFs for a long time to learn how big, how many fans, what airfoils, etc. The installation is like a pusher's. LEFT: Your happy author holding his plane illustrates that this is a big model. By the way, the real plane also has a smooth skin since most of it was plywood-covered.




R.8.
R.7.
R.6.
R.5.
R.4.
R.3.
R.2.
R.1.
S.1.
S.2.
S.3.
S.4.
1/16 THK. ALUMINIUM
NOSE GEAR
BIND WITH COPPER WIRE & SOLDER.
BEND LINE
MAIN GEAR ONE AS DRAWN ONE OPPOSITE
1/4" DIA BRASS ROD SILVER SOLDER OR BRAZE TO LEGS.
AXLE SOFT SOLDER IN PLACE AFTER FITTING WHEEL & COLLARS
BASIC LANDING GEAR CONSTRUCTION. ALL WIRE 5/32" DIA.
SUGGESTED METHOD OF NACELLE CONSTRUCTION. EDGES OF FORMERS PROTECTED WITH STRIPS OF WAX PAPER TO ENABLE EACH COMPLETED HALF SHELL TO BE REMOVED WITHOUT SPOILING J/G. SAND EACH HALF SHELL SMOOTH & SILK COVER BEFORE REMOVING FROM J/G. INCORPORATE FORMER N.1 WHEN PLANKING BUT DO NOT GLUE TO SPAR
1/4" THK HALF CIRCLE BALSA FORMERS GLUED TO SPAR
1/8 THK BALSA PLANKING
3/4" SQ x 28 LONG HARD STRAIGHT BALSA SPAR
1/2" SQ BALSA
7/8" x 1/2" BALSA
3/4" x 1/2" BALSA
VENT & PRESS PIPE
INBOARD FUEL TANK
FUEL FEED PIPE
FLEXIBLE LEADOUT WIRE
1/16" PLY
1/8" BALSA
SECTION A-A
CURVE UP
CURVE DOWN
1/4" SQ BALSA
1/16 BALSA SHEETING
BLOCK BALSA TIP
1/8" PLY.
1/8 THK BALSA
1/2" x 1/4" BALSA
3/32" BALSA SHEETING
1/4" PLY.
3" VECO BELL CRANK CUT DOWN TO 2"
F.6
F.7
F.8.
F.9.
F.10.
F.15
1/8" BALSA
1/4" BALSA
FAIRINGS 0.4 MM PLY
PLANK FUSE
F.1.
F.1A.
F.2.
F.3.
F.4.
F.5.
F.6.
F.7.
F.8.
F.9.
1" X 1/4" BALSA CRUTCH
K&B 40
ROOT RIB
BLOCK BALSA
NOSE WEIGHT WILL BE REQUIRED FIX UNDER F1A AS FAR FORWARD AS POSSIBLE AND IN HOLLOWED OUT NOSE BLOCK
NOSE WHEEL DOOR 1 1/2" WIDE.
DOORS 2 OFF 2" APART 1/16" PLY.
3" DIA WHEEL
GUN COVERS 4 OFF 1/32" THICK PLASTIC MOULD FLUTES RECESS FUSELAGE PLANKING 1/32" & GLUE COVERS IN PLACE.
POWER TWO HIGH PERFORMANCE .40 ENGINES
DUE TO TANK LOCATIONS PRESSURE FEED IS ESSENTIAL
4" DIA WHEELS
INBOARD WHEEL WELL DO
OUTBOARD WHEEL WELL
BOTH 1/16" PLY.



GLOSTER METEOR F.MK.8.

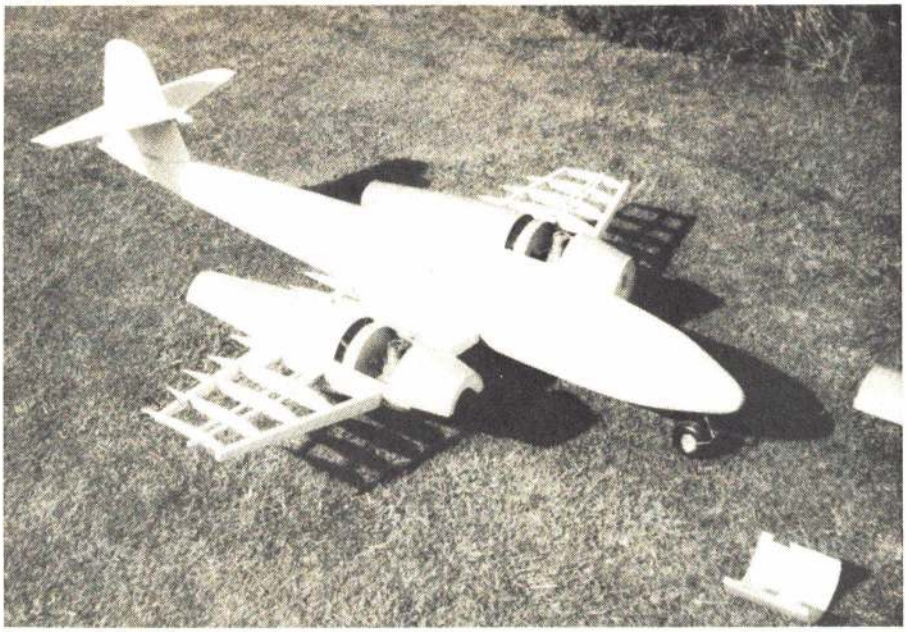
DUCTED FAN POWERED C/L SCALE MODEL

SCALE 1·5" = 1'-0"

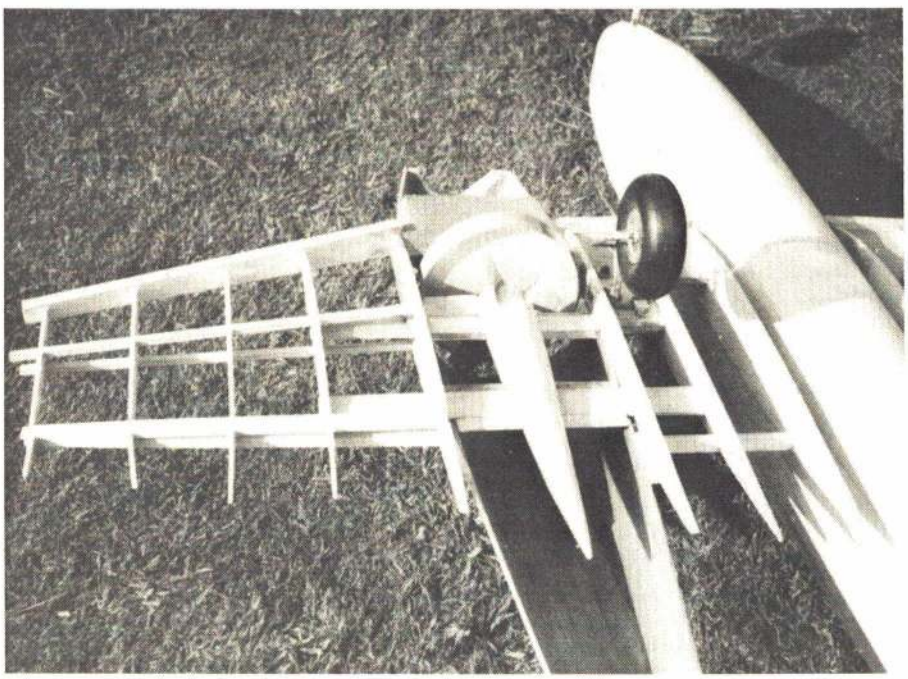
MODEL DESIGNED DRAWN & INKED BY.

DAVID.D.NELSON. DERBY. ENGLAND.

FULL SIZE PLANS AVAILABLE - SEE PAGE 92



As it is designed, the Meteor takes lots of careful planking around many bulkheads. The end result is a light, strong, monocoque assembly. Wings are quite strong when sheeted.



Inside surface of duct is lightly fiberglassed for protection and smoothness. The flow straighteners and internal cone are essential to proper performance of the fan system. Note a disc is used here to keep the shroud perfectly round and close fitting for the fan.

Apply gentle pressure to the top edge. At the same time, heat the bottom half of the blade with a butane torch keeping the flame moving back and forth at all times to avoid blistering the material. The material will be felt to give when the heat has sufficiently softened it. When the curve has been formed, keep the pressure on until it has cooled slightly. Obviously, pressure cannot be applied by the bare hands and an asbestos glove is one form of protection. Alternatively, use a piece of hardwood as a pusher shielded on one side by a patch of metal or wood screwed on as a flame shield.

As the flame should be moving back and forth continually, the patch should not become hot enough to scorch the wood underneath. Practice will be required before consistency is achieved and a few blades will be blistered in the process. Persevere, however, and it will soon become second nature. Full instructions for assembling the fan will be found on the plan.

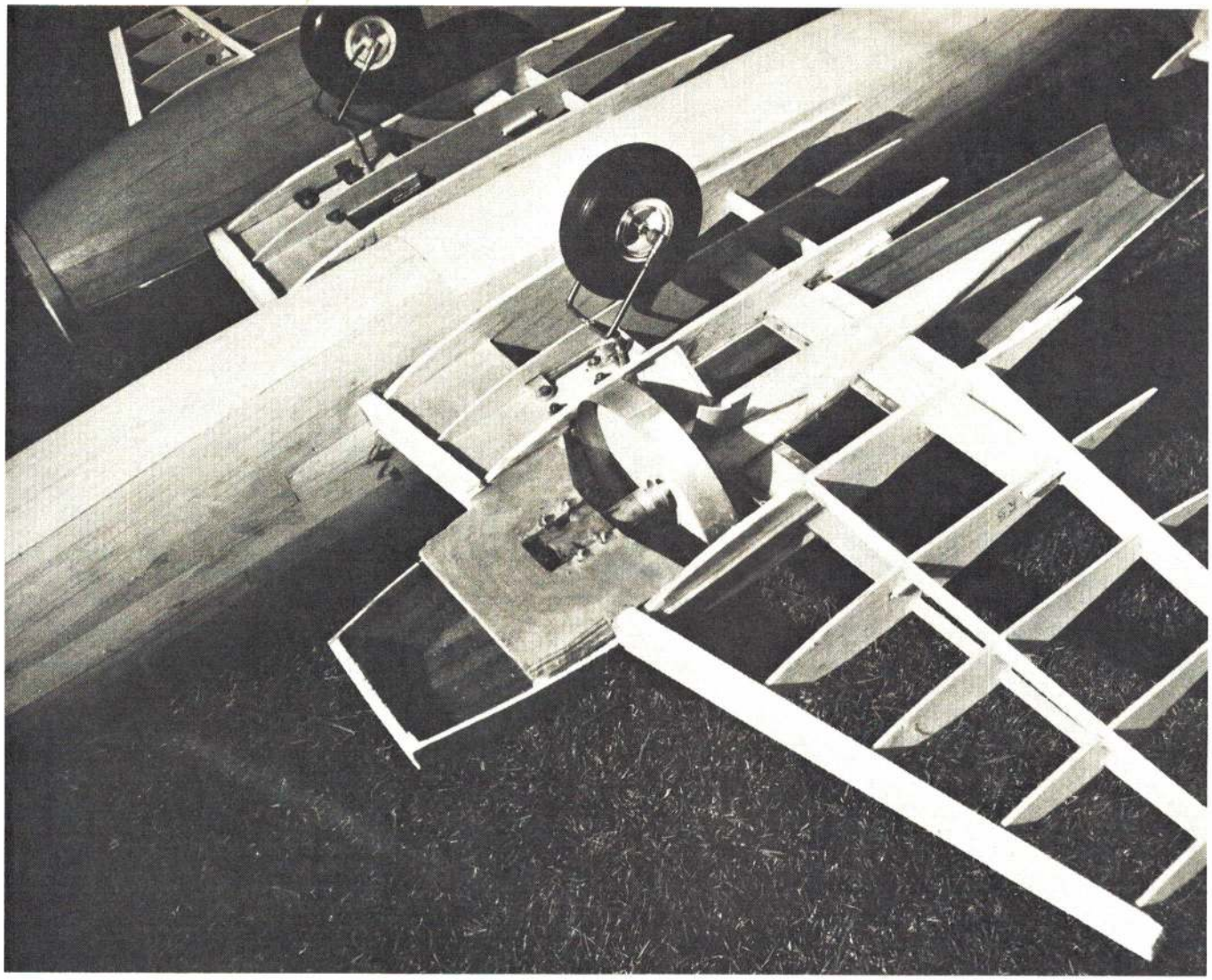
The nacelle construction is rather laborious, but it should be possible to make one half shell per evening. Sand each half shell smooth and silk or nylon cover before removing from jig. Then sand the insides smooth before applying fiberglass. If you can dream up a quicker form of construction, remember that the nacelle adds rigidity to the wing and, therefore, must be of reasonably rigid construction itself.

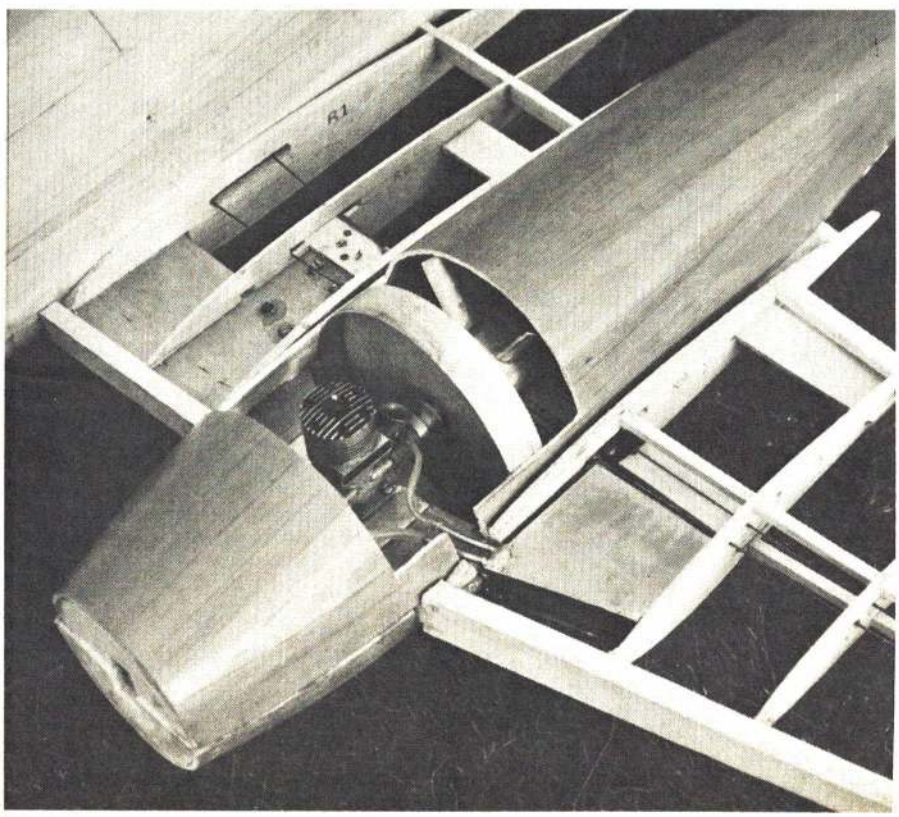
The main airframe assembly is built up around the sub-assembly of S1 and S2, plus the main undercarriage members, bellcrank and aluminum engine mounting plates. Add formers F6, F7 and F8 noting that these do not lie square to S1. Glue the 1 x ¼" crutch to these formers and add the rest of the fuselage formers, taking care that assembly is true. F1, F2 and F3 are glued to F1A, the nose-wheel leg is installed, and the complete unit added in one go. Fit one or two strips of planking to hold assembly rigid, always checking that no distortion creeps in. Assemble fin with bellcrank fitted, and glue in place. Note that the leading edge of the fin includes the front outline of the bullet fairing. Fit all pushrods and leadout wires. Glue ribs R1, R2 and R3 in position plus the ½ x ¼" rear spar which is glued to former F9.

Complete all planking. Fit ribs R4 and ply spars S3 and S4; and rib R5, then the ¼" sq. spars and the remaining ribs. Add ½ x ¼" rear spars and the leading edge.

Bolt motors in place with shroud ring template and shroud ring positioned. Fit top half of nacelles, add flow straighteners, lead out tubes and balsa cone, then fit bottom half. Use strong rubber bands to hold the two halves together while setting. Reinforce seam inside with fiberglass tape and fill any gaps outside with balsa and filler. Finally cover with a strip of silk or nylon. Keep a ply disc or tin lid of suitable size wedged in the end of the tail pipe to assist in maintaining a circular section. Remove when necessary and always replace after work is finished. Do

(Continued on page 98)





ABOVE: The rather big wheels on the model are actually scale. Obviously, they produce gobs of drag. Retracts would help performance as well as the jet impression. LEFT: Engine sits on an aluminum plate sandwiched in a plywood mount. This must be exceptionally rigid. Any vibrations could cause the fan to hit its shroud with disastrous results. Note fuel tank location in the wing.

SIXTY-FIFTH IN A SERIES

getting started in R/C

A WIFE'S EYE VIEW

NORMA McNERNEY

Up until now your husband had been a man of sound mind. Then you began to notice that he had his head buried in a magazine more and more of the time. You didn't recognize the magazine as one to which you normally subscribe. On further examination, you noticed it was a modeling magazine. You took some comfort, however, in the fact that it was a magazine about model airplanes.

Then your husband informed you that he was going out to some field to watch one of his friends fly his model plane. You were a little annoyed as it was the weekend you had a few chores planned for him. However, you saw him off and wondered about his sanity.

Next thing you know he is poking pictures of model planes radios and engines in your face.

"Aren't these beautiful?" he asks.

You are not impressed.

"I think I'll look into getting started in radio control flying," he volunteers.

"That's nice," you reply.

Then it starts. First, he calls a friend to find out whom to contact about how to get started in the hobby. He makes the contact. He orders a radio. You don't see the check (and best you don't). Then he brings home a kit. He starts to build the monster.

Now I hope you have either a basement or garage where your husband can "do his thing." The constructing of a model can be a rather messy thing. Now your husband finds that the kit does not contain everything needed to complete the construction and installation of equipment. So he spends what little spare time he has running all over town seeking out hobby shops that carry RC gear. Saw dust and wood chips appear all over the house. Strange odors seep out from under the basement door—glues, resins, epoxies, acrylic laquers—you get a headache and go to bed.

Finally, he emerges from his workshop with the finished product. You had better be impressed. Long hours of sweat and tears (and much wear and tear on the car and gas credit card) have been spent to produce this product. It is beautiful. He is proud. You can't understand how anything can come out of that messy basement looking so neat and trim. You have an urge to clean up the workshop. DON'T DO IT. Never venture into that no-woman's land. You can't possibly understand what is trash and what is to be saved. Leave the cleaning to the would-be RCer.

The day finally comes. He takes the masterpiece out to fly it for the first time. You wish him well. He returns some time later with his plane—or at least with the pieces. Take heart. It will fly again. It will never look the same, but it will crash and fly many times.

Now this may sound like a cynical attitude toward the hobby. It really isn't. The hobby, though expensive, is a rather healthy one. It gets your man out for some good fresh air and a little exercise and is less expensive than belonging to a Golf and Tennis Club. It gives your husband a chance to spend some time with his peers doing something he really enjoys. He can relax a little. It sure beats having him hang around some bar chasing some real, live model.

I see the hobby as therapy for my husband. It is also good for me as it gets him out from under my feet on the weekends when I want to clean the house. Don't worry about the chores. You may find that he'll get them done a lot more quickly if he wants to go flying. It also will give you an endless list of ideas for gifts for your husband and sons (if they are involved, too). It is an exciting and educational hobby. If your children do become interested it will give them a chance to spend some time alone with Dad to talk "man talk."

Go out and watch your husband and his friends fly. You might even want to learn yourself. It is a fun sport to watch. Try it, you may even like it.

Graupner

BELL 212 Twin Jet

the technically perfect R/C helicopter

This helicopter, equipped with off the shelf MECHANIK sub-assembly parts, has been publicly demonstrated on numerous occasions in all parts of the world with 100% "availability".

ready-to-install mechanical parts precision-made in typical HB engine fashion

smooth running, low friction bearings for all moving parts

ultra-precision fits and 22 roller bearings guarantee smooth running and long life

collective pitch control with novel type of pitch lever linkage arranged inside hollow main rotor shaft

lubrication- and maintenance-free gearbox

all sub-assemblies factory-checked and -adjusted

ready-formed top quality GRP epoxy fuselage

Precision mechanical parts

ready-to-install power pod with special HB 61 STAMO glo engine, automatic centrifugal-type clutch and main rotor gear box. Its high torque and excellent throttle characteristics make the HB 61 STAMO the perfect choice for R/C helicopter models.

ready-to-install rotor head featuring collective and cyclic pitch control

ready-to-install main rotor shaft with bearing, swash plate and pitch control linkage

ready-to-install tail rotor gear box

Ind. No. 4600
Quickie kit ZELLE (airframe)
Ind. No. 80
Quickie kit MECHANIK (mechanical parts)
Ind. No. 90
Training-type landing gear kit

Graupner **models**
model engines
electronics

JOHANNES GRAUPNER · 7312 KIRCHHEIM-TECK · GERMANY

AHM, Associated Hobby Mfrs., Inc.
621 East Cayuga Street
Philadelphia / PA 19120

French Motor Co. Inc.
33, Berry Street
San Francisco / Calif. 94 107

Midwest Model Supply Co.
6929 West 59th Street
Chicago / Illinois 60 638

Royal Products Corp.
6190 E. Evans Avenue
Denver / Colorado 80 222

AZ 53/E

MEUSER ON FF SPORT

(Continued from page 27)

descend, landing in Charlie's waiting hands. Full-size plans will be available; drop me a card c/o **AAM** and I'll send you the particulars.

The future of the Rocket Power event is uncertain as Jetex supplies are no longer being manufactured. However, the large existing stock will probably last several years. Then what? We suggest that Boost Glide would be an acceptable substitute, and as the rocket motors are highly reliable, Boost Glide might turn out to be a good AMA Free Flight event.

THOR'S NEW HAMMER

(Continued from page 64)

internally mounted 30 mm Oerlikon KCA cannon. (On other models, all armament is external to the aircraft.)

Basically an all-weather aircraft, the Viggen is scheduled to phase-out Sweden's Lansen and Draken airplanes in the attack and reconnaissance roles. As a progression of the delta-wing Draken, the Viggen has a tandem-delta wing which is flap-equipped on the canard surface. This bold and attractive configuration gives it the high speed characteristics of a delta wing while the foreplane gives it that added "plus" of an STOL's short field performance.

As a manned weapon system, the Royal Swedish Air Force's proposed System 37 began in 1958 when development work on the Draken was peaking out. Included in System 37's overall requirements were the aircraft with power plant, avionics, ordnance, photo equipment, special ground-handling equipment and testing and training equipment (including simulators).

Because the Viggen represented a bigger, more technically integrated product, it amounted to a whole "new aircraft, new engine and new electronics based on new technical principles."[3] For the Swedes it constituted a major national undertaking. The project, under constant review with the constant threat of economic cutoff, is the result of a vast team work effort between the Swedish Air Force, Saab-Scania (the prime contractor), and numerous Swedish and foreign (mostly American) sub-contractors.

In the fall of 1961 general specifications for a multi-purpose, single-engine, single-seat aircraft with STOL capabilities were approved. In December it was decided that the aircraft should be powered by a military version of Pratt & Whitney's JT8D turbofan engine. Built under license by Volvo and fitted with a Swedish-built after-burner, the engine allows the Viggen to cruise economically at low altitudes, yet provides high reheat thrust when it has to get up 'n scat. It can operate at Mach 2 at high altitudes or Mach 1.1 as low as 330 ft. off the deck.

Actual design, begun in October 1962, was frozen in May 1963. Including the probe, overall length of the Viggen is 53 ft. 5 in. Span of the main wing is 34 ft. 9 in. Height overall is 18 ft. 4 in. Since the airplane operates out of Sweden's network of underground hangars, the main fin folds to reduce overall height to 13 ft. 1 in.

Wherever possible, integration of "off the shelf" items into the Viggen

resulted in considerable savings in overall development costs. These items were fitted into existing aircraft and subjected to thorough testing in order to establish their compatibility with other new or existing systems. All systems tie into a digital computer.

In order to control a potential Mach 2 airplane, it was necessary to come up with a computer system that would get the pilot's workload down to tolerance level and present understandable information without turning him into a blithering idiot drowned in facts. Simulators were used to design placement of instruments and to determine how much a man can absorb and still make decisions.

A sophisticated airplane with sophisticated innards can wind up a pretty "heavy" proposition. From the beginning, Saab engineers had the Viggen on a strict diet to reduce all possible weight without endangering aircraft integrity. They sweated over every pound.

With nearly 25% of the skin area made up of inspection hatches, its fuselage (built along conventional lines) is of high strength aluminum alloy composed, as much as possible, of bonded honey-combed panels. (All control surfaces are honey-combed.) Because of its high cost, titanium is used only in hot areas and in all standard bolts. Still and all, maximum takeoff weight for the AJ 37 with standard armament loads is about 35,275 lb.

In September 1964, the first of seven prototypes—each built for specific systems-test purposes—was begun. It made its maiden flight on February 8, 1967 with the other six prototypes following between then and July 2, 1970. By February 13, 1971 the first flight of a production AJ 37 was accomplished, and delivered into Air Force service in June of that year.

Of the 175 Viggens ordered (157 AJs and 18 trainers), 30 were in service as of March 1973. One independent expert has called the Viggen "incomparably the best constructed aircraft this writer has ever seen."[4]

Now with thousands of research, development and test flying hours behind it, and with the inevitable bugs inevitably working out, production is scheduled to go into the 1980s. Presented such possibilities in a ready-made machine, Australia, the Netherlands and Switzerland are interested.

Notes

[1] The first use of the specific term "Military Type" aircraft was on March 13, 1911 when the Curtiss Company received a $6000.00 order from the U.S. Government. Robert B. Casari, *(U.S. Military Aircraft 1908 to April 6, 1917)*, p. 1.

[2] Except as especially noted, all data supplied by Saab-Scania.

[3] Schroder, Olsson and Ljungkvist, "Viggen" *Astronautics and Aeronautics*, December 1969, p. 26. See also: *Canadian Aeronautics and Space Journal* (Vol. 18, No. 6), June 1972, pp. 167ff.

[4] Roy M. Braybrook, "The Fight for the Skys," *Air Enthusiast* (Vol. 4 No. 6) June 1973, pp. 281.

THE SHRIKE

(Continued from page 20)

you drive the stab from the same point from which the stab itself rotates. This could allow a flutter situation to develop. The slot in the Fork allows the thrust tube to transverse its arc; its position relative to the fork pivot can also be varied. The unit is infinitely adjustable for many different applications, but the setup shown on the plans works best for the Shrike. Contrary to popular opinion, a stabilator is not an overly sensitive device; it is quite the opposite, in fact, when used with a reasonable airfoil section.

The stab on the prototype was made removeable. If you travel by air with your model, you can certainly appreciate this feature. The photo is somewhat outdated in that the lexan flange bearings are not shown. The unit pictured slides into a slot in the rear of the fuselage. The top and bottom of this slot is 1/16" plywood and the whole thing is through-bolted with ¼-20 nylon bolts. Better and simpler yet, put sleeves in one half of the stab to receive the pivot and thrust tube. A few set screws in this half of the stab will secure it. The first time you install a stabilator will be similar to your first experience with retracts. It takes a little familiarization, but the end result is worth it.

The most important step in assembling the unit is to be certain that both halves are perfectly aligned with each other; that is, the leading and trailing edges must match. The rear of the molded fuselage sports stab shoulders molded to accept the stab halves and provide bearing mounts.

At the other end of the machine, I decided on an upright engine with lots of room in the canopy for tank and other goodies. As I see it, the upright engine offers better lateral balance and airflow symmetry. It's easier to line up the carburetor with the tank and is obviously simpler to start and work on. Eventually, I see a rear exhaust motor with a tuned pipe (muffled, that is), housed in the canopy. The generous lateral area in front of the CG allows the knife edge capability necessary as to perform some of the maneuvers.

The airplane is pictured with an HP powerplant, but has since been used as a test bed for one of the original Ross 61 Schnuerle ported prototypes—much power available here. Cliff Telford will follow up with an article on the production version soon.

The wing is a very important part of any aircraft. Here I have chosen a 6400 series airfoil that progresses from 15% at the root to 17% at the tip. Concerning airfoils on model airplanes all I can say is that some do the job well and others just do it. This section works well and particularly good with the strip ailerons. Moderate sensitivity about neutral and a constant desirable roll rate are hard to achieve with some setups of strips. I hesitate to elaborate on all the reasons why, but this combination does work. Refer to Ron Chidgey's article for defer-

(Continued on page 88)

FOX MODEL AIRPLANE PRODUCTS CATALOG FOR 1974!

MADE IN AMERICA

FOX 40-40

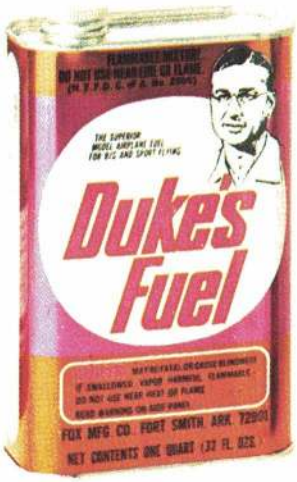
40% nitro, 40% alcohol, 20% oil. A high performance fuel not recommended for fun flying, but capable of producing more power if you have the need. No secret blends, no exotic ingredients, no fancy claims . . . just a good formula similar to that mixed by most plyon racers or combat flyers for themselves. The high nitro content makes this an ideal power additive for your own custom blended fuel.'

QUART . . . $3.25—NO. 30403

MISSILE MIST

25% nitro, 22% oil. Our most powerful sport fuel. Missile Mist runs cooler than low nitro fuels because it's buffered against pre-ignition, giving you quicker starts and broad needle valve settings with less leaning out towards the end of the tank. Missile Mist is recommended for all FOX engines except the Stunt 35. Not surprisingly, a lot of modelers have found that motors other than FOXes like MISSILE MIST, too.

PINT . . . . . $1.50—NO. 30302
QUART . . . . . $2.65—NO. 30303
GALLON . . . . . $8.90—NO. 30305



DUKE'S FUEL

10% nitro, 22% oil. A popular middle of the road fuel, widely used for both radio control and control line flying. The easy starting, good idling and economical operation have been responsible for the every increasing popularity of DUKE'S FUEL.

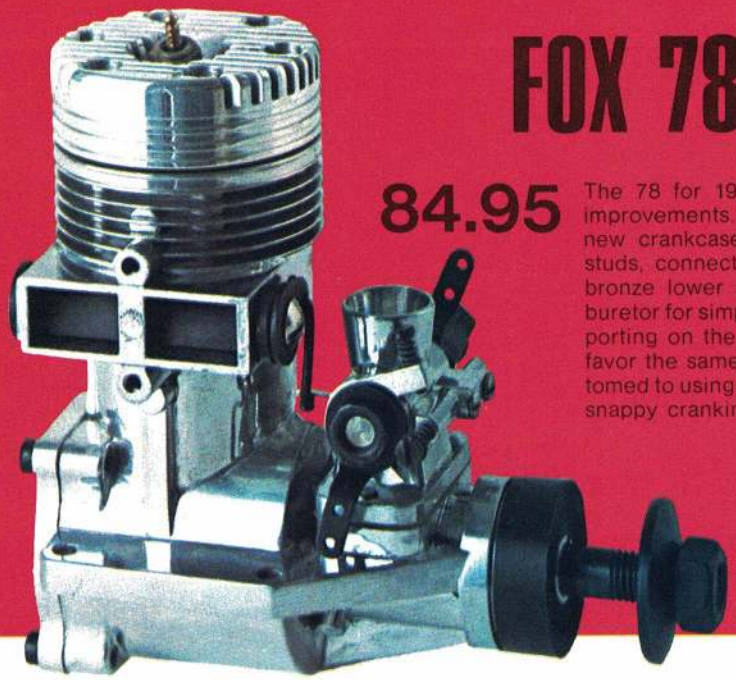
PINT . . . . . $1.30—NO. 30202
QUART . . . . . $2.35—NO. 30203
GALLON . . . . . $7.75—NO. 30205

FOX SUPERFUEL

5% nitro, 28% oil. The first choice break-in fuel for any make engine. Superfuel is preferred by control line stunt flyers since the speed changes very little as the motor leans in a maneuver. Superfuel used in poorly fitted or well used engines increases the compression and performance.

PINT . . . . . $1.30—NO. 30102
QUART . . . . . $2.35—NO. 30103
GALLON . . . . . $7.75—NO. 30105

FOX MOTORS WITH THROTTLE



FOX 78 FOR 1974

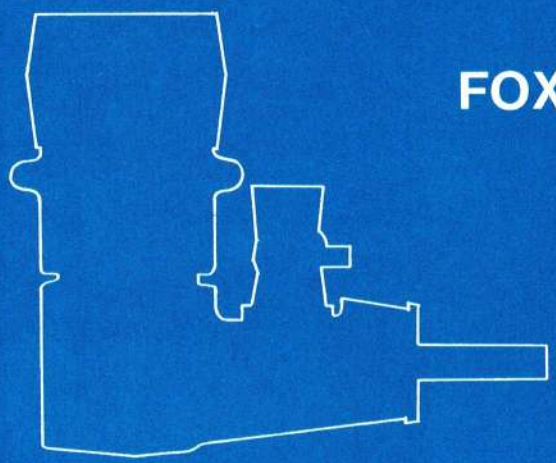
84.95

The 78 for 1974 features several significant improvements. An all new single plug head, new crankcase with deeper bypass, muffler studs, connecting rod now fitted with a cast bronze lower end, and new Eagle type carburetor for simpler carburetor adjustments. The porting on the New 78 has been modified to favor the same size propellers you are accustomed to using on your 60. Two piston rings add snappy cranking compression.

Wt. . . . . 19 oz.
Disp. 785
RPM 13,000
With an 11-8 Prop

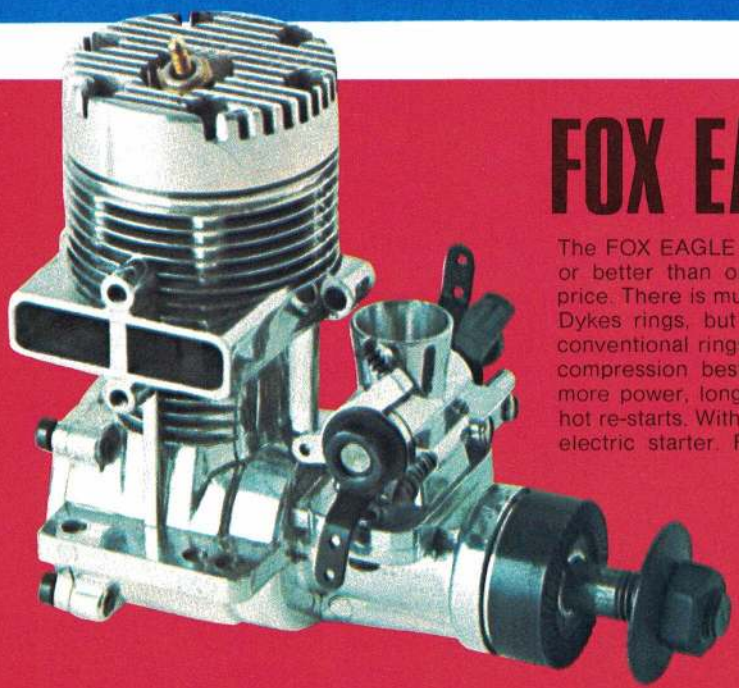
No. 27800

THREE BRAND NEW MOTORS



FOX HAWK 60

The new Fox Hawk 60 is well along in tooling stage and deliveries should be made in time for Spring 1974. This all new motor fits the same mounts and muffler as the Eagle. It incorporates the newest technology in reaching for more power. Parts are durable and the motor is capable of utilizing higher nitro fuels for even more power gain. Tentatively priced at about $100.00.



FOX EAGLE 60...

The FOX EAGLE .60 has performance equal to or better than our competition, regardless of price. There is much talk about single rings and Dykes rings, but Duke is convinced that two conventional rings that fit the cylinder will hold compression best. Better compression means more power, longer life and most of all, easier hot re-starts. With an EAGLE you don't need an electric starter. For easier engine installation there is a six hole mounting pattern and throttle arms on each side.

64.95

WT. . . . . 14 OZ.
DISP 604
RPM 11,500
WITH A 11-8 PROP

NO. 26099

FOX 36
$27.95

Wt. . . . . 8 oz.
Disp. 359
RPM . . . 10,500
With a 10-6 Prop
No. 23600

The FOX 36 has long been a favorite of sport flyers with its sturdy construction. The removable two-jet throttle with coupled rotary baffle will give you quick throttle response for an afternoon of consecutive touch and goes or let you enjoy extended flights at slow ¼ throttle settings. Mounting studs integral with crankcase for B size FOX SILENCER.

FOX 29
$27.95

Wt. . . . . 8 oz.
Disp. 299
RPM . . . 12,000
With a 9-6 Prop
No. 22900

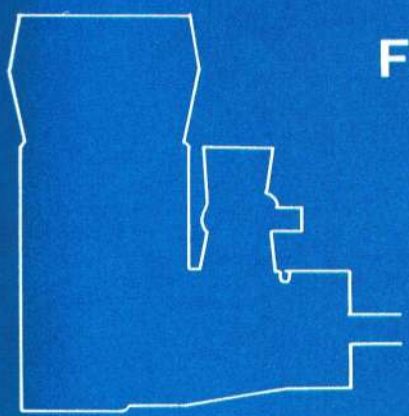
The 29 now has a new crankcase fitted with an easier to adjust two-jet carburetor, rotary exhaust baffle and lugs to make installation of the FOX B size SILENCER a simple screwdriver job. Unlike many engines of this size, the FOX 29 has no bad habits and is so easy to start that we unhesitatingly recommend it to the beginner.

FOX 25
$23.95

Wt. . . . 6½ oz.
Disp. 25
RPM . . 12,000
With a 9-4 Prop
No. 22500

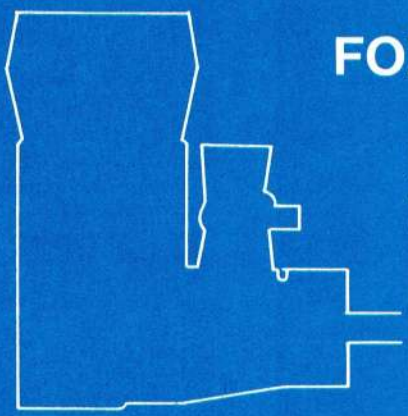
The FOX .25 has power enough to fly a full house multi and with a weight equal to most .19's it will breathe new life into airplanes designed for .19's and yet will not create any mounting or balancing problems. Our two-jet carburetor gives smooth, steady intermediate speeds and a faultless low speed idle. Cast-in lugs make installation of the FOX B size SILENCER very simple.

S TO BE READY IN THE SPRING OF 1974...



FOX 40

The NEW FOX 40 is a radical departure from previous Foxes. Incorporates the latest technology and several tricks never seen before to pull extra horsepower without sacrificing reliability. Will be available in both bushing and ball bearing versions.



FOX 45

The Fox 45 is built in the same frame as the new Fox 40. Added displacement is obtained by larger bore. We expect this new motor to fly pattern ships comparable to most of today's 60's. Keep looking for it, it is the first of the new breed. Projected deliveries summer 1974.

FOX 19
$23.95

Wt. . . . . 6 oz.
Disp. 19
RPM 15,000
With an 8-4 Prop
No. 21900

The FOX .19 has a strong family resemblance to our EAGLE 60 with its removable carburetor with vertical intake stack, rotary exhaust baffle and SILENCER mounting studs. Its conventional porting and two-jet metered fuel flow carburetor makes for quick starting and a steady, low RPM idle. Designed for the B size FOX SILENCER.

FOX 15
$18.95

Wt. . . . . 4½ oz.
Disp. 15
RPM 12,000
With an 8-4 Prop
No. 21500

The Fox 15 is ideal for three channel trainer models with wing spans around 48", but is capable of flying full house models. The smooth action throttle with metered fuel flow and rotary exhaust baffle makes a 3,000 RPM (or less) idle most reliable. With a small prop and hot fuel it becomes a real ¼ midget contender. Our A size FOX SILENCER bolts neatly to the lugs cast into the exhaust stack.

FOX MOTORS WITHOUT THROTTLE

FOX 78 $74.95

Wt. . . . . 19 oz.
Disp. 785
RPM 13,000
With 11-8 Prop
No. 17800

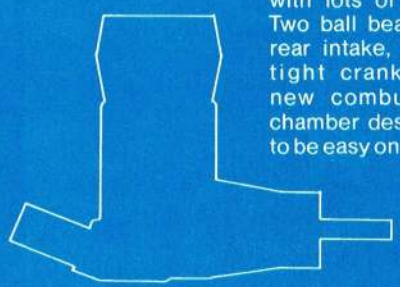
The Fox 78 is the ideal engine for those heavy scale models and any unusual model where you want lots of power. All the features of our throttle 78RC except fitted with a simple spray bar carburetor.

EAGLE 60 $54.95

Wt. 14
Disp. 6
RPM 15
With 8-11 Pro
No. 1609

Today's heavier control line stunt models require smooth, reliable power without a lot of weight or vibration. Fox Eagle 60 at 14 ounces has what it takes . . . snappy compression for instant starting, real free running characteristics, long life, low vibration, and superb fuel suction. The dimensions across the case are smaller than most 60s.

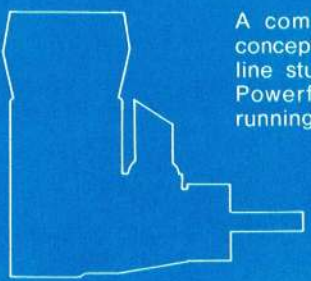
FOX 40 RACING



A brand new motor with lots of urge. Two ball bearings, rear intake, super tight crankcase, new combustion chamber designed to be easy on plugs.

First deliveries expected summer 1974.

FOX 40 STUNT



A complete new concept of control line stunt motors. Powerful, steady running.

FOX 29 $17.95

Wt. . . . . 7 oz.
Disp. 29
RPM 12,000
With a 9-6 Prop
No. 12900

The FOX 29 with its newly styled crankcase and larger crankshaft counterweight starts good and runs very smoothly. We feel that it is the finest running bushed bearing .29 that you can buy. Cast-in exhaust stack studs make mounting the B size FOX SILENCER neat and easy.

FOX 25 $15.95

Wt. . . . . 6 oz
Disp. 2
RPM 12,00
With a 9-4 Prop
No. 12500

New in 1972 we are especially proud of this engine. The 25 will handle Ringmasters, Flite Streaks and similar airplanes designed for 35's. It has bronze bushings and a lapped meehanite piston. Like all FOX motors it is test run before packaging. Cast-in exhaust studs accept the B size FOX SILENCER.

SPORT STUNT COMBAT RACING

FOX 36 $17.95

Wt. . . . . 7 oz.
Disp. 359
RPM 11,000
With 10-6 Prop
No. 13600

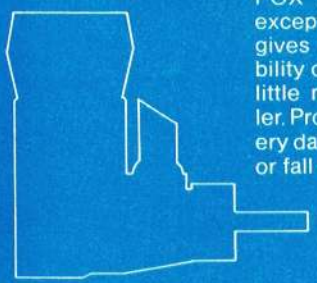
The FOX .36 has evolved from the Black Head Combat Specials through the Needle Bearing Combat Specials and the 36X BB Combat Special. It is fitted with a brand new sleeve bearing crankcase which makes it eligible for slow combat and events which require a bushing main.

COMBAT SPECIAL $39.95

Wt. . . . . 8 oz.
Disp. 359
RPM 19,000
With 8-7 Prop
No. 13700

The new Combat Special has everything you want . . . two ball bearings, instant restarts, capability of utilizing all the nitro you can feed it, coupled with surprisingly light weight . . . not a motor for beginners.

FOX 45 STUNT



Identical to new FOX .40 STUNT except larger bore gives it the capability of swinging a little more propeller. Proposed delivery date is summer or fall of 1974.

FOX 35 STUNT

The size, weight and performance of the .35 Stunt has made it the worlds leading contest stunt motor for 24 years. We are even more proud of the fact that it has introduced hundreds of thousands of young men to model building. An ideal beginners motor, its low compression is easy to crank and forgiving of poor tank installations. The B size FOX SILENCER is easily bolted onto the exhaust stack studs.

$19.95

WT. . . . . 6½ OZ.
DISP. 352
RPM 9,600
WITH A 10-6 PROP
ORDER NO. 13500

FOX 19 $15.95

Wt. . . . . 5½ oz.
Disp. 19
RPM 15,000
With an 8-4 Prop
No. 11900

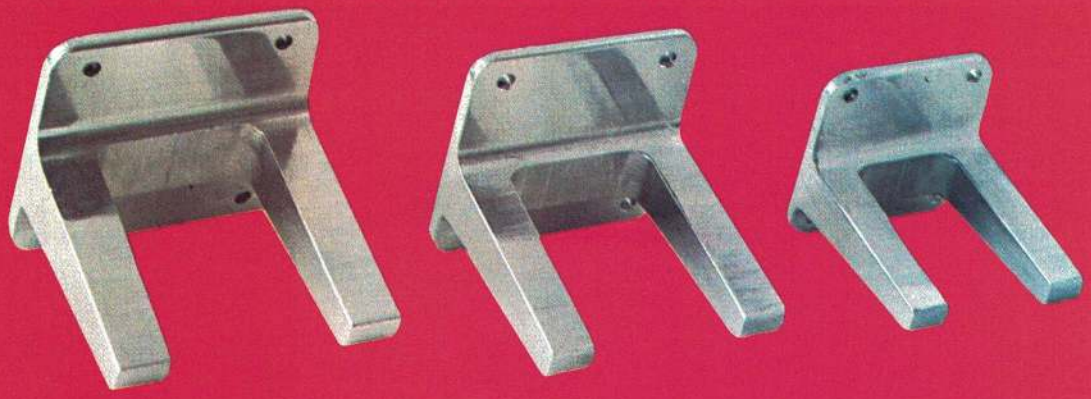
The new FOX .19 is similar in appearance and construction to the FOX 25 and will interchange with the larger engine on the same motor mounts. Power output is surprising for a bushing motor-outrunning many ball bearing engines. The FOX 19 has a meehanite piston lapped to a steel liner to give you many hours of reliable and pleasurable flying.

FOX 15 $14.95

Wt. . . . . 4 oz.
Disp. 15
RPM 12,000
With 8-4 Prop
No. 11500

A light weight little engine with big performance. The FOX 15 is a proven design with recent modification for easier starting and more consistent needle settings. An ideal engine for the Flingmaster, Jr., the Flite Streak, Jr., or many other similar size trainer planes. Designed for use with the A size FOX SILENCER.

FOX MOTOR MOUNTS MACHINED FROM BAR



LARGE SERIES . . . $4.00

WIDTH	FITS	PART NO.
1.475	FOX EAGLE 60 OS 60 ST 51 ST 56 ST 60 ENYA 60 Merco 60	50601
1.525	Veco 60	50602
	Webra 61 H.P. 61	
1.640	FOX 74 FOX 78 ST G-60	50603

MEDIUM SERIES . . . $3.50

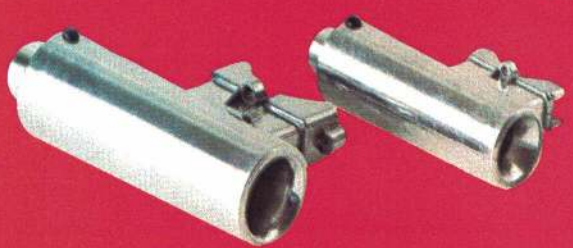
WIDTH	FITS	PART NO.
1.217	FOX .29 new FOX .36 new FOX .35 all OS .30	50401
1.218	FOX .36X all FOX .36BB all ST .35 stunt	50402
1.320	K&B 35 K&B 40 OS 35 OS 40 McCoy 40	50403
1.385	FOX 40 S T 35 rc S T 40 rc Webra 40	50404

SMALL SERIES . . . $3.00

WIDTH	FITS	PART NO.
1.000	FOX .15 OS .15	50201
1.135	FOX .25 ST .19 ST .23 OS .19	50203

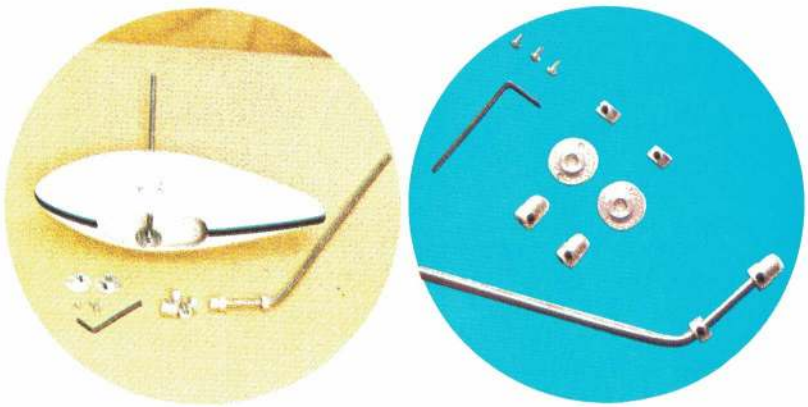
FOX MOTOR MOUNTS are lighter and stronger than cast mounts. The one-piece design gives more precise alignment of engine bearers, more rigidity and less vibration than two-piece or plastic mounts. The bearers are 90° to the backplate. Thrust changes can be made with shims between the firewall and backplate.

FOX SILENCERS



FOX SILENCERS are made specially to fit FOX motors without putting a clamping strain on the cylinder. The two piece design consists of a die cast outer shell with a machined inner liner and can be disassembled for cleaning or alteration of hole sizes. Each of the four different sizes is available in two styles.
The FLOW THROUGH design with an open front is good for an approximate 6 decibel decrease in sound level with no measurable power loss.
The CLOSED FRONT design will decrease the noise level about 10 decibels and cause a 300 to 400 RPM loss.

SIZE	WT.	FITS	PRICE	STYLE	PART NO.
A	1-1/8 oz.	FOX 15,	$4.95	OPEN FRONT CLOSED FRONT	90211 90212
B	1-3/8 oz.	FOX 19, FOX 25, FOX 29 FOX 35 STUNT FOX 36	6.95	OPEN FRONT CLOSED FRONT	90221 90222
C	1-5/8 oz.	FOX EAGLE 60	8.95	OPEN FRONT CLOSED FRONT	90231 90232
D	2 oz.	FOX 78	10.95	OPEN FRONT CLOSED FRONT	90241 90242



FOX WHEEL COLLARS

Our regular wheel collar sets consist of one inside and one outside collar for each wheel. Allen wrench is included in each set. Flanged wheel collars are designed for mounting wheel pants or wheel well doors to landing gear struts.

TYPE	WIRE SIZE	PRICE	PART NO.
2-wheel regular	3/32	69¢	90331
3-wheel regular	3/32	98¢	90332
2-wheel regular	1/8	69¢	90341
3-wheel regular	1/8	98¢	90342
2-wheel regular	5/32	69¢	90351
3-wheel regular	5/32	98¢	90352
2-wheel regular	3/16	69¢	90361
3-wheel regular	3/16	98¢	90362
FLANGED WHEEL COLLARS			
2-wheel	1/8	1.25	90343
3-wheel	1/8	1.85	90344
2-wheel	5/32	1.25	90353
3-wheel	5/32	1.85	90354

FOX FUEL FILTERS

For dependable tank after tank engine runs our two piece fuel filters have a fine mesh screen to collect solid particles. Disassemble for easy cleaning.

LARGE 95¢
NO. 90702

SMALL 95¢
NO. 90701

75¢
LUSTROX
NO. 90811

75¢
GARNET
NO. 90812

LUSTROX . . . mix with oil and dab in intake during first run, polishes running surfaces for more RPM and longer life. GARNET . . . used for hand lapping piston to cylinder fit.

SPINNER NUTS . . .

Machined from solid bar stock in two sizes this spinner has a nicely contoured shape and a cross hole for using a tightening bar.

SIZE	PRICE	PART NO.
1/4 thread	$1.00	60504
10/32 thread	.75	60503

PROP SHAFT EXTENSIONS

½ LONG	10-32THD	1.75	NO.90410
¾ LONG	10-32THD	1.75	NO.90411
½ LONG	¼-28THD	2.00	NO.90412
¾ LONG	¼-28THD	2.00	NO.90413
½ LONG	5/16-24THD	2.25	NO.90414
¾ LONG	5/16-24THD	2.25	NO.90415

Improved type extensions are now supplied with a special nut and washer so that a standard Fox spinner will fit right on. Nut and washer are made from steel and spool from aluminum alloy.

75¢
PRESSURE FITTINGS

For use in tapping muffler or crankcase pressure for pressurized fuel systems. Machined from 3/16 inch HEX brass bar. small - neat. 4-40 or 6-32 threads.

4-40 thread 75¢ PART NO. 90501
6-32 thread 75¢ PART NO. 90502

IF YOU EVER HAVE PROBLEMS AND NEED TECHNICAL ADVICE, CALL 501/646-1656 AND I WILL BE GLAD TO HELP YOU . . .

Duke Fox

THE WORLD'S FINEST SPINNERS

Both configurations of FOX SPINNERS have dovetailed back plates to prevent spreading from centrifugal force or starter pressure. Small hold on screws will not spin off with electric starters. Rugged enough to withstand 99% of all crashes. They will absorb energy like the new auto bumpers and minimize damage to engine and airplane. Normally cut out for pattern props, specify narrow for speed props or blank if you wish to put in your own.

BACK PLATES OF SAME DIAMETER ARE INTERCHANGEABLE. FOR NUT AND WASHER OF SIZES OTHER THAN NORMALLY SUPPLIED, SPECIFY WITH ORDER...ADDITIONAL BACKPLATES $1.00.

CONVENTIONAL CONTOUR

DIA.	PRICE	FITS SHAFT SIZE	PART NO.
1½	$7.00	10-32	60106
1¾	7.50	10-32	60107
2	8.00	¼-28	60108
2¼	8.50	¼-28	60109
2½	9.00	¼-28	60110

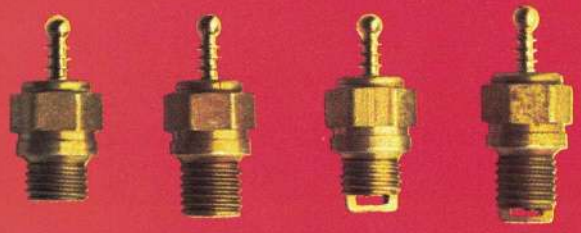
SLIM JIM CONTOUR

1½	$7.50	10-32	60206
1¾	8.00	10-32	60207
2	8.50	¼-28	60208
2¼	9.00	¼-28	60209
2½	9.50	¼-28	60210

ADAPTER NUTS AND MATING WASHERS

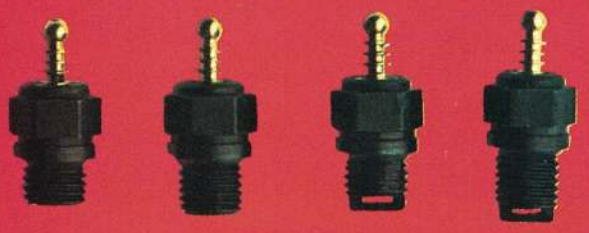
10-32 SHORT	50¢	60401	¼-28 LONG	50¢	60405
10-32 MEDIUM	50¢	60402	5/16-24 MEDIUM	50¢	60406
¼-28 SHORT	50¢	60403	5/16-24 LONG	50¢	60407
¼-28 MEDIUM	50¢	60404			

FOX GLOW PLUGS



STANDARD SERIES

SHORT STANDARD	LONG STANDARD	IDLE-BAR SHORT	IDLE-BAR LONG
69¢	69¢	98¢	98¢
40101	40201	40502	40602



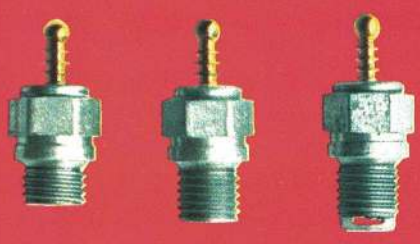
2-VOLT SERIES (Lead Acid Batt.)

SHORT STANDARD	LONG STANDARD	IDLE-BAR SHORT	IDLE-BAR LONG
75¢	75¢	98¢	98¢
40103	40203	40503	40603

FOX COMBINATION WRENCH

Made for modelers . . . FOX WRENCHES are the handiest tool in your field box. Available in three sizes, each wrench fits both prop nut and glow plug.

FOR 3/16" SHAFT MOTORS . . . . . 75¢ — 90101
FOR ¼" SHAFT MOTORS . . . . . 75¢ — 90102
FOR 5/16" SHAFT MOTORS . . . . . 75¢ — 90103



RACING SERIES

SHORT STANDARD	LONG STANDARD	IDLE-BAR LONG
$1.49	$1.49	$1.75
40104	40204	40604

These plugs are very cold running, fitted with .011 diameter wire to stand the high nitro, high compression of the modern racing motors. Not suitable for sport motors as the plug tends to cool off quick.

All prices are subject to change without notice.

FOX MANUFACTURING CO.
5305 TOWSON • FORT SMITH, ARK. 72901
Phone 501—646-1656

ANTIQUE FLY-IN ?

No, these are actually our new Stick Model "6 Way Kits" . . .
But, they sure look real — because they're Authentic Scale.

Sterling MODELS INC.
PHILA., PA. 19144, USA

8.95

ALBATROS DII-A
Kit E9 Span 27¾" Scale: 1 in. = 1 ft.
Amazingly streamlined WWI Fighter. Flown in combat by Richtofen, Boelke, etc.

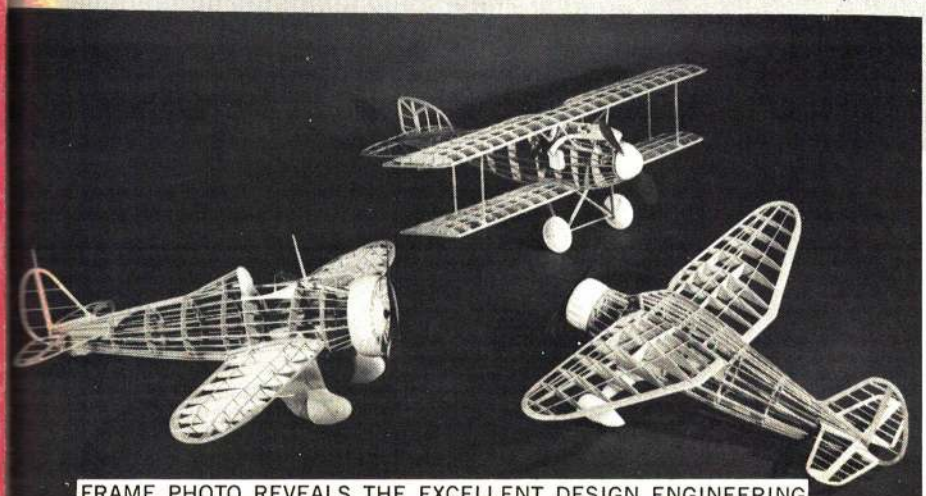
9.95

BOEING P26-A PEASHOOTER
Kit E10 Span 28" Scale: 1 in. = 1 ft.
First U.S. Air Corps all metal monoplane. Held many military speed and altitude records.

7.95

STINSON RELIANT SR-8 GULLWING
Kit E8 Span 31⅜" Scale: ¾" = 1 ft.
Classic 4 place cabin aircraft of the Golden 30's.

These are unique because such amazing scale detail is achieved with these kits that are relatively easy to build. They can be built many ways, such as: Rubber Powered (as supplied), .020, .049 or CO2 Engine Power. For Free Flight, Control Line, R/C (pulse or Single Channel) or Static Scale. *Any version makes a museum-like model. Frame members are accurately Die Cut from the finest quality Balsa Wood, and every part is numbered to insure fast and accurate assembly as clearly shown on the easy step-by-step plan. Highly detailed Plastic Parts simplify assembly adding a touch of realism-in-miniature. Covering material, formed wire parts, Wheels, Decals, Hardware that includes control line parts is a partial list of the contents of these fine kits.



FRAME PHOTO REVEALS THE EXCELLENT DESIGN ENGINEERING

THEY'RE AT YOUR DEALER

GET OVER AND SEE THEM NOW . . .

*Dry Kit. Rubber power material supplied. Other power and equipment not included.

STERLING MODELS • BELFIELD AVE. and WISTER ST. • PHILA., PA. 19144
If no dealer available, direct orders accepted—with 10% additional charge for handling and shipping. (60c minimum in U.S., $1.25 minimum outside U.S.)

- ☐ Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories, etc. 25c enclosed
- ☐ "Secrets of Model Airplane Building." Including design, construction, covering, finishing, flying, adjusting, control systems, etc. 25c enclosed.
- ☐ "Secrets of Control Line and Carrier Flying." Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions. 25c enclosed

No checks. Only U.S. money orders or currency accepted.

Name _____

Address _____ City _____ State _____ Zip _____

THE SHRIKE

(Continued from page 78)

ential setup. He knows what he's talking about.

The sleek flowing lines of the fuselage and vertical fin could be best accomplished by fiberglass molding. There is a positive crease running lengthwise just above the thrust line that gives rigidity to the fuselage, much like a fender line in an automobile. It allows the use of thinner material without sacrificing strength.

The most recent addition to the model is a nose-wheel door. I switched from 180° servos to a Sonic System pneumatic actuator and had ample power to open and close the door. It is simply hinged on one side and rubber band sprung closed. The wheel and strut push it open. The front edge is faired smoothly into the fuselage to prevent the air stream from opening it in flight. It's super simple and works great. Since I fly usually from grass fields, I feel that main gear doors would be too much trouble.

Construction

Construction is not much different from any other fiberglass and foam kit. Because it is capable of rather high speeds with the new more powerful engines and high nitro fuels, I gave a little more attention to areas that will show fatigue. Aileron and rudder hinges should be of the nylon pinned variety and pegged in place with round toothpicks and epoxy. The main landing gear installation using the 1/16" plywood box as shown is extremely durable. Cut a snug hole in the wing to accept it and epoxy on all five sides. This allows a lot of surface area to absorb the landing loads. With a couple hundred landings into a grass field, no signs of stress have appeared in this usually difficult area.

The wing is held in place by two dowels in the front that are actually stressed only laterally because of the molded lip that cups the leading edge. It is secured in the rear by two 1/4-20 nylon bolts that thread into a U-shaped plywood former that straddles both the sides and rear of the wing saddle.

I have tried about every finishing technique possible, but the latest and greatest has to be K&B finishing system. The K&B method has produced for me the easiest to apply, most durable and beautiful surface I have yet to achieve. The purple color will soon be available and the orange was mixed from three parts yellow to one part orange.

Flying

Lengthy discussion on how well it flies by one who designed it might lead you to conclude that I was prone to hyperbole. Quite briefly, it's as good as it looks, will do the whole bag of tricks, and is looked upon with much favor by other more serious pattern fliers who have tried it. The flying stab is a new experience and is particularly noted for extreme smoothness on takeoff and landings.

A Shrike is a bird, a missile or a number of other airborne things. The phonetic sound seems to fit the image of this model screaming down the runway at 120 mph two ft. off the deck. You'll like it—it's a real show-off machine. *(More on page 93)*

MARKS ON RC

(Continued from page 38)

and went into the ground. The triplane is a tough old bird. Even though I never got the throttle back, damage was minimal.

The question was, why did it behave the way it did? Radio failure servo failure, structural failure, interference, or what? Once I used the aileron for the first turn the fun began. I couldn't control its direction—all it wanted to do was roll into a tight turn. Constant opposite aileron and up elevator kept it up until I finally lost it on one last wild spiral. It looked like an aileron servo failure at first, but once the shock was off and the testing began, the radio worked perfectly. In fact, for three straight hours it worked without a glitch. The only thing I noticed was that the power output on the aileron servo was a bit low.

Then, while inspecting a broken aileron, I found it! The torque tube assembly in the wing was binding. I reassembled the wing, and sure enough, the aileron did not center properly. Now the brain was finally in gear—things like leaving the plane locked in the trunk of the car all morning in the hot sun, the trunk seal leak that always lets in a bit of rain, the heavy rain of the day before and the poor design on the triplane aileron system—all came into focus.

The triplane uses wooden dowels at the end of an aluminum tube to transmit the torque to the aileron linkages. These wooden dowels run in plywood bearings. I worried about this when I built the plane so I put in a bit more clearance and finished the dowel bearing with epoxy. Until the crash, frequent

checks had never indicated any binding, but after a few hours in that car trunk steam bath, the dowels swelled. Now the system binds, probably very tightly during the ill-fated flight since the linkage is loosening up each day as it drys out in the garage.

The moral is, don't build it that way. Never use a wooden bearing and shaft assembly, use metal running in nylon or teflon or use an all-plastic assembly. If you build a V.K. triplane, change the design. I've heard of one other triplane that crashed due to reported aileron servo failure. I wonder if it was really the torque tube assembly binding that did it? One other word of warning—while checking controls during the engine run up, I only checked to see that the surfaces moved! Not, how well they returned to Neutral! Believe me, it's going on my checklist from here on out.

UPLIFT

(Continued from page 12)

was hit with a heart attack and eventual open heart surgery. (Bob Nelson was fortunately well enough to attend the show) But the momentum was there. The interest and enthusiasm was infectious. We had a snowball rolling down hill, gaining size, and a trip through the hot place wouldn't have reduced its mass one snowflake.

Five thousand people crowded through the "free to the public" event. Newspapers, television, magazines and radio covered the show with reports and feature articles, and most importantly, the separate clubs made a discovery: They all like aviation. We found great interest in each others' displays, and we found the public was interested and wanted to know more about us.

A good, organized display of non-model aviation materials will complete any show.

Well, children, this story could go on for many chapters about the background and history of the organization, but what is important is what the organization has become. What is Miniature Air Expo, Inc.?

The MAE is a group that has been incorporated under the non-profit organization laws of the State of Minnesota. It is a service organization that is dedicated to implementing its stated purpose which is: "To promote all facets of Model Aviation; to demonstrate to the public the individual and group-oriented modeler skills and to gain a greater unity of spirit, comradery, and cooperation between modelers as they seek individual choice of expression."

It is governed by a nine-man board of directors, who are volunteer representatives of the three chartered clubs. MAE is acting neither as a legislative or regulatory body, but rather as a model aviation service, idea implementation, and representative body. To fulfill its mission, the board members are negotiating with government agencies for the eventual acquisition of recreational lands for free flight, U-control, radio control and all model flying activities.

Educational programs of basic modeling and aerodynamics are being started and operated in the grade schools and junior high schools. These courses are being taught by board members. Plans for high school, college and adult level lecture courses are now in the planning stage.

Negotiations are under way with the modeling industry and local businesses to receive their sponsorship and underwriting for such projects as: The public relations show in the fall, further improvement of the educational program, funding for land acquisitions, production of newspaper stories and television programs for public exposure and education, and improvement of all existing model club facilities in the metropolitan area. More ideas yet to be put into operational form are now under way. MAE has as its number one interest the individual modeler and is attempting to dispell the image of "the grown person playing with toy airplanes." Whatever type of model the enthusiast builds and/or flies—whether the modeler is male or female, belongs to a club or is a loner, is young or old, beginner or pro—the modeler is the reason for Mini Air Expo, Inc.'s

Back Issue Offer

Complete your collection of AMERICAN AIRCRAFT MODELER magazine by ordering today from our library of back issues. Indicate the issue(s) you need by circling the appropriate X(s). Don't forget to complete the coupon (print your name and address) and enclose the correct amount in check or money order.

NEAR COLLECTOR'S ITEMS
$1.25 each

	J-F	M-A	M-J	J-A	S-O	N-D
1963	X	X	X		X	X
1964	X	X	X	X	X	X
1965	X	X		X	X	X
1966	X	X	X	X		

1967-1972—$0.75 each

	J	F	M	A	M	J	J	A	S	O	N	D
1967	X	X	X	X	X		X	X	X		X	X
1968		X	X	X	X	X	X	X			X	X
1969	X	X	X	X		X	X	X	X	X	X	X
1970	X	X	X	X	X	X	X	X	X	X	X	X
1971			X	X	X	X	X	X	X	X	X	X
1972		X	X		X	X		X	X	X	X	X

1973 ISSUES ARE $1.00 EACH

1973	X	X	X	X	X	X	X	X	X

COMPLETE THE COUPON, ENCLOSE THE PROPER AMOUNT IN MONEY ORDER OR CHECK AND MAIL TO:

BACK ISSUES / AMERICAN AIRCRAFT MODELER
733 15th Street, N.W., Washington, D.C. 20005

I have enclosed $_____ for the issues circled above.

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

Foreign orders (other than Canada, FPO's and APO's) add 15 cents per copy ordered to cover postage.

existence. And, finally, MAE is attempting to remain a flexible organization that is sensitive to the needs of modelers and modeling as the future presents itself.

What's in the future? We've heard it said that many large businesses today suffer from "divisionalitis," i.e., the strength of the sum total of the divisions is less than the strength of any one division. Are the individual groups, such as radio control, U-control, free flight and all the others relatively strong, at least in some areas, but collectively extremely weak?

The AMA has done much. If you think not, get yourself elected to a district level office. The AMA can use more help—we all can. Public relations is the answer, not a catchall, but a start. As we, the members of the board of directors of Miniature Air Expo, Inc., look to the future, we offer an invitation to all modelers, to the hobby industry, to the general business world, to local and federal government agencies, to the news media and to the general public.

Modelers, join us and join together. Contact Miniature Air Expo, Inc. for help in your area. Put aside outdated thinking. Seek out your fellow modelers, young and old, regardless of what special interest group they build and fly in. We are stronger in an organized selfless group than we are in selfish splintered fragments. Only the modeler can tell it like it is; only the modeler can destroy any positive image that exists. We need each other. The most unsuccessful people are the ones that glory in their "now success" and forget the future.

Our organization has written, phoned and talked to over 100 organizations in the hobby industry, soliciting their interest, sponsorship and aid in promoting model aviation. Only one responded positively. We are aware that each manufacturer receives hundreds of requests for handouts each year. We are also aware of the many donations of products and of time the manufacturers have made in the past. Also, we know that establishing the validity of each request is monumental. However, we are a group dedicated to (1) promoting the modeler, young and old, (2) interesting people in the hobby and sport, (3) educating the public and consequently (4) establishing a better market for the businessman, wholesaler and retailer. We can realize mutual benefits from a joint venture. We are not looking to compete with the Toledo style trade shows. We are a non-profit organization, but our programs and public show does require sponsorship and funding.

Nine businessmen gave freely many hours of their time to this venture. The Marriott Inn and Mr. Henry Fisher have and are giving much. If more opportunities and facilities are given to youth for a hobby, we can expect more young adults in the future with mental and moral discipline.

We offer the same challenge to the business world and local and federal governmental agencies as we do to the hobby industry. We hope they help

Each model must have adequate space for display.

sponsor and underwrite a growing hobby by providing opportunities, facilities, fundings and flying fields for recreational and competition activities for literally everyone in the family.

We hope that all parts of the news media do as some of the media, newspaper and television agencies have done here in the Twin Cities: Try to find out the real story of model aviation. Print and televise objective stories. There are plenty of real life stories that are more fascinating and reader- and viewer-oriented than many of the media "sensations" of today.

Attend your local model shows, exhibits and demonstrations. Ask the modeler questions and be ready for the flood. Attend local club meetings. Investigate the many aspects of the hobby.

FAIRY UNLIMITED

(Continued from page 28)

cement at all panel joints has hardened. Be advised that there is no twist built in the three center wing panels, but there is barely enough washout in the tip panels to be discernible.

Top quality balsa must also be chosen for the horizontal tail and fins. Use white glue when laminating the strips which form the fin outlines. Soak these strips before attempting any forming around templates the shape of the fin outlines. Strips are prevented from breaking by maintaining tension in them while they are being bent around the fin template.

The wing was covered with red tissue and the tail with white so the ship could be seen more easily in the air and when it drops below treetop level in flight. To prevent fading, the tissue was given an extremely thinned coat of colored dope. In fact, a solution of about 75% thinner and only 25% dope is advisable. This is followed by two coats of clear dope of quite thin table syrup consistency. Do not apply an excessive amount of dope as it may eventually cause warping of the covered parts. If warps do appear later, diagonally placed strips of tissue can be applied and doped to reduce warps by their drawing action.

Select two sheets of medium weight balsa from which to form the fuselage tube—not 1/4 grain stock which is almost impossible to form as required.

An extra length of light type stock needs to be spliced to the end of each sheet as the drawing indicates. If you can get 48-in. stock, this splicing won't

AAM SUDDEN SERVICE PLANS

FULL-SIZE PLANS—SHIPPED FIRST CLASS MAIL WITHIN 48 HOURS—NO EXTRA CHARGE

THIS MONTH'S PLANS

No. 0141, Shrike—Fabulous RC Pattern ship designed by pylon champ Bob Violett is very smooth, fast flyer. Design is intended for fiberglass fuse, foam wing, retracts and a hot 60. **$4.50**

No. 0142, Fairy Unlimited—Lightweight construction, rubber FF design has a Wakefield size for good performance. Features many innovations and modifications. **$3.50**

No. 0143, Meteor MK8—CL Scale model uses unique ducted fans (2) and 40 size engines. Text and plans explain fan construction. Large ship has 58-in. wingspan, 66-in. length and weighs 12-13 lb. **$6.00**

No. 1231, T-19 Trainer—CL Tenderfoot design has flat fuselage for easy construction and a unique removeable wing and tank. 36-in. span, for 19 to 25 size engines. Special price. **$1.00**

No. 1232, Fairey Barracuda—Unusual-looking Scale FF project is rubber-powered. Stick and tissue construction. Good flying characteristics. 35-in. span. **$2.50**

No. 1131, Electra-Fli—Easy-to-build Sport ship is electric-powered for fun, quiet flying. Ship is designed for use with the Astro-10 motor. **$4.00.**

No. 1132, Fairey Firefly—Dave Platt's four-view scale drawings of a proposed NATS level Scale project. The drawings do not contain construction information, but are well-detailed for scale assistance. **$3.00.**

No. 1031, Warlord—This great RC ship was designed to win in FAI competition. With a 61 the Warlord becomes a highly competitive plane. **$4.25**

No. 1032, Consolidated B-24D Liberator—Would you believe a 55" wingspan, four-engined, RC, three-channel B-24D with a flying weight of 36 oz.? It flies great with our 020 PeeWees. Two sheets for **$7.00.**

No. 1033, Focke-Wulf TA 152—Hal Cover's design fits right into the Annual Flight Masters Jumbo Rubber Scale Meet. Construction methods make this a strong plane. **$2.75**

No. 1034, Bosta—Try Neal White's unique design of an elliptical combat plane. Not only is it good looking, but it flies great! **$2.50**

No. 0931, Spezio Sport Tuholer—Smooth and responsive CL Scale ship flies like a typical non-flapped stunter. For 35 to 40 engines. Two sheets. **$4.50.**

No. 0932, Pisces—RC pattern ship by Dave Hale for AMA-FAI patterns. For side-mounted 60 engine and retracts. Ship has 710 sq. in. area and clean lines. **$4.25**

No. 0933, Sparrow—Ship used by Air Force in RPV program presented for modelers wishing to take home movies in flight. Uses Ross four or twin 60s or 80s. Two sheets. **$7.00**

No. 0934, Curlew—Sport FF model has unusually graceful lines and performs quite well. Rubber-powered, the ship has a 24-in. span. **$2.00**

No. 0831, Ole Tiger—Sleek Quarter Midget racer uses fiberglass arrow shafts as spars for simple wing construction. Built-up fuselage. Complies with all QM racing rules, by Don Panek. **$3.75**

No. 0832, Indoor Tandem—Meets the new one ounce FAI rules. Unusual design has two wings and no stabilizer. Design lends itself to experimenting. **$1.50**

No. 0833, Spectra—Semi-scale RC version of an amphibian with engine mounted on a pod in tail. Plane has T-tail stabilizer, wing tip floats. 48-in. span for 23 to 40 engines and four-channel radio. **$4.00**

No. 0834, Spitfire III—Large UC stunt ship features near-scale appearance for impressive looks. Has removeable 58 in. span wing, by Mark Freeman. **$4.50**

No. 0731, Delta Diamond—Sport and slope glider has an unusual delta shape. Uses aileron and elevator control. Small, lightweight design by Ed Erfurth. **$3.50**

No. 0732, "Osprey I"—18-in. span FF seaplane uses Brown CO_2 power in a pusher configuration mounted on a pod above the wing. Fun flier for ROW. **$1.25**

No. 0733, Skyphonic—An easy to fly, 40-in. span ship designed for two channels and 049 engines. Has trike gear, swept wing, inverted engine. **$2.50**

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

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

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

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

No. 0532, Frantique I—WWI type plane with open framework fuse, built-up wing. Can be built in three different sizes according to engine—19 to 35. **$5.00**

No. 0533, The Reliant—Sound Wakefield design creates a consistent flyer. Torque-actuated stabilizer and rudder. **$3.75**

No. 0534, Scorpion—Straightforward Combat ship is designed for strength and speed. For hot 35 engines. **$2.25**

No. 0535, Quickfloat—Specially designed single float for six to ten lb. low-wing stunt aircraft has minimal effect on flight performance. **$3.25**

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

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

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

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

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

No. 0436, AAM Glider Winch—Hefty 6V winch for launching three-lb. RC gliders or on 12V for six-lb. models. Lightweight, uses turnaround pulley. Well-detailed plan. **$2.75**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

No. 1122, Sweet Pea—"V" tailed CL stunter by Dennis Adamsin is consistent winner with semi-scale Good-year-racer appearance. Takes smooth 35 or muffled 40. **$3.50**

No. 1121, Warlock—Mid-wing, tandem bicycle retractable, all-flying stab, and swept wing are features of this 60-powered Pattern ship by Jim Wilmot. Large plan. **$6.50**

No. 1023, Quasimodo—An odd-looking four-channel RC Sport job for 35s. Shoulder wing, tail dragger. A fun flyer. **$4.00**

No. 1022, Lockheed S1—Unique highly-detailed scale biplane of Lockheed's first airplanes. Original dates to 1921. Design by M. Groves, uses a 40. Two sheets. **$7.00**

No. 1021, Bronco—A Class I or II Navy Carrier plane for two 19s or two 29s of the OV-1A C.O.I.N. fighter. The large plan sheets. **$6.00**

AAM PLAN SERVICE

733 Fifteenth Street, N. W. Washington, D. C. 20005

GENTLEMEN: Please send the plans listed by First Class Mail, at no extra charge. I enclose $_____ for

NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

The rates quoted above pertain to the U. S. A., Canada, APO's, and FPO's. For foreign please add 25% for postage.

PLAN NO.	COST
Why not order our complete plans catalog @ $0.25?	
TOTAL:	

SHRIKE *(from page 88)*

VIOLETT'S TECHNIQUES FOR FOAM WINGS

Here are a few of my favorite techniques for working with foam wings. First of all, choice of balsa skins is important since final model weight can vary as much as 4 to 5 oz. as a result of the selection. If assembling your own skins, use a polyester glue to join them and avoid placing a seam at point of maximum curvature of the airfoil.

Prepare the cores by gluing on the trailing edges with Titebond. Then block sand them with No. 220 paper. Clean the residue off thoroughly with air pressure. Several good contacts are available. Southern RC Products' Southern Sorghum, is widely available through hobby dealers and works well. Apply as directed. Be sure to work on a flat surface. Start the skin application from the trailing edge and roll the cores on to the sheeting. Be extremely careful not to induce a twist. If you make a mistake here, throw the whole mess away and start over. I need not elaborate on the worth of any pattern ship with a warped wing.

After the top and bottom skins are on, cap the leading edge with 3/8 x 3/4" medium stock. Band saw the tips to shape, hollow out and cement in place with Titebond. Next, spot glue the aileron stock on the trailing edge and with a ball-point pen, scribe the centerline all the way around the wing. Razor plane the leading edge, tips and ailerons to shape. Acquire a 4 x 11" flat sanding block (I use ½" plexiglass to fabricate this). With No. 80 sandpaper, taper the skin lengthwise from root to tip and cordwise from high point of airfoil to leading and trailing edges. When using 3/32" skins, considerable material can be removed so that the balsa is about half its original thickness at the leading edge, trailing edge and tips.

Dihedral amounts to one in. under each tip, so block sand the root sections to attain this and join the wing halves with epoxy.

The complete wing including ailerons, but before any finish, should weigh no more than 20 oz. If it exceeds this, you've used too much glue, too heavy balsa and not enough sandpaper.

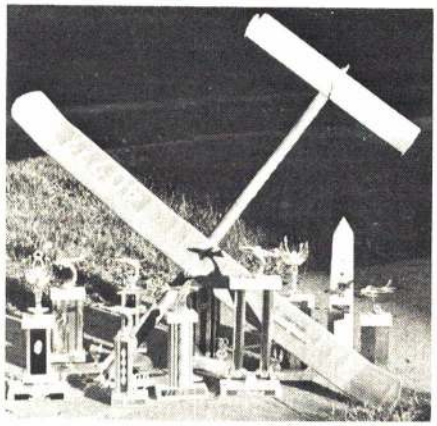
be necessary, but the tube behind the rear motor hook anchor should be sanded down until it is little more than 1/32" thick. To get an object the right diameter on which to form the fuselage halves, you can always wrap a broom handle with cord and increase its size. Use a little patience and form the tube as the drawing indicates and you will have a more efficient structure clear of obstructions inside it—obstructions which would interfere with a large rubber motor unwinding.

Also, a tubular fuselage will have fewer weight-adding cement joints and you won't have any corners for folding propeller blades to foul on.

Cement only one edge of the fuselage halves together before inserting the small gussets shown which stiffen the fuselage considerably. Cover the fuselage with silk to prevent splitting when a motor is blown inside it. Dope the silked fuselage tube about twice as much as the tissue-covered parts; apply one coat of thinned, colored dope followed by three or four coats of clear dope of table syrup consistency.

Shape the nose plug as shown and try to drill the shaft hole to achieve the angular offset the drawing shows. This will reduce the amount of shimming the nose plug will require when trimming the ship for flight. The rear of the nose plug should fit tightly in the fuselage, and the reinforcing blocks it fits inside should be coated with cement.

The propeller is one carved from fairly hard balsa with blades which are on the thin side and of fairly high pitch. One half of the blades near the hub is covered with silk and then covered completely with Jap tissue. This covering should be preceded by two coats of dope followed by a light sanding.



This Nordic is a real performer. Every detail is refined for winning. Powered by a king-size bundle of powerful rubber bands.

Then apply the silk with more clear dope and tissue by positioning it and applying thinner which penetrates the tissue and softens the dope so the tissue adheres to the propeller blades.

Follow the silk-tissue covering with enough color dope mixed with clear to permit a smooth finish after the propeller is sanded lightly. This covering technique seems to leave a plane with a

propeller which is light, yet has withstood a few blown motors smacking into it. When assembling the propeller on the shaft and with the nose plug, be sure to bend the shaft as short as possible so the tension of a wound rubber motor will not effect the thrustline offset.

Locate the steel screw propeller stop in the rear of the nose plug as far as possible from the shaft and adjust it so it will engage the end of the bent around shaft when there are about 25 winds left in the rubber motor. The screw should stop the propeller at a point so the blades can fold on the sides of the fuselage.

The rubber motor preparation and care is most important in the case of a competition type ship. As you've learned many times before from numerous other articles: Rubber should be stored in a cool, dark place. I keep mine in the vegetable bin of the refrigerator. Maybe you have a wine cellar!

I have found that the most reliable method of breaking in a rubber motor is to stretch it by hand till it remains elongated near five percent when relaxed.

Immediately following this, lubricate and wind it 90% of maximum and leave it wound for 48 hr. (Maximum will be 600 winds for a 26 strand, 32-in. long motor of three mm Pirelli rubber.) To wind it 90% of maximum, the rubber motor is stretched to three times its length and wound to 60%, and the remaining 30% as the motor is allowed to return to its normal 32-in. length.

Wind the motor as much as possible in a stretched condition to minimize chafing. Chafing seems to be the most damaging thing a rubber motor has to endure, so try and minimize the rubbing together of the knots which appear during winding. And never, never, let the motor get dry from lack of lubricant.

Trimming for flight should begin by the addition of enough weight to the fuselage nose for the correct balance, as per the drawing, followed by gliding. If the ship stalls in the glide, shim up the LE of the horizontal tail and the TE if it dives. You should be able to get a 75-ft. nearly straight glide from a head high launch.

Cement scraps of 1/16 sheet balsa underneath the LE and TE of the tail so it won't shift. Later, permanently position them for the desired glide circle. Try about 100 turns wound into the rubber motor and launch the ship into the breeze in the same manner as when gliding it. If the ship stalls, add shims to increase the downthrust till no trace of a stall is apparent when wound that much. Increase power by about 100-ft. righthand circles with no stall at any time. Six hundred is about the most winds I have ever been able to get in a 26 strand rubber motor of three mm rubber 32-in. long.

A left glide circle is set up by skewing the wing slightly and/or offsetting the tail which will effect the power flight very little since the rudders are more or less out of the propeller wash.

Recently, having built a new wing for the ship, I had it flying fine when wound to 500 winds. But, fully wound, the climb circles were tight and it climbed very little. It turned out that the new wing was inadvertently doweled in position a full 1/2 in. off center. The fact that, fully wound, it still achieved a hot 95 sec., with no spiral dive, should say something for the overall stability of the ship.

If you retrieve from a firey steed, chase the ship down the road and when

it comes down in the weeds 100 or so yards in front of you and a like distance off the road, continue on the bike to a point about even with the ship, dismount and walk straight out to it. You say it's not there!! Well, you can probably locate it in an hour or so. Besides, you saved yourself some wading through those nasty old weeds. Next time, you'll exercise a little more wisdom and go straight to the point where you last saw the ship with no detouring.

Handled prudently, Fairy should give you many a merry chase and I hope you let it achieve it's full potential—it's quite high.

ON THE SCENE

(Continued from page 16)

clock indicates zero. Go through on 1 or before, and you have to circle back and go through again. You guessed it! Your author was the first to be penalized by that rule. You know what is going to happen. You can see it already. Fifteen planes circling, 15 pilots listening to that countdown. Fifteen minds determined that their plane will go through that window as the clock strikes zero. 10-9-8-7-6.

"Time is flying by. Let's see. That window is 60 feet away. Can I get there in five seconds? Better put it into a dive." "I'm too high, I am directly above the window. I'll put it into a dive at three seconds and pull out as I go through the window." "I've been diving since the clock said 9 and I am moving at 40 mph and I am 50 feet away. I should hit the window exactly at zero! Here I go! Zoooommmmm." Countdown. 5-4-3-2-1-ZERO!!! Fifteen planes screaming by. Fifteen frequencies pulsing into the air. Fifteen planes hit that window at exactly the same time. Oh! I forgot to mention one thing: There is only room for five in the window. Yes, it is rightly called a destruction derby.

Would you believe I exaggerated slightly? Would you believe ten planes at once? How about five? You had better believe it. Think about the logistics of such a meet. There have to be five flag-wavers down at the far pylon, five helpers for the five fliers, a contest director and a few position judges. It just can't be accomplished with more than five fliers.

Try this plan. There are as many three-man teams as there are contestants.

It works best if the fellows on the same frequency are on the same teams. One guy flys, one is down at the far pylon with the flag, and one is assisting the flier. He calls when the flag-man indicates you have passed that far pylon and he lets the judges know on what lap you are flying. We had seven three-man teams and flew nine heats. Most heats had five fliers. some had six or seven. So much for the logistics.

We have a small tape recorder patched into our PA system and we have a prerecorded sequence bleep-bloop (loud attention getting noise). "At the sound of the signal there will be two minutes to launch time and four minutes until the start of the heat." . . . Bleep . . . Further announcements and finally a continuous countdown from ten seconds. Then after "1" there is a bleep. After this signal, the fliers may cross the start line. Each pilot must fly five complete laps around the course. Points are awarded for first, second and third. Cumulative points determine the winner.

Let me describe a few of the Foamies. Larry Fogel decided to fly his back-up plane. The wings were old gold, the fuse nose looked similar to that of an old English Bulldog. A piece of his living room shag carpet was glued to the bottom for a skid and friction tape, masking tape, adhesive tape and 5-minute epoxy held this masterpiece together. Yes, they are easily repaired. Kelly Pike, the "Terror of Torrey Pines," decorated his 1-26 exactly like the full-size 1-26, even to the rounded fin and rudder. It was done in purple and white. The purple is better known as Statutory Grape. Paul Denson used as his motif, the PSA Airlines Grinningbird, the unofficial bird of California—smile, eyes, even a PSA on each wing. He said that stood for Paul Smiling Airplane.

Ed Hoppe had his plane decorated with the colors of his transmitter—yellow and white. The white plane was covered with yellow polka-dots; his black canopy set the plane off beautifully. Jim Pike had his red and white plane decorated like the Rising Sun of Japan—rays radiating out across the wings and terminating on the trailing edge. A number of the fellows went the color chart one better and brought out the luminescent spray cans. Everyone found out they were the easiest to see.

Gary Neeley came over to the flight area with his all-white foamy and, when asked what his other color was, held up a can of blue spray paint. He told us he was going to fly it in low over the crowd and a friend would spray on the blue as he went by. Needless to say he had a blue and white plane before the contest started.

The first round went along smoothly until it came time to decide who won the places. No one kept track, so there was nothing to do but run the heat over.

In the second heat, during the two minutes of flying time between launch and countdown, Buck Faure turned around to move back away from the edge of the cliff. When he looked back, he asked where his plane was. His helper

pointed to it way out over the water, so he flew it for about 30 seconds till he discovered he just didn't have control. Yep, he was flying someone else's plane. A spectator answered his scream,"Where is my plane?" by saying, "I saw one go down way back behind the parked cars." Sure enough, it was Buck's. He had it repaired and flew it in the next heat.

The remainder of the heats went along smoothly with no hitches; a short break was taken between heats four and five. Heat five was called and all the planes were circling overhead waiting for the signal. Here came Gary Neeley with Old Blue from out of the wild blue yonder, diving down upon the starting line. Just as he crossed the line, boring through the air, his rudder developed a flutter. Then zaaaap! It parted company from the vertical fin, and about the same time, it turned itself and headed out to sea like a TWA 747 headed for Hawaii. He pulled it up into a loop and flew it upside down back toward the beach. When he pulled it out, it turned 90° to its original path. In fact, every time it looped, it turned 90°. He managed to fly it back past the parking lot, looping and turning, and down to the ground with minimal damage. The lift at Torrey took the lost rudder and flung it back over the cliff edge into the spectators.

Rounds six and seven were flown. without incident. In round eight, Irv Stafford managed to get caught in turbulence in his final turn and spent the rest of eight and all of round nine half way down the cliff looking for his plane. He was accused of looking down at our nudie beach more often than for his plane.

The ninth and final heat was called and all the planes were in the air. Again the signal came and away went the six planes. By this time, the pilots were making the turns without wasted motion and were roaring back and forth between the pylons. Then it happened. Your correspondent brought his Grinningbird up and around into a tight turn at the near pylon and when he leveled out, there was Buck Faure diving in for this turn. You're right! Two planes cannot occupy the same segment of space at the same time just as the laws of physics say. The smiling aircraft sheared a wing in the mid-air and crashed to the cliff about 30 feet below the edge. Buck's plane managed to finish the race with only a clipped wing tip.

Of my plane, the fuselage was broken in two just behind the wing. The nose looked like that of a bulldog. One wing managed to survive. The Kraft three-channel gear in the plane was not damaged. That says a whole lot, not only for Kraft gear, but for the ability of the "foamy" to survive a 150-ft. straight-in crash. I am going to try and rebuild it—just to be able to say what I did back in the beginning of this saga.

Kelly Pike won the contest with three first places and finished the day winner of the fly-off. R.J. Smith placed second and Ken Banks was third.

The club would like to express their thanks to Sun-X Plastics for the prizes.

But if you think that contest was unbelievable, another phenomenon was encountered by our modelers which was quite apart from the competition, but just as incredible. Near Torrey Pines there is a radar site and two small birds have taken over one of the antennas for their nesting area. They defend this nest against all comers. They have taken on our planes, a multitude of seagulls, and a crow who also lives in the area. This crow soars along the slope quite often and the little birds take him on each time. We don't know how he discovered it (perhaps by watching the planes flying along the cliff), but he found he could roll upside-down and the lift would allow him to fly that way and he could fight back with his claws when the small birds dove down and attacked him. Yes, I called the first guy a liar when he told me about the crow. BIRDS CANNOT FLY UPSIDE DOWN, I countered. Last week I saw him for myself and he did roll upside-down. Today at the contest in plain sight of all the contestants and spectators, he flew almost the full length of the glider-port cliff edge upside down. So help me, Alfred E. Newman.

METEOR F MK 8

(Continued from page 72)

not discard completely until model is finished.

Fit fuel tanks and sheet wings. Add fairings and wing tip blocks. Cover with tissue. The tailplane is the only part that can be built flat on the plan. After sheeting and carving, the leading and trailing edges fit to fin. Connect elevator horn, add elevators and sheet fin. Carve to section the rudders. Glue fixed portion in place first and build up bullet fairings. Add top and bottom rudders. Offset can be incorporated if desired. Remove hatch areas on the nacelles with a razor saw, make fiberglass hatch cover and fit. Cut out auxilliary intake area and cover with aluminum mesh.

The cockpit canopy was adapted from a commercial canopy cut to fit the aluminum framed windscreen. Fit remaining details, e.g., undercarriage doors, gun covers, tail bumper, etc. If desired, the ailerons can be cut free, reinforced and fitted back as separate items.

All that remains is the finishing and this is up to the individual. A wide choice of color schemes can be found in Profile Publications No. 12.

The Meteor is the fifth ducted fan model built over the last four years starting with the Saab J21R, following with a Mig 17, Saab Viggen and Meteor Mark 4. All flew and the lessons learned have been used on the Meteor Mark 8. The model flies well, but requires careful handling until flying speed is attained. Acceleration is notoriously slow and a smooth paved takeoff area is desirable as 1 to 1½ laps will be required to get airborn followed by a shallow smooth climb out. Once airborne, the model is a spectacular sight, flight is stable and shallow climbs and dives are permissible. Always remember, however, to keep control actions smooth and gentle.

Make no mistake, this model is no rat racer or stunter. If, for example, sufficient speed for takeoff cannot be obtained, it is possible that the model is tracking out of the circle causing excessive drag. Cure by twisting the undercarriage legs so that when the model is pushed from behind it travels in a straight line or even turns slightly into the circle. The all up weight of the model should be between 12 and 13 lb. which will include about 12 oz. of lead in the nose. I cannot over emphasize the need to use light wood only for the tail assembly; an ounce or two saved here could save several ounces of nose weight. Any saving of weight is reflected by an increase in performance.

Starting the engines using a pulley cord is not difficult as long as you have a helper to hold the model on the ground firm and steady. Hold the pulley cord with one end in each hand so that a loop is formed. Drop the bottom of the loop to fit in the pulley groove. Turn engine over a few times to pressurize the fuel tank. Then pull cord sharply with the left hand letting go of the cord with the right hand at the last moment. Stand in front of the nacelle facing the rear of the model for starting. Always use a clothes peg type clip on plug connector. Do not use the push on type as these can come adrift and get sucked into the fan with disastrous results. I speak from experience. See that the glowclip is secure at all times during starting and when tuning the

engine. To install engine and fan, place fan in the shroud ring. Then put the engine in position placing fan and pulley on shaft. Add nut and tighten up finger tight only. Bolt engine securely in place. Insert tommy bar in pulley and tighten nut with a spanner. Always use the tommy bar to stop the fan assembly from turning. Gripping the fan by the blades will stress and possibly crack the blade at the root causing it to shear under running stresses.

Even if you have no intention of building this particular model, my objective will have been acieved if your interest in ducted fan propulsion has been aroused. Models nowadays have a tendency to become stereotyped and even scale modeling suffers from an excess of Mustangs, Zlinns, Spitfires, Fokker DV11s, set.

Ducted fan propulsion is not new. It has just never been fully expoited. Yet it can open up a completely new field of experimentation and prototypes. It has recently been proven with model helicopter design that, if a sufficient number of people tackle the problems involved and are enthusiastic enough, wonders can be achieved in a very short time. Maybe this could happen with ducted fan design, even to the extent of manufacturers getting interested. The model jet aircraft is an ideal subject for the application of foam core wings, molded fiberglass or ABS plastic fuselages and nacelles. Perhaps one day we will be complaining about an excess of F86 Sabres, Phantoms, etc., in Scale competition.

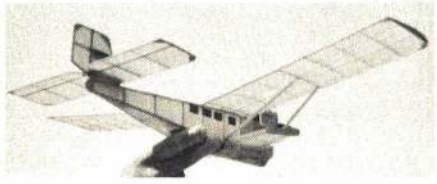
MOONEY ON FF

(Continued from page 63)

Pardue's Monocoupe practically flew out of sight and several others flew into the adjacent tennis courts where they attempted to strain themselves through the wires. Jack Elam was awarded the prize for the slowest qualifying flight—a bottle of castor oil, to GET HIM GOING, presumably by lubricating his rubber motors more efficiently.

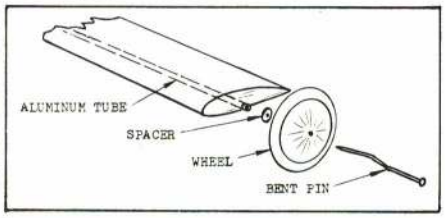
The only other event was Schneider Cup Scale. These seaplanes were supposed to ROG, (Rise Off Grass) but none qualified. Bill Strohman made the best and the most attempts with his Italian hydrofoil racer. The model was nothing if not the strongest ever made. Its flights (it was terribly tailheavy to

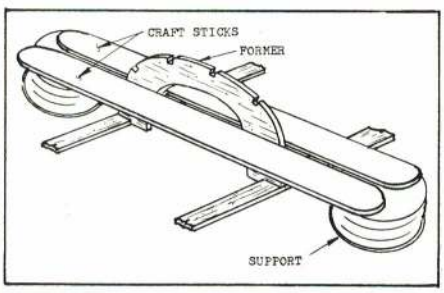
ABOVE: This little CO-2 Dornier has won the CO-2 event at the last two Flightmasters' Annual events. BELOW: Your correspondent's rubber-powered Latecoeur seaplane.



begin with), and Strohman's antics on the field had everyone in stitches, so he was awarded a prize for his efforts.

Construction Ideas: Steve Manion of Pocomoke City, Maryland, sent two ideas which can be used in building. For WWI or similar models, with cross axles that the axle include





a length of aluminum tube in the cross member. Then to attach the wheels, simply use a bent pin through the wheel and inserted into the tube. The bend imparts enough friction to retain the wheel which is still easily removable, and the head of the pin looks better than a blob of cement or a bent wire end.

The second idea is one to help hold ribs or formers vertical while building over a plan. He uses a couple of craft sticks (old popcycle sticks would do), cemented to supports. He used paint jar lids with a gap between the sticks about the thickness of the rib or former. These are simply set over the rib to hold it vertically while the cement is drying.

Salt Lake City's verteran scaler Noal Hess watches his Taylorcraft lift off for a winning flight.

MCCULLOUGH ON RC

(Continued from page 63)

each of the events, it will really be a challenge to produce a design that can come out on top. It all sounds like an infusion of novel

approaches that Pattern and Scale have long needed, combining good features from both. For anyone needing something new for a winter building project, this should be the ticket.

De-duct-ion: Tom Stark, 1973 National Scale Category Champ, says the aluminum in duct pipes sold in hardware stores for laundry drier installations is economical and very easy to form and work when making scale detail parts. The pipes come unassembled so they can be flattened out for use without any difficulty.

HELICOPTER NATS

(Continued from page 44)

stuck his great big training nose-wheel through the hoop like spearing a fish and carried it to the landing pad in 13 sec. Fay's third highly modified 2B flew as well as it looked.

Young AAM editor Ed Sweeney put on a set of old blades he knew worked, fired up his internal 19-powered converted Du-Bro 505, took off and practically flew through the hook and carried it to the landing pad in 14 sec. I think if he had just missed the hoop, it would have bounced to the pad. Ron Wiensch took third with a Du-Bro Hughes 300 in 17.5 sec.

The Figure Eight course was the first event of the second day. The number of scoring entries was down to 12. The pilots soon found more models wandering around with almost a couple of fly-aways, and one near fatal crash into a movie camera tripod. Ernie Huber's first round of 25 sec. was good enough to win, but his second round of 21.2 made him unbeatable. Dave Gray, flying a Hughes 300, came in second with 27 sec. Gene Rock's SSP-5 came in third with 28.4 sec.

The last event against the clock was the most spectacular. The Solo Pylon race had seven scoring entries. Although the average speed for the course was 20 mph, speeds of 50 mph were obtained with a 20 mph tail wind, that would have added up to a 70 mph on the downwind leg. The pylons being so close together meant that the downwind leg was a constant left turn command and therefore not much faster than the upwind one. At least two models hit the deck on the upwind leg, bounced back up and continued to fly. The upwind leg seemed to be a severe dive for most models except the Huey Cobras. Ernie Huber again came out on top with 37.6 sec. Dave Keats at 39.2 sec. won the second spot and third was Bob Bentley with 40.2. The Huey Cobra seems to be a faster model than the Hughes 300, but the pylons being so close did not prove it. Most of the times in this event were very close and those over one min. usually meant that a pylon was cut.

The last event was Expert's Choice with the pilots required to list their maneuvers. There was no limit on the number of maneuvers to be done in a five-min. time limit.

Ernie Huber could do no wrong. He hovered into the wind and then to the left and right followed by S turns into the wind and then a spot landing. He then proceeded to drag his skids on takeoff, followed by crosswind high speed pass with a hammerhead turn. He also did a beautiful left slide along with a vertical climb to 50 ft. and then a vertical descent to a spot landing. During the contest it was found out that Ernie removed 10 sq. in. from the Huey Cobra's rudder which enabled him to hover gracefully in a crosswind. Ernie used an OS 60 and Kraft equipment.

Dave Youngblood took second place with an excellent flying scratch-built. His model seemed to hover effortlessly in the strong wind. His square with con-

stant heading and his stall turn netted his highest scores in this event. Gene Rock took third still flying the S.S.P.-5 with a tail rotor gyro. The gyro slowed down his pinwheel and stall turn. The gyro has since been corrected to incorporate higher yaw rates.

All models entered at the NATS were eligible for static judging in Scale or Non-scale provided they could fly for at least 15 sec. According to the rules, no modeler could win or place in both Scale or Non-scale.

In the Non-scale event, Faye People's scratch-built No. 3 highly modified 2B took first place. The model is two-stage belt driven with a cluch on the intermediate shaft. The tail rotor is driven by a flexible cable inside an aluminum tube. The heat sink on the engine was spring-coiled around the head just above the exhaust. Very ingenious! The fan was simply a two-bladed prop made from sheet aluminum. Every part had a satin finish including a swirl finish on his sheet aluminum. The model is powered by a ST 56, and it has a 54-in. dia. rotor, using Kraft six-channel single stick.

Second place went to Dave Youngblood. His model seems to be a cross between a 2B a SSP. The model is powered by a 60 with a 65-in. dia. rotor using Kraft equipment. Dave's model flew extremely well; the training landing gear giving him a low center of drag seems to be its only handicap.

Dave Keats' converted Du-Bro 505 won third place. The 25 internal engine powered Whirlybird flew all over the sky with graceful Figure Eights and high speed passes, yet it hardly took more room than a backyard to maneuver.

First place in Scale went to Gene Rock's Boeing Boelkow BO-105. The model is powered by a Webra 60 turning a 4½ ft. dia. with the tail rotor turning 6900 rpm. Collective pitch is coupled to the tail rotor and is achieved by moving the Hiller gyro bar vertically. The fuselage is fully monocoque with no bulkheads or stringers. The drive system and servos do not interfere with the scale cockpit area. The cockpit includes a scale pilot, a carpeted floor and wood grained back seat. The radio equipment is Pro-Line and the finish is six-tone Hobbypoxy. Because neither this model nor Dave Keats' converted 505 were entered in the flying events, they flew the 15 sec. minimum flying rule to quality in static judging. Second place went to Dario Brisighella's beautiful Kavan Jet Ranger. Dario is so meticulous to scale that his engine was primed through the chrome turbine exhaust pipes. His power was a Webra 60 complete with working navigational lights and a blinking light for fuel level. The handling characteristics of the model were very scale-like, especially the jump takeoffs and precise altitude control. During the contest, it was learned that offsetting the rudder so that it unloads the tail rotor in forward flight (left turn) would help solve the right high speed turn problem of the model. Having only flown this model for two hours previous

to the contest prevented Dario from putting his model through its paces.

Third place was awarded to Walt Schoonard flying a civilian version of the Schuco-Hegi Huey Cobra. The model was powered by a Veco 61 using a Kavan carburetor. The model sported a four-tone color scheme including instruments on the control console. Walt's faulty equipment was overcome by his sheer nerve. Honorable mention goes to Al Doucette of Texas. His model is the CH-21C tandem rotor. This model was constructed with such careful attention to detail that it could not be distinguished from the full-scale bird except for the size. Everything on the model is scale including swashplate, pitch links, hubs, etc. Al has spent ten years on and off to get his model to this stage of completion. The model has been tested with a Wankel engine and is waiting for the radio installation. The 15-sec. time rule prevented Al from taking first place.

Naturally, the Grand Champion award went to Ernie Huber who had first in the Constant Heading, Figure Eight, Solo Pylon, and Expert's Choice events. The grand championship award is an accumulation of all events. Flying skill awards were based on just the flying: Ernie Huber was awarded first; Faye Peoples, second; and Gene Rock, third.

Dave Keats brough four models to the NATS. Two which were not mentioned or entered were the RCH Jet Ranger and a Du-Bro 505. Dave is the third or fourth owner of the Jet Ranger and has highly modified it to get it back into flying form. Some of the modifications were a new hub, reworked drive for the swashplate and tail rotor slider. The gears in the transmission were also repatterned. After all this, the model flew relatively well, but was somewhat heavy. His Du-Bro 505 was not flown.

Harold Everson displayed his new trainer powered by a Ross twin. Of all the scratch-built, non-scale, aluminum bodied helicopters that have shown up over the last couple of years, this one has probably the most pleasing lines. Harold and his son also displayed their blinking light fuel level system. The light continues to blink until the fuel is low or there is a power failure. He also displayed rod ends that far surpass the quality of any other available on the market. His price is around $16 for the fuel level indicator and $1.25 for his rod end. Address: Harold Everson, 224 N. Rankin St., Appleton, Wisc. 54911.

Steve Darlington flew a Kalt Huey Cobra powered by an Enya 45. The model featured a rigid rotor and handled extremely well in the wind.

On the afternoon of the second day, many of the sun-burnt pilots anxiously awaited the judges' final decisions. Some pilots flew to pass the time while others talked about the type of contest they would like to see in the future. At least three types of contests have evolved in the past two years: Clock, Precision and Free Style. If everyone involved would submit in writing their

preference to John Burkam before next year's NATS, maybe this problem could be resolved. We need to submit the type of contest and the kinds of maneuvers we all would like to the AMA board next year at the Model Airplane NATS to be recognized by AMA in 1975.

All of us involved wish to extend our thanks to John Burkam and Dale Willoughby. Without John Burkam's perserverance, this contest would not have been held.

LOWE ON CL

(Continued from page 18)

direction and stop! Be sure you've lined up for takeoff when you stop and for gosh sakes don't lose any points for not stopping! Suggestion: Taxi downwind a distance sufficient for the aircraft to break ground nearly in front of the judges. Don't start the run directly in front of you! This is a very common error that almost every Class A and B flier made at the NATS this year. I know—I judged them. The takeoff should be "balanced" in front of the judges as are the other maneuvers. Putting the lift-off in front also gives the judges the best view of the most critical part of the maneuver. Don't sluff the takeoff—it's worth as much as any other maneuver! OK, you're sitting there, engine idling. Announce the takeoff and slowly accelerate, keeping it as straight as you possibly can. Be prepared for torque or crosswind effects. Let's hope your engine doesn't cough and die because that would mean a big fat zero after announcing the maneuver—so, know your engine! OK, you're up to flying speed so slowly ease it off—do not rotate and jump off! Keep it absolutely straight and level. Slowly climb to at least six ft. of altitude and announce maneuver complete. It's not necessary to retract the gear before completing the maneuver. In fact, if you're concerned about jostling the aircraft, leave the gear down until the maneuver is complete—I normally do.

A couple of pointers for better takeoffs: Make sure that the ground attitude of the aircraft is not negative—if so, the aircraft will stick to the ground due to negative lift and won't rotate properly without excessive elevator, and then it jumps off. I set up my aircraft for about zero angle of attack on the ground. Make sure that your rudder and nose-wheel track—otherwise you will have to fight nose-wheel with rudder and it will break ground in a hideous yaw or bank. The thing should track about straight without the use of rudder in a zero crosswind. Toeing in the main wheels slightly will significantly help the ground track. OK, let's do the touch and go. Ease around and line up well out. Once perfectly lined up and about ten ft. high, an-

Don Lowe flies his "Kalt" at Chardon, Ohio.

Sometimes a little grovelling helps influence the judge—right? Dave Brown tries it on Jerry Nelson at Chicago. Didn't help much—sorry Dave!

Mark Radcliff (left) and his dad, George Radcliff, clean up after muddy flight at Chardon, Ohio. Mark is becoming a very hot Class C Expert flier and is pushing us oldsters with his Phoenix.

nounce touch and go landing. Try your darndest to hold that heading and descent rate all the way down to flare. Speaking of flare, please don't drive the aircraft into the ground. Flare smoothly so that the main gear touches first with the nose high so that the judges can see it. If on hard surface, the aircraft should roll some distance before the nose slowly drops. After this occurs, slowly accelerate and break ground as you did on the first takeoff. When six ft. high, announce maneuver complete. The biggest error made on landing is failing to flare and touch main gear first. In judging A and B fliers at the NATS, I saw about two flared landings! On hard surface the nose should not bang down on contact. On grass this can't be prevented due to very high drag on the main wheels. Judges should not grade down for this on grass since it simply can't be prevented—but he can sure tell if you've contacted properly!

Well I guess that we will have to leave you suspended in mid-air until next month for the continuation of the saga of Joe Flier, Boy Expert!

RABE ON CL

(Continued from page 18)

bushed ends), will show excessive wear. Ring type pistons, bearings, crankshafts and cases are seldom damaged.

My efforts to improve the ST60's low end performance were severely hampered by lousy, hot runs which were ruining rings as fast as I could install them. At first, I thought my problems were undesirable side effects of boost ports, varied compression, altered port timing or perhaps, just insufficient break-in from each rebuild. Slowly it became apparent that, whatever the configuration, my engines were running poorly and much too fast at the end of each flight. Finally, suspecting heat as a cause as well as an effect, I began increasing the ring end gap by filing the ring ends to delay the onset and reduce the severity of heat problems. Unfortunately, large end gaps (more than .005") make it difficult to obtain a good "seal" and high power. I finally went to the NATS with two sick engines and lots of spare parts hoping that "better air" would give me at least adequate runs.

At the NATS, neither of my engines ran any better in Wisconsin than they did in Texas. So I took my problems to Don Jehlick who agreed that my engines were running too hot and made two very helpful suggestions.

First, Don suggested that I try more nitro in my fuel and second, that I try installing a baffle on my engine's cylinder head to improve cooling. Come to think of it, last year I

had good runs using 10% nitro but then, I was using it simply to decrease the length of my run. If anything, I would have thought nitro would make the engine run hotter. Part of this year's mods were to increase fuel consumption so that I would have proper duration on 5% fuel.

Don explained that adding nitro reduces the engine's operating temperature because nitro is low in heat energy (5000 BTU/lb.) and methanol is high in heat energy (9600 BTU/lb.). When you dispiace 9600 BTU methanol with 5000 BTU nitro, the total heat energy of the fuel is reduced.

John Shannon added some explanation of why power is increased even though the temperature is lower. In an internal combustion engine the fuels burn to form gasses which do the work of pushing the piston down. When burned, nitro produces a larger volume of gas than burning methanol. This extra volume of gas (obtained by displacing methanol with nitro) compressed above the engine's piston, produces a higher gas pressure which does more work to produce more power.

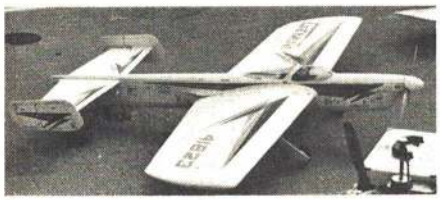
Don's suggestion to use a cylinder head baffle was equally logical. Don explained that the cooling airflow around the front of the cylinder is laminar (in smooth contact) and cools well. However, the airflow separates from the cylinder fins as it goes around the wide point and becomes turbulent and stagnant behind the engine.

Since the air does not flow through the cooling fins behind the engine, little cooling

Jim Walker Fly-Off. Al Rabe (center) 1st place, winner of Open Stunt; Alan Adamissin (left) 2nd place, winner of Senior Stunt; Bob Patten, 3rd place, winner of Junior Stunt.

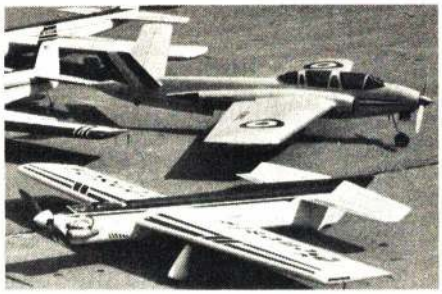
Al Rabe's 1st place modified Sea Fury has all-new tail surfaces and paint job. The Sea Fury II crashed a week before the NATS when a flying wire broke.

Bill Simon's ST 46-powered Gemini (5th place). Swinging a rev-up 13-5 prop. Uses muffler pressure uni-flow and foam wing.



of the back of the engine takes place. A baffle is a very simple device. It is simply a sheet of metal, wrapped tightly around the head from a point where the airflow is laminar, around the back, to the point where flow is laminar again—with a slot in the back to let the hot air out of the fins. Looking down on the engine, the baffle would run from about the 2 o'clock position to the 10 o'clock position with approximately a 1/4" slot vertically down the baffle at the 6 o'clock position.

I made my baffle from tin can stock in about 10 min. and strapped it to the head of my engine with a piece of brass wire, twisted in front. I mentioned my baffle to the fellows at St. Louis FAI. Lew McFarland and Dennis Adamissin immediately tried them with



Bob Hunt's Genesis and Dennis Adamissin's Semi-scale Magister. The Magister uses an OS 35 and conventional, unpressured two-vent tank and runs in an outstanding fashion. This airplane flies very well in spite of its unusual V tail configuration.

apparent success. Lew's run seemed particularly improved by the baffle.

These final observations may be of interest. First, after cooling my engine with nitro and a baffle, I was able to return to tighter internal fits in my engine (.003" end gap ring) to obtain a really great "seal" and pick up still more power. Second, all engines can probably profit from the use of a cylinder head baffle. Even the completely exposed engine on a profile model probably lacks any significant cooling airflow in the fins behind the engine. Third, to offset heat effects of muffler usage, I suggest that you increase the nitro content of your fuel by 5% when you install a muffler.

Finally, this information on heat makes me wonder if, just possibly, we have been overemphasizing tank deisgn. Maybe apparent leaning tendency of the conventional tank is, at least partly, heat build-up in the engine. Similarly, maybe the uni-flow tank's apparent richening tendency is really the engine's internal friction drag from heat build-up—with the tank design preventing increased rpm's. Maybe.

THERMO JET J-3200

(Continued from page 34)

warm up. Open the valve all the way and then lay the play down to a level position. The engine will now be delivering full thrust and be ready to fly.

You will now understand why ear protection is necessary—use it. The J3-200 is designed to operate at a combustion frequency of 240 cycles per sec.

YES, this engine is throttable. Our tests showed that the engine could reliabily and dependably by throttled between 30 to 48 oz. static thrust. While 48 oz. is the maximum power, 30 oz. may not seem like much of an idle, but keep in mind a base weight for engine and fuel in excess of 2 lb.

We have not as yet flown our test engine, but have a Thermo-Jet Drone under construction and are anxiously looking forward to first flights—U-control first; then, if all goes well, RC.

YS 60 RC

(Continued from page 36)

Fuel in the reservoir is released when the diaphram pushes the regulator valve open. Fuel then goes up into a chamber beneath the diaphram surface where a passageway goes to the carburetor fuel fitting, and finally to the carb.

Carburetor adjustments were exactly as described in the instructions. Function of the carb is the easiest I have encountered to date, apparently due to proper fuel flow at all throttle settings. The engine performed well during the test runs. I preferred a standard Fox plug to the idle bar plug.

Horsepower curve shows a peak at over 15,000 rpm. I've noted this in other tests and recommended the use of lower pitch props to take advantage of power available. With the introduction of the pressure regulator and good throttle response at all positions, I believe the RC engines of the future will operate at much high revs. Props will change to wide-blade, thin airfoil and lower pitch designs.

The almost 1.2 HP produced by the test engine is the highest to date in the series of comparable engines.

DC TO DC CHARGER

(Continued from page 39)

long as you don't overcharge the cells and burst the internal seals. Several hundred chargings is a lot of flying.

With the in-field charger, I can fly my 475 MAH, 2.4V Mattel SuperStar with only four min. of charging with careful monitoring of the charger. At much lower rates, I can simply wait ten min. (or until my frequency is clear again). Three to six min. flights are enjoyed.

To determine the voltage for which to look on your meter, multiply the number of cells by the 1.2V per cell rule and by the 1.41V per cell rule. Be very, very cautious of dead cells in battery packs. They can fool your system unless you check occasionally for nominal 1.2V per cell voltage well before reaching the peak of charge. Further, the cell temperature will rise at peak voltage and often rises suddenly during normal charging of any cell that's gone bad. Best to watch the meter!

Late this year, we hope to present an automatic in-field charger by Fred Marks. It monitors cell condition constantly and varies the rate to suit. The thing is much more complicated and much more expensive. It will further shorten the charging time, too. Meanwhile, I hope you try electric flight and enjoy this in-field charger.

ROAR NATS

(Continued from page 50)

Racing got underway on Friday afternoon with the Drag Racing events. There were 72 entrants: 39 in the Sports/Formula/GT class, 18 in the Funny Car class, and 15 in the Rail Dragster group. Fastest time of the day was 3.40 sec. posted by Amateur G. Lemke's rail machine beating Expert R. Welch's winning rail by 0.05 sec. Third fastest overall, and first in his class, was Expert Arturo Carbonell's Can Am car with a surprisingly fast 3.55 sec. which was about 1½ sec. faster than the winning time at the '72 NATS. The fastest Funny Car belonged to Expert D. Amedo and turned 3.80 sec.

Saturday was Oval day with two rounds of Amateur heat races and one round for the Experts. Darkness and hungry mosquitoes caused the second round of the Expert heats to be postponed until the following morning. At first there was little enthusiasm for the oval course. Its great size caused visibility problems and would allow speeds likely to take a nasty toll of engines. However, after a little practice car control was mastered, helped to a great extent by the smooth consistency of the road surface and by the almost seamless wooden wall which often guided rather than spun cars. The races were real crowd pleasers, especially to the oval oriented Indy spectators. The cars looked very realistic—drifting through the sweeping turns and screaming down the straights. Speed was the order of the day. Averages of over 35 mph including refueling stops were commonplace. Straightaway speeds were close to 50 mph. Both the Amateurs and the Experts turned similar times with top Amateur Ray Charbonneau's time beating that of the third place Expert. It all added up to a full day of fast racing and most of the early pessimists conceded that the Oval event was turning out to be a lot of fun.

In the hot brightness of Sunday morning, the racers regrouped to settle who was going to be the fastest Expert around the oval. The final heat featured a grid that placed side by side most of the top names in RC car racing: Curtiss, Fisher, Morrissey, Thorp, and Carbonell. All would see for themselves if the legends were justified. For many Amateurs, this was a prime reason for coming to the NATS. They wanted to witness the ultimate performance capabilities of the hottest RC cars and to evaluate their own skill against the best in the world. Most of the top Experts are professionals whose incomes depend on their success in competition. The onlookers were guaranteed an all-out race. Saturday's first round had given each driver the opportunity to evaluate his car against the competition. Where deficiencies had been noted, remedial action had certainly been taken. Each car was tuned to its ultimate potential for the final confrontation on the superfast oval. And so, at 11 AM, with only a smattering of spectators present, the cars lined up, the flag fell, and just five min. three sec. later Del Fisher had streaked to victory covering the 25 laps at an average speed of 37.2 mph. The final oval results showed Roger Curtis was second, seven sec. back, and Mike Morrissey was third, 21 sec. behind Curtis, but only one sec. ahead of fourth placer Gene Husting. The fans had seen the fastest RC car racing every held. The average scale speed had been in excess of 295 mph!

Earlier on Sunday the 1/12th Scale Road Race had taken place, postponed from the previous day and with only one set of heat races for each of the driver classes. Ten cars were entered in the Expert event and ten in the Amateur races. Using the same road course as the 1/8th Scale cars, the little cars were dwarfed by its size. In 1/12th Scale, the course was two mi. per lap. In spite of their limited top speeds on the long straight sections, the 1/12th cars covered the track in 36 sec. per lap versus 26 sec. for the bigger cars. Thirty-six seconds for two mi. equals 200 mph in the 1/12th world. First place went to Tony Bellizzi in the Expert class and to Steve Stallings in the Amateur class. Steve, from Bellflower, California, is 12 years old.

At noon on Sunday, with only the Road Race event remaining, Tony Bellizzi was leading in the Expert point standings. He combined a first place in the 1/12th event with a second place finish in the Funny Car Drag competition to give him the highest point total. Tied for second position were last year's Grand National Expert Champion Roger Curtis and Mike Morrissey. Sharing third place were Del Fisher and Arturo Carbonell. The Road Races would be the deciding event. Unlike the Oval Race, the Road Race would have only one set of heat races. Abbreviation of the event was necessitated by the 7 PM starting time for the Award's Banquet.

Before starting the Road Races, a lunch break was called during which time the Concours Competition took place. All the non-concours participants were invited to place their cars on the starting grid for a group photo. Not all the Experts' cars were available for the photo, however. Many were in pieces at the time, being transformed from an open-wheeled to a closed-wheeled con-

(Continued on page 118)

Editor:
Carl Wheeley

MODEL AVIATION

Official magazine

A.M.A. NEWS

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

1974-75 CL, FF & Scale Rules Decided

RC & Gen Rules Near Completion

All year long the four AMA Contest Boards have been considering what new competition rules and rules changes should be accepted for 1974-75 use. They began accepting proposals from AMA member modelers just before the close of 1972. Following the end of the period for accepting proposals, April 1, each of the Contest Boards conducted a Preliminary Vote on the proposals within its purview, and the FF, CL, RC and Scale boards acted collectively on proposals of a general nature; at about the same time a review of the proposals and their intended purposes was published in AMA's Competition Newsletter. There were more than 70 CL proposals and about a dozen, more or less, before the other boards. Obviously the Control Line Contest Board had its work cut out!

Proposals which passed the Preliminary Vote were subject to cross-proposals from AMA members. The latter represent different methods of accomplishing essentially the same purposes as the basic proposals—c changes in details of the basic proposals. Jus. before the National Contest the proposals and cross-proposals were put to another test—the Initial Vote (some of the boards had their Initial Votes at the Nats). Dual purposes of the Initial Vote were to decide which was more preferable, the basic proposal or the cross-proposal, and to again test the desirability of the proposal—this time with many members having had the opportunity to state their views, pro or con.

The last step in the interim (1974-75) rules-making procedures was the taking of a Final Vote of each of the Contest Boards by mail. This took place within about a month following the Nats for the CL, FF and Scale Contest Boards, and the new or revised rules for 1974-75 which follow are based upon the Final Vote results. The RC and General Final Votes were in progress when this was written.

All in all this was a tremendous amount of work for the voluntary AMA Contest Boards to have accomplished in a very short time span. This is a primary reason for adoption of the two-year cycle for rules changes (for 1976-77 rules and beyond); hopefully this longer time period will allow more of the Contest Board business to be printed in these pages on a schedule sufficient for members to voice their opinions in an effective manner.

Now, on to what the 1974-75 competition rules will be like.

The Westbrook family from Los Angeles is hard to beat in ½A Proto competition. The boys (L-R) are Clarence, Edward and John; dad, Si, is behind. One of the boys had a national record rejected in 1973 because his engine was measured to be over the allowable limit (but not big enough for the next class). This created interest in eliminating the gap and also in fixing displacement limits to take into account normal rounding off practices.

CONTROL LINE

GENERAL. Engine displacement limits have been revised as follows:

General: 1/2A:	.0000	thru	.0504
A:	.0505	thru	.1525
B:	.1526	thru	.3004
C:	.3005	thru	.6500
Speed: 1/2A:	.0000	thru	.0504
A:	.0505	thru	.1525
B:	.1526	thru	.3004
C:	.3005	thru	.6500
Jr. C:	.3005	thru	.4000
Proto 1/2A:	.0000	thru	.0504
Proto B:	.1526	thru	.3004
Dive Bomb:	.1500	thru	.4599
Rat Race:	.1500	thru	.4000
Carrier I:	.0000	thru	.4009
II:	.4010	thru	.6500
Profile:	.0000	thru	.3600
Novice Stunt:	.0000	thru	.3600
Combat:	.0000	thru	.3600
Stunt:	.0000	thru	.4000
	.4001	thru	.6500

** In measuring line diameters the instruments used shall be capable of measuring accurately to .001"; these measurements shall be rounded off to the nearest .001" by dropping .0001"-.0004" and rounding up .0005"-.0009" to .001". ** Line specifica-

tions for CL Scale models have been revised as per the accompanying chart.

SPEED. A new rule allows two models in each event. ** Completely constructed models sold by an incorporated company may be entered by Junior flyers in ½A events. ** Class C Speed for Seniors has been revised to .40 cu. in. maximum displacement, the same as for Junior C Speed. ** A new Speed class for engines of from .280 to .405 cu. in. has been created (for all age classes); requires two .018" single-strand control lines of 60' length, at least a one-wheel gear for unassisted ROG, timed for 14 laps from a standing start. ** An engine may not be used by more than one entrant at any one contest. ** The alternate method of single line construction, identified as Fig. No. 1A on page 17 of the 1973 rule book, is prohibited for Class C and Jet Speed.

The Class A Speed line length has been increased to 60 feet. ** The "wrist" has been defined, in connection with flying from a pylon, as being within 3" of the wrist bone; the new rule book will also provide for cross-bar handle usage in the pylon. ** Timing of flights at Class A and B meets will be by means of two stopwatches. ** The new rule will consider excessive stem movement of a mono-line control system as an attempt to shorten the line length, resulting in the calling of an attempt against the flyer. ** The maximum starting time for prop and jet models has been fixed at three minutes, with failure to do so being recorded as an attempt. ** The regular pull test shall also be applied to jet engines and their mounts.

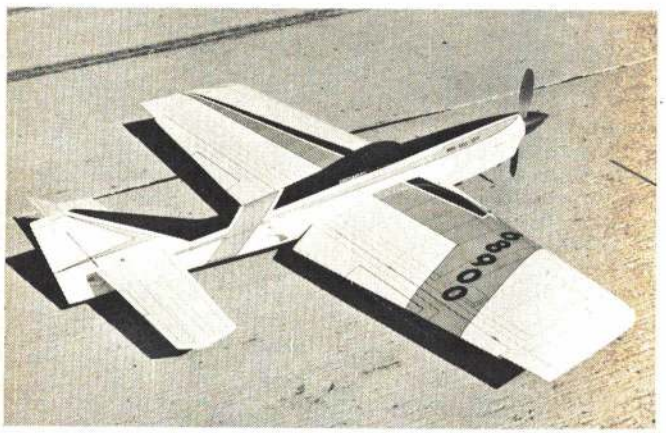
CL SCALE LINE SPECIFICATIONS CHART

Engine Size (cu. in.)	Model Weight (Lbs.)	Line Length	Required Minimum Diameter (Ins.) of Each Line					Pull Test
			Single Strand			Multi-Strand		
			1 Line	2 Line	3 Line	2 Line	3 Line	
.000—.050 Total Disp.	0—4	35'—70'	.010	.008	—	.012	—	10G
.050—.099 Total Disp.	0—4	35'—70'	—	.010	—	.012	—	8G
.100—.350 Total Disp.	0—4	52'6"—70'	—	.015	.012	.015	.012	8G
.350—1.25 Each Eng.	4—8	52'6"—70'	.020	.016	.014	.021	.018	8G 55 lb. max
.350—1.25 Each Eng.	8—15	52'6"—70'	.024	.020	.016	.027	.021	6G 55 lb. min—80 lb. max.
.350—1.25 Each Eng.	15—20	52'6"—70'	.031	.024	.020	—	.027	5G 80 lb. min.

½A MOUSE RACING AND SCALE RACING. These events are to be included in the rule book as supplemental. Both events provide for separate competitions according to engine type: Class I is for any SPORT-type .049 engine (with the exception of T.D., Medallion, Hornet, Wasp, or similar "high performance" models); Class II is for .049 engines with no restrictions as to type. Mouse Racer models must have at least a single wheel landing gear; Scale Racers are profile fuselage models of actual Formula I racers with a minimum consistent scale of 1" to the foot. For both events the line length is 35', with the requirement being for two lines of .010" dia. if single-strand or .012" dia. if multi-strand.

CL AEROBATICS. Appearance judging has been revised by eliminating Realism and Originality from static scoring (leaving Workmanship and Finish, each with a maximum score of 10 points).

COMBAT. The pull test has been fixed at 35 pounds regardless of the model's weight. ** Steamer specifications have been standardized: "They shall be 10 feet long and two inches wide. A six-foot long string leader shall be tied to one end of the streamer with a double knot. The streamer should be doubled and then folded lengthwise for two inches at the end before being tied with the string. String shall be cotton of 16 to 20-lb. breaking test and shall be marked with ink 48 inches from the knot." ** The minimum required flying height, when only one plane is airborne, has been increased to 15 feet. ** The number of points to be awarded for each "cut" has been increased to 100. ** The definitions of "kill" and "cut" will be made more specific in the next edition of the rule book. ** Beginning in 1974 the pilot will be permitted to start and restart his engine (or this may be done by his pit crew). ** Mechanical or electrical starters are prohibited.



Above: Bob Whitley's Miss Kell should fare well with new CL Stunt rules which provide for static scoring only for workmanship and finish. Right: CL B Proto models will need clear canopies to comply with 1974-75 AMA rules. Tom Upton and Aquarius shown.

Class B Proto Speed models must henceforth have a clear canopy. ** Proto Speed timers will be located on the side of the circle opposite the launching point. ** Proto Speed flyers will be allowed a lap and a half to get in the pylon, and another new rule allows officials more freedom in calling excessive whipping during the period of getting in the pylon. ** Backup flights for record purposes must conform with the same starting requirements as regular contest flights (three minutes).

SPORT SPEED. This category will be eliminated from the rule book, it being stated that it has not achieved the intended purpose of introducing newcomers to Speed flying.

NAVY CARRIER. The engine and the venturi throat area of the carburetor in the Profile class must be unmodified. ** The landing gear of Profile class models must be fixed and consist of at least a two-wheel main gear in which the wheels are separated by at least four inches. ** The new rule concerning propulsion is that the type of power used for the model (prop or jet) does not need to agree with the type of power used by the prototype. ** The new rule book is to state that forward flight is to be relative to the ground. ** To determine how many control lines are bearing the load, lines will be "plucked" during the pull test; the number which are tight when "plucked" determines the required line diameter. ** It is no longer required for the prototype to actually have performed carrier-type takeoffs and arrested landings in order to qualify for bonus points.

SLOW COMBAT. A compromise set of rules was adopted for inclusion in the rule book. AMA Combat rules, including scoring, apply except as follows. MODEL SPECIFICATIONS: Planes shall be of the profile fuselage type with canopy, horizontal stabilizer, elevator and vertical fin. Fuselage length shall be no less than 24" from the propeller thrust washer to the leading edge of the movable elevator surface. Minimum wing area shall be 300 sq. ins. Maximum engine size shall be .360 cu. in. displacment. No pressure fuel systems shall be allowed, but fuel vents may be positioned to take advantage of airstream. The entire fuel tank must be located forward of the leading edge of the wing. Models shall have a minimum of a one-wheel landing gear and shall be capable of unassisted R.O.G. Hand-launching is permitted only when it is the Contest Director's opinion that the flying site will not allow for safe R.O.G. CONTROL MECHANISM: Two .018" dia. control lines of multi-strand construction and a length of 60 feet, plus or minus 6". OTHER RESTRICTIONS in addition to those above may be added, such as plain bearing engines only, maximum speed limit, minimum airfoil thickness as a percent of wing chord, etc., but the event should not be flown with any of the above basic restrictions eliminated. If additional restrictions are added it must be stated "special rules" when the contest sanction is applied for, and details of such rules publicized as well in advance as possible.

FAI COMBAT. The CL Contest Board voted to include the existing FAI provisional rules in the AMA rule book. Basically these rules provide for a max engine size of .1526 cu. in., line length of 52'2-5/8", minimum wire size of .012" (single line not permitted), two models allowed each entrant in each time period (4 minutes after signal to launch, 5 minutes after first signal to start engines). Points are awarded according to the number of seconds a model is airborne during the four-minute flight period, plus 100 points for each cut of the opponent's streamer (no points for cutting the leader).

New Combat rules provide for a fixed pull test of 35 lbs. regardless of the model's weight, increase 'cut' points to 100, and allow the pilot to start the engine. Photo shows Robert Nelson and Diane Mearnes pitting for Max Mearns during the 1973 National contest.

SCALE

GENERAL. Scale models which come under the Unified Scale Judging Rules must now have included in their documentation a ruler which allows direct comparison between the model and the drawings. On one side the ruler would be calibrated in units to the scale of the drawings; the other side would have the same calibration units but in the scale of the model.

RADIO CONTROL. The flight scoring system has been simplified so that, basically, only simple addition will be needed to determine the total score. ** The maximum time of flight has been eliminated, and other revisions are intended to equalize potential flight scores of all prototypes. ** Competition in proficiency classes will be provided for in the 1974-75 rules: Class I and Class II, with the latter being for those who have won 1st through 3rd in three meets.

CONTROL LINE. Line size revisions have been enacted by the Control Line Contest Board. See the CL section.

RC SPORT SCALE. Maximum points for "Accuracy of Outline" have been increased to 40, while max points for "Finish, Color & Markings" have been reduced to 30. ** A flyer's best single flight score will be used in determining winners rather than an average of two flights as previously.

Above: New RC Scale rules provide for separating the novices from the "pros." Winning first through third three times provides the point of division. Shown is Dick Graham and his Piper Pawnee. Right: Tony Naccarato's electric power Aeronca will be at home in the newly named Outdoor Free Flight Scale Fidelity class. Previously named FF Gas Scale, all power types except rubber now allowed.

CL SPORT SCALE. Rules were adopted for this new category which parallel RC Sport Scale for static judging. Flight scoring is from 10 maneuvers and/or scale operations, four of which are obligatory and six are optional. Required scoring is for takeoff, 10 airborne laps, landing and realism in flight. The options may come from any of the AMA or FAI Aerobatics or Scale rules. Each of the 10 items scored may receive a maximum of 10 points.

FF GAS SCALE. This category has been renamed "Outdoor Free Flight Scale Fidelity," and allowable types of power have been expanded to include all types except for rubber power.

OUTDOOR RUBBER SCALE. A new rule limits the number of points which may be earned for flight to the number of points which were earned during static judging.

FREE FLIGHT

Of all the categories, Free Flight had the fewest rules-change proposals to act upon; therefore, there are not many changes to the FF rules for 1974-75.

OUTDOOR HELICOPTER. To these provisional rules the only revision is to allow replacement rotor blades.

FF POWER, R.O.W. The 1974-75 rules amend the flyoff requirements for these models. Whereas previously flyoffs could be hand-launched, the new requirement is for rise-off-water launching of all flights, including flyoffs.

Nickels for Nicholls. Handsome plaque featuring a collection of American nickels was created and presented by AMA President John Clemens (L) to a distinguished visitor from England, Henry J. Nicholls. The presentation took place during the 1973 National Contest. Nicholls has long been a leader in British and international modeling affairs; he holds the title of FAI CIAM Honorary President. Meanwhile Clemens was recuperating from additional surgery in October, when this was written, and was working on ideas for AMA to acquire its own permanent Nats site and museum--a goal that he is extremely enthusiastic about.

AMA Seeks More RC Frequencies From FCC

The Federal Communications Commission in 1973 noted the possibility of opening up a new frequency band for general citizen use: 224-225 MHz. Following consultation with legal counsel it was agreed that AMA should propose specific allocations for Radio Control operation. The following document was filed by AMA on September 20, 1973.

Comments of the Academy of Model Aeronautics, Inc., FCC Docket No. 19750.

1. On January 12, 1973 the Commission released its Notice of Inquiry and Notice of Proposed Rule Making in the above-captioned proceeding proposing to establish "a form of fixed and mobile service in the band 224-225 MHz." The uses to which the band might be devoted were not, however, specified. Instead, the Commission invited suggestions in this regard. Some guidance in this respect, however, is afforded by a letter to the Commission from the Office of Telecommunications Policy (OTP) dated March 29, 1972 which is part of the exchange of correspondence making the frequencies available for non-government use. First, the OTP letter refers to the "need for a disciplined radio service." Secondly, the letter speaks of satisfying "unfulfilled communications needs of a nation on the move–travelers, sportsmen, HOBBYISTS. . . ." (emphasis supplied). Against this background, the Academy of Model Aeronautics herewith responds to the Commission's invitation to submit comments as to "services and types of operation which should be provided" in the new frequency allocation.

2. The Commission has repeatedly recognized that model aircraft flying is a scientific hobby of substantial social value and public significance. Accordingly, the Commission has found it to be in the public interest to allocate valuable radio frequencies for this use. Thus, not only did the Commission make available in the first instance frequencies in the 27 MHz band, but frequencies in the 72 MHz band were also subsequently made available in the mid-1960s. This latter allocation was made in an effort by the Commission to alleviate the harmful effects of the unlawful interference that aircraft modelers were receiving from Class D Citizens Band operators in the 27 MHz band. Unfortunately, as is well known, the chaotic activities of certain Citizens Band operators have grown even more serious since then. In a recent letter to the Commission's Field Engineering Bureau regarding this situation, the Academy reported that in the St. Louis area alone, at least 15 crashes of radio control model aircraft had occurred because of radio interference; that there had sprung up a new sport of Citizens Band operators of "shooting down" radio control model aircraft; and in discussing the problem of Citizens Band operation, how one of the Academy's members on the West Coast had referred to the weekend that "it rained model aircraft." (We are in no way disparaging the Commission efforts to lessen Citizens Band excesses and in fact have received from the Field Engineering Bureau a preliminary encouraging response to our letter.) The Academy referred not only to the very substantial monetary loss involved but also the potential danger to the general public and to spectators when radio controlled model aircraft go out of control because of interference. The increasing problem in the 27 MHz band has further motivated an increased number of modelers to seek relief in the 72 MHz band and indeed relief has been found in some instances; but in that band there is an inherent limitation on the modelers resulting from the legitimate use by television stations of channels 4 and 5. Although the Academy has been and remains grateful to the Commission for making the 72 MHz frequencies available to modelers, the inescapable fact is that in some cities it has been found that channels 4 and 5 signals were so

strong that the model plane receiver was rendered inoperative. A theoretical technical solution to part of the problem of TV interference to model aircraft exists. Regrettably, the necessary equipment would be very costly and its availability is limited. Thus, there is no practical solution to the modeler's problem in certain areas of the country where illegal activities of Citizens Band operators are widespread and the normal conditions of TV use of channels 4 and 5 are such that the modeler is unable to resort to the 72 MHz band.

3. Summarizing the situation, therefore–despite the best efforts of the Commission to make available to aircraft modelers the frequency resources needed to carry on their activities–there are an increasing number of situations in which the 27 MHz frequencies are rendered unuseable because of unlawful Citizens Band interference, and at the same time the alternative of 72 MHz frequencies is not available because of television interference. We therefore request that five frequencies in the band 224-225 MHz be made available for radio control model aircraft. In support of this request we point out that:

(a) Such a special allocation would help to realize previous Commission findings and intentions that adequate frequency resources should be made available to aircraft modelers.

(b) It would meet the criterion referred to above (suggested by the Office of Telecommunications Policy) that any service in the new frequency band be a disciplined radio service. The remarkable record of compliance with the Commission's requirements by aircraft modelers and the total absence of violation notices to any member of this group speaks for itself in this regard.

(c) It is technically feasible for modelers to use these frequencies. Radio Control model aircraft have already been flown with amateur built equipment in this band. The technical requirements can easily be structured in a manner similar to that already established in the 72 MHz band.

(d) It is anticipated that there will be a substantial growth in the number of radio control aircraft modelers in the next ten years. There is good reason to expect over 100,000 modelers to be active. Practically all of the growth since 1966 has been in the area of radio control modelers. This is the most appealing area of aeromodeling and the best organized–most of AMA's chartered clubs (over 1,000) are primarily RC oriented and are growing rapidly. Contributing to this growth is the fact that radio control equipment has steadily decreased in price despite our inflationary economy. Better equipment is now available for much less cost than was typical five years ago, and the trend continues because quanitity of production is increasing and thus lowering unit costs.

4. It is further requested that provision be made for use of any frequency in the new frequency band for low power telemetry with an input of 10 milliwatts. We believe that the interference potential of a transmitter of such low power is so slight as to be negligible. Although the Commission found in its Report and Order in Docket No. 19572, 38 FCC 2d 916, 26 RR 2d 404 (1973) that a "200 milliwatt transmitter operating at high altitudes can be heard over areas of hundreds of miles," there is a substantial difference in a ratio of 20-1 between the power the Commission was then considering and the power now proposed. Further, the modelers have had seven years of experience using low power telemetry on the two meter amateur band and there has not been a single case of interference. Assuming the Commission to be correct in its belief that a 200 milliwatt transmitter operating at high altitudes can be heard over large areas, it is also valid, we feel, to conclude that a 10 milliwatt transmitter will not cause *significant* interference to co-channel or adjacent channel occupants of the same frequency band because the difference in the strength of the desired and undesired signals will be so great that interference in any significant sense of the word will not occur. Thus, low power telemetry can be a virtually no-cost add-on use to any frequency in the band in which normal power would be regularly authorized for other purposes. Such a provision would not inhibit the use of the frequency for other purposes and simultaneously would permit the low power telemetry activities also to take place. The net result would be a fuller utilization of the frequencies involved in such a sharing arrangement. Further, we respectfully bring to the Commission's attention these additional considerations.

(a) Milliwatt telemetry has become an increasingly important part of radio control model aircraft flying. In other filings with the Commission, we have described its use for such purposes as rate of climb information ("thermal sniffers"), and speed and altitude information.

(b) Another important by-product of a provision for low power telemetry would be its use in connection with ecology studies–a subject which is among the foremost concerns of the country. Many ecology studies rely on radio transmitter tagging of birds and animals. Ecologists have had to use authorizations in the Amateur, Experimental, or one of the land mobile services for this purpose, but of course, none of these services are particularly suitable for this purpose. It is safe to assume that universities and ecologists would welcome the availability of a low power telemetry band with simple Citizens Band type licensing procedures.

5. In summary, the Academy recommends that, if a portion of the 220-225 MHz amateur band is reallocated to other services as proposed in the Commission's Notice of Proposed Rule Making and Notice of Inquiry, then the Commission should:

(a) Provide five frequencies for use in connection with radio control model aircraft activities.

(b) Authorize ten milliwatt telemetry on any frequency within the band in which the disparate powers utilized would be such that sharing between low power telemetry and other uses would be feasible.

AMA Renewal Time

DECEMBER 15 IS CRITICAL DEADLINE TO RENEW AMA MEMBERSHIP WITHOUT LOSING SERVICE, BENEFITS.

Owing to the publication lead time, the very least to be expected for members whose renewal applications are received by AMA HQ after this time is that their March Aircraft Modeler Magazines will reach them late. This is because the March issue is mailed in January, and the address tapes of AMA members are prepared for the publisher during December. The same goes for those who choose to receive only a reprint of the "AMA News" section of the magazine.

Those who wait until after the critical deadline will have 1974 subscriptions initiated from scratch–just like new members, with a six-week lag in publication renewal service.

The February AAM, which is printed and mailed in December, is the last magazine to be mailed to 1973 AMA members–all 1973 memberships expire December 31, 1973.

Renewal notices were mailed to 1973 members in early October. Any AMA member who has not received his 1974 bill for dues by the time this issue reaches newsstands should notify AMA HQ immediately.

Thinking of joining AMA for the first time? Right now (by December 15) is the best time to do so because, by joining early, you will receive maximum value–12 issues of Aircraft Modeler or the "AMA News" reprint plus all AMA benefits during each month of 1974. Use the handy form on page 117.

Again for '74

Two very useful parts of the AMA membership package are a full color vinyl AMA Bumper Sticker/Safety Code and a collection of coupons for free and special introductory reduced rate offers from model industry firms–both exclusively for AMA members.

The special coupon offer was conceived by AMA HQ as a cooperative effort with the industry to make it easier for AMA members to sample sponsors' products or to obtain special benefits and services. The effort recognizes AMA members as the leaders among all modelers. The total offer amounts to many dollars in savings.

Hobby Dealers–Clubs–Leaders: need AMA application blanks? For a free supply write to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005. Specify how many are wanted.

Chartered Club officers who receive the AMA Monthly Mailing found out in November what was November's big modeling news. Did you? If not, ask your officers why not!

record reviews

CL Class II Navy Carrier national AMA record, Senior age class: 537.00 points, established by John Gerber (AMA 37377), Wyomissing, Pa., on August 20, 1973.

John's model is the Martin MO-1 which has been documented as having made carrier landings in 1924. The model version was designed by Donald H. and John D. Gerber–published in the August 1969 Aircraft Modeler Magazine, although this particular model was increased in size for Class II. It has a wing of 36" span and 9" chord, stabilizer of 12" span and 5" chord. The fuselage length is 25".

A clock-wise running Rossi .60 powered the model. It had a Fox heavy duty plug and swung a homemade left-handed prop of 10" diameter and 8" pitch. Home mixed fuel was carried in a homemade pressure tank.

The plane was built from Sig Contest balsa and finished with HobbyPoxy. It weighed 2 lbs., 8 ozs. Three-line control was by means of the J. Roberts system.

FF Unlimited Rubber national AMA record, category II, Senior age class: 22 minutes, 11 seconds, established by Marty Thompson (AMA 26406), Livermore, Calif., on July 7, 1973,

Marty's original design model is named the Patriot. At 8 ozs. total weight, it was powered by 28 36" strands of 5/32" Pirelli turning a prop of 24" diameter and 24" pitch.

The plane has a wing of 52" span and 5" chord, and a stabilizer of 14" span and 3" chord. Overall fuselage length is 36". Covering was with Sig Jap tissue finished with clear dope.

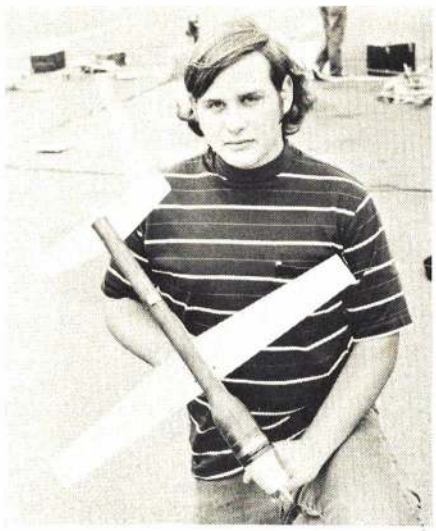
The record was established during the 1973 Boeing Management Association Scholarship Contest at Kent, Wash., which enjoyed nearly perfect weather; Thompson's Unlimited stayed within 300 yards of the launch point on each flight. He was the big winner of the Scholarship Contest, again: the championship trophy and certificate representative of the $1,000 scholarship, plus the AMA record certificate, are shown in the photo.

FF Rocket national AMA record, category I, Senior age class: 12 minutes, established by Steve Emmert (AMA 65602), Belmont, Calif., on May 31, 1971.

The airplane is the "Jet-Texan" as published in American Aircraft Modeler. It has a wingspan of 30" and 4¾" center chord. The stabilizer is 14" x 3½". Power was a Jetex 150. Construction was of Sig balsa which was covered with Sig Jap tissue and finished with Aero Gloss dope. Sig fuse was used to actuate the dethermalizer; speaking of this, the plane was lost out-of-sight on its last official flight, still going up with the dethermalizer popped!

CL Jet national AMA Record, Senior age class: 196.21 m.p.h., established by Jim Wade (AMA 55060), Anaheim, Calif., on July 7, 1973.

The all-metal airplane, which has set a record of greater speed than any other age class, was designed by Jerry Thomas. The wing has a span of 25", with 3½" center chord; the stab is 11" by 3"; both are formed from sheet aluminum. The fuselage, obscured by the engine in the photo, also is the fuel tank. The airplane weighs 34 ozs.



A Dyna Jet engine was used, but according to Wade it was modified by being fitted with a tuned intake; he also said the tube was tuned. Also, starting ignition was provided by a probe instead of the usual plug. Single line control was accomplished by a homebuilt torsion unit of the H&R type plus a mono-line handle produced by Bill's Miniature Engines.

FF Class A R.O.W. Gas national AMA record, category II, Open age class: 7 minutes 49 seconds, established by Jack Larimer (AMA 85303), Salt Lake City, Utah, on April 15, 1973.

The record setting airplane was a float equipped Hydrostar as kitted by Competition Models and powered by an L.M. Cox engine of .051 cu. in. displacement and a Cox 6"D x 3"P prop. It weighed 8½ ozs.

The model was covered with Sig Jap tissue and finished with clear AeroGloss dope. It used a Tatone Tank Mount to carry the Cox Racing fuel and a Tatone Tick-Off for engine run timing. Sig fuse was intended for dethermalizer timing, but it was doused in water on every flight so that it was of no value–probably accounting for the hour and a half search following the second flight.

Mike Flinsch Profile of a Life Member

By Jim McNeill

This month we want you to meet Mike Flinsch, AMA Life member number L-10. If you meet Mike in the business world, it's Dr. Flinsch. He has a Ph.D in astronomy, is administrative director for a New Jersey astronomical observatory, develops telescopes for manufacture, is active in related organizations: New York Academy of Science, Royal Astronomical Society of Canada, enjoys a vice-presidency in the International Union of Amateur Astronomers.

Mike likes to fly full size sailplanes and powered craft. He and wife Patricia have two fine children, Kathleen Michelle, 3, and Francis Jr., 4; when time permits they all go hiking, camping and fishing.

How does a busy astronomer find time to tinker with little models? Like so many of us

he got hooked on them as a kid. He first stuck together a rubber job with balsa sticks, tissue paper and glue. Graduating to bigger things, he built some seven of the Cleveland Super Condors and towed them aloft with 300 to 500-ft. lines using bicycles and automobiles. Now interested in RC, he has joined the New Jersey Tri-County RC Club.

Let Mike tell you in his own words why he joined AMA exclusive Life member group: "I well realize the many benefits modeling has given me in the past. I hope it will continue to do so for a long time into the future. I can look back and see my experiences in building and flying models as a beneficial effect on my education and life in general. . .I feel the contribution I have made to AMA in the form of a Life membership fee is an investment in the future. Finally, as I intend to live to be at least 100 years old, my membership fees are paid in advance, and I do not have to worry. . . ."

Good thinking, Mike. We're pulling for your centurial birthday cake, and with dedicated members like you, maybe the Academy can be around to light the candles.

Over 400 Feet And the FAA

In a recent issue of Contacts, newsletter of the Kansas City RC Association, there appeared an article of advice, interest and concern to all model flyers. The article was based on a letter received by Contacts Editor Charlie Reed from Ed Cox, a member of the Mid Missouri RC Club. Here is Ed's letter, slightly edited:

"On the front page of the Columbia, Mo. Daily Tribune was an article about a pilot's reported encounter with a model airplane 2800' MSL above the old Columbia Municipal Airport. (Ed. Charlie Reed's note: MSL is elevation above sea level–since Columbia is about 1000 ft. MSL that would make the glider 1800 feet above the ground.) The article was outlined in a bold black line to draw attention to it. As a result of the pilot's calling the FAA flight service center, the police were called and a reporter monitoring the police calls picked it up. There is more to the story than meets the eye.

"We had previously notified the FAA and FBO's (Fixed Base Operators) at local airports of our flying activity at the Municipal Airport and had received written approval from the airport manager of a little airport 3.8 miles from the flying site, to conduct model activities there.

"The club was shook up at the thought of losing the flying site. You can image the idea of losing a 2,000-ft. paved runway right at the edge of town. We contacted the FAA and learned a lesson that should be passed on. It is not enough to write a general letter advising the FAA and airports of this activity. The nearest FAA flight service center should be called and given the exact time and date when models can be expected above 400 feet and this information should be provided no later than on the morning of the day when the flying is to be conducted or, preferably, the day before. Local airports should receive the information as soon as possible so that, if necessary, they can reschedule or adjust their operations accordingly.

"We found the FAA representatives very considerate of our activities and have nothing but praise for these people. It turned out the pilot who reported us is an RC model builder. He called the FAA, after taking evasive action to miss the glider, to warn other pilots of the planes, not to blow the whistle on the whole activity. This pilot is also a flight instructor at the local airport. We invited him to talk at the next club meeting on flying safety, which he was happy to do, and it turned out to be a most interesting meeting. I recommend such a program to clubs for one of their regular meetings.

"Thanks to initiative taken by the club as a result of this incident and some very cooperative and considerate people at the FAA and local airports, this story has a happy ending. We pass this on to you as we learned the hard way to adhere to the altitude recommendations of the AMA and FAA and cooperate with the local FAA and airport personnel. We hope everyone is fortunate enough to work with the kind of people we do."

Contest Calendar

Official Sanctioned Contests of the Academy of Model Aeronautics

Note: For quick response and as a favor to those staging, administering and directing the contest, be certain to send a stamped, self-addressed, envelope along with your request to the listed Contest Director (CD) for additional information.

DEC. 2—TUCSON, ARIZ. (A) Cholla Choppers M.A.C. Winter Slow CL Fest. Site: Rodeo Park. B. Reynolds CD, Rt 8, Box 51, Tucson, Ariz. 85710. Sponsor: Cholla Choppers M.A.C.

DEC. 2—HOMESTEAD, FLA. (A) AMP'S 3rd Annual RC Fly-In. Site: AMP'S Field. P. Hendricks CD, 11742 SW 176th Terr., Miami, Fla. 33157. Sponsor: Aero-Modelers of Perrine.

DEC. 9—MESA, ARIZ. (AA) Tri-City Winter CL Invitational. Site: Mesa Community College. M. Sledge CD, 1755 W. Auburn, Mesa, Airz. 85201.

DEC. 9—ELSINORE, CALIF. (A) Jumbo/Peanut Scale 5th Annual FF Contest. Site: Lake Elsinore. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: N.A.R. Flightmasters.

DEC. 9—ELSINORE, CALIF. (A) "Wakefield Annual FF Meet" Site: Lake Elsinore. M. Keville CD, 6618 Dashwood St., Lakewood, Calif. 90713. Sponsor: Thermal Thumbers.

DEC. 30—FRESNO, CALIF. (A) F.G.M.C. Monthly FF (Cat II) Meet. Site: Ave. 12, Road 37½. F. Ginder, Jr. CD, 5740 E. Ashlan Ave., Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

JAN. 19-20—BUCKEYE, ARIZ. (AAA) 24th Southwestern FF (Cat. I), CL & RC Regionals. Site: Buckeye Airport. R. Gudahl CD, 615 E. Winter Dr., Phoenix, Ariz. 85020.

JAN. 26-27—PHOENIX, ARIZ. (AA) 3rd Annual Southwestern RC Championships. Site: Aux. 3. K. Peterson CD, 4202 W. State Ave., Phoenix, Ariz. 85021.

FEB. 3—GREEN BAY, WISC. (A) Annual Polar Bear FF (Cat I) Meet. Site: Frozen Green Bay. R. Cowles, Jr. CD, 2424 Ducharme Ln., Green Bay, Wisc. 54301.

MARCH 23-24—SAN ANTONIO, TEX. (AA) A.R.C.S. Spring RC Contest. Site: San Antonio. D. Bottoms CD, 3329 Fredericksburg Rd., San Antonio, Tex. 78201.

APRIL 27-28—MESQUITE, TEX. (AA) Dallas RC Club 10th Annual RC Pattern Meet. Site: Samuels Park East. D. Brown CD, 930 Vinecrest Ln., Richardson, Tex. 75080.

JUNE 9—DAVENPORT, IOWA (AA) 17th Annual CL Model Meet. Site: Davenport. R. Norgard CD, 2324 W. 29th St., Davenport, Iowa 52804. Sponsor: Davenport Model Airplane Club.

OVER 48,000 JOINED IN 1973
YOU CAN TOO!

AMA* MEMBERSHIP OFFERS:

LIABILITY PROTECTION SPECIAL DISCOUNTS OFFICIAL RULES MANUAL
COMPETITION PRIVILEGES MAGAZINE SUBSCRIPTION EXCLUSIVE DECALS
AID TO AIR YOUTH NATIONAL RECOGNITION BONUS COUPONS

SUBSCRIPTION to American AIRCRAFT MODELER or "AMA News" reprint from AAM is included with AMA adult membership. Members under age 19 can purchase the magazine or the reprint at a special AMA rate.

DISCOUNTS on special items stocked by AMA Supply & Service Section—books, magazines, pins, decals, etc.

SPECIAL HELP FOR YOUTH MEMBERS: Membership fee, with full competition privileges, eligibility for AMA scholarships, only $3.00 for either Juniors (up to 15) or Seniors (15 thru 18). (Does not include magazine subscription or AMA section reprint.)

OFFICIAL RULE BOOK included with all AMA memberships. This manual details the specifications by which different types of models are built and flown and clarifies most of the specialized model aviation terms—a real aid to understanding model magazine reporting.

***THE ACADEMY OF MODEL AERONAUTICS**—a non-profit organization, organized in 1936, guided by regional officers elected from among the membership. National headquarters is in Washington, D.C. AMA members have privileges in other organizations: National Miniature Pylon Racing Association (NMPRA) open only to AMA members. Membership in the National Free Flight Society (NFFS) is $1.00 less to AMA members. All AMA members are automatically part of the National Aeronautic Association (NAA) and the Federation Aeronautique Internationale (FAI); may become voting members of NAA—with other special benefits—for half price, and may obtain an FAI sporting license for international competition.

LIABILITY PROTECTION is included with all AMA memberships. Bought separately, this protection would cost more than the adult AMA membership fee. Coverage is for $1,000,000!

SPECIAL OFFER COUPONS. Many free and reduced rate offers from model industry firms included with all AMA memberships; some items are completely free with the AMA coupon—others require some amount of money plus the AMA coupon to obtain the sample product. Altogether, use of the coupons represents many dollars in savings.

SUPER DECAL SHEETS—a big 9" x 12" sheet contains AMA wings and FAI emblems in many sizes; another 7½" x 9" vinyl self-stick decal contains an attractive bumper sticker and also the official AMA Safety Code.

COMPETITION PRIVILEGES. All AMA members are licensed to enter the National Model Airplane Championships and all other non-restricted meets (over 500 each year—fun-flys, local, state and regional meets, and record trials); to establish national and international records; to compete on U.S. teams in World Championships (two or three held per year).

TO JOIN AMA USE THE FORM BELOW. AMA membership ends each year on December 31, regardless of the date a membership application is received. Late-year membership policy is as follows: those who apply between August 1 and September 30 pay full one year rate, but will receive half-year credit of the dues paid for the current year toward the next year's membership—they must, however, use this credit by July 1 of the next year; those who apply between October 1 and December 31 pay full one year rate and receive full membership for the following year, plus whatever days of membership remain in year of application.

APPLICATION—1974 AMA MEMBERSHIP

Academy of Model Aeronautics, 806 Fifteenth St., N.W., Washington, D.C. 20005

For Those 19 or Over by July 1, 1974 — Check One Only!

OPEN MEMBERSHIP—Includes all membership and competition privileges and monthly AMA News as published in American Aircraft Modeler Magazine $12.00

OPEN MEMBERSHIP—Same as above, plus subscription to American Aircraft Modeler Magazine (which includes monthly AMA News) $16.00

For Those Not 19 by July 1, 1974 — Check One Only!
FILL IN DATE OF BIRTH: Mo.____ Day____ Yr. ____

JUNIOR OR SENIOR—Includes all membership and competition privileges but no monthly AMA News or magazine subscription $3.00

SAME AS ABOVE—With monthly AMA News $5.00

SAME AS ABOVE—Plus subscription to American Aircraft Modeler Magazine (which includes AMA News) $9.00

MAIN INTEREST (Check only one): CL☐ FF☐ RC☐ Indoor☐ Scale☐ All☐ 1974 Membership Expires Dec. 31, 1974

Name_____

Address_____

City, State_____

Zip_____ New____ Renewal (number_____)

HQ use only

ROAR NATS

(Continued from page 109)

figuration. Others were being cannibalized for engines or tires which were being switched to their owner's road car chassis for the afternoon's racing. For some, there was just no time for lunch or photos.

The Concours drew only ten entries with two being truly outstanding examples of the art of detailing. Ted Gradt's L&M Porsche was selected as the winner, a stunning model which deserved the enthusiasm it drew from the racers and the other Concours entrants. Featuring operating brakelights, tachometer, instrument lights, steering wheel, and an animated driver, it also excelled in the quality of workmanship, especially in the intricate painting and lettering on the body and in the accurate body contours not found in off-the-shelf vacuum formed bodies. Bob Welch's Coca-cola Torino stocker was second and utilized a special tubular frame and roll cage as in the prototype. Many hours went into the construction of these cars and although they did not compete on the track, they represent a valuable facet of the RC car sport, especially to persons living in areas where there are no others to race against.

Shortly after noon, the Road Racing was underway with the Amateur heats preceding the Experts'. From a field of 65 Amateurs, Ed Pennewill won the event by a five-sec. margin. His victory was noteworthy in that the car was an out-of-the-box Delta SL assembled just three weeks prior to the event as part of an AAM kit analysis. At the last minute, Ed decided the NATS would be a good place to appraise its performance. Ken Morton finished fifth, but earned enough points to clinch the '73 ROAR Amateur Championship. The top five finishers were bunched within a 16-sec. spread, which for a 13-min. race, was pretty close competition.

The Expert class Road Race concluded the '73 NATS with the big name personalities again being featured in the final heat races. With only one chance instead of two as in the Oval event, the competitors were noticeably more serious as they took to the track for the three min. warm-up period.

The track temperature was considerably higher than when the drivers had competed in the morning. Six hours of hot sun had made the asphalt sticky and car behavior had changed. Appropriate changes were made to the mixture settings and there was at least one last minute scramble to change tire rubber. Here was where the pros showed their expertise by being able to quickly recognize and compensate for any subtle change in their cars' characteristics caused by different track conditions. At the fall of the flag, Morrissey's car leaped into an early lead and was gone. Carbonell's car gave chase, but the gap was ever-widening. Back in the field, positions changed several times and there was some good racing, but Morrissey was never challenged. Arturo Carbonell finished 20 sec. behind Morrissey

and Gene Husting was third, eight sec. behind Carbonell. A lucky last minute guess on tire compound, said the modest Morrissey afterward, but it was obvious everything else about his car was just right, too. And so it was that Mike Morrissey won his first ROAR Grand National Championship by combining a first in the Road Race, a second in the Rail Dragster event, and a third in the Oval Race. For him it has been a long sought goal to excell in racing miniature cars. About ten years ago he was recognized as one of the fastest men on the slot car tracks.

In the final standings, Arturo Carbonell finished second, Gene Husting third, Tony Bellizzi fourth, and Roger Curtis fifth. In the Amateur division, overall winner Ken Morton was followed by George Lemke second, Jerry Thompson third, Carl Petri fourth, and Ray Charbonneau fifth.

Promptly at the appointed hour, the Award's Banquet began at the Sheraton Motor Inn. Everyone was especially pleased to find that the Indy 500 RC Car Club had invited the scoring crew to the affair so that their efforts could receive proper recognition. The scorers were teenagers and young adults getting their first introduction to a NATS event. They took their jobs very seriously and with great care recorded the data needed to score the event, putting in long hours in spite of the discomforts of high temperature and hard seats. Without their help the event would not have been a success.

Trophy and merchandise awards were then made in a pleasant and relaxed atmosphere. With the stress of administration and competition suddenly behind them, everyone was in a happy mood and the banquet was over too soon. Afterwards, the Annual ROAR Meeting was held.

Roy Moody announced that he has been nominated, with competition, to be president again in 1974. His retention of the office was greeted with cheers and applause because Roy has done a splendid job in ROAR's behalf. A net gain of 50 members was announced with the total ROAR membership, as of August, standing at 452. During the meeting, various topics and business were discussed, the results of which will have been summarized in the ROAR newsletter long before this article appears. Any Nationals event provides an opportunity to measure progress in the particular field. It's a showcase for the state of the art in equipment and the statistics often identify trends.

The equipment was better this year. The reliability of gears, wheels, clutches, axles, and servos has improved as a direct result of competition. More is known of the shock loads these components must endure than ever before and weaknesses have all but been eliminated. The body shells are improving aerodynamically—not just to be streamlined, but to become a working part of the car by producing downforce rather than lift at the front plus downforce and a little drag at the rear for stability. It all adds up to better equipment that

HELP WANTED

Midwest Products Company requires a first class modeler capable of building rapidly and accurately with a knowledge of most finishing techniques. He will be employed in our prototype development shop and should have a good basic grounding in all areas of model airplanes with emphasis on R/C. He must be dedicated, flexible in thought, capable of producing good, simple line drawings in ink and also be able to produce accurate wooden mold patterns.

Excellent medical insurance plan and profit sharing scheme.

Salary commensurate with ability.

Send resume to:

Midwest Products Co.
400 S. Indiana St.
Hobart, Indiana 46342

newcomers can buy with confidence.

On the oval and road courses the cars looked faster than ever. The lack of track records, as in full-scale racing, makes direct year to year comparison impossible except in the Drag Racing categories. This year saw last year's drag record trimmed by 1.45 sec. It shows that engine horsepower is way up. Its effect on Oval and Road Racing performance should be a substantial increase in speed and acceleration. Many experts, like Morrissey, used the McCoy engine, claiming it exceeded the VECO in potential. The aluminum piston in the McCoy was credited with allowing more rpm because of its lower inertia. There was a hot third engine present, a hybrid, let's call it a "VeCoy."

The statistics show the sport is growing. This year's NATS attendance was 50 percent greater than last year's with approximately 20 percent of the ROAR membership present. Seventy entered as Amateurs and 49 considered themselves Experts. The state with the biggest representation was California with 23, followed by Illinois with 21. Canada, Nova Scotia, England, and Ireland were also represented. Ages ranged from 12 years for Steve Stallings and Rick Thomas to 50 years, and perhaps even higher as several declined to state their ages.

Sidelights that attracted attention included the intense Central versus West rivalry for recognition as the area having the hottest cars and drivers. In spite of the emphasis on competition sports-

FOR "PRO" FLIGHTERS:

Seelig Timers: Nordic $13.50; Wakefield 3 functions $16.90; Power 4 functions $19.90; Tatone Timers fuel shut off and D-T $6.90; Bartels props: Rev-Up props; Covering Materials; Kits; Engines; Glow Plugs; Tank Mounts; Surgical tubing; Towmaster Glider Winch; Rubber, etc., etc. AEROMODELS, P.O. Box 245, Culver City, Calif. 90230.

ADVERTISER'S INDEX
JANUARY 1974

manship and cooperation prevailed with racers serving as pit crews for each other and lending a helping hand or a spare part whenever needed. There were few, if any, protests. A great many of the cars displayed original and eye-catching paint jobs ranging from sweeping multi-color wave patterns to flames, polka dots, and zebra strips. Just as in full-size car racing, there were offers to buy the winning cars made by racers eager to terrify their hometown groups.

In retrospect, the Race Director's welcoming remarks should be paraphrased and put into the past tense to reflect the event's successful accomplishments: The '73 ROAR NATS "Truly and fairly detemined the National Champions in the various classes and kinds of radio operated auto racing, provided as much pleasure and convenience for the contestants and spectators as possible, and exposed the greatest number of people possible to the safest and potentially most exciting form of motor racing."

That part about the safest form of motor racing is especially timely. The '73 ROAR NATS proved to the spectators and contestants that exciting racing can be enjoyed without anyone's life being endangered. The technical and human competence required to win is at a high standard, offering a satisfying challenge. The RC car racers of today will find their sport growing in popularity and public acceptance as the years pass. The future is very bright.

CLASSIFIED ADS

Rates: 30 cents per word (including name and address). Minimum—14 words. Send remittance with copy and order to: AMERICAN AIRCRAFT MODELER, 733 Fifteenth St., N.W., Washington, D.C. 20005.

WANTED—OLD MODEL ENGINES: 5-cylinder radials, 4-cycles, multicylinder and accessories. Will pay top prices for good pieces. Howard F. Scott, 11830 Duxbury Drive, Dallas, Texas 75218.

BIG SAVINGS! Complete line of R/C and U/C equipment. Send for our free price list. B&N Hobby Center, 5200 Rye Drive, Dayton, Ohio 45424.

MODEL AVIATION BOOKS: Out-of-print. List 25 cents. JOHN ROBY, 3703D Nassau, San Diego, Calif. 92115.

Supertigre & Max Engine Parts. Books, Listing Parts, Prices for all current models. Postpaid 75 cents each. Don's Sales & Service, P.O. Box 224, Ft. Thomas, Ky. 41075.

Ignition, Glow, Diesel Engines—New and Used: List 25 cents. T. Crouss, 100 Smyrna, W. Springfield, Mass. 01089.

Private collection of ignition model airplane engines. Elf 4 cyl. Denny-mite, etc. SASE for complete list of engines and spares. P. O. Box 239, Waterford, Calif. 95386.

OLE TIGER—Don Panek's Quarter Midget featured in August AAM. Semi-kit contains complete House of Balsa glasspar, wing kit, wind screen, landing gear, full plans and instructions. At your dealer or $14.95 postpaid. CUSTOM CONTROL, 1234 RICHMOND, NORFOLK, VA. 23508.

R/C AUTO RACE CARS— 1/8 SCALE— 1971 & 1972 NATIONAL OVAL & RACE CHANPIONSHIPS: Send for free catalog. ASSOCIATED ELECTRICS, 1928 East Edinger, Santa Ana, Calif. 92705.

WANTED: Detailed plans WWI Fredrickshafen GIII, Gotha GI. Zepplins. Ogsbury, PSC 1, Box 8409, APO SF 96286.

WORLD WAR ENTHUSIAST 1939-1945: New bimonthly magazine for Second World War collectors, modelers, war gamers, historians, enthusiasts. Sample $1.00; year $5.00; foreign $6.00. Graphics House Ltd., 218 Beech, Bennington, Vt. 05201.

Speed Equipment—Monoline Handles, Takeoff dollies, dolly wheels, 100 one and new ignition engines. Send 25 cents to Walter Brassell, 4361 Montview Drive, Chattanooga, Tenn. 37411.

WANTED: Any or all parts two Veco 1¼" needle nose spinners, plus two adapters nuts for FOX 15. Also one Veco No. 110 extension shaft. John Zeman, 51 Shenandoan, Buffalo, N.Y.

HOT AIR BALLOON—40-ft. diameter, No. 250 capacity, kit $199. Plan $19. Send $3 for brochure to U.S. Sportcraft, Box 1184, Topanga, Calif. 90290.

Cleveland, Miniature Ace Whitman, etc. Kits wanted. Also Flying Aces, Air Trails, 1928-1945. Jerry Antczak, 7506 Sussex Drive, Plymouth, Mich. 48170.

Randolph dopes, Vintage plans, silk and synthetic covering, custom building service. Free list. Lindell Products, 6228 Hatter Road, Newfane, N.Y. 14108.

TRANSPARENT VINYL FOR WINDOWS. Pressure sensitive (peel off back and stick). Two big sheets 10 x 12". Only $2. postpaid. Curtiss Robin kit. 60-in. span. Send 8 cents in stamps for brochure. INKY, 10436 W. Rae Ave., Milwaukee, Wisc. 53225.

Kraft KP-5 Sport Series Systems now *in stock* for only $237.60 postpaid and insured in Continental U.S. only. Add $10.00 outside Continental U.S. (Florida residents please add $9.50 sales tax.) We will special order any Kraft radio of your choice at similar low prices. All Kraft accessories in stock at 20% off retail. Kraft WINGMASTER kit send only $23.96. . .you save $5.99, Kraft WINGMASTER JUNIOR kit send only $22.36. . .you save $5.59. Send bank cashier's check, postal money order or cash to speed your order.
Send your name and address for FREE Kraft catalog, FREE list of money-saving hobby suppliers and FREE postage-paid ordering envelopes to: MAIL-AWAY MODELS, INC., P.O. Box 375, Cocoa Beach, Florida 32931

Collector Wants: Any unusual miniature engines you have. Multi cylinder 2 cycle, single or multi cylinder 4 cycle gas engines, Stuart or other multi cylinder steam engines. Antique gas engines also desired. Send description and price you want to: Chris J. Botsolas, P.O. Box 46, Fords, N.J. 08863

WANTED: Identification Model Aircraft—1/72, other scales. Thompson, Hat Shop Hill, Bridgewater, Conn. 06752

"BEFORE YOU BUY!" It will pay you to get our low prices on R/C equipment, engines, kits, accessories. Free list. PUGET SOUND R/C, 4230 Hoff Rd., Bellingham, Wash. 98225. 206 - 733 - 4986

R/C Systems Manufacturers, Sales and Service. Quantized Control, 19 Moss Lane, Amherst, Mass. 01002. (413) 253-7617.

Y & O Propellers. 38 Sizes now available. Stamp for list of sizes and prices. Dealers write. Y.& O Props., 503 W. Astor, Lee's Summit, Missouri 64063.

QUALITY HOBBY SHOPS

Quality Hobby Shop spaces are sold on a six-month basis at $7.00 per month, payable in advance. All insertions must be consecutive. No mention of mail-order business is permitted. Closing Date: 10th of third preceding month.

OREGON—MILTON FREEWATER
Planes R/C, C/L and F/F. Boats, Trains in all scales and cars. Top lines in plastics. Modeling accessories, mortors and finishing materials. Also artists and craft supplies, books and kits. "Just don't buy a gift, buy a hobby." Hours 12:30 to 6:00 PM Weekdays, 10:00 AM to 6:00 PM Sats. Closed Sundays.

THE HOBBY SHACK
P.O. Box 406, 604 N. Main St.,
Milton-Freewater, Oregon 97862

MASSACHUSETTS –CAPE COD
Radio Control Electronics Service Center. Free technical consultation. Fast, expert repairs. Best prices new and used R/C systems, parts, test equipment, electronics supplies. We stock literature, data, circuit diagrams, transistors, ICs, etc. Will buy, sell or broker used equipment.

COOK-OUT-LET
636 Main St., W. Yarmouth, Mass 02673
(617) 771-3248

OHIO—CLEVELAND
We carry the most complete line in Ohio for your model airplane hobby. Also large HO train department. Boats, R/C, motors, parts, supplies, dope, balsa, tools, books, magazines, etc. .

NATIONAL HOBBY, INC.
5238 Ridge Road (216) 749-4750

MASSACHUSETTS –CAMBRIDGE
Model planes, motors, railroads, ships, radio control equipment and accessories—also slot racing supplies. Open 9:00 AM to 5:30 PM daily & thursday evenings.

CROSBY'S HOBBY CENTRE
1704 Massachusetts Ave. (617) 547-4389

OREGON—PORTLAND
Portland's Headquarters for Radio Control Equipment, all major brands all at discount prices, "Shop American," "The Friendly Shop."

AMERICAN PET & MODEL AIRPLANE SUPPLY COMPANY
4308 S.E. King Rd. in the Disco Mart Shopping Center
Ph. 654-8777 Zip: 97222

COLON, REPUBLIC OF PANAMA
The only hobby shop in the country. Model Planes, Motors (radio controlled), ships, HO and N Gauge trains, complete stock of parts and accessories.

KELNIA S.A.
Front Street, Colon, P.O. Box 2086, Zone 3, Telephone, 47-7040. Warehouse in the Free Zone of Colon.

SOUTH CAROLINA—NEAR BOWMAN
Located on Road 36 just off I-26. Complete U-Control Center on 12-acre flying field. Big Discounts! Open 4 to 8 weekdays and all day Saturdays. Plenty of help for beginners. Flying every Sunday afternoon

ACTION HOBBIES MODEL AIRPORT
Route No. 1, Box 53AB Bowman, S.C. 29018

HONG KONG—KOWLOON
The most complete stock of aeromodeling and hobby supplies in the Far East. Sole agents for Graupner, O.S. and Min-X and agents for Vernon, Frog, Solarbo and many others.

RADAR CO., LTD.
2 Observatory Road Kowloon, Hong Kong
K-680-507

GEORGIA—AVONDALE ESTATES
Southeastern factory repair center for Micro Avionics and Orbit systems. Complete stock of parts. All work guaranteed. Parts in stock for Blue Max and most systems. Authorized factory service center for Testors planes and radios.

HOBBY DISTRIBUTORS
4 Avondale Road, P. O. Box 102
Avondale Estates, Georgia 30002

RHODE ISLAND –PAWTUCKET
Radio Control, Model Planes, Motors, Ships, Rocketry, Arts Crafts, Slot Racing, Parts and Accessories, HO & N Gauge Trains, Open 6:30 PM to 10:00 PM Daily & Saturdays 12:30-5:00 PM.

R & M HOBBIES
81 Columbus Ave. (Zip: 03860) (401) 728-4320

OHIO—JAMESTOWN
Radio Control Specialist. Have done professional building and consultation for research work. Retail stock consists of Radios, Engines, Mufflers, Kits (Arf. & Balsa), R.C. Helicopter Kits and most support items for R.C. Disount prices. 15 years experience at your service. 6-10 Eve. 10-6 Sat.

MID-OHIO RADIO CONTROL
3949 N. Lake Shore Dr. 513-675-2613

CALIFORNIA –LAKEWOOD
California R/C Headquarters, stocking complete line; MRC, Citizen-Ship, Kraft, etc. Also complete line of line-control models, gliders, Free Flight, Rubber Power and most other hobbies & supplies. SPECIAL attention to Clubs.

GRANGERS HOBBIES
5942 South St., Lakewood, California 90713
(213) 866-9414 Open 7 days

VIRGINIA –ARLINGTON
Washington D.C. Area? Try us first! Model aircraft, R/C, U/C, F/F, R/C Cars, boats, engines, accessories, equipment, publications, tools, unimat lathes and parts. Hours: Mon, Thurs, Fri: 10-9, Tues and Sat: 10-6.

ARLINGTON HOBBY CRAFTERS
625 N. Glebe Rd., Arlington, Va. 22203
522-6442

SOUTH CAROLINA—BEECH ISLAND
Three miles from Augusta, Georgia. Headquarters for Radio Control equipment. Kits—motors—retractable gear—fuel. All kinds of accessories for R/C and U/C Building of Kits. Ready built planes always in stock. We help you build and fly. Open 9:00 A.M. till 11:00 P.M. plus Sundays till 10:00 P.M.

MILLER'S HOBBY SHOP
315 Laurie Dr. (803) 822-0565

COLORADO—COLORADO SPRINGS
Complete line of U-Control, Free Flight and Engines. Headquarters for R/C. We feature Royal Classic, Lee Engines, Sig Products. Master Charge. Discount to AMA Members. "We Fly What We Sell."

CUSTOM HOBBIES
2408 E. Platte Ave., Colorado Springs,
Colorado 80909 (303)634-7400

GEORGIA –DECATUR
HO Railroads, Planes, Model Car Racing. Open 11 AM to 10 PM. Metro Atlanta's Friendly hobby shop.

HOBBY HOUSE
DECATUR SPEEDWAY
130 E. Ponce de Leon 378-2253

MICHIGAN—DETROIT (FERNDALE)
Trains, planes, stamps, coins, R-ways. Over 50,000 items for hobbyists. Mich. largest antique train collection. Look for our 55' RR crossing sign. Arnold Rapido.

MODELS HOBBY CENTER
22524 Woodward Ave. (Zip 48220) LI-3-2242

NEW YORK—BUFFALO
Factory authorized Orbit and Micro-Avionics sales-service center. New Orbit and Micro radio systems at very best prices. Complete stock of parts and accessories. Immediate service on all Orbit and 1970 Micro systems. Guaranteed reconditioned previously owned Orbit systems always available.

ORBIT NORTHEAST
3833 Harlem Rd. 14215 Ph. (716) 836-6860

MEXICO—MEXICO CITY
The most complete stock of aeromodeling and Radio Control supplies in Mexican Republic.
Factory authorized Kraft System, Pro Line System, Webra and H.P. Engines.
Sales and Service center, all best items and the best prices.
We accept Bancomatic and Bancomer Cards.

MATHELIN MODELISMO
Retorno 3 DeGral, Ignacio Zaragoza No. 47
Mexico 9, D.F.. Tel: 5-71-75-07

SOUTH CAROLINA—NEAR BOWMAN
Located on Road 36 just off Interstate 26. Most complete U-control center in entire state. Discount prices. Free use of excellent circles and R/C strip. Open 4-7:30 Tues-Fri. and all day Saturdays. Flying every Sunday afternoon. Plenty of help for beginners.

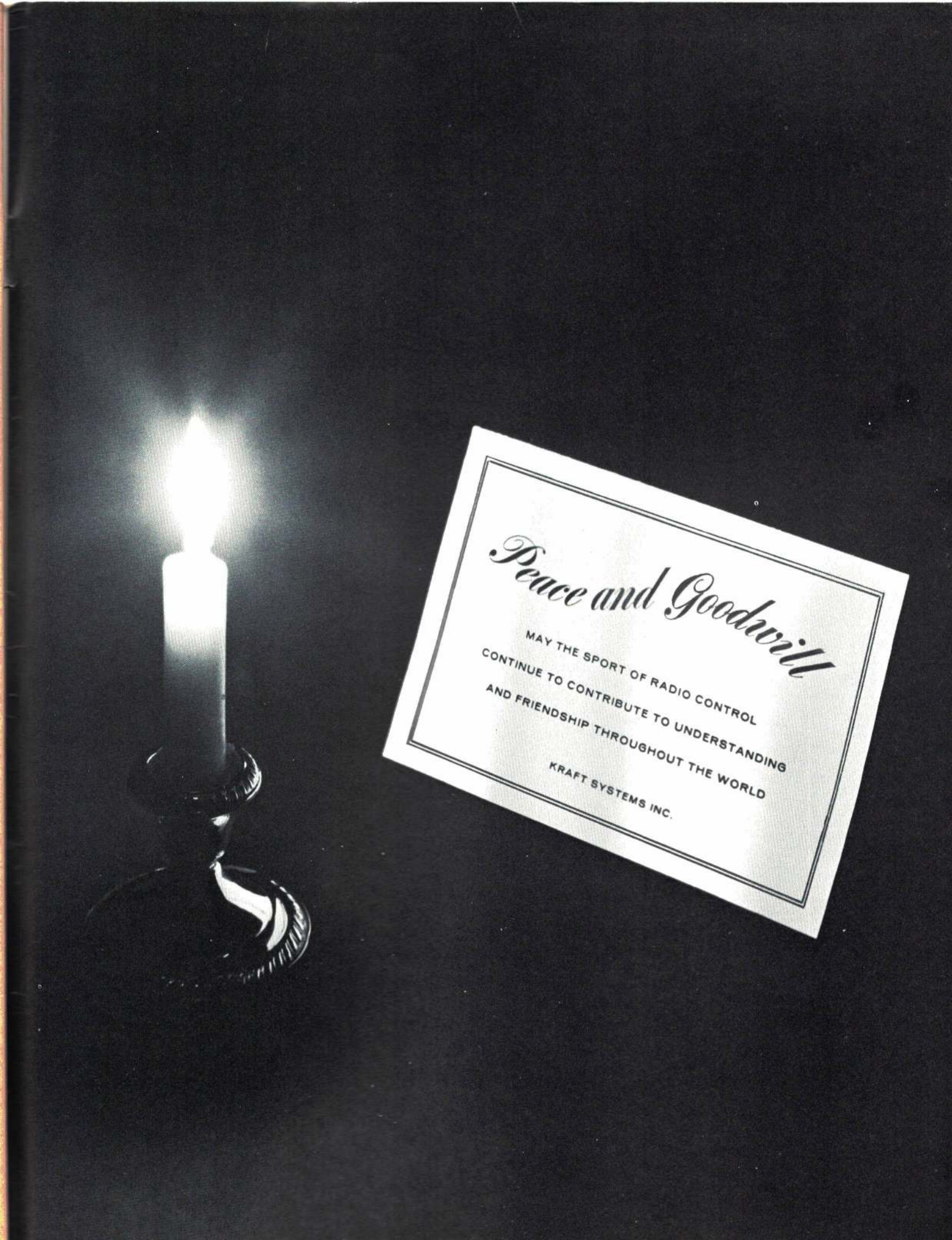
ACTION HOBBIES MODEL AIRPORT
Route 1, Box 63AB Bowman, S.C. 29018
Telephone (804) 829-2368

HOW DO I JOIN

The EAST COAST SOARING SOCIETY ECSS

Membership in the society is obtainable by submitting a membership application and payment of the current year's dues payable to the East Coast Soaring Society and mailing them to the Treasurer, Jack Alderson, 111 Anderson Road, Newark, DE 19711.

Additional information may be obtainable by writing to the Secretary, Clive Sadler, 46 Oakcrest Drive, Dover, DE 19901.


Peace and Goodwill
MAY THE SPORT OF RADIO CONTROL
CONTINUE TO CONTRIBUTE TO UNDERSTANDING
AND FRIENDSHIP THROUGHOUT THE WORLD
KRAFT SYSTEMS INC.

When the best compete the winner must be a Champion!

ITALIA

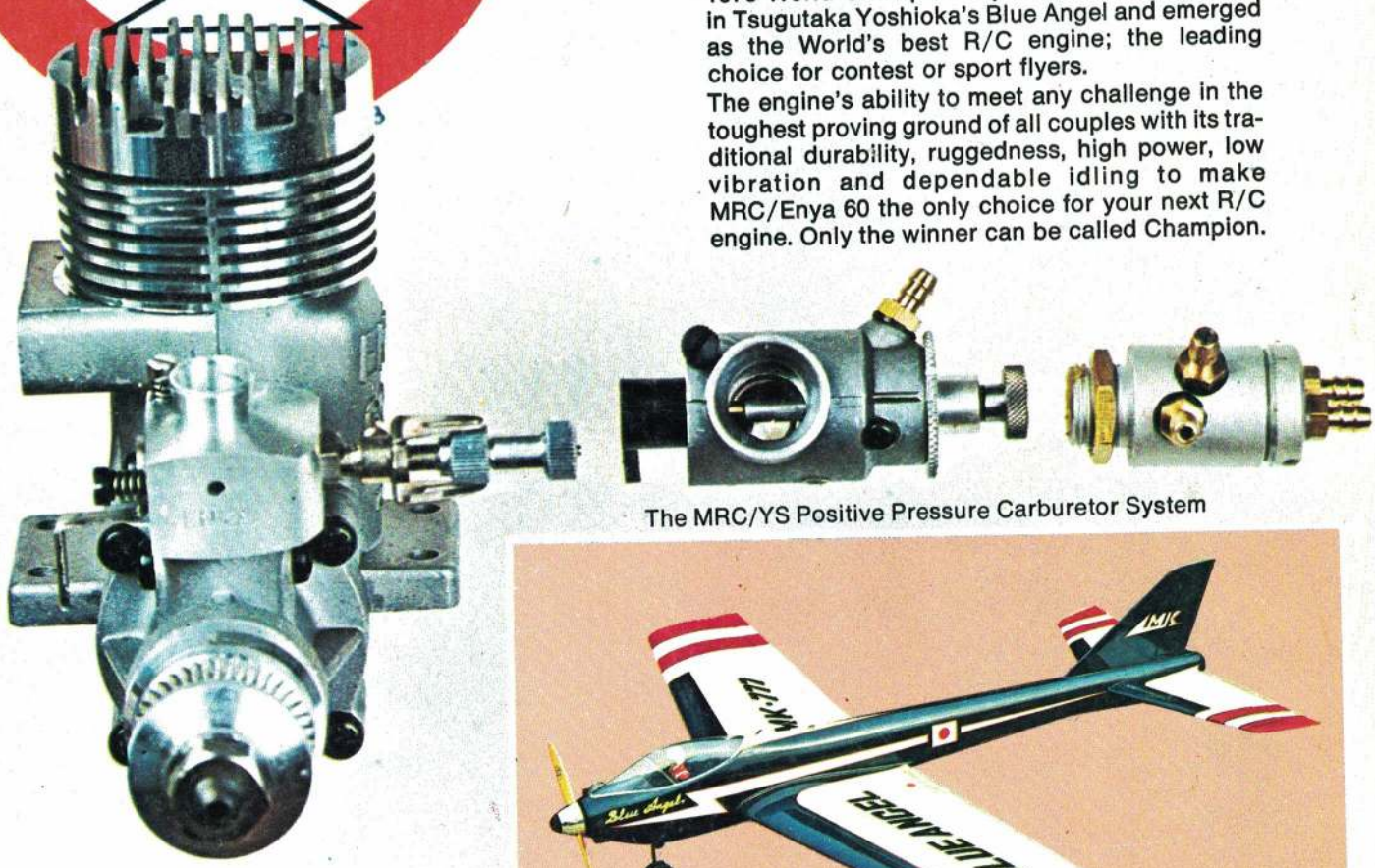
R C

MRC/ENYA 60III B ...1973 CLASS C EXPERT, INTERNATS WINNER

When an R/C powerplant wins in regional or national competition it achieves position within a grouping of five or six fine engines available today. However, when an engine reaches the level of performance and product superiority necessary for a World Championship win it must be considered the leader.

MRC/Enya's 60III B met all competition at the 1973 World Championship event in Gorizia, Italy in Tsugutaka Yoshioka's Blue Angel and emerged as the World's best R/C engine; the leading choice for contest or sport flyers.

The engine's ability to meet any challenge in the toughest proving ground of all couples with its traditional durability, ruggedness, high power, low vibration and dependable idling to make MRC/Enya 60 the only choice for your next R/C engine. Only the winner can be called Champion.



The MRC/YS Positive Pressure Carburetor System

MRC/Enya's acknowledged high power output and reliability was enhanced by using the new MRC/YS positive pressure carburetor system on Yoshioka's World Championship winner. This system is now available in kit form for 60's by MRC/Enya, Webra and Super Tigre. A completely reliable, controlled pressure system and variable carb with tremendous venturi opening will give you increased power and no sag operation in your present R/C engine. Flight forces acting on your fuel supply that cause fuel surge are completely eliminated as is the need for any specific tank location.

This year's World Championship aircraft, M. Kato's Blue Angel, as flown by Tsugutaka Yoshioka at Gorizia, Italy is now available in a superb MRC/MK kit. Featuring finely finished wood parts, hardware and fully detailed plans, this kit will produce an exact duplicate of the plane that won it all in 1973.

MODEL RECTIFIER CORPORATION • 2500 WOODBRIDGE AVENUE • EDISON, NEW JERSEY 08817