

# RCM



1975

JULY 1978

\$1.50



# radio control MODELER

THE WORLD'S LEADING PUBLICATION FOR THE RADIO CONTROL ENTHUSIAST



**This Page Intentionally Left Blank**

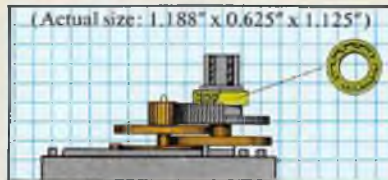


**Full size power.** Our new S20 is small in size, but packs a great big 22.2 oz/in. of torque.

And big power won't mean shorter flights, because our mighty mite's five-pole, micro motor and integrated circuitry draws a mere 5mA at idle.

### Precision cut, metal transport gears.

So all of that power doesn't go to waste, metal gears efficiently deliver every gram of torque. And an output shaft ball bearing keeps your servo action smooth, effortless and precise; matched with the quickest transit time of any servo in its class... a rapid .5 of a second.



### Completely compatible.

Like all of our fine servos, the S20's electronics and mini, three-pin connectors are compatible with every system we make, from the FP-2GA to the Contest 7.

**Value.** The S20 is very big in performance, but we've kept it small in price. \$39.95. Because with Futaba less is definitely more.

## Futaba

# The Futaba S20. We put a lot of servo into our little servo.

Actual size



# RCM MODELER

VOLUME 15 1978 NUMBER 7

## FEATURES

FROM THE SHOP .....	2
CUNNINGHAM ON RC .....	7
ENGINE CLINIC .....	10
SOARING .....	12
SUPER SCALE .....	15
CAP'N DICK'S COCKPIT .....	20
MULTIPLE PART CUTTING JIG .....	21
MAKE YOUR OWN MODEL CLAMPS .....	21
HOVER .....	22
HERE'S HOW .....	24
SUNDAY FLIER .....	27
PIT STOP .....	30
SUPER PARASOL .....	32
FUEL TIMER .....	38
EASY SANDING BLOCK .....	39
WHING DING II .....	40
HALL OF FAME SALUTES KEN WILLARD .....	47
MICRO COMPUTER-CONTROLLED PATTERN PLANES .....	48
IT'S THE NEXT BEST THING .....	50
SCALE VIEWS .....	52
RADIO SPECS: Tower Hobbies 3 Ch. ....	55
MISS GRANDIN .....	56
RADIO SPECTRUM .....	66
RC FLYING & THE LAW — Part V .....	69
POWER BOATING .....	70
TRANSITIONING — RC PILOTING TO FULL SCALE FLYING — Part IV .....	72
SOAR BIRDY — RCM Product Test .....	74
TEAM SPECIAL — RCM Product Test .....	75
1ST ANNUAL WESTERN STATES REGIONAL RC CHAMPIONSHIPS .....	76
COMBAT .....	78
DELUXE TRION — RCM Product Test .....	82
SOUTHERN KITE — RCM Product Test .....	83
FOR WHAT IT'S WORTH .....	84
MEMORIAL — Frank Tallman .....	86
SHOWCASE '78 .....	94
MODEL OF THE MONTH .....	131
READERS EXCHANGE .....	188
ADVERTISERS INDEX .....	189
READERS SERVICE .....	189

### Editor and Publisher

Don Dewey

### Executive Editor

Patricia Crews

### Technical Editor

Dick Kidd

### Assist. Editor

Dick Tichenor

### Graphics Editor

Barbara Richardson

### Assist. Graphics Editor

Mary Robillard

### Art Editor

Susan Steele

### Photo Editor

Barbara Norton

### Associate Editors

Al Kindrick — Chuck Cunningham — Jim Oddino — Gene Husting  
David Thomas — Doug Spreng — Clarence Lee — Fred Reese  
Dick Bradford — Ken Willard — Don Shultz — Jerry Smith  
Hobie Steele — Don Chapman — Dick Phillips — Claude McCullough

### Contributing Editors

Grady Howard — Dick Sonheim — Ben Strasser — George Steiner  
Geoff Watkinson — Joe Bridi — Bernie Murphy — Bob Wallace  
Gil Horstman — Jim Simpson — Lee Renaud — Arthur J. Sabin  
Paul Denson — John A. deVries — Bob Lopshire

### Office Staff

Beverly Calhoun — Chris Nicholson — Mary Ann Fomey — Jane Wall  
Pat Johnson — Edith Olah — Sheila Pierce  
Peggy Holland — Doreen Bradley — Lynn Gillett

### Plans Dept.

Danny Nicholson — Bob Taylor — Greg Acton

### THIS MONTHS COVER

Lovely Sheri Wyvill of South Windsor, Connecticut on the running board of a beautifully restored vintage Model A Ford shows off Bob Wallace's 1928 Heath Super Parasol. The Parasol is featured this month on Page 32. Ektachrome transparency by Lloyd W. Burnham.



**R/C MODELER MAGAZINE** is published monthly by R/C Modeler Corporation, Don Dewey, President. Editorial and Advertising offices at 120 West Sierra Madre Boulevard, Sierra Madre, California 91024. Telephone: (213) 355-1476. Entered as second class matter at Sierra Madre, California, and additional offices. Contents copyright 1978 by R/C Modeler Corporation. All rights reserved. Reproductions in whole or part, without written permission of the publisher, is prohibited.

**EDITORIAL CONTRIBUTIONS** are welcomed by R/C Modeler Magazine, but cannot be considered unless guaranteed exclusive. Manuscript must be accompanied by return postage and any material accepted for publication is subject to such editorial revision as is necessary, in our discretion, to meet the requirements of this magazine. Editorial material is selected on the basis of general interest to the radio control enthusiast and the publisher assumes no responsibility for accuracy of content. The opinions stated in published material are those of the individual author and do not necessarily reflect those of the publisher. R/C Modeler Corporation assumes no responsibility for loss or damage of editorial contributions. Upon acceptance, payment will be made within 30 days of publication, at our existing current rate, which covers all authors rights, title to, and interest in, the material mailed including, but not limited to photos, drawings and art work which shall be considered as text. Submission of the manuscript to R/C Modeler Magazine expresses a warranty, by the author, that the material is in no way an infringement upon the rights of others.

**SUBSCRIPTION RATES:** The United States \$16.50 per year, \$32.00 two years. Single copies \$1.50 each. Add \$2.50 per year for postage outside of the U.S. (except APO's and FPO's). Change of address notices, undelivered copies and orders for subscriptions are to be sent to P.O. Box 487, Sierra Madre, California 91024. Allow 6 weeks for new subscriptions and changes of address. Back issues available: \$2.00.

**ADVERTISING:** Send advertising copy and complete instructions to Advertising Department, R/C Modeler Magazine, P.O. Box 487, Sierra Madre, California 91024. Telephone: (213) 355-1476.

JULY

# From The SHOP



DON DEWEY



ray, better, even, than a veteran California encounter groupie. But let us examine this question dispassionately.

"You have said that you love flying, Phlydo. By this, I suppose that you mean you take pleasure in escaping your normal pursuits in the city, to come to this field for the sole purpose of guiding your models through the sky — landing, taking-off, flying fast or slow, high or low, at your will."

"Yes, I enjoy doing these things, Socrates."

"This flying, then, is a recreation, is it not, Phlydo? For a recreation is defined as 'a means of refreshment or diversion.'"

"That is true."

"And do you now guide your models better or worse than you did last year?"

"Oh, much better, Socrates. Last year I was but a rank beginner, and did often scare the toga off my fellow fliers when I attempted to land."

"So this recreation of yours requires a certain amount of physical skill to be truly enjoyable, does it not, Phlydo?"

"It does."

"Then flying is a recreation or diversion requiring physical skill?"

"Yes, that is correct, Socrates."

"And have we not just defined a sport, my friend? For what is golf or hunting, tennis or archery, if not a 'recreation requiring physical skill'?"

"Truly, model flying is a sport, Socrates, and we who fly models are sportsmen."

"And is it necessary that sportsmen build their own equipment, Phlydo? Do golfers make their own clubs, hunters their own shells, tennis players their own racquets, or archers their own arrows?"

"Indeed, Socrates, hunters do often make their own shells, and archers their own arrows — just as fishermen often tie their own flies, or bicyclists and auto racers build their own machines."

"And yet these things are not necessary to the full enjoyment of the sport, are they, Phlydo? It is quite possible for the hunter, archer, fisherman, bicyclist or race car driver to pursue his chosen sport with equipment built by someone else."

to page 183

**W**ho says you're too young? Steven Beltz, son of Ron Beltz of the Toledo Weak Signals, is 16 months old. He is shown piloting a small electric car (comes complete with radio and car with forward, reverse, and left and right controls — goes about 5 mph). He started, at 5 months, crawling after it in the house; then as he began walking he realized that Dad was controlling it; he took it over and it's now his favorite toy.

• •

The following is a little-known Socratic dialogue, in which the famous philosopher addresses himself to the question of whether radio control flying be a hobby or a sport. Translated by Professor Emeritus.

## The Phlydo

The scene is a club flying field just outside the city walls of Athens, about 420 B.C. It is early morning. Phlydo the Sophist kneels in the dewy (no relation) grass, refueling a .60 powered, foam and fiberglass ARF. Socrates arrives, carrying a diesel powered triplane and a burnished teakwood field kit.

"Hail and good morrow, Phlydo. I see you have beaten the Sunday morning crowd."

"Nay, but I have beaten the very sun itself, Socrates. For I did creep from my house this morning by the dawn's early light — lest my wife should awaken and

think upon the uncut lawn."

"You are indeed wise, Phlydo, for you forget not the words of the Ancients: 'business before pleasure, except on weekends.' What are you flying today?"

"It is called a Super Migraine. I purchased the kit just last evening, from the little shop near the Lyceum."

"Truly? And have you assembled it so quickly, Phlydo?"

"It is an ARF, Socrates. The veriest details, even unto the pushrods and servo rails, were completed at the factory."

"For I must confess, Socrates, that I find no pleasure in constructing models from plans or kits. My life is full and busy, so that time spent in building, for which I have little love, would be time robbed from flying, for which I have great love."

"Yet I am ashamed to meet a skilled modeler such as yourself upon the field. For the hours of loving craftsmanship that you lavish upon your models do put my simple ARF's to shame. And even though my planes may cost many times more than yours, yet they do appear cheap and vulgar by comparison. Does this not place us in two separate and hostile camps, my friend?"

"Truly, Phlydo, you do express your feelings of guilt and unworthiness with the eloquence of a protestant hymnist —

# You'll see many good radios in this magazine. Here are the BEST ones.



*When we say these are the BEST radios you can buy we'd better have good reasons for saying it. We do:*

#### MOST RELIABLE

1. Hobby Lobby Radios are the radios best designed to prevent vibration-caused failures. Ours are the ONLY radios you can buy that have the servo amplifiers inside the more shock-protected receiver case rather than inside the servos.

2. You get more SAFE FLYING TIME from a Hobby Lobby Radio. Our servo amplifiers use very little current. With a HL radio you can fly confidently right through your last flight of the day while owners of other radios are worrying about discharged batteries.

3. You are never the test flyer for any Hobby Lobby Radio system. The electronic design of HL radios is a well-proven design. It has not ever required redesign. The tradition with less reliable radios is to redesign annually. And each annual change makes the RCer the guinea pig for field testing.

4. Owners of other radios have to worry about the security of their often-disconnected aileron servo connector (which can't be tightened like Hobby Lobby's). The owner of a HL radio can tighten the connectors on his set and then forget about them. Flying a high performance RC plane can be nerve-racking enough without having to worry about connectors coming apart.

5. We don't recommend this, but many owners of HL radios tell us that they can fly their HL

radio with the transmitter antenna partially collapsed. You can fly your RC plane much more confidently knowing that there is tremendous extra flying range built into your HL radio system.

6. Hobby Lobby Radios use electronic circuitry that gives you one-cell-out flight capability. In the rare event that one of the four cells in the airborne battery pack loses its charge or shorts out your HL Radio continues to fly safely.

#### MOST USABLE

1. One transmitter is capable of flying many RC planes. But, with most RC outfits it costs you almost the price of a complete new radio system just to buy four new servos to put into a second airplane. When you own a Hobby Lobby Radio you only pay for the expensive servo amplifiers once—they're inside the receiver case (except for the two auxiliary channels on the HL6). So, extra servos for our radios only cost you \$14 each. There's no other radio made that lets you equip a second 4 channel plane with 4 servos for only \$56.

2. "Usable" means your being able to change the direction of rotation of our servos in less than a minute. It's so simple to do this that you can do it right at the flying field. If you own any other radio than a HL radio you have to send the servo back to the factory for this

change. Or, worse yet, you have to buy another servo.

3. The HL6 and HL3 both have adjustable centering tension on the control sticks. You can adjust yours real tight if you're a beginner and need tight sticks to keep yourself oriented during nervous first flights. When you become an expert you can loosen our control sticks so there's nothing between you and the "feel" of your high performance aircraft.

4. You get an Owner's Manual with the HL6 that tells you how to do routine maintenance, how to install the radio in a plane, how to reverse servo rotation, how to adjust servo neutral—one more example of how we make our radios more USABLE.

5. A "usable" radio is one that'll fit into today's smaller RC planes. The four-servo version of the HL6 weighs only 11½ ounces. The two-servo version of the HL3 will only add 7 ounces to a small .049 plane (with our optional small battery). And these light airborne weights are for radios that give you enough servo power to fly planes as big as a 25 pound, 12 foot span Curtis Robin that we've flown.

*These are the reasons that we can say that Hobby Lobby Radios are BEST. Call us and order one today.*

#### HOBBY LOBBY 6 DIGITAL PROPORTIONAL ..... \$219.00

(Includes Transmitter, Receiver, 4 servos, Rechargeable nicads for transmitter and airborne, Charger, 6 month limited warranty, extra servo outputs, mounting grommets, Illustrated Owner's Manual. Available on all 27 mhz. and 72-75 mhz. frequencies.

( ) I enclose check for \$\_\_\_\_\_ plus \$1.40 handling. ( ) Charge to my BankAmericard No. \_\_\_\_\_ Expires \_\_\_\_\_  
( ) Charge to my Master Charge No. \_\_\_\_\_ Expires \_\_\_\_\_ ( ) Ship C.O.D. \$2.75 handling for C.O.D. and bank card orders.

Name \_\_\_\_\_

Address \_\_\_\_\_

City-State-Zip \_\_\_\_\_

Rt. 3, Franklin Pike Circle, Brentwood, TN 37027 • 615/373-1444

Would you like a copy of Hobby Lobby 6 Illustrated Owner's Manual? Send \$1.00 and we'll send you one by First Class return mail.

#### HOBBY LOBBY 3 CHANNEL SYSTEMS (27 or 72 mhz. frequencies)

with 2 servos ..... \$109 .. \$119.00  
 with 3 servos ..... \$119 .. \$129.00  
 with 3 servos and airborne nicads, charger ..... \$139 .. \$145.00

**FREE EXTRA SERVO  
with Hobby Lobby 6  
bought before July 31**


**HOBBY LOBBY**  
INTERNATIONAL

**SAVE UP TO 68% ON HARDWARE!**

**NEW!**

<p><b>BULK PACKAGE Control Horns</b> 75 Control Horns only <b>\$3.35</b> Compare at \$10.00! 3 sizes</p> 	<p><b>BULK PACKAGE Polypropylene Hinges</b> 200 Hinges only <b>\$2.99</b> Compare at \$9.50</p> 	<p><b>BULK PACKAGE RC Metal Clevises</b> 35 Clevises only <b>\$4.99</b> Compare at \$13.12 2-56 threaded, plated—can be soldered!</p> 	<p><b>BULK PACKAGE Nylon Tube Pushrod</b> 25 feet Nylon Outer Tube 25 feet Nylon Inner Tube only <b>\$3.99</b></p> 	<p><b>BULK PACKAGE Brass Threaded Couplers</b> 35 Couplers only <b>\$3.99</b></p> 	<p><b>BULK PACKAGE Mini Nylon Pop Clevises</b> 25 Clevises only <b>\$3.99</b> Compare at \$7.25</p> 	<p><b>BULK PACKAGE Mini Nylon Pin Hinges</b> 66 Hinges only <b>\$3.99</b> Compare at \$8.58</p> 	<p><b>BULK PACKAGE 8 Wheels</b> 4 Pairs: 2" thru 2 1/2" Compare at \$10.76</p> 
<p><b>BULK PACKAGE RC Steel Links with 10" Rods</b> 25 Links only <b>\$4.99</b> Compare at \$12.25</p> 	<p><b>BULK PACKAGE Flex Cable Pushrod</b> 20 feet nylon tubing 20 feet 1/16" bronze cable only <b>\$3.99</b></p> 	<p><b>BULK PACKAGE Wing Fasteners</b> 20 threaded wood blocks 20 1/4-20 nylon bolts Compare at \$8.50 only <b>\$3.99</b></p> 	<p><b>7 Fuel Filters</b> only <b>\$3.99</b></p> 	<p><b>BULK PACKAGE 10 FEET Surgical Fuel Line Tubing</b> only <b>\$1.99</b></p> 	<p><b>BULK PACKAGE Mini Nylon Pop Clevises with 10" Rods</b> 20 Clevises only <b>\$3.99</b> Compare at \$7.00</p> 	<p><b>BULK PACKAGE Threaded Ball Links</b> 10 Sets only <b>\$3.99</b></p> 	<p><b>NEW!</b> These are lightweight, high quality air-inflated wheels on strong molded nylon hubs. We think these are comparable to, or better than wheels that sell for twice the price. We absolutely guarantee that you'll like them. If you don't think they're comparable to wheels that sell for twice the price, return them and we'll give you your \$5.99 back.</p> 

**BULK Balsa Wood**

	20-1/16x3x36 <b>\$7.77</b>
	20-1/16x4x36 <b>\$11.11</b>
	20-3/32x3x36 <b>\$9.99</b>
	15-3/32x4x36 <b>\$11.11</b>
	10-1/8x4x36 <b>\$8.88</b>
	10-3/16x4x36 <b>\$9.99</b>
	10-1/4x3x36 <b>\$7.77</b>

There are three things wrong with this wood: it still has the sawdust on it; it's a little longer than 36"; it doesn't have anyone's name stamped on it.

**NEW!** Coverite's Glasskote, 1/2 pint.... **\$2.95**  
Glasskote Thinner, pint..... **\$2.55**

One clear single coat gives extreme high gloss finish. Compatible over dope, epoxy, enamels, lacquers, etc.



**NO ONE UNDERSELLS Z-10**  
1/2 oz.  
14.1 Grams  
**\$1.99**



Any beginner can build it...  
Every beginner can fly it!

Hobby Lobby  
**RECRUIT**  
**\$21.95**



Assembles in an evening—fly it the next day. Ready-built fuselage, foam wings that only need joining. Designed to be flown by a beginner with **NO HELP FROM AN EXPERIENCED RCer.** 2 channels required and a Cox Babe Bee.

**SURE-FLITE A-R-F FOAM KITS**

**PIPER J-3 CUB FOAM ARF** ..... **\$28.85**  
List price \$37.95  
For .15-.19 engine, 52" span, 442 sq. inch area. 2 to 4 channels. Includes semi-rigid engine cylinders, vinyl numbers, stripes, Cub decals, steerable tail wheel.

**SPITFIRE MK I....** **\$28.85**  
List price \$37.95  
Brand new injection molded all foam kit. Clear canopy and molded radiators. Decal sheet. 50" span, 450 sq. in. wing area. For 2 to 4 channels, 29-40 engine.

**CESSNA SKYLANE 182 FOAM ARF** ..... **\$28.85**  
List price \$37.95  
For .15-.19 engine, 53" span, 420 sq. inch area, 2 to 4 channels. Steerable nose gear, 2 hour assembly.

**HOWARD "PETE" \$18.95**  
List price \$24.95  
36" span, 250 sq. inch wing area, all foam RTF for .051-.10 engines. Classic racer of 1930's, includes decals, hardware, nylon pushrod material. For 2 RC Channels.



**I GUARANTEE you'll like SUPERKOTE. If you don't — I'll buy it back from you!**

Hobby Lobby's

**SUPERKOTE**

Superkote is a new plastic heat shrink Model covering material. It irons on to an airplane structure at very low heat. Because of this low heat requirement it is also an excellent covering for foam aircraft. 1. Superkote shrinks and keeps on shrinking as you iron it. Very few wrinkles are so bad that Superkote's tremendous shrinkability can't eliminate them. 2. Superkote adheres to sheeted surfaces with a remarkable absence of air bubbles. 3. Superkote adheres to itself so well that joints are nearly invisible. 4. Superkote is strong, resists sagging, and is more easily repairable than other covering materials.

**Superkote 27" wide, 6 foot roll... \$3.99**  
list price \$6.95

Cessna White	Midnight Black
Beechcraft Red	Campaign Brown
Piper Yellow	Terra Green
Waco (dark) Blue	Taylorcraft Cream
Ryan Orange	Metallic Gold
Aero (light) Blue	Aluminum

**NEW! METALLIC COLORS**  
Available about June 30, 1978  
Metallic Blue — Metallic Green — Metallic Plum



**NEW! Revolutionary! Variable Pitch Prop!**

Hobby Lobby/S.L.E.C. 10" MULTI-PROP Introductory Price **\$9.99**  
List price \$14.50

This is the most revolutionary model airplane prop we've ever seen. It is 10 inch diameter and comes with 3 blades. Extra or replacement blades are available from open stock for 99 cents each. You can set it up as a 2, 3, or 6 blade prop. It is scale in appearance—both the blade shape and the hub. The 3 blade version runs noticeably quieter than a conventional model airplane propeller. It's made of glass fiber filled black nylon. It will run on engines from .29 to .60 displacement because it can be adjusted to any pitch you want! With 3 blades the prop looks like a Hamilton Standard with the hydraulic pitch control type of hub. With 2 blades it looks like most private plane props. With 6 blades it looks unearthly! Since the pitch can be minutely adjusted through a range of about 4 to 10 pitch it is capable of getting the absolute maximum out of any engine you put it on. You can't imagine what happens to engine performance when you can adjust prop pitch to any value you select.

**HERE'S HOW IT WORKS:**



Labels in diagram: PITCH ADJUSTOR PIN, HUB FRONT PLATE, BLANKING PLUG, PITCH ADJUSTOR PLATE, PROP NUT, PITCH INDICATOR.

**HOBBY LOBBY**  
INTERNATIONAL

**BRAND NEW! Now available in 12" diameter!**  
Hobby Lobby/S.L.E.C. 12" "MULTI-PROP"... Introductory Price **\$11.99**  
Spare 12" Blade for S.L.E.C. Prop... \$1.49 List price \$15.95

Rt. 3, Franklin Pike Circle, Brentwood, TN 37027 • 615/373-1444

**NEW!** Here is the fanciest **CHIPMUNK** Kit you'll ever see!

**HOBBY LOBBY/TRUeline**  
**KRIER CHIPMUNK** \$79.00

List price \$105



50" span near scale model of the Krier Conversion DeHavilland Chipmunk. For .35 to .40 engines and 4 RC channels. A very deluxe Trueline kit: Pre-shaped balsa and plywood parts, pre-veneered foam wing and pre-veneered rear fuselage section. Formed wheel pants, wing root fairings and cowling. Superior molded clear canopy, good hardware and detailed drawings with instruction manual.

If you've always wanted to build a Chipmunk but were waiting for a kit that was good enough to be worth building—here it is!

**Brand New Design! Lower Price!**  
**STARTS, CHARGES, LIGHTS,**  
**FILLS, DE-FUELS, TESTS!**

**Hobby Lobby**  
**POWER CENTER**

**\$17.88**

List price \$29.95



This is the ideal field box accessory. With your 12 volt battery you can run your starter, your electric fuel pump and fill or defuel right from the Panel! It will also fast charge your airborne Nicad pack and your transmitter battery right at the flying field. It will power your 1½ volt glow plug on the "HI" plug position and a 2 volt plug on the "LO" position... or you can use it to burn off too much fuel prime on your 1½ volt glow plug on the "LO" position. The meter gives indication of glow plug condition and current flow during fast charging. It won't fly the plane or clean it up when you go home, but it sure will just about do everything else you need in starting and getting your plane fueled, started and staying in the air. Size: 6" x 3 5/8".

**NEW! HARPOON**  
**Flying Boat**

**\$88.00**



Here's the easiest way for you to start flying off the water. Harpoon is an A.R.F.—the fuselage is ready-formed PolyLite—similar to epoxy glass in appearance. And the wings are foam cores that come **ALREADY SHEETED** with balsa. Harpoon is 57" span, 540 sq. in. wing area, for .35-.40 engines and 4 channels. Hardware includes: Formed wire parts, hinges, control horns, pushrods.

Now there is . . .

**HOBBY LOBBY**  
CANADA

Bax 6550 — Station C  
Edmonton, Alberta, Canada T5B 4M4  
Phone (403) 477-3456

**NEW!** NO ADAPTERS NEEDED!  
These will fit any engine!  
**KAVAN ALUMINUM SPINNERS**



1½" (40mm) diameter ..... \$4.80  
1¾" (45mm) diameter ..... \$5.10  
2" (50mm) diameter ..... \$5.40  
2½" (55mm) diameter ..... \$5.70  
2¾" (60mm) diameter ..... \$6.00

Kavan Four-way wrench ..... \$2.50

The deeply inset flange is held directly against the prop by the prop nut eliminating adapter bolts. You can use a socket wrench or the Kavan 4-way wrench to tighten the prop nut. A soft rubber plug caps the spinner. Spinners are cast and polished aluminum that'll last when used with an electric starter.

**STOCK UP NOW!**

**HOBBY LOBBY GLOW PLUGS**



R/C Longs, 6 for \$3.99  
R/C Shorts, 6 for \$3.99

Absolutely top quality from one of the most famous manufacturers in the business.

You save about 50% 'cause we buy these in BULK without paying for fancy packaging.

This outfit starts you flying R/C with a full 4 channel plane!

**JUNIOR TELEMETER**  
**BEGINNERS OUTFIT \$277**



Combo price in effect until July 31, 1978

**CANADIAN CUSTOMERS**

Hobby Lobby CANADA is your source for Hobby Lobby Radios (and REPAIR SERVICE for Hobby Lobby Radios!) and ALL your RC needs! Shop by mail or phone and SAVE! MasterCard, Visa, C.O.D.

Catalog with Canadian prices, \$3.00.

Send \$3 to Hobby Lobby Canada in Edmonton.

**NEW!** Pre-veneered foam wing, pre-veneered foam fuselage sections and much more!

**HOBBY LOBBY/TRUeline**  
**HAWKER TYPHOON**

**\$88.00**

List price \$115



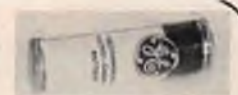
53 inch wing span near scale model of the famous WWII fighter and ground attack aircraft. For .40 size engines and 4 or 5 RC channels. The kit is a truly deluxe Trueline product: pre-shaped balsa parts, veneered foam wing panels, 3 large veneered foam fuselage sections, formed wing fairings, cowling and detail parts, authentic spun aluminum spinner, decals, accessory packs, detailed drawings and step-by-step building sketches. Typhoon is an excellent stand-off scale subject because model engines can be effectively hidden in the unusual deep scale cowling.

**SPECIAL!**  
**G.E. Nickel-Cadmium**  
**Batteries**

1 2 volt 500 mAh. Pencil size

**4 for \$9.99**

(Regular \$23.20 each)



This is the high quality G.E. cell that's original equipment in the best radio outfits. Cells have solder tabs.

**VOLUME 7 CATALOG**

Hobby Lobby's best catalog yet!  
\*More LOW PRICES! \*More RC AIRPLANE KITS!  
\*More BOATS and BOAT HARDWARE items!

SEND VOLUME 7 CATALOG TO:

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

\$3.00 — send at FIRST class.  \$2.00 — send it THIRD class.  
(Deduct \$1.00 from above prices if you enclose the words "VOLUME 7" or "VOLUME 8" from old Catalog cover.)

**CALL US! (615) 373-1444**  
**for FAST SERVICE, C.O.D. or CREDIT CARD**  
**ORDERS—ADVICE**



We've got over 100 years of RC experience among us (we are older than we look). Call us with your RC problems.

**Hobby Lobby CANADA prices . . .**

Hobby Lobby 6 Radio .....	\$349	Sig Kommander .....	\$44.95
10" Multi-Prop .....	\$14.50	Sig Kougat .....	\$49.95
12" Multi-Prop .....	\$15.95	Revolution 40 .....	\$359.95
Superkote .....	\$5.75	Revolution 60 .....	\$449.95
Senior Telemeter .....	\$138.00	Jet Ranger .....	\$495.00
2-40 Adhesive .....	\$3.75	M.E.N. Trainer .....	\$34.95
H.I. Power Center .....	\$26.95	M.E.N. Buzzard Bombster .....	\$53.95
Surelite Casina Skylane .....		K&B 61 R/C w/pump per... ..	\$122.00
182 ARF .....	\$42.95	K&B 40 R/C .....	\$74.95
Surelite Spitfire ARF .....	\$42.95	OS 25 R/C .....	\$45.95
Surelite Piper J-3 Cub .....	\$42.95	OS 40 R/C .....	\$74.95
Sig Kader .....	\$38.95	OS 60 Schnuerle R/C .....	\$149.95

Prices in effect until July 31, 1978.

I ENCLOSE CHECK FOR \$ \_\_\_\_\_  
ADD \$1.40 HANDLING

CHARGE TO MY **BankAmericard**

CHARGE TO MY **Master Charge**

CARD NO. \_\_\_\_\_

EXPIRES \_\_\_\_\_  
(\$1.75 HANDLING)

SHIP C.O.D.  
(\$1.75 HANDLING)

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY — STATE — ZIP \_\_\_\_\_

rcm 6

**HOBBY LOBBY**  
INTERNATIONAL

Rt. 3, Franklin Pike Circle, Brentwood, TN 37027 • 615/373-1444



**Hobby Shack** — **PITOT**

**RADIO-CONTROL**

**ALMOST READY TO FLY**

**A.R.F. Motor Glider**  
**SPORTAVIA RF-5B**  
**TESTOR .049 ENGINE INCLUDED**

- HAND BUILT — FACTORY COVERED WING & STAB
- ABS PLASTIC FORMED FUSELAGE
- EVERYTHING INCLUDED EXCEPT YOUR RADIO
- ASSEMBLY TIME 1 HOUR



SPAN: 58.7 in.  
AREA: 434 sq.in.  
WEIGHT: 1.2 lbs.  
RADIO: 2 channel

A.R.F. Motor Glider  
**SPORTAVIA RF-5B**  
plus aero sport two system

Both for  
**\$129<sup>99</sup>**

The SPORTAVIA RF-5B is an ARF powered glider which comes complete with a Testors .049 engine, a ready made ABS plastic formed fuselage, and built up balsa & spruce wings which are already factory plastic film covered. The kit contains: engine, engine mount, landing gear, wheel, spinner, pushrods with keepers, hinges, control horns, servo tray, bolts, nuts and liquid cement. Also included are full size illustrated plans with instructions for radio installation. To finish, simply join the wing halves, fit the stabilizer, mount the engine (included) and install your radio — now you are ready to fly! Assembly time about one hour.

RETAIL \$75.00  
**Hobby Shack**  
DISCOUNT PRICE  
**\$59<sup>99</sup>**

**Order By Mail Or Call Us!**

**Hobby Shack**

18480 BANDILIER CIRCLE  
FOUNTAIN VALLEY,  
CALIF. 92708

Area 714  
**963-9881**



**CHARGE IT!**

Add \$3.00 postage & handling. California residents add 6% state sales tax.





**B**efore I forget to mention it somewhere during this month's discourse, let me again remind you of the First Annual Southwest Jumbo R/C Fly In, to be held at Thunderbird Field, just outside of Fort Worth, Texas, July 22 and July 23, 1978. This Fly In is for all large aircraft, not just scale, but any biggie. It is a Fly In, not a contest, so you won't risk your bird in any type of competition other than static display. You can fly if you want to, but there are no prizes for flying. There will be trophies awarded for "most impressive model", "best scale model", "best non-scale model", and one for the entrant who traveled the farthest distance to attend this Fly In. The trophies will be awarded based upon the votes of all of the entrants, you won't catch me trying to decide which is the "most impressive". A five buck entry fee will be charged each entrant, but that entrant can enter one model or one hundred models. So plan to attend. Bring your bird if it is finished, semi-finished, or just a gleam in your eye. We plan on having a good time, and we'll have a better time if you're there also. For further details and entry blank, write to me at 2440 Colonial Parkway, Forth Worth, Texas.

Since my interest in big models is a natural outgrowth of my interest in building and flying antique and old time R/C aircraft, it would seem to me that this is a somewhat natural pattern — but this may not be so. I have been reading lately that many pilots of big aircraft have had trouble trying to adjust to the size of their aircraft, and keep landing on the other side of the runway because they thought that the bird was nearer to them than it really was. This can be a problem, but those who have learned to thread a needle and land a soaring Old Timer won't have this problem moving into the Biggie class. You know, model aviation is simply the greatest hobby around. There is always something new to get a grip on you, and something that you can enjoy doing. I really feel sorry for all of the non-modelers sitting in front of the tube, just wasting their life away, not enjoying the many, many thrills of R/C modeling. Modeling in any form is great, but R/C simply has to be the most enjoyable of all because of the great variety of fun that it offers. It makes no

difference if you are flying 1/2A or a Suevia 25cc powered aircraft, the fun is there for your enjoyment. I've been modeling for over forty years, and darn glad and proud of it. And, I hope that you are all proud of your hobby too. It may be a demanding hobby, but it is by far the best. Okay, off of the soap box and back to basics for awhile.

The other evening I watched a demonstration on covering with Super Coverite by our outstanding gal type model builder, Rosemary Edwards. She uses a normal size laundry type iron turned way up, wrapped in a cloth, to stick down the Coverite. The results are great. Same is true with MonoKote, but here she uses the normal sealing type iron. These new (well, how about ten years old for MonoKote, Solarfilm, etc.) type coverings have really made modeling more enjoyable than ever before. And these newer covering materials have made the building and flying of large aircraft much easier to do. There isn't any way that I would tackle as many large aircraft as I have built in the last couple of years without these great covering materials. A great plus is that if you work carefully with them and use your head when covering and shrinking, you won't have any warps. And, if you do screw up and get a warped wing, you can remove this warp rather easily. But how? First, start with a warp-free item. Most warps are in the wing, so let's talk about this first.

When you build the wing of your bird, and I don't care if it's a 3' span or a 10' span, you must use a warp-free building board. If you always have a warped wing on your model, then chances are that you may be using a warped building board. Check it out. A solid core door is a great building surface, and even a hollow core door works fine, as does a piece of 3/4" plywood, provided that they are warp-free. You can check this by sighting along the flat surface of the door, board, etc. If it isn't straight, get another one. Also, check your building board support, it may not be square, thus causing the building board to warp when it is fastened to it. Check it out before you build any more wings. Next, take a look at your building technique. Do you pin all of the pieces down securely to the building board, or do you let some of the pieces "float" a bit?

Speaking of pins, visit your local office supply store and invest in a quarter pound box of banker's pins rather than trying to bring home some dress makers pins from the local five and dime . . . (five and dime — ye gads, more like fifty and a buck now). When you are building your wing, do you leave it pinned to the board until it is really dry, or do you yank it off in a hurry so that you can construct the other half. Frankly, it's a good idea to let the wing structure dry about 24 hours if you're using any type of "white glue" so that you know that the moisture is thoroughly dried out of the glue joint. Lots of the newer glues are "fast grab" or "quick tack", but they still take awhile to cure. Take an extra day and let each wing panel dry thoroughly before removing from the building board.

Covering your new wings with a plastic film is easy, and the instructions with most of the films make this a very easy task - - - but shrinking of the film is another matter, and this is the place that you may build in a warped surface. Before shrinking the plastic film to the structure, take a nice sharp pin and make one small pin hole in each space between ribs on the bottom of the wing. This hole is to let the heat escape while you're shrinking the covering material.

When you start to shrink the material, alternate from the top to the bottom of the wing. By this I mean that if you start shrinking at the wing tip, do the tip and the first two panels on the top of the wing, then turn it over and do the tip and the first two panels on the bottom, and then two more on the bottom. Turn over, do two on the top, plus two more, then back to the bottom and so on. This will help prevent a warp. It is almost a positive thing that if you do all of the top, and then do all of the bottom, you're going to wind up with a warped surface. Do the same for the tail section, no matter if it is a solid sheet surface, or a built-up section. If you're of the old school and simply must use dope and silk, then alternate in the same fashion when applying the dope to the wing.

If you have followed all of this, and still wind up with a warped wing, don't worry about it, it's easy to fix. It takes two people to do it, so grab your wife and get her to help you. Hook up the heat gun again, then grab the wing, twist it until the warp is out, and just a bit past the

to page 176

# Hobby Shack®

Charge it!  
Fast PHONE  
ORDERS ---  
(714) 963-9881



CHARGE CARD

For Mail Order Write To-  
18480 BANDILIER CIRCLE,  
FOUNTAIN VALLEY,  
CA 92708

## Hobby Shack WET CELL BATTERY & CHARGER



Hobby Shack WET CELL STARTER BATTERY, 12V, 5.5 Amp and No. 1200 CHARGER

RETAIL VALUE \$28.90

Hobby Shack DISCOUNT PRICE **\$18<sup>88</sup>**

Hobby Shack

## Handipump

HAND OPERATED FUEL PUMP



- Easy to use
- No batteries
- Nylon gears
- Strong plastic case

RETAIL \$8.95

Hobby Shack DISCOUNT PRICE

**\$4<sup>99</sup>**

Hobby Shack

## KITTY R1500

RADIO-CONTROL High Performance Glider

ALMOST READY TO FLY  
• HAND BUILT & COVERED BALSA WING, STAB & RUDDER • ABS FORMED FUSELAGE — NO PAINTING FOR YOU! •



SPAN: 61 in.  
AREA: 377 sq.in.  
WEIGHT: 18 oz.  
RADIO: 2 channel

RETAIL \$62.95

Hobby Shack DISCOUNT PRICE

**\$49<sup>99</sup>**

## Hobby Shack SPIRIT 76 INJECTION MOLDED ALL FOAM GLIDER



- Factory joined, all foam fuselage • All foam wing, stab & fin • Vacuum formed canopy

SPAN: 76 in.  
AREA: 504 sq.in.  
WEIGHT: 32 oz. w/radio  
RADIO: 2 ch.

RETAIL \$34.95

Hobby Shack DISCOUNT PRICE

**\$27<sup>76</sup>**

Hobby Shack

## STAGGERWING BIPLANE KIT

INJECTION MOLDED ALL FOAM



- One piece all foam wings, fuselage, stab & fin • Complete accessory package • Decals

SPAN: 39.5 in.  
AREA: 450 sq.in.  
ENGINE: .15-.20-.25  
RADIO: 2-3 ch.

RETAIL \$37.95

Hobby Shack DISCOUNT PRICE

**\$29<sup>99</sup>**

SURE FLITE PRODUCTS

Supermarine

## SPITFIRE

INJECTION MOLDED ALL FOAM



RETAIL \$37.95

Hobby Shack DISCOUNT PRICE

**\$28<sup>99</sup>**

SPAN: 50 in.  
AREA: 450 sq.in.  
ENGINE: .29-.40  
RADIO: 4 ch.

— FEATURES —

- All foam fuselage, wing and stabilizer • Molded clear canopy • Molded exhausts and radiators • Complete decal sheet and color notes • All hardware included • Best wire landing gear •

## Hobby Shack HEAT GUN



HEAT SHRINKS ALL POPULAR BRAND MODEL COVERING MATERIALS — Solarfilm KwikCote — Monokote

- Heat control on-off switch / Motor, on-off switch
- Spreader bar for even heat flow
- Air flow control
- Light weight
- Easy to use
- Just the right heat for film covering materials
- Priced right!

Hobby Shack DISCOUNT PRICE

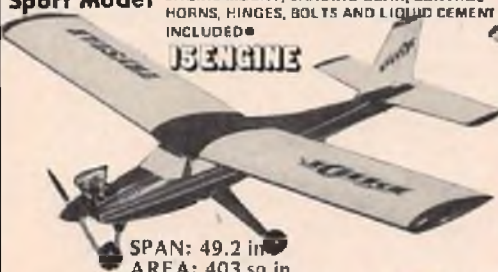
**\$14<sup>99</sup>**

Hobby Shack

## TRYSTAR-15

Best Beginner's Trainer or Sport Model

- FACTORY HAND BUILT BALSA AND SPRUCE WINGS • WINGS FACTORY COVERED WITH PLASTIC FILM • A.B.S. PLASTIC FUSELAGE • ENGINE MOUNT, LANDING GEAR, CONTROL HORNS, HINGES, BOLTS AND LIQUID CEMENT INCLUDED •



SPAN: 49.2 in.  
AREA: 403 sq.in.  
RADIO: 3 ch.

RETAIL \$62.95

Hobby Shack DISCOUNT PRICE

**\$49<sup>99</sup>**

Hobby Shack

## CESSNA-150

- FACTORY HAND BUILT BALSA AND SPRUCE WINGS • WINGS FACTORY COVERED WITH PLASTIC FILM • A.B.S. PLASTIC FUSELAGE • ENGINE MOUNT, LANDING GEAR, CONTROL HORNS, HINGES, BOLTS AND LIQUID CEMENT INCLUDED •



ENGINE: .20  
RADIO: 3 or 4 channel

SPAN: 52in.  
AREA: 426.25 sq.in.

Hobby Shack DISCOUNT PRICE

**\$62<sup>88</sup>**

# aero sport two

SINGLE-STICK TWO CHANNEL  
RADIO CONTROL SYSTEM

Hobby Shack  
Is Making  
Radio Control  
Better and Better

AERO SPORT TWO RADIO SYSTEMS INCLUDE: Two channel transmitter (for pencil batteries) with trims, two channel receiver, 2 new Aero Sport Servos (NS-ICR), dry airborne battery pack, switch harness, frequency flag and FULL 180 day warranty.



(72 MHz only)

FEATURING NEW  
"TRIPLE TUNED FRONT  
END RECEIVER!"

Hobby Shack  
DISCOUNT PRICE

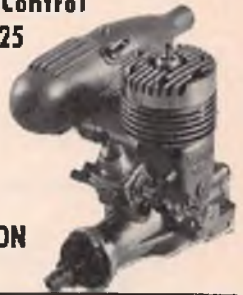
**\$75<sup>00</sup>**

Hobby Shack

# Thunder Tiger GAS MODEL ENGINES

Throttled R/C or U/Control  
.15 - .20 - .25

EASY STARTING • HIGH  
PERFORMANCE • PRICED  
RIGHT • SMOOTH AND  
POWERFUL • POPULAR  
SIZES • SOLID CONSTRUCTION



R/C ENGINES	Retail	SALE
.15 III R/C (with muffler)	27.95	21.99
.20 R/C (with muffler)	29.95	23.99
.25 R/C (with muffler)	32.95	25.99
STANDARD ENGINES		
.15 III STD. (with muffler)	23.95	18.99
.20 STD. (with muffler)	24.95	19.99
.25 STD. (with muffler)	26.95	21.56

Hobby Shack

**SPEED BUILT**  
MANUFACTURED BY DA MODEL COLLECT

RADIO CONTROL RACING CARS  
.09-.10 ENGINE 2 CHANNEL

# MARTINI PORSCHE 935 TURBO

- FORWARD/REVERSE AND ENGINE SPEED CONTROL WITH ONLY A TWO CHANNEL RADIO SYSTEM
- ONE PIECE ALL DIE CAST METAL CHASSIS
- TOTAL FOUR WHEEL INDEPENDENT SUSPENSION

- TRANSMISSION GEAR BOX, NYLON MOTOR GEARS, CLUTCH AND REAR SUSPENSION ALL FACTORY INSTALLED—ELIMINATING ANY DIFFICULT WORK FOR YOU
- STEP BY STEP INSTRUCTION BOOK WITH PARTS BAG NUMBERED TO THE INSTRUCTION BOOKLET

Strong, Lightweight,  
Pre-Colored Bodies  
— No Painting!



MARTINI PORSCHE  
935 TURBO  
RADIO CONTROL RACING CARS  
COMPLETE CAR LESS MOTOR AND RADIO

RETAIL \$109.95

Hobby Shack  
DISCOUNT PRICE

**\$87<sup>99</sup>**

TECHNICAL DATA

Length: 14.4 inch      Forward gear ratio: 13.05 : 1  
Width: 7.08 inch      Rear gear ratio: 18.7 : 1  
Height: 3.54 inch      Radio: 2 channel  
Wheel base: 8.14 inch      Engine: .09 - .10

# OUR GIANT NEW Hobby Shack CATALOG IS READY



• 200 LOADED PAGES FULL OF YOUR MODELING NEEDS • 80 PAGES OF FULL COLOR PHOTOGRAPHS • DISCOUNT PRICES FROM COVER TO COVER • LARGEST SELECTION FROM ALL OVER THE WORLD • MANY BRAND NEW ITEMS •

I am enclosing \$2.00 for your new fully illustrated modelers catalog. Please rush it to me today!  
MAIL THIS COUPON TO:

HOBBY SHACK  
18480 BANDILIER CIRCLE,  
FOUNTAIN VALLEY, CA 92708

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_ Zip: \_\_\_\_\_

POSTAGE & HANDLING INFORMATION:  
\$ 0.00 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      Order over \$50.00 add \$3.00  
\$15.01 to \$20.00 add \$1.60  
California residents please add the 6% State Sales Tax.

# Hobby Shack

**FOUNTAIN VALLEY**  
Main Warehouse Store  
Or Mail Order Shopping!  
18480 BANDILIER CIRCLE,  
FOUNTAIN VALLEY, CA 92708  
(714) 963-9881  
S.D. FWY - EUCLID OFF RAMP

**HOURS:**  
Mon - Fri ..... 10 - 9  
Saturday ..... 10 - 6  
Open Sunday .... 10 - 5

**RIVERSIDE**  
6135 VAN BUREN BLVD.,  
RIVERSIDE, CA 92503  
(714) 785-6773  
CORNER VAN BUREN and ARLINGTON

**LA HABRA**  
1401 SOUTH BEACH BLVD.,  
LA HABRA, CA. 90631  
(213)947-2574  
CORNER BEACH BLVD. & IMPERIAL HWY



Charge It



Ordering by Mail  
**Hobby Shack**

18480 BANDILIER CIRCLE,  
FOUNTAIN VALLE.,  
CALIFORNIA 92708



I had hoped this month to be able to give you a full report on the Damo 218 four cycle twin cylinder engine from Sweden but, fortunately or unfortunately, as the case may be, the rains finally came to California and Sunland/Tujunga in particular where I have my home and business. At the time of this writing (March) Sunland/Tujunga has had 45" of rain this season and it is still raining today. I do all of my engine testing out of doors, and although there has been a few sunny days in-between storms, my engine running site is knee deep in mud which sort of throws a wrench in the works until things dry out. Hopefully, we will have the test report and article for you next month, if Sunland/Tujunga doesn't get washed out to the Pacific Ocean. Believe me when I say that there were a couple of times in the past two months when we were ready to start building an Ark.

Before getting to the letters this month, I have a new item to bring to your attention that some of you might find useful. Bob Lopshire who heads Idea Development, Inc., sent us one of their latest products this past month. A heat sensitive paint Bob calls "Hot-Hed" that will let you know if you are trying to melt your engine or not. Some of you guys seem to have a tin ear when it comes to properly setting the needle valve. For some reason this always seems to mean running the engine on the lean side rather than the rich side. Naturally, everyone tries to get every bit of power possible and then in hopes of a few hundred more rpm's, turn the needle a couple of clicks leaner. When the engine sags in climbing maneuvers and won't scream the whole flight out, you wonder what is wrong with the lousy thing. Hot-Hed will not help the lean running but it will let you know when you are running the engine too lean. Hot-Hed is simply applied to the head of your engine with a toothpick, small brush, or whatever is handy. The normal color of Hot-Hed is olive green and it will stay this color as long as you operate your engine in the proper heat range of 375°-390°. This is the cylinder head temperature at which most model engines operate. When you exceed 400°, you get into the area where oils begin to break down and

engine destruction begins. As the engine temperature increases, Hot-Hed changes from its normal olive green color to brown, indicating you are running the engine too lean. Richening the engine back up and allowing it to cool will, in turn, result in the Hot-Hed returning to its olive green color. Although this will give you a visual means of adjusting your engine on the ground, it naturally does not tell you if the engine is exceeding normal operating temperature in the air. However, at temperatures above 490°, Hot-Hed will take on a permanent color change of deep red brown. So, if you land and find the paint a deep red brown rather than olive green, you will know that you will be investing in a new engine very shortly. Over a period of time, Hot-Hed will darken naturally but this change does not occur before at least 16 hours of use.

Hot-Hed sells for \$3.00 postpaid. If not available through your friendly hobby dealer, you may order direct from Idea Development, Inc., P.O. Box 7399, Newark, Delaware 19711.

★

Dear Mr. Lee,

*I have written you a few times before. All your answers proved extremely helpful and I am very thankful.*

*Now a new problem—I decided to get into ducted fans, and I just can't get the engine to run right. I am using a Perry Pump (extra wide intake) carb instead of the exhaust baffle throttle which costs an outrageous \$25.00! The carb I am using, I took off my K & B .61. The venturi size is the same as the stock carb on my Racing .40 (K & B rear rotor). The problem I am having is that the engine doesn't run for any length of time, unless I don't move the throttle.*

*The fuel tank is 2 to 3 inches higher than the carb and I believe this is causing my problem, but there is no other place to put the tank. By the way, I am using a Perry Pump/Regulator as in the Scozzi/Violet Systems 1 method. What can I do? I tried hooking up the pump position of the Perry unit to the engine crankcase pressure tap by building a "chamber" around the rear portion of the pump. This way, I would transmit the variable pressure from the engine to the pump. No go. I heard the valve working, but the pump wouldn't*

*pump, even when I applied my electric starter and observed the end of the fuel line. Nothing flowed through. Is this because of the timing of a racing engine? Would the Robert Pump work?*

*I feel that a pump is my only solution, but any idea you could supply me with would be most appreciated. Thanks for any help you might be able to give me.*

Very truly yours,

Jay Sabot

Roslyn, New York

The Perry Pump cannot be used in a remote chamber using a pressure tap and connecting line. The pressure impulses are not strong enough to actuate the diaphragm. This might work if you were to use a large diameter connecting line, but you are then making this line and the chamber part of the crankcase of the engine and there is too much volume involved which the pumping action of the piston could not handle. For the Perry Pump to operate, it must replace the back cover on an engine. This is why most fellows are not using the K & B 6.5 front rotor racing engine which can be modified to accept a K & B .40 Perry Pump. In your case, as you are using the 6.5 rear rotor racing engine, you would be better off using the new Robert Super Pumper in conjunction with the Perry Pump carburetor. You will not have the advantage of the Perry regulator system which means that you can expect the engine to lean out considerably as the fuel level in the tank drops. Especially when you will have to use a 16 ounce tank to get in an 8 to 10 minute flight. The racing engines develop high power and rpm, but also use a lot of fuel doing so. You did not say what type of aircraft you are using the ducted fan in, but you are going to have to do something about lowering the fuel tank. 2"-3" higher than the carburetor is always going to cause you trouble — especially idle and through the mid-range. Tank position is one of those things you have to take into consideration when designing an airplane (something even a lot of kit manufacturers seem to forget about). Your 6.5 rear rotor engine will also idle better if you use a full length tuned pipe; the pipe acting like a muffler to help keep the plug hot at idle. If your design will not

to page 171

# we've earned the name champion



Sport flyers around the world have discovered the quality and dependability that the EK Champion offers. The confidence that you are flying with the best equipment available and knowing that your radio is backed by the most experienced digital R/C company in the world, makes this radio the all-time Champion.

The Champion transmitter provides 5-channels for control with two 2-axis sticks, plus one lever for non-centering auxiliary control. The transmitter has a voltmeter for quick reference and a light-emitting diode (LED) charging indicator.

The receiver is crystal controlled superheterodyne, with a double tuned front end. The Champion receiver has an operating tempera-

ture range of 0 to 140°F. This, along with a 450 mAh airborne power supply with high vibration, shock resistant cells, ensures dependable service under all operating conditions.

The Champion system also includes 4 EK Super Miniature servos. The light weight combined with an output thrust of 4 lbs. allows you to handle any model from 1/2 A to 1/4 scale with EK's SM servo.

Your Champion also includes nicad batteries, switch harness, transformer isolated wall charger and charge cord, transmitter antenna and all necessary mounting hardware including servo and receiver trays.

EK also provides the most generous full year limited warranty in the industry. For all these reasons, and many more, we've earned the name Champion.

**For our full line brochure, write EK PRODUCTS, INC., 3322 STOVALL ST., IRVING, TEX 75061, U.S.A. Distributors and Dealers contact us for our new merchandising program.**

## **EK-Products**

**Reliable radio control systems**

©1978 EK-Products, Inc. 784



One of the most talked about in the field of airfoil design by modelers, is the Reynolds number. After giving this subject much thought. What is it? What does it do? What does it tell me as a modeler?

Armed with a tape recorder, pencils and a pad, I spent many evenings in a local college library reading and noting, trying to compile an understood meaning of the Reynolds number. Hereafter noted as Rn.

The term Rn is named after Osborne Reynolds, who first noted its significance in fluid flow problems in 1883. Like the Mach number, the Rn is a dimensionless ratio and serves as an index used in predicting changes in flow character.

At low Rn the boundary layer is laminar and at higher Rn the layer becomes turbulent. The transition from laminar to turbulent flow is the key to Variation of the airfoil coefficients with the Rn.

The Rn varies with speed, size, and Kinematic viscosity, the greater the speed and size, the greater the Rn, and the greater the Kinematic viscosity, the smaller the Rn. Operation of modern aircraft involves large variations in the Rn because of the great speed range and high ceilings designed into these airplanes. A modern military airplane is capable of attaining a maximum speed up to 25 times its stalling speed and is capable of flight in the stratosphere where Kinematic viscosity may be many times as great as at sea level. Such an airplane is thus capable of 25 fold increase in the Rn at sea level and further increases at altitude. Additional Rn variations are encountered on a tapered wing because the tip chord is smaller than the root chord and therefore operates at a lower Rn.

It is clear that one cannot avoid variation of the Rn in flight, accordingly, the effects of such variations must be evaluated. To accomplish this evaluation, we shall first consider the physical picture.

A **turbulent layer** is more stable than a **laminar layer**. This is true because of the interchange of energy among the various fluid particles in the turbulent flow. Which gives the turbulent layer a higher energy level close to the surface. When dealing with either a turbulent or a laminar flow, energy is lost because of friction. So that the energy level in both



*From Bill Amour comes a new winch drum and turn around. Note tapered turn around for true line tracking.*



*Kindrick, Bridi and Kidd. Sounds like a law firm but actually a fun fly team.*



*Tom Williams shows off his new Viking sailplane. Note the large rudder.*

types of boundary layer is always less than in the free stream. It follows that separation of the boundary layer must always occur if an adverse pressure gradient is present, as is the case with flow over wings, the difference between the laminar and turbulent cases being that a laminar layer will separate earlier

than a turbulent layer.

At low angles of attack, when an airfoil produces only small values of lift coefficient, the separation point is generally close to the trailing edge, regardless of the type of boundary layer. Separation of this sort has no noticeable effect on the lift characteristics, but does increase the pressure drag.

As the angle of attack is increased, the separation point moves forward and the pressure drag increases. Close to the stall the movement of the separation point becomes rapid. The final result is that the lift drops off and the pressure drag increases sharply.

Separation occurs regardless of the type of boundary layer, however, a laminar type always separates earlier than a turbulent layer under the same type of adverse pressure gradient. At very low speeds and with small chord airfoils, the Rn throughout the boundary layer remains low and the transition from laminar to turbulent flow either does not occur or occurs well back on the airfoil. Because of this, the pressure drag coefficient is relatively greater at low Rn and the stall occurs at lower angles of attack. As the Rn is increased and the boundary layer becomes turbulent over more of its length, the separation point moves aft, resulting in a reduction of pressure drag and an increase in stalling angle of attack and maximum lift coefficient.

Although a turbulent boundary layer results in a reduction of pressure drag, it also produces an increase in skin friction drag as compared to a laminar layer. In order to achieve minimum drag, the ultimate airfoil would be one with a laminar layer over its entire chord, coupled with a separation point far aft. This ultimate airfoil will never be designed for two reasons: (1) At high forward speeds a laminar layer is not possible over the full chord. (2) Although the adverse pressure gradient may be minimized at low angles of attack, it cannot be minimized over a wide range of angles of attack, thus the separation point cannot be fully controlled.

In spite of these limiting factors which prevent the development of the ultimate low drag airfoil, it is possible to design airfoils, with pressure distributions that promote the maintenance of a stable boundary layer laminar over a greater

# Lanier Ready-to-Fly\* Models

...every one designed and flown by the experts!

- \* Four Easy Steps to R/C Flying**
1. Glue pre-cut wing halves together.
  2. Mount tail surfaces.
  3. Attach control surfaces.
  4. Install engine and equipment (not included).
- NOTHING to cover or paint.**

Span 50"  
Area 700 sq. in.  
Power .45-.60

IF YOU WANT TO  
FLY A BI-PLANE  
THIS IS IT

## Jester II

designed by Len Purdy



Span: 63 in.  
Area: 530 sq. in.  
Wt. Complete: 6 1/4 lbs.  
For .50-.61 engines  
Files with rudder,  
elevator, aileron  
and motor control.

**KIT LA 124**

FLIES COMPLETE AMA & FAI PATTERNS

**NOTHING To Build, Cover, Or Paint**

## REBEL BIPE

\$99.50  
LA 159

FEATURES PRE-CUT  
FUSELAGE TRIM  
& WING SUN-BURST



## Transit

LA 108

\$44.50

Files with motor,  
rudder, elevator  
control.  
(No ailerons).



Span: 65 in.  
Area: 520 sq. in.  
For .35 or .45 engines

Wing, Stab & Fin  
covered with "Toughskin"

## Lanier INSTANT R/C WING KITS

All Lanier Wings are pre-covered and furnished with Tips & Gear blocks installed (where applicable) and correct Dihedral angle cut. Hinges are pre-installed in the wing with slots in the Ailerons. Aileron connecting fitting is also provided (where applicable).

**65" Span 12% Symmetrical Standard Taper — 520 Sq. In.**

Regular Low Wing Trike	...LA 131	\$22.95
Retract Low Wing Trike	...LA 127	\$22.95
Tail Dragger Low Wing	...LA 133	\$22.95
Retract Tail Dragger	...LA 126	\$22.95
Shoulder Wing Style	...LA 136	\$22.95
Stab. to Match Above		\$ 6.00

**52" Span 10" Chord Clark Y Straight Chord 520 Sq. In.**

Shoulder/High Wing	...LA 138	\$18.95
Low Wing Trike		
Stab. to Match Above		\$ 6.00

**50" Span 10% Symmetrical Standard Taper 350 Sq. In.**

Regular Low Wing	...LA 157	\$18.95
Shoulder/High Wing	...LA 156	\$18.95
Pre Hinge Stab. for Above		\$ 5.00

### Len Sez

QUIK® fuselage repairs. Try this for quick & easy fuselage repairing of Lanier models. (1) Clean the damaged area with alcohol. (2) Cut a piece of Lanier QUIK® which will cover the area + 1/4" on all sides. (3) Dip the QUIK® in Air-O-Cement (or MEK) & apply the now flexible patch to the outside of the fuselage. (4) Allow the repair to dry & then paint with scrap fuselage plastic dissolved in Air-O-Cement for a near invisible repair.

Len

See next month's ad for other details & hints.

IMMEDIATE DELIVERY FROM

Our complete stock of kits and parts ... thru your dealer or direct. Same day shipment — prepaid.

## Pinto

48" - 3 CHAN. TRAINER/SPORT

LA 146



\$46.50

Span: 48 in.  
Area: 480 sq. in.  
Wt. complete: 3 lb. 8 oz.  
For .23 or .35 engines

Files with rudder,  
elevator and motor  
control.

## Cessna

48" - 3 CHAN. TRAINER/SPORT

LA 119



\$46.50

Files with motor,  
rudder, elevator  
control.  
(No ailerons).

Span: 48 in.  
Area: 480 sq. in.  
For .15 or .19 engines

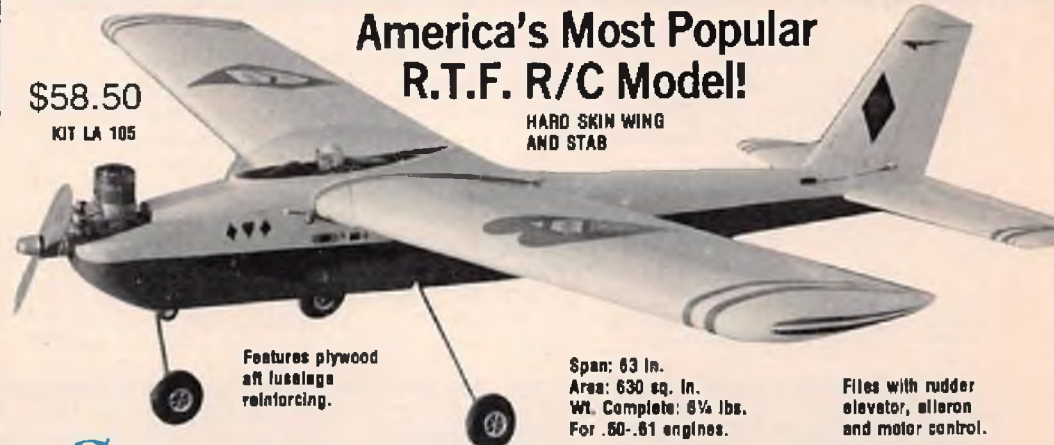
## ACCESSORIES

QUIK® 6" x 12" ..... 70¢  
AIR-O-CEMENT ..... 65¢  
"TRIM" PACK ..... \$1.25  
5 asst'd colors

## America's Most Popular R.T.F. R/C Model!

\$58.50  
KIT LA 105

HARD SKIN WING  
AND STAB



Features plywood  
air fuselage  
reinforcing.

Span: 63 in.  
Area: 630 sq. in.  
Wt. Complete: 8 1/2 lbs.  
For .50-.61 engines.

Files with rudder  
elevator, aileron  
and motor control.

## Comet II

LANIER R/C • BRIARWOOD ROAD • OAKWOOD, GEORGIA 30566 • TELEPHONE (404) 532-6401  
CANADIAN DISTRIBUTOR, SOUTHWESTERN HOBBY, 5540 WYANDOTTE S.E., WINDSOR, ONT.



# READ ABOUT THESE RESULTS with

# MAGNUM POWER



Dear Carl,

RECENTLY, I WAS ASKED BY A FELLOW CLUB MEMBER FOR SOME HELP. Sid Greenleaf was flying a Sig Cadet with an OS35, but had never gotten a complete flight because of engine problems. The engine felt stiff to me, and after starting it with his well-known national brand fuel, it wouldn't idle. From a moderate 2-cycle, it would flood out when the throttle was opened. I fiddled with it for some time, and finally decided to fly the ship with the engine nearly full throttle.

After take-off and flying out about 300 ft., and making a 180° turn, the engine quit as though it were lean. I brought the plane in, restarted the engine, set the needle valve 5 clicks richer, and took off. Again the engine quit the same way. With Sid's permission, I drained his tank and filled it with Magnum Power 10. We restarted the engine, set the needle valve, and Sid noticed an immediate improvement. We now had a good idle and good transition from low to high. I took the plane off, got up to altitude, and handed Sid the transmitter. For the first time all summer, the engine ran fine for a complete flight. After landing, Sid said that Magnum Power had made a tremendous difference in the way his engine ran. It was much freer and the first few minutes of running had cleaned out all the varnish from the old fuel. Sid then made many more flights, and his engine ran reliably from the beginning to the end of the tank.

Another time, Dr. Alan Spievaek asked me if it was true that engines ran longer with Magnum Power. Alan flies a tri-motor Stinson with three OS Wankels. He was getting only 8 or 9 minutes running time with his fuel (also a well-known national brand). I gave him a gallon of Magnum Power 10, and he decided to run a test. Using a regular fuel, he flew an entire flight until the engines quit — rather daring with a scale job. He then filled with Magnum Power, and restarted. He had to lean his engines more than with his old fuel, and picked up several hundred RPM as measured with a tach. He then flew an entire flight again until the engines quit. After landing, he could immediately touch the engines, which he had not been able to do for several minutes with his old fuel, since they ran hotter with it. He also noticed a black residue that had been cleaned out by the Magnum Power, and now his exhaust was clear and clean.



Dr. Allen Spievaek with his tri-motor Stinson with 3 O.S. Wankels.

He was extremely surprised to find he was getting well over 10 minutes with Magnum Power. He now had plenty of time to complete his schedule of running maneuvers. Alan went on to run tests with various airplanes and engines, and found that everything that is said about Magnum Power is true and then some.

These two cases just confirm all the experiences I have had with this fuel. In every case when Magnum Power was substituted for the previous fuel, there was an immediate slight RPM increase, the engine ran longer per tankful, and the exhaust was very cool and clean. There is no doubt in my mind that Magnum Power fuel has something that none of the other fuels has.

Very truly yours,

CUSTOM MODEL PRODUCTS  
John G. Smith  
Brockton, Mass.

For the best performance your engine can deliver, ASK YOUR DEALER TO GET

### AVAILABLE IN 5 BLENDS

- **Magnum Power 5:** 5% Nitro Methane. The best fuel obtainable for break-in, control-line aerobatics, and sport flying - Good idle. \$3.50/Quart, \$10.95/Gal.
- **Magnum Power 10:** 10% Nitro Methane. Finest extra-power all-around sport and aerobatic fuel - excellent idle. \$3.90/Quart, \$11.95/Gal.
- **Magnum Power 15:** 15% Nitro Methane. Excellent for 1/4 midget racing, helicopters, and high performance pattern flying - excellent idle. \$4.15/Quart, \$13.25/Gal.
- **Magnum Power 25:** 25% Nitro Methane. Outstanding power for 1/2A, combat, and high performance pattern flying - excellent idle. \$4.95/Quart, \$16.25/Gal.
- **Magnum Power 50:** 50% Nitro Methane. Super power wherever maximum engine performance is required. \$7.95/Quart, \$27.95/Gal.

# MAGNUM POWER

Manufactured by  
ALDRICH PRODUCTS, INC.  
exclusively for  
CARL GOLDBERG MODELS, INC.

**CARL GOLDBERG MODELS, INC.**  
4738 West Chicago Avenue • Chicago, Illinois 60651



# SUPER Scale BY DICK PHILLIPS



wonder if anyone else noticed? In the descriptions published to date covering the Tournament of Champions in Las Vegas, the apparent direction being taken by next years rules, leads me to believe that those of us into the larger models may well be leading the way. Next years judging appears to be made to measure for large, stand-off scale models with scale-like propellers turning at more or less prototypical speeds. As I read it, the judges will be looking for more realistic performance from the models and for less of pattern type flying from scale models.

This seems to have become a trend in the past couple of years where models like Bob Nelitz' Chipmunk do very well in the air, flying much as the full scale prototype rather than like a pattern ship. Dave Platt's comment reported at the World FAI Scale meet in Sweden last year, referring to Nelitz' Chipmunk, that it was nice to see a model flying on its wing rather than its propeller, was very much to this same point. I have hopes of being able to attend this years T of C especially now that it seems to be headed in this direction in pattern as well as scale.

Andy Sheber flew his 1/3 scale Pitts S2-A at the '77 T of C, and as I hear it, it was the only model flown in the high winds of the first day, estimated to be in the 50 mph range. Andy's Pitts did not score all that high, but let's face it, to have been in that kind of competition for the first time with that kind of model is in itself a bit of a triumph.

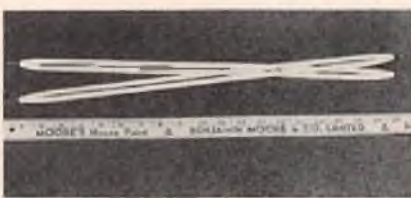
One further note, Circus Circus and Bill Bennett rate the thanks of modelers world wide for sponsoring this prestigious event. I'll be very much surprised if they do not establish this sort of flying as a spectator sport of some stature in years to come.

In my last column I covered the use of a pantograph in enlarging plans to the sizes in which we are interested. This month the third method will be the use of a set of proportional dividers. If you cull through your past issues of Model Builder, you'll find plans for a set of proportional dividers you can make yourself. They are also available as a commercial item through your local drafting supply house. The commercial

model has a vernier adjustment for setting the degree of enlargement (or reduction) but are a bit small for use in the sizes we will be concerned with and good ones are rather expensive, cheap ones are not too good. (See Photo 1.)



Basically, the instrument is a set of dividers, with an adjustable pivot point. The pivot point, or center, is adjustable in that it can be moved back and forth to establish a ratio to suit the plan being modified. The set in Photo 2 were homemade in less than an hour and should not tax the capabilities of the experienced modeler. The center slot was cut by dropping the blade of a radial arm saw through the wood (carefully!) in the correct place and then moving the wood along to the other end of the slot, the two arms are held together with a 6-32 nut, bolt and washers. There is a washer on each side and a thin spacer between the two arms for ease of swinging them in relation to one another.



The two parts are held together by this nut and bolt set-up, but, the nut and bolt can be moved along the open slot to establish the ratio desired between the ends. Once tightened down, the nut and bolt will hold the setting, but permit the two arms to be swung in relation to one another without disturbing the setting.

It's not a bad idea to mark out both ends of the dividers on the work sheet before you start, just in case you disturb the setting you can re-set it without having to re-measure. With a convenient reference handy, they can be checked or re-set from time to time without the annoyance of having to re-measure each time this is done.

I always use a reference line on the

original from which to work. The thrust line marked on the original plan works fine, a line drawn through a wing from tip to tip, or the parting line of a fin and rudder or stab and elevator is quite adequate for this purpose. I then lay out the same line on the new drawing material and use this as the same line on the enlargement.

On a fuselage, the former stations can be laid out with the dividers in their appropriate places. For example, when enlarging a plan to twice it's original size, the dividers will be set at 1:2 and we step off the distance from the firewall to the first former on the '1' end of the dividers, then reversing them, we step off the appropriate distance on the new plan using the '2' end. The various stations can then be plotted by repeating this process until they are all marked on the new plan. We can then use the dividers to establish the height above the reference line of all stations, and likewise the distance below the line at each station. If necessary for accuracy, it is possible to insert dummy station lines between formers in order to give us additional points to establish the fuselage outline. These may or may not be necessary, depending on the complexity of the plan and the skill of the planner! As with any plan, once a sufficient number of points have been plotted, the points may be joined using french curves etc., in order to establish the outline.

The above process is repeated for all parts of the plan until it has been completed. Straight lines may be measured with a rule in the usual way, but should be checked with the proportional dividers from time to time in order to assure accuracy. When a fuselage side is constructed of framed square stock, the lines indicating the square stock are usually straight so they can be measured and laid out with the rule, no need to make things any more complex than necessary! Naturally, you'll want to use the dividers for odd-ball ratios other than 2:1, 3:1, etc.

Doing a plan in this way produces a finished product from which to build in the usual manner. As mentioned in a previous column, if you produce your plan on tracing linen or mylar, it can then be inked for duplication any number of times. Enlarging your own plans, as pointed out previously, will require

to page 19

# ED WISSER'S AMAZING SMITH MINIPLANE WINS AGAIN

Captures 1st Place in Non-Military Scale  
at the Toledo R/C Exposition !

Ed Wisser, scale-master of McKeesport, PA, continued his sweep of the 1978 eastern-states static shows by winning at the prestigious Toledo Weak Signals Exposition with his Smith Miniplane. Built from the Sig kit with many fine scale details added, it is a real show stopper. We'll let the photos of the model speak for themselves - at least a thousand words for each one!

Here is the complete record of trophies:

- 1st NON-MILITARY SCALE . . . TOLEDO R/C EXPOSITION  
Toledo, Ohio
- 1st R/C SCALE . . . . . NATIONAL MODEL PLANE SHOW  
Cleveland, Ohio
- 1st & BEST OF SHOW . . . . . GOODYEAR MODEL AIRCRAFT SHOW  
Akron, Ohio
- BEST OF SHOW . . . . . "HALL OF FAME" R/C SHOW  
Canton, Ohio

SMITH MINIPLANE - KIT RC-38 - \$49.95



## PLAN TO ATTEND SIG'S INTERNATIONAL MINIATURE AEROBATIC CHAMPIONSHIPS FOR AEROBATIC BIPLANES AND MONOPLANES - JUNE 17 & 18, 1978

SKYBOLT - KIT RC-34 - \$62.50

AN IDEAL IMAC ENTRY



**5 EVENTS:**

- BIPLANES - SPORTSMAN CLASS \*
- BIPLANES - ADVANCED CLASS \*
- MONOPLANES - SPORTSMAN CLASS \*
- MONOPLANES - ADVANCED CLASS \*
- SPECIAL ADDED EVENT FOR MAMMOTH  
SCALE AEROBATIC MONOPLANES AND  
BIPLANES COMBINED - NO ENGINE LIMIT

\* EVENTS LIMITED TO BELOW .61 CU. IN.

SIG FIELD Montezuma, Iowa  
(1-1/2 Miles South on U.S. Highway 63)

AMA SANCTION # 275

NO ENTRY FEE

PRIZES FOR ALL CONTESTANTS



Full-Size Aerobatic Demonstration  
by the SIG MINI AIR FORCE -  
SUNDAY NOON!

For More Information, Contact:  
Mazey Hester, Contest Director  
Box 368, Montezuma, Iowa 50171  
PH: 515-623-5154, 623-5157 or 623-2194

**1977 AMA/IMAC RULES WILL BE USED**

**SPORTSMAN CLASS SEQUENCE**

1. INSIDE LOOP
2. ONE ROLL
3. ONE SPIN
4. HALF CUBAN EIGHT
5. IMMELMAN TURN
6. HALF REVERSE CUBAN EIGHT
7. ONE INSIDE SNAP ROLL
8. SQUARE INSIDE LOOP
9. ONE FREE STYLE MANEUVER
10. PRESENTATION

**ADVANCED CLASS SEQUENCE**

1. 45 DEGREE CLIMBING SNAP ROLL
2. HAMMERHEAD
3. REVERSE SPIN -  
ONE TURN EACH WAY
4. OUTSIDE LOOP
5. SLOW ROLL
6. INSIDE LOOP - SNAP AT TOP
7. KNIFE EDGE FLIGHT
8. 4 POINT ROLL
9. TWO FREE STYLE MANEUVERS
10. PRESENTATION

120 DEGREE AEROBATIC ZONE.  
10% SCALE BONUS APPLIES FOR BIPLANE EVENTS.

Monoplanes must be a stand-off or full-scale copy of an aerobatic aircraft that was designed for and flown in full size competition aerobatic "box". Contestants must furnish proof of the aircraft's identity and connection with full-size aerobatic competition.

SEND A SELF-ADDRESSED, STAMPED ENVELOPE FOR A COPY OF THE RULES THAT WILL BE USED AT THE CONTEST.

See your dealer first! To order direct, add \$1 postage under \$10, postage free over \$10. No C.O.D.

# SIG MANUFACTURING CO., INC. . . .

# LEARN TO FLY RC THE SIG WAY

## WHY RUDDER CONTROL?

Some expert fliers think beginners should learn to fly by starting with an aileron-controlled model. Maybe this will work out if an instructor pilot is available to make the takeoffs and landings and stand by every minute of a flight, ready to take over if the student gets disoriented, until his pupil gets skilled enough to manage by himself. But this process takes a lot of flights. Most beginners do not have someone willing or able to spend so long a time with them.

We think a stable, rudder-controlled model is a lot less likely to get a novice into trouble from overcontrolling or not controlling. If the flier freezes up momentarily and can't decide what to do next, a flat bottom sectioned, high wing model—like the Kadet—will right itself, or partially do so, if the sticks are allowed to snap back to neutral, giving him time to think. Most aileron-controlled models need immediate and proper corrective control movement to make them recover, an automatic reaction that a beginner has not yet developed.

Many club instructors and hobby dealers have told us that two or three check-out flights on a Kadet are sufficient to allow a student to practice fly and learn without constant attention. And we know of modelers in isolated areas, with no one to help them, who have taught themselves to fly with the Kadet.

So remember—you may dream of darting around the sky with a sleek P-51, but first you must have some flying time with our boxy buddy, the dependable Kadet. It's the standard trainer—nationwide!

## STEP 1 BASIC: Start With Rudder Control



# KADET

Designed by CLAUDE McCULLOUGH

LENGTH: 42 in.  
WING SPAN: 57 in.  
WEIGHT: 4 Lbs.  
ENGINES: .19 - .35 Cu. In.  
FOR 3 CHANNEL RC EQUIPMENT

\$34.95



KIT NOW INCLUDES BEGINNER'S CHECK LIST AND FLYING HINTS.

## STEP 2

### INTERMEDIATE: Progress To Ailerons

Balsa Rib Construction Wing Featuring Built-in Washout *or*

Larger Sized Model - Foam Core Wing with Built-in Washout



WING SPAN: 55-1/2"  
ENGINES: .29-.40

# KAVALIER \$39.95

Designed by CLAUDE McCULLOUGH

When the student pilot feels secure flying the Kadet and can handle it capably, he is ready to take the next step. The Kavalier has a special wing design, calculated to make this transition easier. The precise amount of incidence change required to help eliminate tip stall is automatically incorporated as the wing is built in the usual way on a flat surface. In addition to this aid to stability, differential movement aileron horns are furnished in the kit, providing less down and more up travel on the ailerons. Adverse yaw in turns is reduced by this simple method and controllability of the model is greatly improved. Find out what smooth flying really is with the Kavalier.



WING SPAN: 62 in.  
LENGTH: 44 in.  
WEIGHT: 5-1/2 Lbs.  
ENGINES: .40 - .50 Cu. In.



# \$39.95 KOMANDER

Designed by CLAUDE McCULLOUGH

Specially designed for novice RCers who want to move up from simpler models or prefer to start with an aileron controlled airplane. The built-in stability, coupled with good maneuvering and aerobatic ability, allows rank amateurs and low-time fliers to do a creditable job. Piloting boners that would clobber other airplanes are readily forgiven by the Komander. It will fly right down to the full stalling point without snap rolling or falling off on a wing. This enables slowed down, nose-high landings to be made. Coupled with the shock absorbing qualities of the wing mounted gear, the superior ground handling characteristics make this a fine performer from rough or grass fields.

## STEP 3

### ADVANCED: Move Up To Aerobatics



Foam Core Wing with Washout



\$44.95

ENGINES: 40 to 80  
WING SPAN: 51 in.  
WING AREA: 550 Sq. In.  
LENGTH: 45-1/2 in.  
WEIGHT: 5-1/4 Lbs.

# KOUGAR

Designed by CLAUDE McCULLOUGH

After some flying time on the Kadet and the Komander, the student will be ready for this sleek stunter. The Kougar is a carefully tailored design that will do every stunt in the book—even the lomcevak—and yet is not difficult for low-time pilots to handle. The wash-out incorporated into the foam wing allows the model to be slowed down to a walk for the landing approach and flared onto the runway in a main-gear first touchdown without undue stalling or snap rolling tendencies. The large amount of wing area for the 51" span keeps the wing loading low and aids handling characteristics. The Kougar is highly recommended as an introduction to low-wing flying and AMA pattern competition.

## STEP 4

### EXPERT: For The Graduate Flier



Foam Core Wing

Plywood Skin Balsa Skin  
\$51.65 \$47.25

WEIGHT: 6-1/2 - 7 Lbs.  
ENGINES: .45 - .60 Cu. In.  
WING SPAN: 67 in.

# KOMET

Designed by MAXEY HESTER

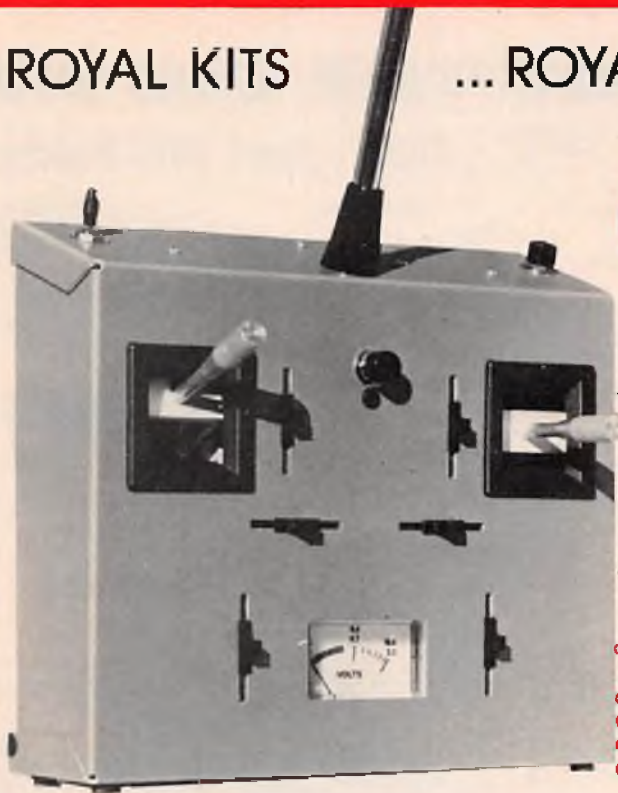
In the Komet, Maxey Hester has created a pattern ship that meets the requirements of the most demanding competition flying, yet is equally at home at a Sunday afternoon sport flying session. As in the Kougar, construction is speeded and appearance improved by a formed plastic top made from ABS plastic that is easy to glue and easy to paint. It carries no load and serves only as a streamlined fairing on top of the rugged balsa box fuselage. Featuring a foam core wing, this big kit takes only a short time longer to build than one of the so-called ARF (almost ready-to-fly) types and results in a durable aircraft with lower wing loading and higher flight performance, at a lower cost.

PLACE YOUR ORDER NOW FOR SIG'S LATEST COMPLETE CATALOG - \$1.50 POSTPAID

# 401 S. Front St. Montezuma, Ia. 50171

ROYAL KITS

... ROYAL QUALITY



# omega 7-channel TRANSMITTER KIT

The Royal Omega 7-channel transmitter kit is precision engineered and performance proven - at a price that makes sense . . .

- Separate RF board - field changeable
- Encoder - linear ramp
- Non-linear controls
- Two programming buttons
- Metal gimbals
- Optional mixer for elevons/flaperons
- Servo reversing direction switch
- Expanded scale voltmeter
- Optional timer

**WRITE TODAY FOR INFORMATION, OPTIONS AND PRICES**

## TACH-TRON

MAIN ROTOR GOVERNOR FOR COLLECTIVE PITCH HELICOPTERS

Tach-Tron constantly monitors main rotor RPM and automatically adjusts throttle servo to maintain constant RPM for the most precise hovering you've ever experienced. Each Tach-Tron is engineered specifically for YOUR equipment.



**KIT AS LOW AS 28<sup>00</sup>**

Write for detailed description and ordering information.

## PRO TACH



An easy-to-build, easy-to-use tachometer kit that gives superior accuracy and readability over full range of engine RPM and light conditions.

Includes: all parts, case, standard meter, switches, built-in battery check and easy-to-follow instructions

**59<sup>95</sup>**

Fully assembled and calibrated: \$89.95

## MODEL 250 VARIABLE CHARGER



Charge rate can be adjusted from 15MA to 250MA by knob on front panel. Chart supplied lets you set the proper charge rate to the MA/hr. capacity of your NiCad battery.

**15<sup>00</sup>**

## 1/2A 2-channel RECEIVER



Lightweight (1.1oz.), low drain (7.5 to 9.5MA) and small size make this the flyingest 2-channel receiver to come along in years. Put the fun back in R/C with the Royal 2-channel 1/2A Receiver.

**INTRODUCTORY PRICE 22<sup>95</sup>**

Complete kit less connectors

\*U.S. Patent pending. Designed by Al Irwin.

CANADA:  
Ron Shettler Enterprises  
Pottery Road, RR3  
Vernon, BC, Canada  
V1T6L6

use your **MASTERCHARGE**

# royal

**ELECTRONICS CORP.**

3535 S. Irving  
Englewood, CO 80110  
303/761-5960

or **BANKAMERICARD**

providing yourself with drawing instruments, T square, triangles, a good assortment of french curves and the related items required to produce good drawings. If you design your own models or enlarge plans for your own use, these items will become part of your standard hobby equipment and your skills will improve with practice. The ruling pen can subsequently be used to detail a model as well, laying out panel lines, doors, access panels and so one. A lettering guide is a valuable tool as few of us can letter perfectly free hand and properly noted plans have a finished look which is lacking when we use our normal scrawl. Lettering guides in various sizes are in-expensive as are the tools required to ink the lettering.

As with any 'do it yourself plan', be sure to make best use of the space by laying everything out in advance. You should also 'try fit' the parts as construction proceeds. It is not unusual to find minor discrepancies as you go along. However, be sure you make the alterations in the plans as these changes are made. You'll never remember them if they are not done as you go along, and no one needs a plan that cannot be built!

Naturally, you'll need an area spacious enough to spread out the enlarged plan and this can require a lot of room. I have a few plans which are so large that it is difficult for me to have the plan laid out and find room enough in my relatively small shop to build it as well.

In the case of a very large plan, you will find it convenient to roll the material on which you are working at each end of your drawing table, and then use the T square along the bottom of the board laying the triangles up to the square as usual but working at right angles to the 'normal' method.

When you get to the building part of the larger models, things are going to be a bit different from what you are used to. For one thing, that old building board is probably not going to be large enough for some of the larger plans now becoming available. Since starting in on the really big birds, I have been building on a door, and before you have visions of trying to build on the door to the bathroom, let me add that the door I have been using is one I bought especially for a building board. If you watch your builders supply ads you'll likely find, as I did, they frequently have damaged Mono-doors which are sold at special prices. The damage is usually only on one side or along the edge of the door and this does not interfere with its use for building. The surface of the door is light mahogany plywood laid on a

wooden core or framework and will take pins quite well. It will be long enough for all but the very largest models. These are absolutely flat, quite light and can be stood up out of the way while you wait for the glue to dry.

When enlarging a plan from a smaller, currently available plan up to the sizes we are interested in, (i.e., 3" to the foot) you'll probably be using materials other than balsa in the construction. It is rarely necessary to enlarge the size of material used in the same ratio as you enlarged the plan. For example, if the original construction was quarter square stock, don't go to half inch material for the larger model. Rather, use quarter square, but go to another material. Using spruce in place of balsa in this instance will rarely require larger wood. Just use quarter square in a stronger material.

This is meant as a guide only as there may be highly stressed areas where you feel the larger stock would be wise and this is where your own judgement will come into play. I tend to go a bit huskier than is really necessary for my own peace of mind, but remembering that I want the thing to fly and it will only do that if the weight is right.

As far as weight is concerned, you'll find many of your ideas will change as you get into building larger models. The wider wing chords and deeper airfoils will lift a lot more than their mere size would indicate. Doubling the dimensions of a wing will quadruple its cubic capacity and increase its lift. Dave Platt suggested in a recent article that 5 cubic inches to the ounce is about right, but in the larger models this can be reduced quite successfully to almost half that figure. For example, my J-3 Cub weighs in at 16 pounds for 19 ounces to the square foot wing loading and a friend here has a nine foot DH Beaver approximately the same size, which comes in at around 37 ounces to the square foot. The take-off run on these models at a full Quadra power is 32 feet for the Cub and 35 feet for the Beaver, so the weight and wing loading have not made a significant difference in performance. In this type of model (high wing-flat bottomed airfoil) you'll be surprised how quickly they get airborne and how they want to float on landing. Ground effect as they flare is also quite noticeable and flaps make a significant difference in landing speed, although they are rarely necessary in the larger models of the high wing/high lift variety.

I have had a few comments about my Cub weighing as much as it does. As mentioned earlier, I tend to over-build a bit, to err on the side of strength as the engines I have been using (Quadras) have amazing power and their vibration is of a lower frequency than glow engines so I have concentrated on strength as weight reduction is not as important a consideration as it might be in a smaller model. Up to around the 20

pound weight (depending on the type of wing being built) weight is of less importance and I'd much rather have a bit too much strength than any too little.

In actual construction, I have been taking a leaf from the EAA's book and have added gussets to all joints, in both fuselage top and sides. That is to say, when building the usual framed fuselage, I gusset each joint on the inside of the side framework with 1/32 or 1/16 plywood scraps. Then, when adding the top and bottom cross members, I gusset them as well, back and front and both sides. In this way I'm assured a much stronger and more rigid joint and provide significantly greater gluing area as well. Our usual butt joints is all right for the smaller models with higher vibration frequencies, but I feel a lot safer my way, especially when that big bird is up in the air. Photo 3 illustrates the gussets used on a scratch built Mr. Mulligan from Bud Nosen plans. (Okay, purists, it's not really scratch built as it isn't my own plan, but it isn't from the kit box!) The addition of all these gussets does add to the time required to build, but it's worth it in the sense of security it provides.



Firewalls for the larger engines should be doubled from the original plan. This is particularly necessary if you are to use one of the larger engines. I prefer half inch aircraft grade plywood. This adds a bit of extra weight forward as does the engine. The Quadra weighs in at 3 pounds, plus or minus, and it needs a bit more behind it than your average glow engine. This applies to balance of the model as well, with that extra weight up front you can afford extra weight in the tail feathers and this will allow sturdier construction that might be normal in a smaller model.

In future columns, I'll be covering some of the methods we have been using to mount these larger engines and which have, to date, stood the test of some considerable flying.

Control surfaces on these larger models present some problems, they are a good deal larger than we are accustomed to and present a heavier work load (and therefore higher current drain) to a servo. I have been using standard EK SM servos to date and they have proven adequate to the job. It is a good idea to use a servo on each aileron

to page 162



## Cap'n Dicks Cockpit BY DICK BRADFORD



Those Winnipeg boys like RCM (especially the cover) — from L to R; Leo Menard, Bill Heywood, Ross Taylor and Danny Pethrick — note the two Proctor Bipes under construction.



Bill Heywood (L) and Danny Pethrick (R) building twin Antic Bipes — Ross Taylor (far left) lends a hand — these boys have been building together every Friday night for years.



L to R — Leo Menard, Ross Taylor, Bill Heywood checking Antic Bipe plans — note the beautiful Stand-Off Scale ships overhead — Dan and Bill build two of everything.

● "ATC clears flight 715 present position INS direct Winnipeg — maintain flight level 390."

That's good — a direct clearance will cut a few minutes off the flight plans and get us into Winnipeg early. Ross Taylor, the Trans Air maintenance crew chief at Winnipeg International Airport, will be waiting for me at the hotel. He says he's got some club members for me to meet at a weekly 'building and bull' session.

It was one of those typical February evenings in Manitoba — 22° below zero — clear as a bell, with the aurora borealis blazing away overhead.

During the drive to Dan Pethrick's home (our host for the evening), Ross told me a bit about R/C in Winnipeg.

"The Winnipeg Radio Control Club (WRCC) has about 80 active members. The club started as MALM (Model Aircraft League of Manitoba), but evolved into WRCC about 10 years ago. We're associated with MAAC (Model Airplane Association of Canada), the equivalent of your AMA."

I was especially interested in Ross' comments on the club's flying facilities and interests.

"We have a 3 runway paved model airport 15 miles south of Winnipeg; also, the sport fliers have the unlimited use of Marcel Tailliau's (a local contractor) private grass strip 4 miles west of town. All Marcel asks is that we clear the field for him when he lands his full scale Cessna. The club is heavy on 15-500 pylon, pattern, world class scale, and sailplanes — — — and there are a lot of sport fliers like the two you're going to meet tonight. These boys are super model builders — — — they don't enter contests any more — — — too hectic — — — simply do it for fun and fellowship."

I found out that R/C gear costs the Canadians about 30% more than their American cousins pay. They have access to just about everything we do, and (of course) R/C Modeler is their favorite magazine (especially the cover).

Danny Pethrick and Bill Heywood have been building and flying together for more than 30 years. They have every Friday night set aside for a building session; and the door and refrigerator are always open for friends. This night,



Dan's SE-5 and Spitfire, E.K. Radio, both use Veco .61.



Dan has a fantastic collection of plastic scale models — uses these to help in detail work on R/C projects.



Dan's radios in front of his plastic scale collection.

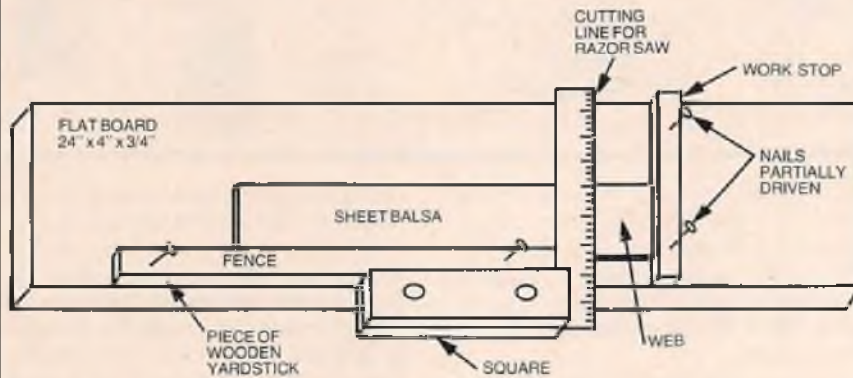
Leo Menard had dropped by to 'kibitz' a bit.

Twin Proctor Bipes were under construction on Danny's table. It seems that over the years, Bill (a modeler since the early 30's, and an aircraft fabric worker by trade) and Dan build twin ships — two of everything. Currently in their stable are two Sterling Spits, two

to page 161

# MULTIPLE PART CUTTING JIG

By William R. Shirley



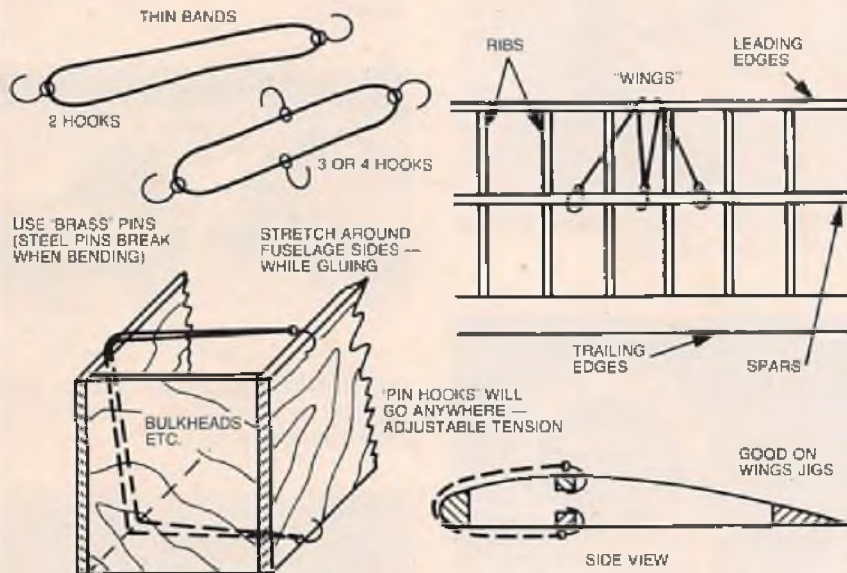
Scratch builders faced with the tedium of cutting multiple, identical parts like webbing for wing spars, may be interested in this simple, temporary cutting jig. If you regularly scratch build, a flat piece of 1/2" or 3/4" plywood could be substituted for the scrap board shown in the sketch.

Assemble the parts with small nails, leaving the heads protruding so that the parts may be relocated; the work stop to control the length of the parts to be cut, and the fence to establish a new cutting line when the cutting board surface inevitably becomes slotted from the razor saw.

The fastest way to set-up for a cut is by placing a flat metal ruler in place under the square, then locating the position for the stop by reading the proper dimension on the portion of the ruler extending past the cut-off line. Cut one trial piece and measure it carefully before manufacturing a whole batch.

# MAKE YOUR OWN MODEL CLAMPS

By D.B. Mackay



Model clamps come in all sizes and varieties, but none are made so versatile as to fit every need. This idea will fill in the gaps and is also quick, economical, and inexpensive to make.

Take an assortment of small to medium size rubber bands, then bend "brass pins" to a hook shape. Put two or three hooks on a band.

To use, just place one hook at the desired location and stretch the band around and hook the other end on the other side of the structure. The tension will hold the parts together while the glue sets up. The sketches will give you some ideas as to uses. You will find many more uses for them once you start to use them. They are a real help when assembling fuselage and wings. Try them — we think you will like them.

SPECIALIZING  
IN  
RADIO  
CONTROL  
AIRCRAFT

# MARK'S MODELS

P. O. Box 2134  
Escondido, California 92025

## MODEL AIRPLANE KITS FOR THE MODELER

57 years of combined building and flying experience have gone into the design of each airplane in the Mark's Models line. Our active participation in both sport and competition flying assures the modeler he is purchasing a proven practical airplane. See these fine kits today at your local hobby shop. Send stamped, self-addressed envelope for free catalogue.



\$32.95

## Windward

Wing Span ..... 72 in.  
Wing Area ..... 532 sq. in.  
Weight ..... .24 oz.  
(With 2-channel radio)

\$44.95



## Windfree

Wing Span ..... 99.25 in.  
Wing Area ..... 555 sq. in.  
Weight ..... 29 oz. (Ready to fly)



# Hover



**T**he NRCHA Nationals will be at Columbus, Ohio July 21st, 22nd and 23rd and, as this is being written, the location is tentative but not official, so when you read this if you have any questions call or write Dwyane Stephens, 5911 Olentangy River Road, Worthington, Ohio 43085, Phone (614) 846-7495 (home) or (614) 297-2204 (work). Dwyane is the C.D. and will be able to answer any questions you might have.

In trying to put together a contest to select an overall champion, which

encompasses all types of flying, I'll try to list most of the proposed tasks so you can be practicing to do your best. The contest will have a variety of types of helicopters flying and, after reading some of the tentative tasks, you'll see what I mean.

Starting with Novice; the complete Novice division will fly the AMA Novice rules which is a series of lift off and hovering and landings. The AMA Novice flying is designed to be challenging enough, but not too much for the guy just starting.

Sportsman division will be required to lift off to a hover for 15 seconds, then proceed to prescribe a constant heading

Figure 8, ending with a landing. Then lift off and a climb out into a procedure turn to the left or right at pilot's option, then into a large 360 flying circle, then to a large square procedure approach and descent to a landing. After the landing, a lift off and proceed to the precision gates. For the Sportsman class there will be three sets of three gates. The first set of three gates will have 6' total rotor clearance and each gate will be placed

to page 158



D.C.'s new Jet Ranger with the new HP Gold Cup Series .60.



Both 3" and 4" Angleometers as used to check and set pitch.



3" Angleometer used to level flybar and level the machine for accurate checking.



New head on D.C.'s Jet Ranger where the mixing levers have been eliminated for a cleaner more scale appearance.



D.C.'s transmitter trays shown with Variant transmitters - details of construction in text.



3" and 4" Angleometer along with X-Acto clamp, available at Sears.



Close-up shot showing how to properly use 4" Angleometer and X-Acto clamp.



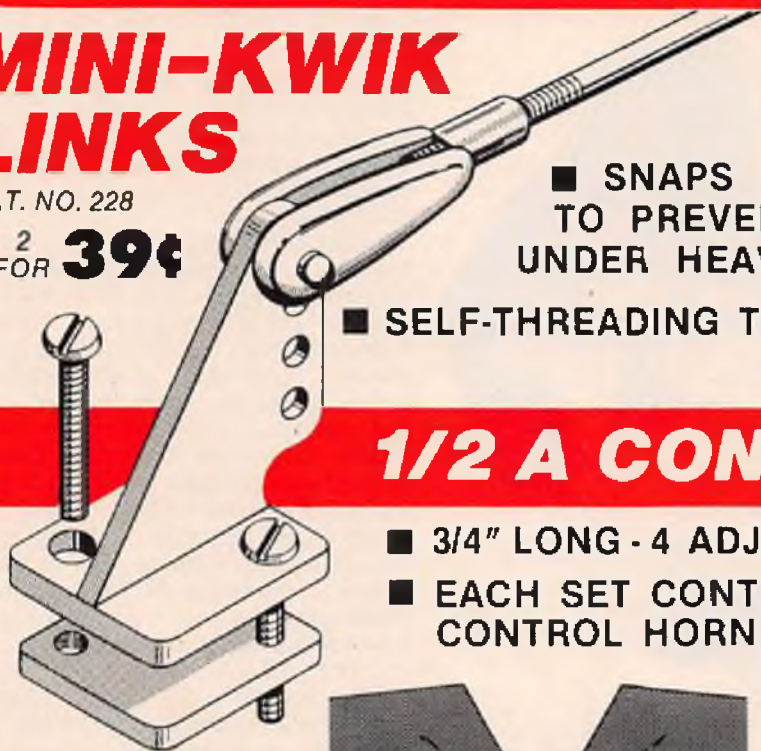
Schluter Bell 222 Scale Fuselage clear plastic with lots of molded in detail for mounting on Heli-Boy, \$89.95.

# NEW DU-BRO 1/2 A MODEL ACCESSORIES

## MINI-KWIK LINKS

CAT. NO. 228

2  
FOR **39¢**



CAT. NO. 107

2  
SETS **49¢**

■ SMALL AND STRONG - ONLY 3/4" LONG!

■ SNAPS SHUT AND LOCKS IN PLACE TO PREVENT ACCIDENTAL OPENING UNDER HEAVY STRESS LOADS

■ SELF-THREADING TO FIT 2-56 RODS OR COUPLERS

## 1/2 A CONTROL HORNS

■ 3/4" LONG - 4 ADJUSTMENT POSITIONS

■ EACH SET CONTAINS 1 RIGHT AND 1 LEFT CONTROL HORN FOR SAFER INSTALLATIONS



ENABLES YOU TO MOUNT A HORN SAFELY ON EITHER SIDE OF ELEVATOR WHILE KEEPING THE MOUNTING HOLES FURTHEST FROM THE EDGE

## MINI-NY-STEEL PUSHROD ASSEMBLY



- NO-SHRINK, NO-STRETCH, FREE RUNNING PUSHROD ASSEMBLY - PERFECT FOR 1/2 A AIRPLANES. LIGHTWEIGHT, FLEXIBLE AND STRONG
- TRIM SETTINGS ARE NOT AFFECTED BY WEATHER CONDITIONS
- NEW SPRING-THREAD COUPLERS AT BOTH ENDS FOR MICRO TRIM ADJUSTMENTS (SEE OTHER SIDE) CAT. NO. 113 2 COMPLETE SETS **\$1.49**

## MINI-KWIK-LINKS ON 12", 2-56 THREADED RODS

SKIN PACKED 5 PER CARD  
CAT. NO. 230  
BENDABLE AND STRONG  
5 FOR \$1.39

AVAILABLE SEPARATELY  
PACKAGED 18 PER TUBE  
CAT. NO. 229 ONLY 29¢ EACH  
TUBE PRICE \$5.22

ALSO  
AVAILABLE

**DU-BRO PRODUCTS, INCORPORATED**

# HERE'S HOW

## THE RC FLIGHT SIMULATOR



*Dale Heuberger  
and the RC  
Flight Simulator*

**T**his month's Here's How is a switch from my usual how-to format. I ran across this neat little RC Flight Simulator and felt it was well worth passing on to all you readers out there. I have never seen anything like it in my years as an RC'er, and feel it has much to offer those who want to know more about RC flying before investing a pile of money. I think you will agree, after looking it over, that it's certainly unique in its reflection of what really happens in RC flight. Of course, seeing the actual operation of the simulator will convince you further. I was completely amazed when I took hold of the controls; however, let's back up to the beginning and learn how it all came about.

Bremen, Indiana is a small farm community located in the northern part of the State. As you enter the city limits a big sign indicates, in very large letters, that this is the home town of Governor Otis Bowen, the current governor of the State. Bremen is also the home of Dale and Martha Heuberger, owners of one of the most complete RC hobby shops in the area. The hobby shop is better known as Heuberger's. Modelers from as far as forty miles away stop in at Heuberger's for their needs. And they can be sure that the latest RC items in demand will be in stock for their inspection. Heuberger's are proud of this fact and take special pride in

keeping abreast with our great hobby/sport. It is something special to enter their shop and find two people so completely on top of their job.

Many potential RC'ers come to Heuberger's to find out what it's all about, and, Dale spends considerable time giving them some idea of what to expect. However, the prospective RC'er is soon overwhelmed and somewhat frustrated after viewing the many different radios, kits, engines and hardware now available on today's market. Realizing that more information was needed and this was a serious problem, Dale began to look for a way to demonstrate the "feel" of actually flying an RC airplane.

This would give the newcomer a fair idea of the flying aspect and what to expect should he decide to become an active RC'er. Dale reasoned that an RC Flight Simulator (RCFS), coupled with the experience of a seasoned RC'er, would certainly be a valuable tool to convey additional information to the newcomer.

Over several months the idea of the flight simulator began to form in Dale's mind. At first it seemed quite simple but, as more functions were added, the project became complicated and cumbersome. Keep in mind that each function must be accompanied by control reaction on the simulator. For example, when up-elevator is applied on

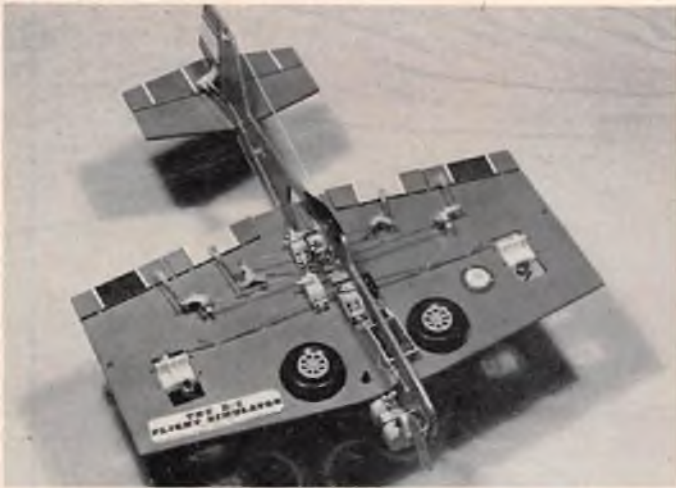
the transmitter, the flight simulator's elevator will move up and the simulator itself will pitch upward and show the direct relationship of action from control reaction. Perhaps you can now better understand how hard it was for Dale to keep things on a simple basis.

Let's take a look at Dale's RCFS and see exactly what it does. First and foremost, the RCFS demonstrates the actual characteristics of a model flight, visually and mechanically. Because of its open construction, it gives on the spot visualization of both RC mechanics and RC function.

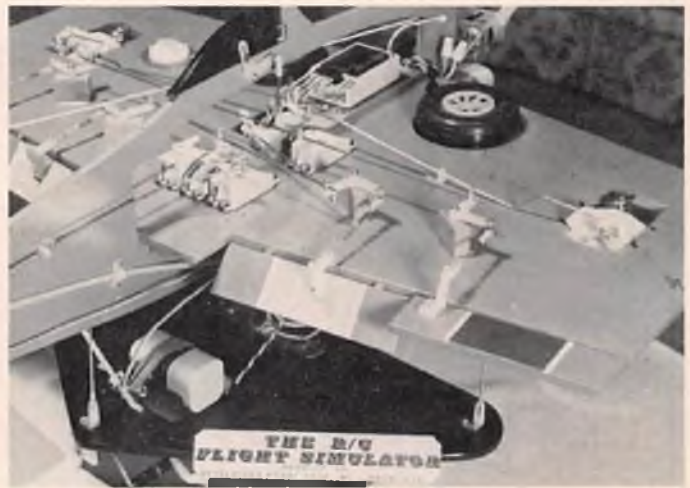
The RC function is very evident as one operates the control sticks on the transmitter. There are three main functions; roll, yaw and pitch. For you beginners, that's aileron, rudder and elevator. Remember, as the control surface moves the simulator reacts to that particular control. Then, engine throttle. To simulate this aspect, Dale installed a small electric motor and prop with a speed control. As the throttle stick is advanced the rpm on the prop increases proportionately. With the throttle all the way back, the motor is turned off. Flaps and retracts make up the additional two channels. These are not normally needed to fly an RC airplane but add to the overall realism and glamour of the Flight Simulator. When the flaps are lowered, the canopy slides back simulating a dual function with one servo. And, watching retracts go up and down can also intrigue the newcomer as to what is available and what can be done.

All of the control rods are plainly visible, and demonstrate typical hook-ups from servo to control surface or other functions. With all the pushrods in plain view, the beginner has very little to imagine with regard to control hook-up.

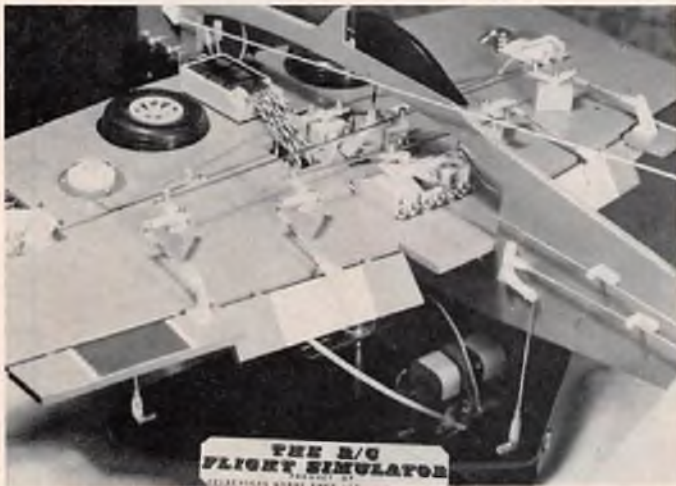
Although the Flight Simulator is at home in the hobby shop, it shows its true value when taken to an RC show, or flight demonstration. Wherever there is a large crowd of people at one of these shows, you will find them gathered around Dale and his Flight Simulator. When demonstrating the RCFS to a large crowd, the buddy box is employed. Generally, it works this way. The battery is removed from one transmitter and that transmitter is fastened to a stand. This eliminates the danger of someone dropping it. And, without a battery it doesn't matter if they turn on the switch. The buddy box is placed out front, close to the Flight Simulator. Dale operates his transmitter and has control of the buddy box. This allows the interested spectator to operate the Flight Simulator. In this way, Dale has perfect control at all times with no chance of accident. This method



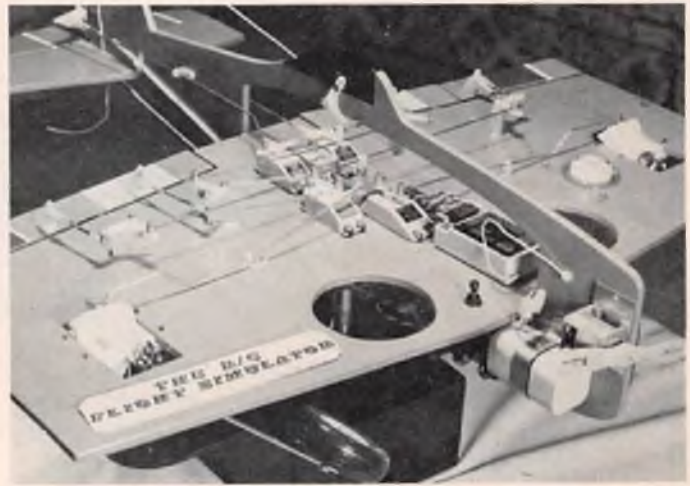
Overall view of Flight Simulator. All flight control surfaces are color coded to further aid visualization. Entire Simulator is made of aircraft plywood and painted.



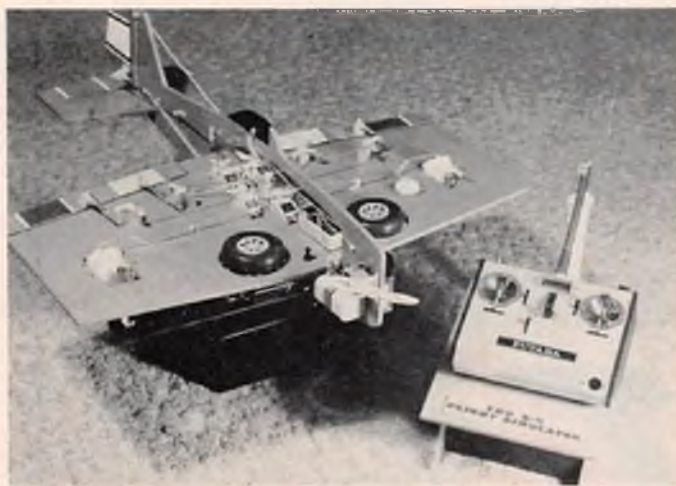
The Flight Simulator with flaps extended. Receiver power supply is mounted on the base for ease of accessibility.



Left side view. Note center bubble level mounted on wing denoting level flight. Bellcrank mounted on side of fuselage transmits pitch action from elevator. Canopy is open with flaps extended.



Retracts are headed down. Receiver on-off switch located in front (Du-Bro). Battery mounted in front is power supply for electric motor and speed control operated by the throttle stick on transmitter.



When demonstrating Flight Simulator, transmitter is mounted on stand and used as a buddy box. Control is given over to student from the transmitter held by instructor - the buddy box method.



The R/C Flight Simulator at half throttle, full right aileron and full up elevator. A small light on each wing tip blinks on and off to let you know it's ready for action.

# Pity the poor guy who hasn't tried Super MonoKote™ and EconoKote™



If you're tired of the fuss, mess, bother and hair-pulling you get from painting, now's the time to switch. The next time you want a really great looking bird but want it faster, easier, stronger, and lighter, remember these winning ideas from Top Flite.

## ● Super MonoKote

There are a lot of good reasons more modelers choose SUPER MONOKOTE than any other iron-on covering. Super Strong Yet Lightweight — Long Lasting — Fuel And Moisture Proof — Puncture Resistant — Odorless — Won't Induce Warping — Quickly Cleaned — Built-in Finish — And A Wide Selection Of Colors To Choose From.

## ● EconoKote

The perfect companion to Super MonoKote, ECONOKOTE has many of the same outstanding features but, since it requires a lower iron-on temperature, it's the perfect covering for foam wings. EconoKote is an excellent trim material for any covering or finish. Its easy handling also makes it ideal for covering fuselages and other

compound curved surfaces . . . and EconoKote's low cost is a real advantage, too.

## ● Trim Sheets & Markings

With MonoKote self-sticking TRIM SHEETS and MARKINGS you can finish off your planes with all of the beautiful detail you want without countless hours of painting and masking.

## ● Irons & Heat Guns

For the best and most professional looking finish possible apply Super MonoKote and EconoKote with a Top Flite IRON and HEAT GUN. Both work great on other heat sealing coverings, too.

More good reasons why Top Flite continues to be the choice of champions.



Top Flite Models, Inc.  
1901 N. Narragansett Avenue  
Chicago, Illinois 60839



*This was Toledo 1978 --- a seething mass of R/C enthusiasts --- jamming every booth, buying everything in sight -- and a half scale airplane hovering overhead.*



*Romey Bukolt with Concept Models' 1/4 scale Fleet Biplane. So realistic, I wished I could shrink down to 1/4 scale and get in and fly it!*

**M**r. Dum-Dum lives! As you may recall, I was beginning to wonder, since the letters were pretty slow in coming. But my faith is restored; there are still a lot of you out there who manage to screw things up like I do. But, when I do it, I really get things backwards. Reminds me of a story -- which I'll clean up a bit, but you'll get the idea.

Seems there was this aspiring young actor, who was making some progress in the local Little Theater group. He'd studied hard, learned how to paint scenery, move sets, get the lighting arranged for scenes, and that sort of thing, but he just seemed to choke a bit when he tried to say his lines. After awhile, though, the director felt sorry for him, and gave him a very simple speaking part --- one line. He was to come in from the wings, stop, cup his hand to his ear and say "Hark! I heard a pistol shot!"

So he rehearsed, and rehearsed, and rehearsed some more. He was letter perfect. Came opening night; the play was going great. There was his cue! He rushed on stage, cupped his hand dramatically to his ear, and cried "Hark! I heard a shistol pot! Ah-h, I mean a shotstol pit --- postle shot! Oh, M---! Horse spit, Bullshot! I didn't want to be an actor anyway!"

Well, did you happen to read my column about 1/2A engines, in which I pontificated on throttles, their pros and

cons, and wound up telling you which one was the best I had found --- at least for me? So, what did I do? I extolled the virtues of the "Hotchkiss" throttle. No sooner than the magazine hit the stands, but only a split second later, I got phone calls and letters asking, "Where can I get that throttle?" Mr. Dum-Dum strikes again --- what I really meant was the Hiscott throttle! Boy, it's a good thing I wasn't as rattled as that actor --- think of all the possibilities!

While I sort through the letters and pick the winner, here are a couple of examples. First, though, before printing some letters I did get --- how about the one that I didn't get? I suppose it's not too unusual for readers to get the columnists mixed up --- I've been accused of losing my interest in small R/C jobs because "I designed the Lazy Ace!" And I would bet that Chuck Cunningham got a lot of letters about downwind turns back when we were kicking that around.

But this one went even further. A modeler wrote to the Editor of another magazine, said he "understood they were looking for entrants in the youngest and oldest categories of R/C fliers." Then he went on to list his entries. Now get this --- he would have won on both counts in the contest I was running --- if he had sent the letter to me! And I can't give him the Dum-Dum award because he didn't enter it! A real loser.

This one's funny because it could

have been a disaster but turned out to be only embarrassing. Tom Geary, of Warner Robins, Georgia, writes:  
*Dear Ken,*

*I would have written you sooner concerning the Mr. Dum-Dum contest but you see I hadn't pulled my boner until last Saturday afternoon at the field.*

*After last winter's dismal flying days the first Saturday in Spring turned out to be absolutely beautiful flying weather. You know one of those few days with the only wind around being the hot air projected by waiting R/C enthusiasts, and not a cloud in the sky, definitely strong sunglass weather.*

*It all started during the initial checkout of my Lanier Comet. I noticed that my Friday night pre-flight had not caught the slight right turn of my nose gear in center position. I proceeded to correct this problem. I couldn't see into the tank compartment with my sunglasses because my shadow had darkened the area, so I layed them aside. I completed the arm adjustment ever so slightly and went about my usual hook-up, and fired up the Veco .61, taxied out and gently rumbled down the runway. The Comet climbed out steadily, I released the elevator and all of a sudden the nose went down at least 15°. I got back on the elevator and hollered help! to my instructor (after all, I am still learning) who was a comfortable 10' away. He came running and asked me what was*

*to page 154*

### BALSA SUPER SALE

Size	Pieces per box	Box price
1/16x3x36	25 @ .35	\$ 8.75
1/8x3x36	20 @ .42	\$ 8.40
1/4x3x36	20 @ .50	\$10.00
1/2x3x36	15 @ .62	\$ 9.30
3/4x3x36	15 @ .67	Sold \$10.05
1x3x36	10 @ .88	by \$ 8.80
1 1/2x3x36	10 @ 1.02	Box \$10.20
1 3/4x3x36	20 @ .66	Only \$13.20
1 7/8x3x36	20 @ .68	\$13.60
2x3x36	15 @ .81	\$12.15
2 1/4x3x36	15 @ .89	\$13.35
2 3/8x3x36	10 @ 1.07	\$10.70
2 1/2x3x36	7 @ 1.40	\$ 9.80
2 3/4x3x36	6 @ 1.85	\$11.10



Our balsa is packed in 200-lb. test cardboard cartons to minimize damage.

*Call us 'n save!*

#### 3-inch Assortment

- (7) 1/16x3x36
- (6) 1/8x3x36
- (5) 1/4x3x36
- (4) 3/16x3x36

Only \$14<sup>58</sup>

#### 4-inch Assortment

- (5) 1/16x4x36
- (4) 3/32x4x36
- (4) 1/8x4x36
- (2) 3/16x4x36

Only \$15<sup>57</sup>

# THE HOBBY

Jay



Dave

### 3 new Sig R/C Kits



**KIWI \$26.25**

54" span, low-wing sportster for .35-.45 engine. Large area control surfaces for maneuverability. Simple construction.

**KAVALIER \$27.97**

56" span, smooth flying for stunt or sport. No tendency to stall or snap roll. Kit has full size plans. For .29-.40 engine.

**COLT \$15.70**

45" span, sorta-Cessna sportster. Foam wing is ready to use. For .08-.15 engine, 2 or 3 channel radio. Builds fast.

**Sure Flite CESSNA, J-3 CUB or SPITFIRE plus Fox .25 R/C w/muffler \$46<sup>99</sup>**

**Goldberg FALCON 56 MARK II plus Fox .36 R/C w/muffler \$51<sup>99</sup>**

**BARGAIN BOXES**

**Craft-Air WINDRIFTER & 3 rolls MonoKote \$46<sup>99</sup>**

**Smith MINIPLANE plus Fox .40 Bush Schneurle R/C w/muffler \$69<sup>77</sup>**

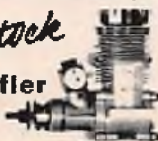
**\$29<sup>99</sup> Sig COLT plus Cox Medallion or Tee Dee .09 (no throttle)**

**\$49<sup>99</sup> Airtronics OLYMPIC II plus 3 rolls MonoKote**

### HB ENGINES at Savings!

- .12 R/C \$26.70
- .15 R/C \$28.95
- .25 R/C \$38.95
- .40 PDP \$59.99
- .61 PDP \$74.95

*In stock w/muffler*



*with special O-ring needle valve*

Precision made for power, performance and reliability. Every engine includes a Perry carb; PDP on some models for increased power and speed. Order now — a great engine at a great price.

## SAVE COVERING AND COVERING ACCESSORIES

**SUPER MONOKOTE 3 rolls \$14<sup>97</sup>**

OPAQUE: red, white, orange, yellow, dove grey, clear, aluminum, blue, dark blue, chrome or olive drab.  
TRANSPARENT: yellow, red, orange or blue.

**3 rolls \$17<sup>97</sup>**

METALLIC: green, purple or blue.  
FLAT: aluminum, olive drab or grey.

**ECONOKOTE 3 rolls \$11<sup>97</sup>**

Red, white, blue, dark blue, orange or yellow.

**SUPER COVERITE 3 rolls \$13<sup>97</sup>**

**PERMAGLOSS 3 rolls \$16<sup>89</sup>**

Balsarite .. \$1.88  
Glass Coat \$1.99

**TOP FLITE HEAT GUN \$18<sup>99</sup>**

**HEAT SEAL IRON \$13<sup>77</sup>**

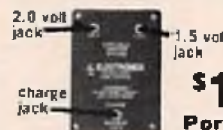
### R/C KITS SAILPLANES

Super Malibu	\$21.00
Olympic II	\$36.00
Aquila	\$48.00
Square Soar	\$17.95
J-Bird	\$38.99
SD-100	\$38.99
Soar Birdie	\$13.77
Wanderer	\$12.77
Windfree	\$26.99
Windward	\$21.40
Cox Cadet	\$25.99
Silent Squire	\$24.99
Pierce Arrow	\$24.50
Pierce Paragon	\$42.00
Viking	\$48.99
Legionair 100	\$57.99
Legionair 132	\$72.99
Legionair 140	\$84.99
Shuttle 7B	\$33.99
Shuttle 100	\$39.99
Shuttle 132	\$46.99

### .049 TO .30 POWER

Alpha	\$11.99
GLH II	\$11.05
Hornet	\$12.97
Ace Shrike	\$19.97
Whizard	\$11.37
Mach None	\$12.97
Butterfly II	\$31.99
Pacer	\$12.97
Q-Tea	\$15.97
Baby Birdie	\$10.99
Ranger 42	\$15.37
T-10	\$19.99
Klipper	\$14.65
Super Sport	\$13.95
Kadet	\$24.45
M.E.N. Trainer	\$20.99
T-20	\$24.99
Sun Fil IV	\$20.99
Falcon 56 Mark II	\$25.99
RCM Sportster	\$27.99
Basic Trainer	\$27.99
Super Pacer	\$20.99
Tweedy Bird	\$27.99
New Era III	\$34.99
Cutlass	\$16.99

### L & L Electronics IGNITION SYSTEM



**\$13<sup>99</sup> Portable!**

For 1.5 & 2.0-volt glow plugs. Solid state, rechargeable with automatic glow driver.

### .40 POWER

Kaos .40	\$39.99
Dirty Birdy .40	\$41.99
Sweet Stik	\$25.99
Attacker	\$25.99
T-40	\$38.99
Kommander	\$28.00
Kougar	\$31.45
M.E.N. Trainer .40	\$35.99
Hoss Fly	\$29.00
Solo	\$29.00

### .60 POWER

Ugly Stik	\$41.99
Sr. Falcon	\$36.35
Skylane 62	\$36.35
Panther	\$74.99
T-60	\$44.99
Kaos	\$46.99
Dirty Birdy, balsa	\$59.99
Super Kaos	\$48.99
Bootlegger	\$52.99
Tiger Tail III	\$52.99

## PLUS JULY ENGINE SALE

K&B, Fox, OS, Webra, H.B. at super-sale prices! We're gonna wheel 'n deal.

*Call or write for availability*

### Sailplane ACCESSORIES

Standard Hi-Start	\$24.50
Heavy Duty Hi-Start	\$28.00
Standard Rubber only	\$12.99
Heavy Duty Rubber only	\$15.97
Craft-Air Parachute	\$ 4.20
Adjustable Tow Hook	\$ 1.85
Stabilizer Horn Set	\$ 1.35
Spoiler Kit	\$ 2.80
Sun Shield	\$ 2.80
Stick-On Weight, 6-oz.	\$ 1.40
Tow Hook Release-THR	\$ 3.20

### Power ACCESSORIES

12 vt. Wet Cell	\$13.97
DuBro Fuel Pump	\$ 6.95

### ADHESIVES

Hot Stuff	\$ 1.99
Blue Hot Stuff	\$ 2.99
17-oz. Wilhold	\$ 1.88
R/C 56, 4-oz.	\$ .78
Epoxy Brushes	6 for \$ .69

# MARKET

3930 W. Vickery Blvd.  
Fort Worth, Texas 76101

Phone 817/731-0444 or 731-6388  
P. O. Box 2172



**RADIO SALE**

- \*KP2A..... \$ 89.99
- \*KP4A..... \$190.00
- \*KP6A..... \$225.00
- \*KP5C..... \$269.00
- \*KP7C..... \$369.00

- LRB 3 dry w/2 servos .. \$ 99.99
- Nimbus 2 .. \$ 97.99
- Nimbus 4 .. \$186.99
- \*Champion \$225.00
- \*Super Pro \$255.00
- \*1-yr written warranty

- Cox 2 channel D/S..... \$ 72.99
- Cox 3 channel w/2 servos .. \$135.00
- Cox 3 channel w/3 servos .. \$169.99
- Cox 6 channel \$229.00

**Mitre Sander**  
\$1999  
Deluxe



Bevel or square parts. Quick-build kit; all parts pre-cut, drilled.

**L. R. Taylor & Co. POWER PACER**



\$4899

NiCad tester/charger/cycler spots trouble.

**PAINT SPRAY OUTFIT**



by **BROWN** \$4299  
with compressor

Sprays any type of paint. Adjustable spray pattern makes it great for complete jobs or touch-ups.

**HOBBY GUN** \$688  
w/1-oz. jar & hose

**DREMEL**

- makes building easier
- Model #245 \$26.97
- \*Model #271 \$33.47
- \*Model #281 \$36.82
- \*Model #381 \$44.75
- Model #571 \$43.99
- Model #572 \$58.99
- Model #210
- Drill Press \$15.95
- D-Vise..... \$17.66
- \*with 34 accessories

Be kind to your engine—  
Use **ZINGER PROPS**

- 9x6, 7 ..... doz. \$ 9.99
- 10x6 and 10x6w ..... doz. \$10.88
- 11x6, 7, 7w
- 7½, 8 ..... doz. \$11.88

All maple, true pitch. Airfoiled tips. You get smooth power, less vibration. Stock up!

**RACERS**

- QM Toni ..... \$52.99
- Formula I Toni..... \$72.99
- Formula I Midget
- Mustang ..... \$66.99

**"500" RACERS**  
\$2899

your choice

- Haffast 500
- Quickie 500
- Quickest 500

**Craft-Air Field Support Box \$1899**



**Justo jig Full House**

Build accurate wings in half the time. Use \$3799 adapters to convert to fuse-jig.

**A. J. ½A RETRACTS**

Lightweight, durable, \$717  
easy to install.  
Can be used on U/C

**NEW Super SANDER**

- 3 sizes Aluminum tube with handle. E-Z Flex Metalite Cloth bonded to bottom. Easy to guide.
- 1-foot \$ 3.99
- 2-foot \$ 9.99
- 3-foot \$10.99



Some items in limited quantity and advertised specials, subject to availability, will be honored until July 10, 1978. Prices may change if retail prices change.

**Hobby Market R/C LONG GLO PLUGS**



Space Age insulator for superior conductivity. Withstands heat and pressure of "hot" engines.

- 6 for \$372
- 12 for \$697
- 24 for \$1275

*Fly Bipes 'n have fun!*

- Ace All-Star ..... \$15.99
- Sig Aero Bipe ..... \$15.35
- Mark's Sunny ..... \$20.97
- Sig Skybolt ..... \$43.75
- Sig Miniplane ..... \$34.95
- Sig Liberty Sport ..... \$45.45
- Cox Gere Sport ..... \$27.99
- Honker Bipe..... \$21.97

**Join the Quiet Revolution**



**Electric Flight Systems**

- Fournier RF/4 Scale Sailplane ..... \$29.50
- P-6B Victor ..... \$29.50
- Bushmaster..... \$31.50
- Electra-Flie ..... \$17.50

*Call us—you'll save!*

**FORMULA U**

- 12-oz. spray... \$2.37
- 8-oz. can..... \$2.23
- 4-oz. jar..... \$1.19

Fuel proof 1-step formula. Polyurethane finish for foam or wood.

*Color match to Solarfilm*

**R/C or FF OLD TIMERS**



- Playboy Senior ..... \$35.96
- Quaker, 7-ft. .... \$33.99
- Quaker, 54-inch ..... \$20.99
- M&P Dalaire Sportster .. \$41.99
- M.E.N. Buzzard
- Bombshell ..... \$34.99

**Electric Motors**

- Astro .020 R/C ..... \$16.10
- Astro .05 ..... \$31.50
- Astro .10 ..... \$56.00
- Astro .15 ..... \$67.50
- Astro .25 ..... \$75.00
- Astro .05 Twin ..... \$38.50
- Astro .15 Twin ..... \$87.50
- Astro .25 Twin ..... \$122.50
- Rapid Charger for .020 or .05, plugs into cigarette lighter ..... \$21.00
- Field Charger for .10, .15 or .25 ..... \$28.00 (uses 2 motorcycle batteries, not included)

**House of Balsa**

½ KITS \$2099

- P-51 .40 size ..... \$36.99

**PROP DRIVE UNIT**

\$6299 by DuBro



Smooth running, belt driven unit for slow, powerful flight. New realism for scale & sport.

- Extra Belts ..... \$4.20

**CALL TH HOBBY MKT**  
where it's like shopping over the counter

**HOW TO ORDER**

- A. Within 48 continental states
  1. Add \$2.00 to prepaid (non C.O.D.) orders
  2. Add \$5.00 to C.O.D. orders
- B. Outside 48 continental states
  1. Add \$10.00 for actual postage and handling; excess will be refunded
  2. No C.O.D. orders accepted

**Credit Card shipment Call (817) 731-0444 or 731-6388**

Name			
Address			
City	State	Zip	
QUAN	ITEM	PRICE	
Enclosed: Check		M.O.	SUB TOTAL
Master Charge or Visa (BankAmericard)	Add handling to all orders: \$2.00 prepaid, \$5 C.O.D. (\$10.00 outside 48 states)		TOTAL
Good thru	Signature		
Hobby Market P.O. Box 2172 Ft. Worth, TX 76101			

THE HOBBY MARKET





## HOW TO START A CLUB

**A**lthough R/C car racing is growing very fast, there is still many areas that are not organized yet, to the point of having clubs and regularly scheduled events. Even in areas where there is strong club activity, it's hard for the beginners to find clubs and racing events.

You can write to R.O.A.R., 20860 Homeland Rd., Matteson, Illinois 60443, and ask them for the name and address of the club nearest you. R.O.A.R. (Radio Operated Auto Racing), the National organization, keeps a record of clubs in the USA. New clubs can also send in their name and address to R.O.A.R. to add to this list so that new racers in their areas know where to contact them. Also, for \$5.00 you can join R.O.A.R. and receive a copy of Revup every other month. Revup is a R.O.A.R. publication that keeps the members informed of what's happening around the country.

If there is no organized activity in your area yet, it would be very easy for you to start it up. Ask your local hobby dealer if it would be all right for you to post a small 8" x 11" notice in his shop about R/C cars. On the notice, you could have a photo of a R/C car. You could also state something to the effect that "Every Sunday afternoon, at 1 pm, there will be a demonstration of R/C cars in the parking lot at Main Street Shopping Center, at Main and Broadway Streets. For further information call Joe Racer at 637-7654." Change the wording around to suit yourself. The important thing is to take the first step and get the noticed posted in the hobby shop. Pick a location to run on that has a lot of exposure to people walking by. There are an awful lot of would-be car racers that would like to race, if they only knew that there was such a thing as an R/C car. If you run on a parking lot where no one can see you, then there will be no new people to join your fun.

Wherever you run, try to keep some kind of safe crowd control. Don't let the people get too close to where you're actually driving, and it's not necessary to show the crowd how fast you can go. It's much better to set up a simple course and just drive around it. When you stop running, be prepared to answer a million questions. This is a **very important**



*This is a scene from a race in So. Calif. at Briggs Cunningham Car Museum being run by the Orange County R/C Car Club. A flat bed truck serves as a platform for lap counters. Transmitters are impounded on folding tables. A permanent driver's stand and 12" high boards that surround the track are also shown.*



*The Central Florida R/C Auto Racers Club in Orlando, Florida has a self contained trailer that is used for transmitter impound and race tags. It also is used to haul the boards that surround the track.*

step. The interested spectator is what it takes to become a future R/C car racer. You'll be answering the same questions a hundred times, but if you can get 4 or 5 guys really interested, you've got your club started.

Once you get 2, 3, 4, or 5 guys running at the same time, then it's a lot easier to get more new people interested. It's fun running by yourself, but it's a whole lot more fun running with other racers.

Most hobby shops would be glad to let you post notices of your R/C car activities. It wouldn't cost them anything to do so, and they know that you would be helping them by bringing in new

customers for them. All the hobby shop owners I've met have been real nice people who are genuinely interested in helping their customers.

Some hobby shop owners are a little apprehensive about R/C cars, mainly because they are quite familiar with airplanes, but they don't know anything about the cars. Clean up your car and show it to the hobby shop owner. I'm sure he would be glad to take the time to look over your car while you explain the different parts to him. As soon as he finds out the cars are a lot easier to understand, than he might have thought, he'll be much easier to work with.

Don't expect him to rush right out and put in a huge stock of R/C cars. It doesn't work quite that way. In the beginning he'll be glad to order whatever parts you need, as well as a complete car for a new customer. When there are 4 or 5 racers in his area, he'll probably start to stock a few parts for them. As the number of racers grow in an area, you'll start to see the stock of R/C car parts growing in the hobby shop.

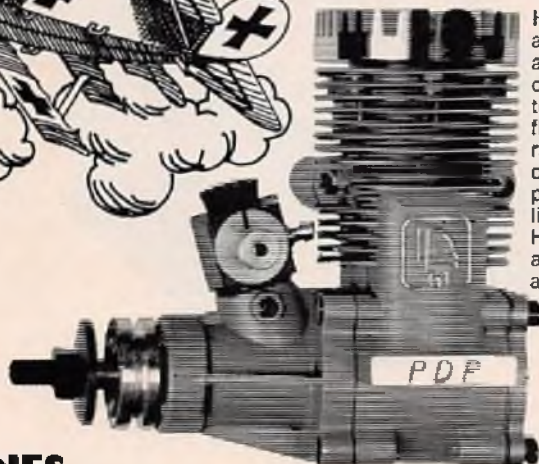
When you get up to 5 or more racers, it's time to form a club. With your club formed it's then time to have regularly scheduled events. Normally a 2 week spread between races is good, but you can vary this to suit your club. Here in Southern California between the 1/8 and 1/12 scale clubs, there's from 1 to 4 races every weekend, year round, between the 9 clubs. And it's still growing!

With your club formed, you should



*If you know the right people, like the Northwest R/C'ers Car Club in Seattle, Washington do, you can get Tony Bellezzi to take a semi trailer and build a double decker platform for a driver's stand and lap counter's stand and put a cover on it.*

# HB COMMAND For the Baron in You.



HB Engines have now been well accepted by the modeling public and they are available at an ever increasing number of dealers. You too may now enjoy RC, CL or FF flying, power boating and car racing. HB Engines are precision made for power, performance and reliability. Every HB Engine includes a Perry carburetor and several models offer PDP (Perry Directional Porting) for increased power and speed (up to 1,500 RPM's more). Sizes available: .12, .15, .20, .25, .40, .50, .61 displacement. Let HB precision, maneuverability and speed satisfy the Baron in you. For a complete catalog, see your local dealer or write us directly.

## HB ENGINES

Bavarian Precision Products Co. Dept. RCM  
formerly: Helmut Bernhardt Precision Movements Co.  
P.O. Box 6, New Canaan, Ct. 06840 (203) 966-8781

All parts available from stock — Prompt service assured.  
Dealership inquiries invited.

start to collect dues. Don't make it too much to begin with, you don't want to scare anyone off. You'll need some money to make boards to surround the track, to protect the spectators from your overly enthusiastic driving lines. As your club gets larger you'll want to buy clocks and a P.A. (public address loudspeaker) system.


For your first races you should also present trophies. About one trophy for

every 4 or 5 competitors is enough. Trophies are very important because there's nothing else in the world like winning your first trophy. The trophies are paid for by the race entry fees, the amount of which is determined by your club members, \$2, \$3, \$4, or whatever you decide on. Trophies should be awarded at the conclusion of the days events.

When your club is new, you won't

need clocks or a P.A. system to begin with. As an example, you can run a series of short races. You'll find that in the beginning, short races are much better for the majority of racers than long races. Limit your races to say, 4 or 5 ten lap races. Give 10 points for 1st place, 9 for 2nd and so on. The racer with the most points at the end of the day wins the trophy. A series of shorter 10 lap

to page 151



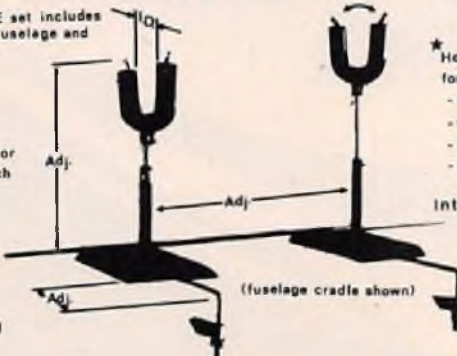
### MODEL MASTER Model Cradle

\* Select Cradle I.D size (Any Two), A-(2 1/2"), B-(3 1/2"), C-(5") D-(8") - fuselage cradle only

\* MODEL CRADLE set includes one pr. each of fuselage and wing cradles

\* Self standing or clamp on bench

\* All machined Aluminum




\* Holds all MODELS for:  
- building  
- repairing  
- adjusting  
- shows

Introductory price: **\$39.95**  
List \$49.95  
(Until AUG. 31, '78)

### MODEL MASTER Torq-Ski

\* All machined black anodized Aluminum \* Quick mount-Torsion set-True Tracking

Introductory price: **\$19.95**  
(Until AUG. 31, '78) List \$24.95



Please specify axle diameter. \* .19 to .60 eng.

---

#### How to Order:

Mail money order, certified check, personal check (please allow delay for clearance), C.O.D. with certified check. Add \$2.00 to prepaid orders for shipping & handling. Add \$3.50 for C.O.D. Add \$10 to orders outside 48 states (taxes refunded).

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City & State: \_\_\_\_\_ zip: \_\_\_\_\_  
MODEL CRADLE:  
\* Fuselage cradle size: (A)(B)(C)(D)(CUSTOM - optional)  
(for CUSTOM cradle please specify I.D. size & sketch shape)

MODEL CRADLE \$39.95set  
CUSTOM Cradles \$ 9.50pr.  
TORQ-SKI \$19.95set  
(Nebr. Res. add 3% sales Tax)

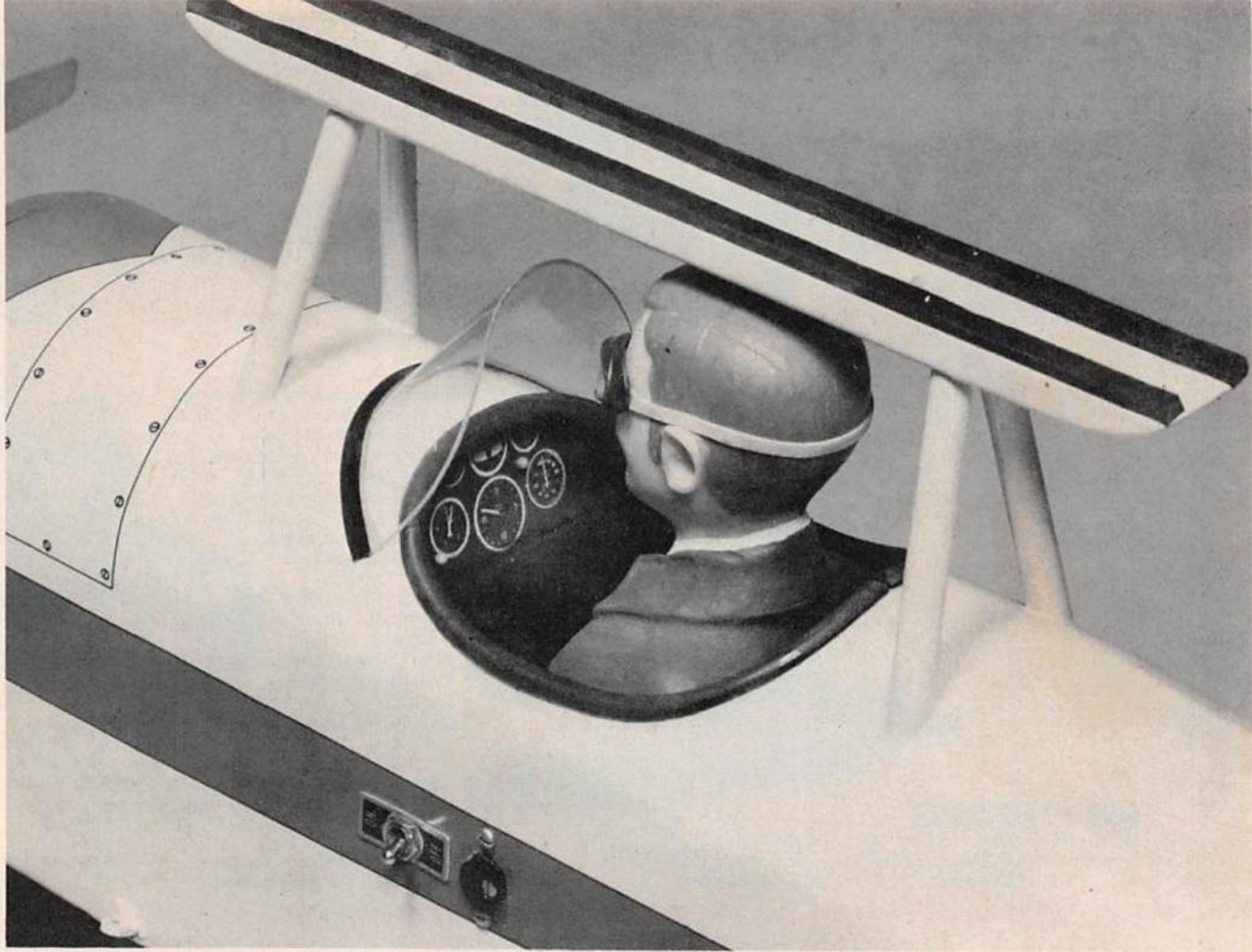
Patent Pending

#### D&C Model Products

P.O. Box 14078  
Omaha, Nebraska 68114

See your Dealer or Order Direct

**S  
U  
P  
E  
R**



**P  
A  
R  
A  
S  
O  
L**



**T**he Heath Super Parasol was designed, built, and first flown by Edward Bayard Heath in 1925. Ed Heath was born in Brooklyn, New York in 1888 and grew up in Amsterdam, a town 25 miles northwest of Albany, New York. Heath's interest in aviation started at an early age. His first successful aircraft, a Bleriot type monoplane was flown in 1909 on a flight of 40 seconds duration. This aircraft was severely damaged less than a year later, when in spite of Heath's small physical size (5' - 130 lbs.), the clearing of a 3' high fence at the end of the field became an impossible task for the fragile monoplane.

Young Heath then went to work for Curtiss in the hope of finding work in the aircraft division. As luck would have it, the only position open to Heath was in the motorcycle department. While employed by Curtiss, Heath acquired a thorough understanding of motorcycle engines and was able to at least study and observe the various Curtiss aircraft designs. This wealth of knowledge would be put to good use in subsequent Heath designs.

Being of a pioneering and creative nature; Heath was not to stay at Curtiss long and after returning to the Amsterdam area for a short time, where he rebuilt his original 1909 monoplane for use in country fair demonstrations;

Heath headed for Chicago and formed the E.B. Heath Aerial Vehicle Company. This company, which provided the many sundry items to the infant aviation industry, flourished and it was during World War I that the prophetic Heath decided that what was needed was a low cost aircraft that would be within the average man's means. The resultant design was called the "Feather". It was a single seat biplane with a 20' wing span, weighed 270 lbs., and was powered by a 15 horsepower motorcycle engine. The Feather flew quite well, however, Heath's intentions of manufacturing it were scrapped due to the glut of low cost government surplus aircraft and engines, that were readily available after World War I. Heath instead, turned to providing replacement parts for these surplus aircraft. The company name was changed to the Heath Airplane Company and in 1921, Heath again turned to designing aircraft with a biplane named the "Favorite". This was a three place aircraft powered by a Curtiss OX-5 engine. The "Favorite" was flown by Heath to a third place finish in the "On to St. Louis Race" segment of the 1923 National Air Races. This success inspired Heath to design a shoulder wing monoplane type racer; with the help of an aircraft engineer named Claire Linstead, which was to win the Philadelphia National Air Race. The

**A .19 powered, 3 channel Stand-Off Scale/Sport flyer version of the 1928 original by the Heath Aircraft Company.**

**By Bob Wallace**



prize money from this race was put to use by Heath and Linstead in designing the first parasol model. Powered by a converted Henderson Motorcycle engine of 23 HP, the Parasol proved to be a stable, easy to fly aircraft. After building and testing several Parasol variations, the Heath Aircraft Company began in 1927 to produce the Super Parasol in numbers. The original factory fly away price was \$595.00! In the years that followed, the Super Parasol was offered in kit form with or without engine and propeller, or a complete set of blueprints could be purchased for \$5.00. Also available were kits in progressive groupings, wing ribs for \$12.47 etc., for the installment or "pay as you build" buyers. The Henderson motorcycle engine, an inline, upright, four cylinder, air cooled type, was modified by Heath and redesignated the Heath B-4 engine. It was available with propeller for \$285.00 or the "do it yourself" conversion kit could be purchased for \$65.00.

Between 1927 and 1930 many plans and kits were sold. The purchaser needed only basic hand tools to assemble his super Parasol. However, as is usually the case with home built projects, the quality of construction ranged from crude, poorly assembled models to modified "show piece type" specimens.

The Super Parasol had a wing span of 25', was 17' long, weighed 260 lbs. empty, and could carry a useful load of 300 lbs. The top speed was 70 mph, landing speed was a modest 28 mph and the cruising radius was 200 miles on 5 gallons of gas.

Although many Super Parasols were built and flown, virtually no two were built alike. This included the factory built Super Parasols, which were continually being improved and modified.

The Parasol design was also developed in a mid and low wing configuration. It was in the low wing version that Ed Heath was to be tragically killed, when the wing failed on a test flight in 1931.

The death of Edward Heath prompted the sale of the company several months later to a group of Chicago investors, who re-named the firm, The International Aircraft Corporation. In the years that followed, the Heath Super Parasol was offered by International in the conventional and mid wing configurations. The low wing version was never produced. The last Super Parasol was built in 1936, although parts and blueprints remained available up to World War II. The company which had by then become highly diversified, flourished and grew, particularly in the radio and electronics field. Today as everyone knows, Heath Kit Corporation is a giant in the electronics kit industry.

What first prompted me to consider building a R/C model of the Heath Super



## HEATH SUPER PARASOL

Designed By: Bob Wallace

### TYPE AIRCRAFT

Stand-Off Scale/Sport

### WINGSPAN

52 1/4 Inches

### WING CHORD

9 1/2 Inches

### TOTAL WING AREA

490 Square Inches

### WING LOCATION

Parasol

### AIRFOIL

Flat Bottom

### WING PLANFORM

Constant Chord

### DIHEDRAL, EACH TIP

2 3/8 Inches

### OVERALL FUSELAGE LENGTH

34 1/4 Inches

### RADIO COMPARTMENT AREA

(L) 5 3/4" x (W) 3 1/8" x (H) 2 7/8"

### STABILIZER SPAN

16 Inches

### STABILIZER CHORD (incl. elev.)

5 3/8 Inches

### STABILIZER AREA

85 Sq. In.

### STAB AIRFOIL SECTION

Flat

### STABILIZER LOCATION

Top of Fuselage

### VERTICAL FIN HEIGHT

6 1/8 Inches

### VERTICAL FIN WIDTH (incl. rudder)

6 3/8 Inches

### REC. ENGINE SIZE

.19 Cu. In.

### FUEL TANK SIZE

4 Ounce

### LANDING GEAR

Conventional

### REC. NO. OF CHANNELS

3

### CONTROL FUNCTIONS

Rud., Elev., Throt.

### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, Ply & Spruce
Empennage	Balsa
Wt. Ready-To-Fly	50 Oz.
Wing Loading	12.5 Oz./Sq. Ft.



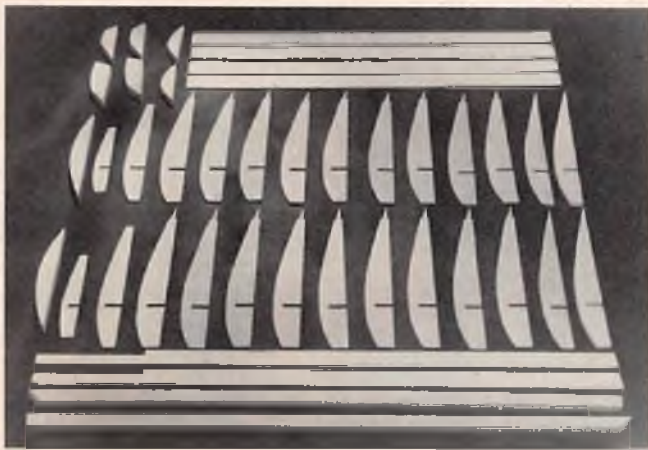
Parasol was a strong interest in home-built aircraft of the 1920-1930 era. The Bradley Air Museum in Windsor Locks, Connecticut has on display, a partially restored Super Parasol. After viewing it, I simply had to build one. The Super Parasol shown in the accompanying plans is intended as a Stand-Off or Sport Scale project. The nose has been lengthened slightly, but the only substantial change is the reduction of the elevator and rudder surfaces for better R/C flight characteristics.

The R/C Super Parasol is both easy to build and fly. If you have a yen to build a "fun to fly" R/C model, with a vintage home-built look, the Super Parasol should be of interest to you. Whether you build it as a Sunday sport flyer or a more detailed contest type model, you won't be disappointed. For the contest type of model, two excellent sources of scale detail information on the Super Parasol are available from the following: The Thomas Studio of Melville, New York, who offer an outstanding historical documentation booklet on the Heath Super Parasol and the Historical Aviation Album, P.O. Box 33, Temple City, California, which has an issue (Volume IV) that covers Ed Heath and his numerous designs.

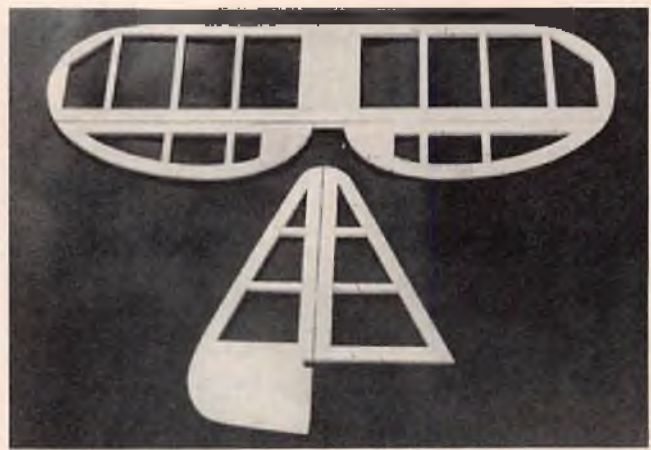
### CONSTRUCTION

#### Wing:

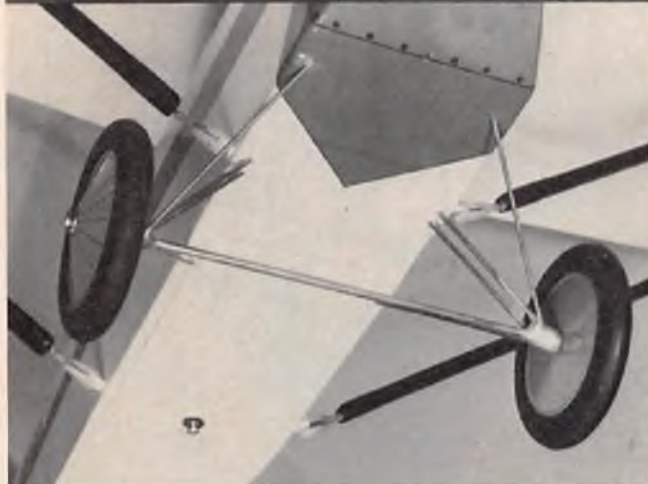
Start by cutting out the ribs, using the outlines shown on the plan. All ribs are 3/32" sheet except the two center ribs; which are made from 1/4" sheet. Stack and pin all the wing ribs according to their respective numbers and sand to a uniform contour. Cut the wing tip pieces (WT1, WT2, WT3, & WT4) from 1/2" sheet. Cut out the 1/8" and 1/16" plywood strut support pieces and the 1/4" x 1" x 1" hardwood wing bolt blocks. Pin the 3/16" x 3/4" main spar in place over the plan (be sure that your building surface is absolutely flat), this spar should be either hard balsa, spruce or pine, and the step down cut from rib W3 to the tip should be made prior to pinning it in place. Pin the bottom trailing edge 1/16" sheet in place. Position several ribs on the pinned down main spar and use them to locate and pin the 3/8" x 3/4" leading edge in place. Pin and glue the bottom 1/16" center section sheeting between the leading edge and main spar, and the trailing edge and main spar. Pin and glue all the W1 and W2 ribs in place. Since the bottom center section sheeting covers the rib locations in this area, use the rib positioning lines which are shown beyond the leading and trailing edges. The 1/4" center rib should be angled 5° to produce the proper dihedral angle. Pin and glue the 1/2" wing tip pieces in place and add the W3 and W4 ribs. Glue the 1/8" plywood strut support plates in place along with the 1/4" triangular stock reinforcement pieces. Glue the 1/4" x 1"



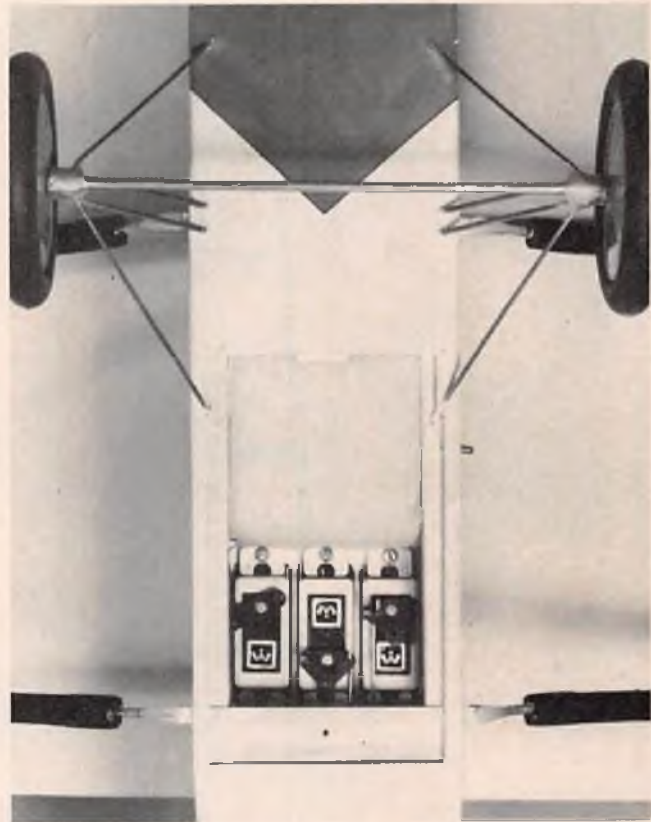
*Complete wing kit made up and ready to glue together.*



*Completed tail feathers sanded and hinges fitted in place.*



*TOP: Fuselage sanded and ready to be covered. ABOVE: Note excellent soldering done on landing gear. Simulated cowl screws inked on with draftman's pen.*



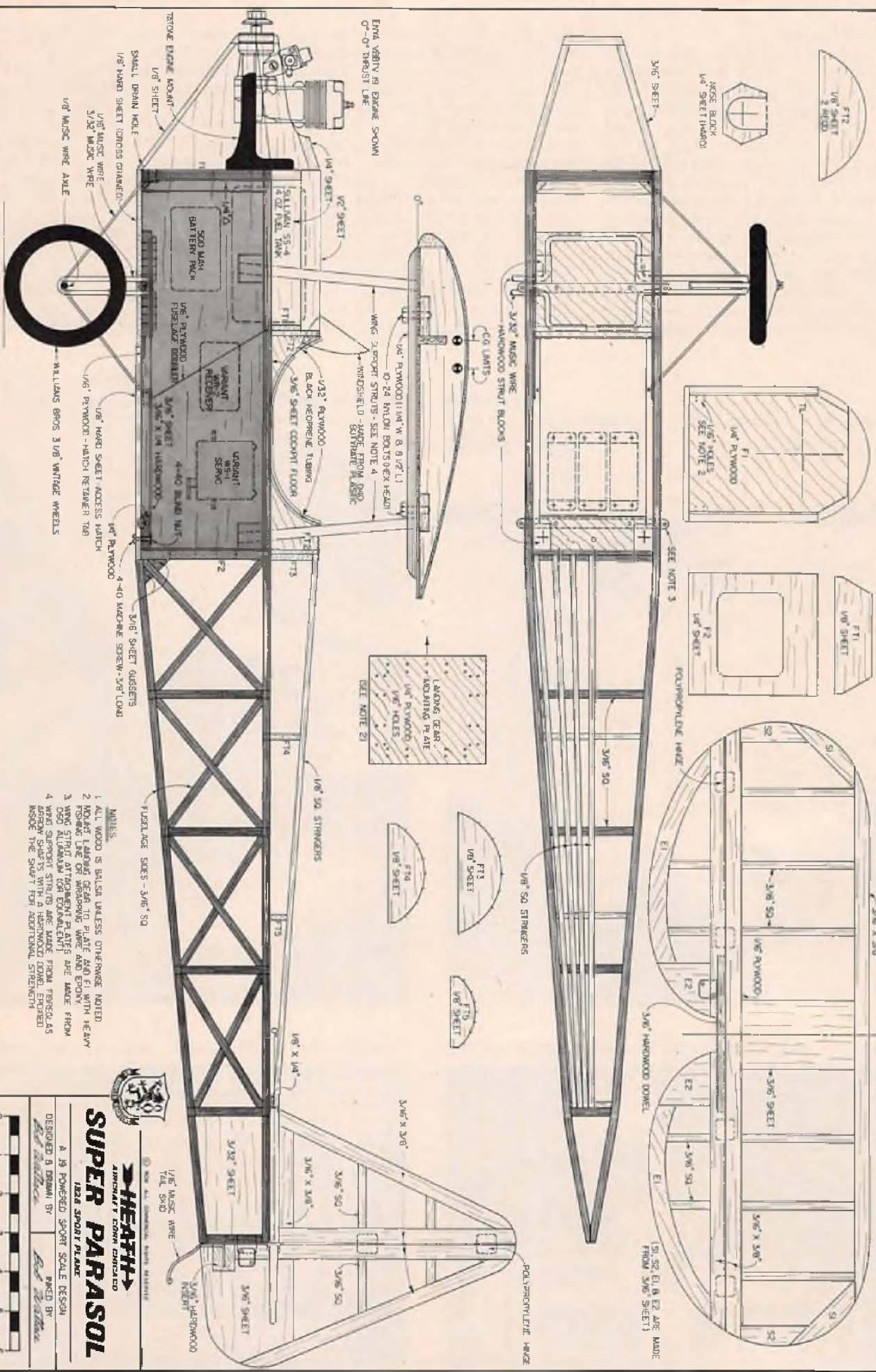
*View of radio compartment hatch removed. Very neat installation.*

x 1" hardwood wing bolt blocks in place. Be sure that you have bevelled the bottom of these blocks as shown before gluing them in place. When dry, remove the pins from the trailing edge sheet and add the top 1/16" trailing edge sheet. Add the center section top 1/16" sheeting over the W1 ribs. Let assembly dry. Repeat construction sequence for the opposite wing panel, except for the wing bolt blocks which were installed in the first wing panel. These blocks should slide into the notches cut in the 1/2" center rib of the wing panel that you are now building. When both wing panels are dry, they may be removed from the building board and joined together at the

proper dihedral angle. Be sure that no twist or warp is built in when you glue the two wing halves together, by pinning them down at the center on your building board, and blocking up the tips to the indicated angle. Glue the 1/16" plywood strut attachment plates into the 1/8" plywood plates. Shape and sand the leading edge and wing tips to the proper contour. Sand the center section sheeting to a smooth ridge free surface and apply a 3" wide strip of fiberglass cloth to the center section joint with polyester resin or thinned down epoxy. An easy method to apply the fiberglass cloth and resin is as follows: Cut the cloth strip about 20" long. Apply the

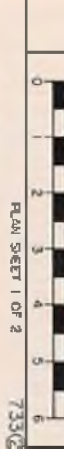
resin liberally to the center section area to be covered, with a brush. There is no need to be fussy in applying the resin. Lay the cloth onto the resin and wrap it around the leading edge. The two ends should overhang the trailing edge. Gently smooth out all bubbles and wrinkles and then blot off all excess resin with toilet tissue or paper towel. Don't worry - - - it won't stick to the cloth or pull the cloth up! Let the resin cure and harden. Trim off the excess cloth which extended beyond the trailing edge and lightly sand off any high spots and feather the cloth edges. The wing can now be fine sanded in preparation for

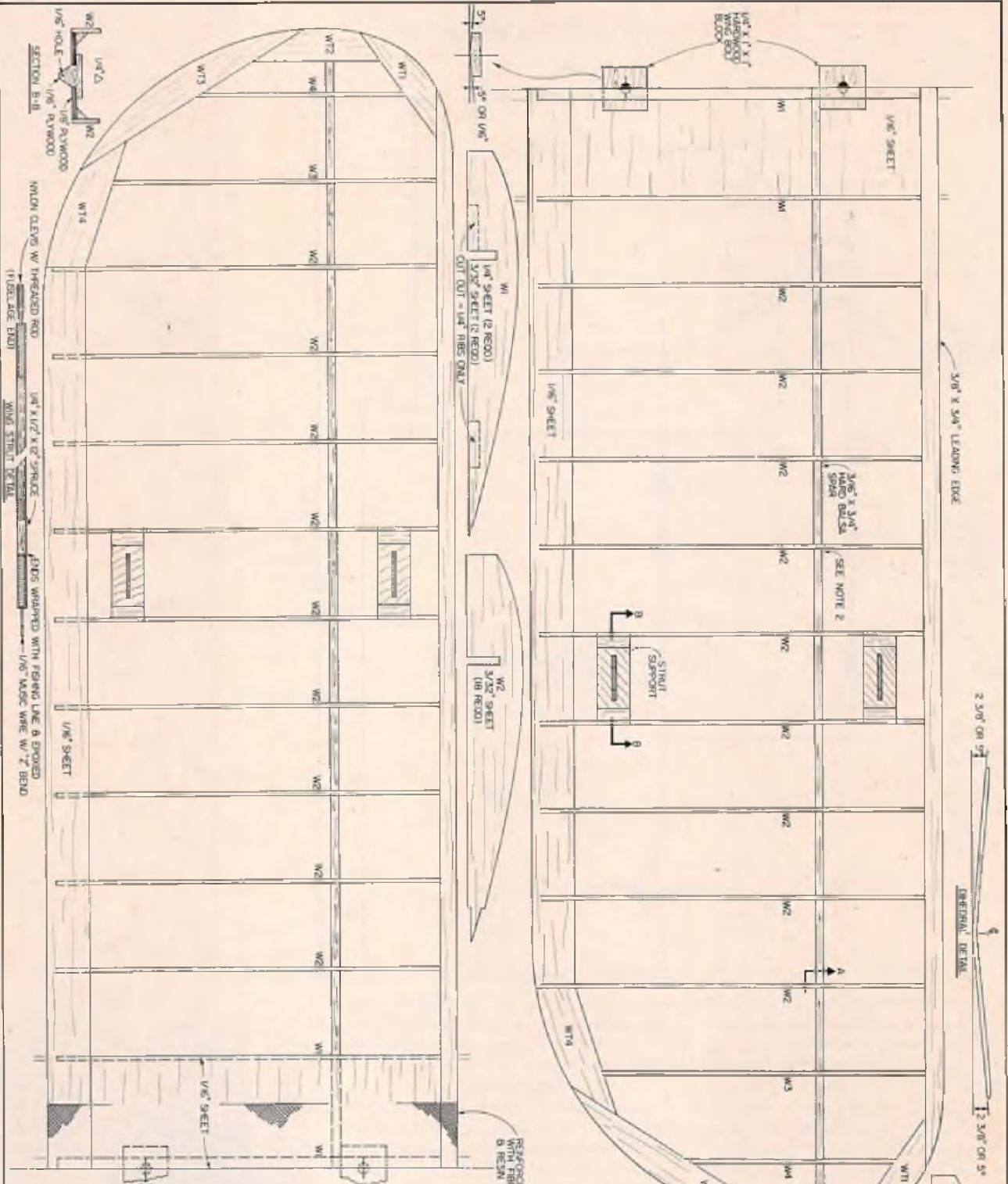
**text to page 144**



- NOTES:
1. ALL WOOD IS BALSAM UNLESS OTHERWISE NOTED
  2. MOUNT LAUNING GEAR TO PLATE AND E1 WITH HEAVY FISHING LINE OR WINDING WIRE AND EPOXY
  3. WING STRUT ATTACHMENT PLATES ARE MADE FROM 1/8" ALUMINUM STRIPS AND ARE STRENGTHENED FROM INSIDE WITH A HARDWOOD CONE, ENDED INSIDE THE SLOT FOR ADDITIONAL STRENGTH

**HEATH**  
 APPROXIMATELY 1/2000 SCALE  
**SUPER PARASOL**  
 1928 SPORT PLANE  
 DESIGNED & DRAWN BY *Ed Rahn*  
 BUILT BY *Ed Rahn*



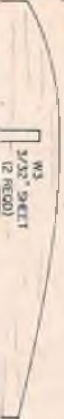


1/8" X 3/4" LEADING EDGE

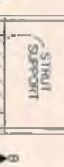
2 3/8" OR 5"

INTERNAL DETAIL

2 3/8" OR 5"



1/8" X 3/4" HARD Balsa SPAR SEE NOTE 2



ALONG SPAR DETAIL

SECTION A-A

OUT HARD Balsa SPAR FROM W3 TO W12

REVERSE CENTER SECTION  
W/RESIN

1/4" X 1/2" X 2" SPARCE  
W/2 STITCH DETAIL

FILES WRAPPED WITH FIBRO LINE & STROUD

1/8" SHEET

1/8" SHEET

1/8" X 1/2" X 2" SPARCE  
W/2 STITCH DETAIL

1/8" SHEET

1/8" X 1/2" X 2" SPARCE  
W/2 STITCH DETAIL

1/8" SHEET

**NOTES**

1. W1, W2, W3, & W4 ARE MADE FROM 1/2" SHEET
2. THE MAIN WING SPAR IS TO BE HARD Balsa, SPRUCE.

DESIGNED BY *Bill Redden*

INVENTED BY *Bill Redden*

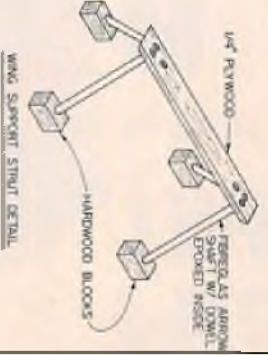
**SUPER PARASOL**

1928 SPORT PLANE

A. B. FORTNER SPORT SCALE DESIGN

MADE IN CHICAGO, ILL.

© 1928 ALL RIGHTS RESERVED



WING SUPPORT STRUT DETAIL





# FUEL TIMER

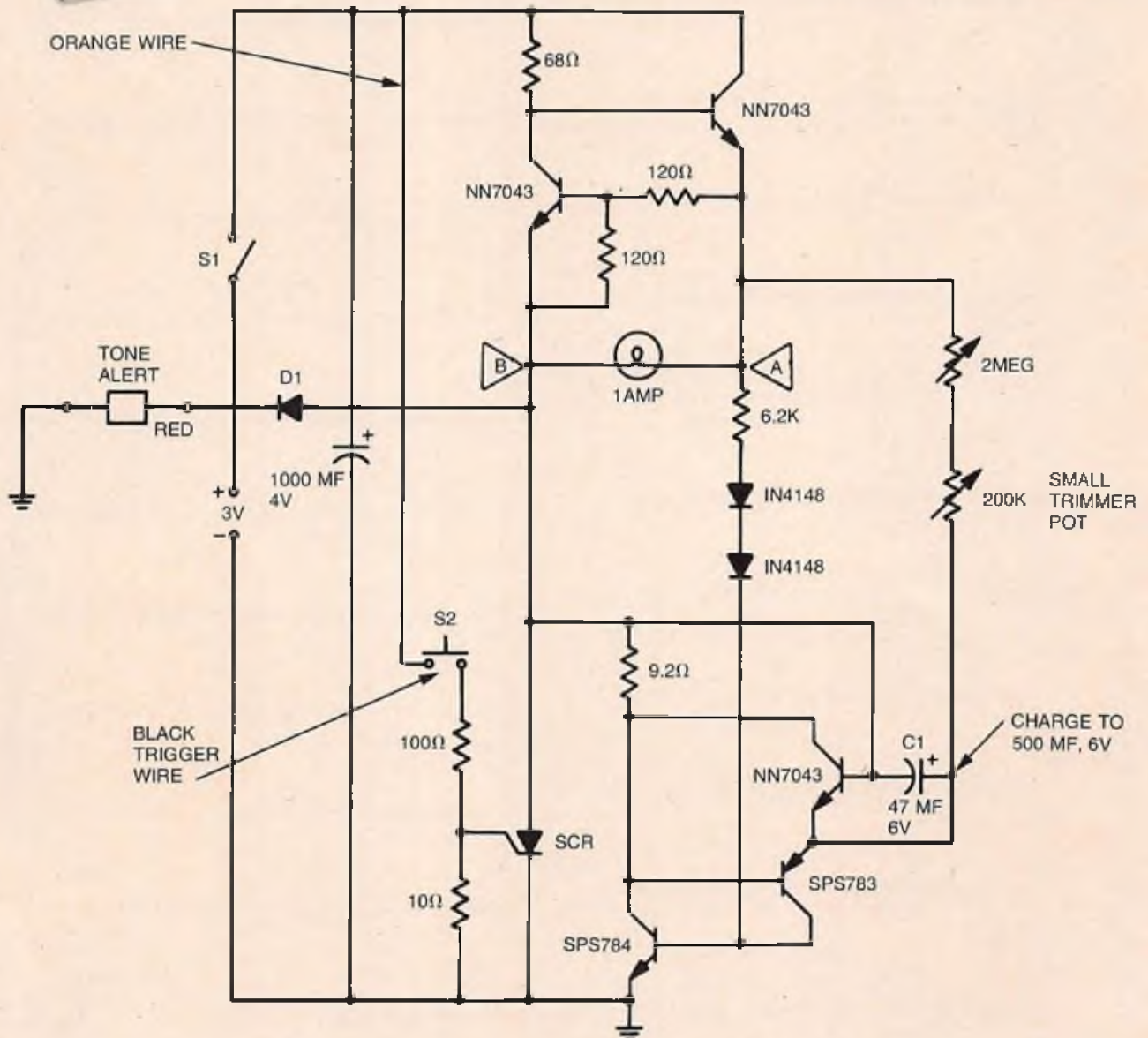
By David Auxier

**H**ave you ever had trouble keeping track of the time and finding your plane running out of fuel, thus causing you to make an emergency landing? This easy to build little timer, which can be installed in your transmitter or in a small metal box, should help solve the problem. It can be adjusted from approximately 1½ minutes to 18 minutes, giving a beep when it's time to land.

### Construction

The timer is built with a few readily available parts plus a capacitor discharge photo timer and tone alert module obtainable from a Poly Paks

catalogue. First, you will have to replace capacitor C1 on the photo timer with 500 uf electrolytic capacitor. This will extend the operating time of the timer from 2 minutes to approximately 18 minutes. Next, solder the anode lead of the 3017A diode to the B lead of the small light bulb on the timer board. This can be easily done by slipping a short piece of insulating tubing over the lead of the diode and then soldering it to the foil side of the diode to the board. Solder the cathode lead of the diode to the red lead of the tone alert module. The diode acts as a switch which only allows the alert module to draw current when the bulb on the timer goes off. Solder the black lead of the tone alert module to the foil where the negative sign is located on the timer board. Now attach the black trigger wire from the timer to one terminal of the push button switch and connect the orange wire coming from the positive mark on the other terminal. Remove the white wire from the timer board and solder the black wire from the battery connector in



FUEL TIMER SCHEMATIC

its place. Solder the red wire from the battery connector to one of the terminals on the toggle switch. Run a wire from the other terminal on the toggle switch to the positive input on the board.

#### Testing

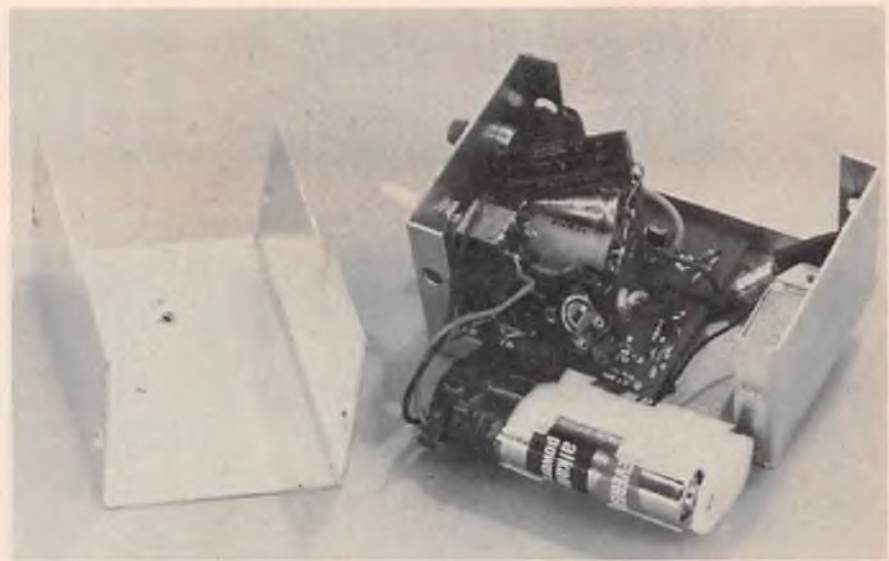
Connect the batteries to the timer. If you have not mounted the tone alert module firmly, press down firmly on it so it will operate. Flip the toggle switch on and you should hear a beep from the tone alert which indicates that the timer is operating.

#### Installation

The unit can now be installed in either your transmitter or a small metal case. Simply drill holes for the two switches and for the shaft of the time control pot. A little care must be taken when drilling the hole for the pot shaft so that the photo timer board with pot can be placed right behind the front of the case with the pot shaft extending through to the front. Now take a small drill bit and drill a few small holes in the position you wish to place the tone alert module. The timer board and module can now be secured with some 5-minute epoxy or silicone glue.

#### Operation

To operate, just flip the toggle switch on and tap the push-button which starts the timing mode. The time length can be adjusted with the 2 meg pot. The timer can now be calibrated with a watch, marking with a labeler the minutes around the pot shaft on the outside of the box or transmitter. □



#### PARTS LIST

Item	Quantity	Part No.	Cost
Photo Timer*	1	92CU 3492	\$2.50
Micro-tone Alert*	1	92CU 3513	1.98
Capacitor C1	1	500 uf @ 6V Electrolytic	
Diode D1	1	RCA SK3017A	
Battery Holder	1	AA Type 2 Battery Type	
Battery Connector	1	Double Snap Fastener Type	
S2 Switch	1	Miniature Push-Button (N.O.)S1	
Switch	1	Miniature Toggle (SP. ST.)	
Batteries	2	AA Eveready Alkaline	
Metal Box (op.)	1	Aluminum (3/4 x 2 1/2 x 1 1/2)	

\*Can be obtained from Poly Paks, P.O. Box 942, South Lynnfield, Mass. 01940.

The Tone Alert Buzzer can also be purchased from: Formula International, Inc., 12603 Crenshaw Blvd., Hawthorne, California 90250

BLOCK MAKES DIHEDRAL SANDING EASY AND PRECISE.

90°

9 5/8" APROX.

4" x 24" SANDING BELT.

1 1/2" PINE HALF-ROUND.

ASSEMBLE THESE WITH TIGHT-BOND.

2 LAYERS 3/4" PLY.

EASY SANDING BLOCK

NOTE WEDGE CUT TO EASE INSERTION.

LOOSE 1 1/2" PINE HALF-ROUND—ADJUST WIDTH TO MAKE BELT TIGHT.

## EASY SANDING BLOCK

*By Bill Phillips*

*This easy to make sanding block is very handy where a precise long sanding surface is required — across wing or tail rib structures, dihedral ribs, leading and trailing edges, etc. The sanding belts in various sizes, and grits are normally used on electric belt sanders and are very durable with a fabric backing. By using only one layer of plywood, a longer block can be made. Belts available at hardware stores.*

# WHING DING II



*Dottie Curl poses with the WD II at Rancho Bernardo Playground in Southern California.*

**A Stand-Off Scale model of the ultra-light home built biplane. The original full size has a span of 17 feet against our model's span of 42 inches. Powered by a Tee Dee .049.**

**By Paul Denson**

**R**obert W. Hovey's thoughts of building the 'Ultra Light' were brought on by the advent of the McCulloch 101A. This jewel of an engine inspired the WD-II design. The WD-I had a single wheel like a glider, but didn't work out too well. After analysis and design changes, the WD-II was constructed in a four month period and the first flight was made at Mojave, California, in February 1971.

Roll control is done with wing warping, however, the WD-II is so stable, some people turn with rudder only. If, after construction of the model, you desire to build the full size version, plans are available for \$15.00 and an information packet for \$2.00 from Aircraft Specialties, P.O. Box 1074H, Canyon Country, California 91351.

The original WD-II is advertised as an Ultra Light Biplane, ultra simple, ultra low cost, and ultra fun. The plane weighs 118 lbs., is powered by a 12 HP McCulloch engine and has a wing span of 17'. It is designed for 50 mph with a fuel capacity of 1/2 gallon which keeps it in the air for 15 minutes.

The three-views were found in the library of the Aerospace Museum in San Diego and I thought what an unique model this would make. The flight picture included with the three-view showed the sun shining through the wing so that all spars, diagonals, and ribs showed, which made me decide then and there nothing else but silkspan would do for the wing covering.

It was my intention to keep the plane as near scale as was practical without making the construction too difficult. This decision nearly ended the project on the first flight. The stab is full flying with 1/3 forward of the hinge line and 2/3 behind. The smallest movement available with the servos used would probably have been enough for the full size plane. Needless to say it was way too much for the model. After an uneventful hand launch, it flew well until the first stab correction was necessary then it went wild. Every time I touched the stick it was too much and it looked as if it was locked to the tracks of a roller coaster. The ensuing touchdown, if that is what you want to call it, wasn't too bad, but it did indicate that the boom had to be much stronger and the stab had to be changed. I put the stab in  $0^\circ$  position and epoxied the hinge line then cut off the rear 1" of the stab, hinged it and added the horn — this turned out almost perfect.

In the plans stage, I thought about using aluminum tubing for the boom; this turned out to be unavailable so a built-up boom was tried. It consisted of two layers of 1/32" balsa wrapped with cloth and the whole thing given two coats of epoxy. The tubing was formed around a 3/8" dowel baked dry in the oven, then another tube formed around that, then baked dry. The two tubes were

cemented together then wrapped with the cloth strip and given the two coats of epoxy. This was just great until I tried to get the two outer Gold-N-Rods down the tube - - they just wouldn't go. I contact cemented two turns of a sandpaper strip on the end of the 3/8" dowel and reamed out the center of my fabrication - - this was just enough to let the Gold-N-Rods

much heavier than the built-up boom, but much more rigid.

I cannot claim credit for designing the bucket seat; I read about the idea in some literature quite some time ago. Ask your pharmacist to save the proper size pill bottle for you. Since I teach chemistry, all I had to do was look up and down the chemical shelf, pick out the right size plastic bottle, and transfer the contents to a glass jar, and I had my bucket seat. I hope no one looks for the Paradichlorobenzene! You can outline your seat with black rubber tubing and secure it with Hot Stuff.

The rigging is not only nice to look at, but it is functional. If you tighten the turnbuckles just right you can take out wash-out or wash-in and, furthermore, it keeps the wings attached to the fuselage. The #1 turnbuckles are available from Proctor Enterprises.

All brass fittings are made from .005" shim stock available in the K & S rack in your hobby shop. .005" that's what the micrometer says it is - - .005. I don't believe it is that thin, but that is what it says — .005". (Grumble - grumble, gonna' throw that dumb micrometer away.)

There are three hatches in the fuselage, the front hatch under the stick is for ballast and the small 500 mil. battery. I am sure a 250 mil. battery would work just as well. The hatch cover is sprung in place being held down with lips at each end. The cover for the receiver compartment is held in place by the seat, the servo mounting tape sticks only to the seat back. A screw through a hole in the seat holds down the cover to the servo compartment.

#### Wing:

I am different from most people, I like building wings and there is where I start - - besides this wing is so different from the normal wing, it is much more fun to build. My building board is made of Celotex for ease of shoving in pins. Drape the plans over the edge of the building board in such a way that the spar is exactly on the edge. Pin the spruce spar in place, add the leading edge after it has been tapered. While drawing the plans, I envisioned using trailing edge stock here but, the taper is wrong and it is less expensive to use 3/16" x 3/8" stock and plane your own bevel. Cut and glue the 1/8" square spacers. From a 7" long sheet of 1/32" ply, cut the 1/8" wide cap strips. Glue and pin the forward end of the cap strips to the leading edge and allow them to stick up into the air; make sure they are perpendicular to the leading edge. When they are absolutely dry, put a drop of glue on the top of the spacer and on the spar, bend them down and back over the spar, glue in place and pin. The excess will hang out over the edge of the building board. Add the diagonal braces. When completely dry, remove from the

text to page 44

## WD II

Designed By: Paul Denson

### TYPE AIRCRAFT

1/2A Stand-Off Scale/Sport

### WINGSPAN

42 Inches

### WING CHORD

7 Inches

### TOTAL WING AREA

588 Square Inches

### WING LOCATION

Biplane

### AIRFOIL

Flat Bottom/Overlapping T.E.

### WING PLATFORM

Constant Chord

### DIHEDRAL, EACH TIP

1 1/2" (Both Wings)

### O.A. FUSELAGE LENGTH

31 1/4 Inches

### RADIO COMPARTMENT AREA

(L) 6" X (W) 1 3/8" X (H) 1 3/4"

Plus Rcvr. Comp.

### STABILIZER SPAN

14 Inches

### STABILIZER CHORD (incl. elev.)

4 1/2 Inches (Avg.)

### STABILIZER AREA

60 Sq. In.

### STAB AIRFOIL SECTION

Flat

### STABILIZER LOCATION

Top of Boom

### VERTICAL FIN HEIGHT

7 1/2 Inches

### VERTICAL FIN WIDTH (incl. rudder)

4 1/2 Inches (Avg.)

### REC. ENGINE SIZE

.049-.051 Cu. In.

### FUEL TANK SIZE

2 Ounce

### LANDING GEAR

Conventional

### REC. NO. OF CHANNELS

2

### CONTROL FUNCTIONS

Rudder & Elevator

### BASIC MATERIALS USED IN CONSTRUCTION

Fuse. .... Balsa, Ply, w/aluminum boom

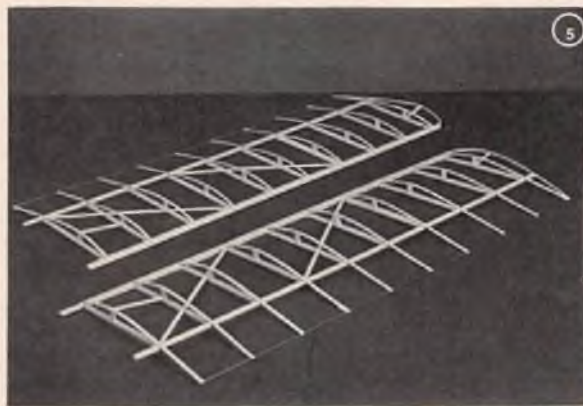
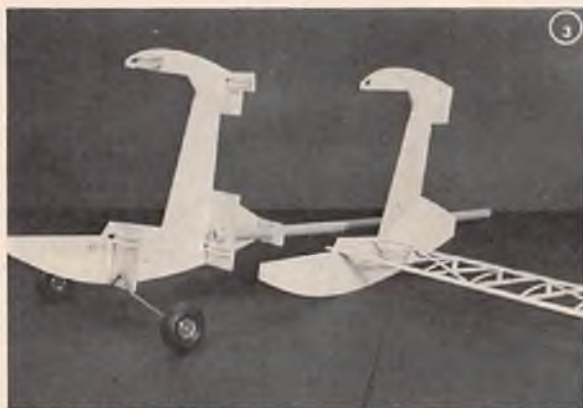
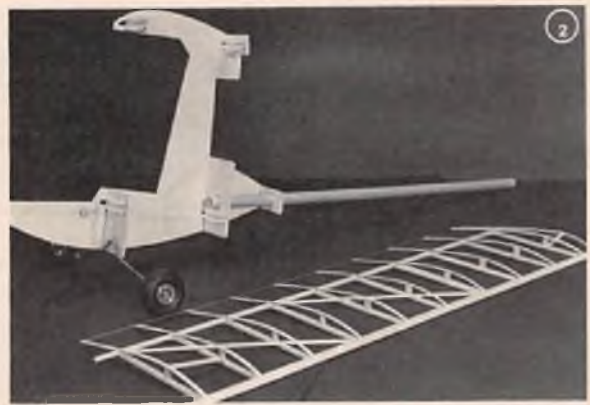
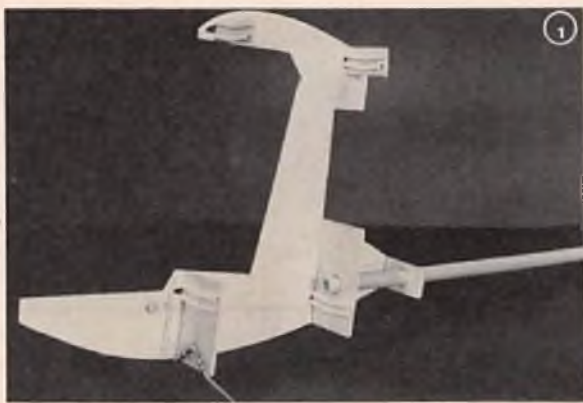
Wing .... Balsa, Ply, Spruce, Music Wire

Empennage .... Balsa & Ply

Wt. Ready-To-Fly ..... 25-28 Oz.

Wing Loading ..... 6-7 Oz/Sq. Ft.

pass through. This boom shattered in three places on the first flight. I turned to the expert on gliders and hang gliders, Mark Smith of Windward and Windfree fame, and he came up with a piece of aluminum tubing from one of his old hang gliders which fit the bill just perfectly. It was 1/2" OD seamless aluminum tubing 6061 T-6 and is not



(1) Fuselage side shown with bulkheads in place. Landing gear has to be wired and epoxied in place before bulkhead is installed. Boom is not epoxied in at this point. (2) Another view of partially completed fuselage shown with one completed wing panel. (3) Left fuselage side ready to be joined to fuselage. Wing is shown set in leading edge and spar holes in fuselage side. 1/8" sq. spruce guides hold wing in dihedral position. (4) Fuselage approaching completion stage. Again note holes for wings to plug-in; these have to be accurate as they determine the wing incidence. Note receiver location. (5) One completed wing shown ready to be covered. Note ultra light construction built very similar to full size aircraft. (6) Three quarter rear view of completed Whing Ding prior to the painting and wing covering. (7) Three quarter front view. Only thing missing is the three hatches and something to keep the wind from blowing through the wings.





**(8) Completed tail section. Note brass attachment plate on stab to attach to tail boom also 1/32" ply plates on both stab and fin. (9) Close-up of completed tail assembly on finished model. Boom slotted for pushrods. Rudder exits on right side. Brass sheet wraps around boom to help secure vertical fin. (10) Close-up of the wing struts and attachment brackets. Rigging wires are permanently attached at strut end. (11) Cox Tee Dee .049 set up on an Ace R/C 1/2A mount. Note Proctor #1 turnbuckles used on rigging. Turnbuckles placed at fuselage where rigging is taken apart when removing wings. (12) Plastic pill bottle makes a perfect pilot's seat. All that is missing is the pilot. (13) Photo looks like the real thing. Only the engine and receiver switch gives it away as an R/C model. (14) From this view it shows that the rigging is a very functional part of holding the wings on and in alignment. The wash-in or wash-out can be corrected by adjusting a turnbuckle on the rigging.**

building board, block up the spar until the leading edge and the trailing edge of the tips just touch the board. Cut the tips to a straight line, put wax paper under them and glue a piece of 1/32" music wire to all of the tips to act as the trailing edge. This glue joint is only temporary, it will be necessary to reinforce each joint with a small strip of cloth cemented top, around the wire and back along the bottom side of each cap strip. The wing-tip is a cap strip turned sideways. Make four wing halves and be sure to allow the leading edge and spar to extend into the middle.

For your consideration, the wings did bow slightly as the paper tightened, this is not objectionable as the upward bow just increased the dihedral. It was intended to keep the WD-II as near scale as possible and the three-views did not show another spar - - in fact, I added the spacers. I was reluctant to put one in place of the spacers. The rigging adds the necessary strength to the wings, but a 3/32" x 3/8" spar in place of the spacers might stop the bowing tendency. If you do this, the spar would have to be notched for the diagonal braces.

Fill in-between the cap strips on the leading edge with 1/32" x 1/8" balsa strips. When you cover the wings, let the silkspan extend 3/8" beyond the trailing edge on top, then fold under and cement. (Remember the newspaper and flour paste kites we used to build?) The bottom of the wing is covered from the leading edge back to the spar only.

#### **Fuselage:**

Cut the two sides to shape using 1/16" medium hard sheet balsa and duplicate each side from 1/32" ply, trying to keep the materials cross grain to each other. Laminate the ply to the balsa with contact cement. Sand the two sides together to shape. Cut out formers from materials indicated on the plans. In addition, you will need a compartment bottom under the fuel tank, and the receiver, and you will need two bulkheads in the upper wing area for channels to hold the top wing, cut from 1/8" sheet. These were not shown to shape on the plans as they will vary slightly depending upon your choice of tanks and radio equipment.

Bend the landing gear wire to shape and sew it to former #2 with copper wire or heavy thread. Using formers 1 and 3, the ply boom former and the firewall, build your fuselage box by gluing the formers upright on the right fuselage side. Add the compartment bottoms and the two formers in the upper wing area. It should now look like a maze and the task is to get from point A to point Z without passing Go or collecting \$200.00. Now that you are out of Jail, you might glue the other side in place. I did not put the channel strips on the formers until I had the fuselage finished to the point that I could install the wings. Then the channel

braces were installed to hold the wings in the dihedral position. Be sure and cut holes in the compartments for servo and battery wires, then most of the 3/32" edging may be applied. Keep the boom compartment open until the last when you will epoxy the boom in place (small wedges hold it in place until you are ready to epoxy).

#### **Empennage:**

The rudder is pretty straightforward except for the 1/32" ply stiffeners which are contact cemented in place. The stab, like the wings, is a horse of a different color. Even though you don't intend to use the whole thing for control, it is still a unique and good way to affix it to the boom. Cut it to shape from 1/8" sheet, cut the stiffener from 1/32" ply. Make the hinge by cutting the pattern shown from .005 shim stock, fold it around a 1" length of 1/16" ID brass tubing and solder. Cut a 6" length of 1/16" music wire and insert through the tubing. Cut a groove in the stab where shown and lay music wire in the groove; epoxy then cover with the stiffener. The long end of the hinge is attached to the boom. Before installing the empennage on the boom, make a tapered wooden plug from 1/2" dowel which is inserted in the tail end of the boom and epoxied. Form the hinge over the plug and onto the boom, bend to fit the curve of the boom and epoxy in place. Drill a 1/16" hole through the hinge boom and plug. Make the tail wheel pivot in the same manner as you did the stab hinge and fasten it to the fin with a 2-54 nut and machine screw. Roughen the top of the boom with a coarse file and epoxy the fin to it. To make sure it is at right angles to the stab, push a short piece of 1/16" music wire through the whole set-up till it hardens. Bend the right angle on the tail wheel wire, push it down through the pivot and on through the boom, slide on a wheel lock and secure. Bend the remainder of the tail wheel wire and add the wheel.

Place the fuselage on the wheel wires and block up the tail end so that it assumes the position shown in the side view on the plans. Note the incidence of the wings. Cut the holes in the sides for the leading edge and spar extensions. Elevate the wing tips for the proper dihedral and block in place. Cut four struts 6 7/8" long from 1/8" x 3/16" medium hard balsa stock. Use a strut to keep the top wing parallel to the bottom. Glue the 1/8" square spruce strips in place, as shown on the plans to form channels for the leading edge and spars. Remove the wings and cut notches just above the leading edge holes and spar holes for the rigging anchors. Put them in place just before installing the wings for rigging. Install your servos now before you add the edging. The servos may be removed through the hatch, but it is rather tedious; add your switch and harness. Install the bottom edging made from hard 3/32" balsa, line the

battery-ballast compartment with 1/16" ply for strength. Add the remainder of the edging except for the piece over the boom. Add the soft balsa nose plug and sand. When you are ready, make sure the fin is parallel to the upright part of the fuselage and the stab is perpendicular, epoxy the boom in place and close the compartment. Give the fuselage, stab and rudder a couple of coats of sanding sealer, finish sand, and paint with white dope. Before the wings were given their final coat of dope, they were fogged white to match the fuselage.

Run your pushrods through the boom and attach to the servos and proper part of the empennage. Unless you are willing to take the consequences, do not fly the plane with the full flying stab. When the plane is blocked up with the tail in the air, make sure the stab is parallel to the building board then epoxy the hinge joint in place. Use the back 1" of the stab for the elevator.

#### **Rigging:**

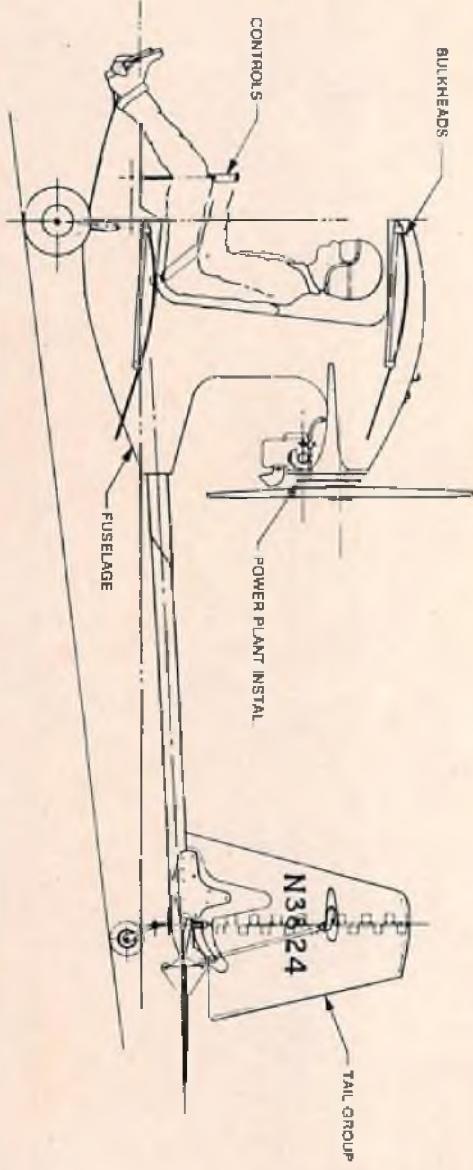
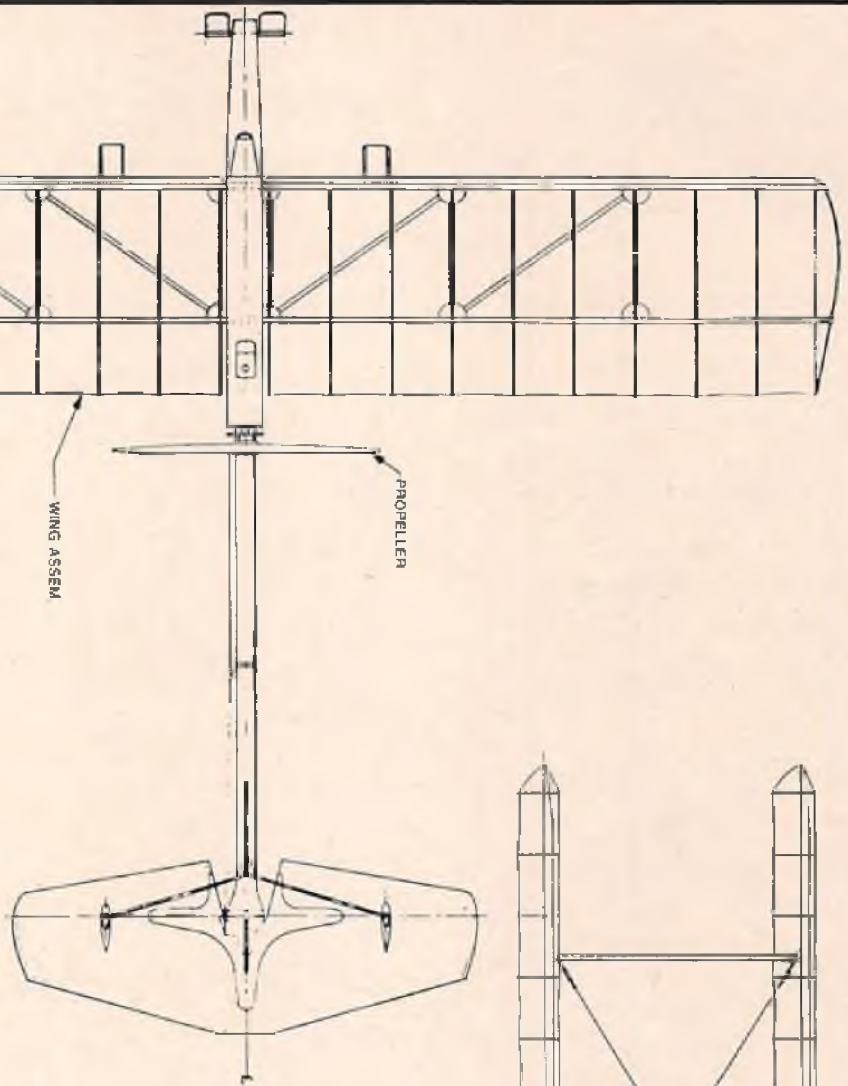
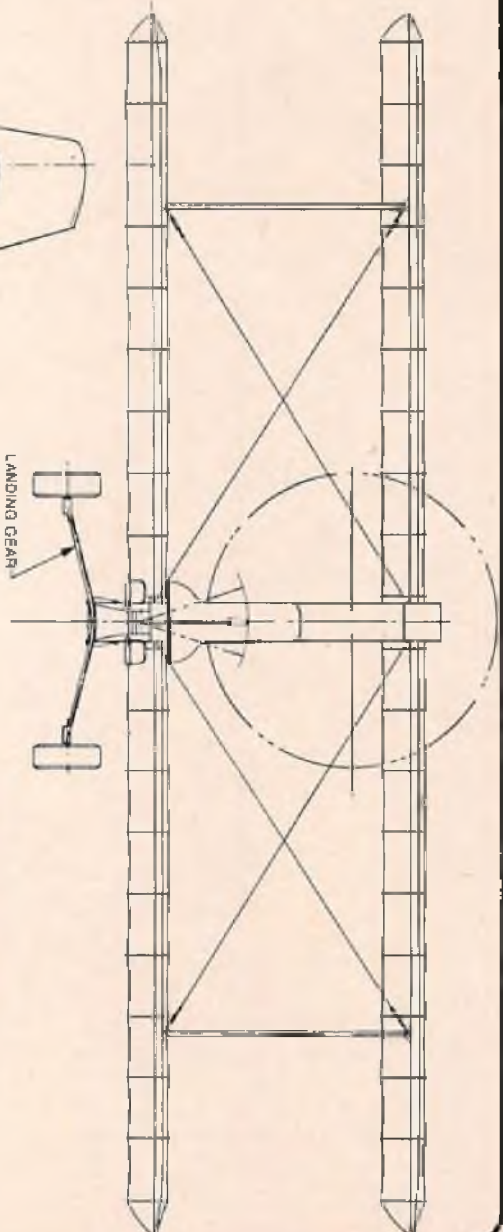
Make the rigging brackets from .005 brass shim stock and affix to the wings. The front brackets bend around the leading edge and are epoxied there for strength. The rear brackets on the bottom of the upper wing bend around the spar and are pinned with liny 3/8" pins. The rear brackets on the lower wing were also pinned through to the 1/8" spruce spar. Anchor pins have a loop on one end and pass through the bracket and strut end then they are bent over at right angles to secure. The turnbuckles are at the fuselage end of the bracing wires. The bracing wires are 10 lb. test monofilament fishing line, I used 1/16" OD aluminum tubing as swages. Cut the tubing into 3/16" lengths (16 of them). Thread a piece of the line through a swage, through the loop in the anchor pin, back through the swage, pull up taut and squeeze the tubing flat with pliers. Open the turnbuckle about half way, pass the line through the eye of the turnbuckle, pull taut, and swage. Do this for all eight lines. Look at the ends of the wings for wash-in or wash-out and relieve by tightening or loosening the turnbuckles.

#### **Safety wire the turnbuckles:**

It must be remembered that the maximum gross weight of the full size plane is 300 lbs., with the plane weighing 118 lbs. - - that leaves 182 lbs. for the pilot who sits just forward of the C.G. We do not have that mass available for the model so it will necessitate quite a bunch of lead in the front end to get the plane to balance at 1/3rd of the chord.

No other engine was tried other than a TD .049, but I imagine a Cox Black Widow would work just as well. A right hand prop starter spring is available at most hobby shops. If you use the Black Widow, the fuel tank is unnecessary.

The stick and foot rests are just decoration and can be made of  
text to page 142



**AIRCRAFT SPECIFICATIONS**

DESIGN MAX GROSS WT. = 310 LB.  
 WT. EMPTY = 122 LB.  
 ENGINE McCULLOCH MODEL 101A  
 H.P. = 12 TO 15  
 ENG. SPEED = 9500 RPM  
 DRIVE RATIO = 1:3.86  
 PROP. DIA. = 48" PITCH = 28"  
 POWER LOADING = 25 TO 20 LB/HP  
 STALL SPEED = 26 MPH  
 MAX DESIGN SPEED = 50 MPH  
 FUEL = 5 GAL. (APPROX 15 MIN.)  
 DESIGN LOAD FACTORS = 3.0 G. (LIMIT = 4.5 G.) ULT.  
 WING  
 SPAN = 17.0 FT.  
 AREA = 86 SQ. FT. WING LOADING = 3.66 LB/SQ. FT.  
 CHORD = 36 IN. ASPECT RATIO = 5.95  
 HORIZONTAL TAIL  
 SPAN = 75" AREA = 10.4 SQ. FT.  
 VERTICAL TAIL  
 HEIGHT = 37.5" AREA = 5.3 SQ. FT.

GENERAL ARRANGEMENT  
 WD-II BIPLANE







## AMA MODEL AVIATION HALL OF FAME HONORS KEN WILLARD

In ceremonies aboard the Queen Mary, Ken Willard was awarded a plaque signifying his election to The Model Aviation Hall of Fame. AMA President, John Clemens made the presentation in recognition of Ken's outstanding contributions toward the advancement and prestige of aeromodeling.

Nearly a hundred prominent members of the modeling fraternity attended the banquet to honor Mr. Willard. Among the distinguished guests were Hall of Fame members Carl Goldberg and Nathan Polk. Prior to the actual award, close to two hours were devoted to tributes to Ken by several of his long time friends and associates. These were presented in the popular roast style and loaded with zingers that would even top Dean Martin's writers.

Ken Willard is world renown through his "Sunday Flier" column in RCM. He has been associated with RCM for more than 13 years and has held high popularity ratings in the reader's surveys throughout those years. His model designs featured in RCM (many of which have been kitted) are too numerous to

**ABOVE:** Hall of Fame plaque was presented to Ken Willard by AMA President John Clemens. Hall of Fame members, Carl Goldberg (Left) and Nathan Polk (Right), were guests at the Awards Banquet.

list. His innovations include a 1940 Control Line Patent, extensive R/C seaplane developments, and successful experiments to increase sailplane wing efficiency.

Willard helped organize the League of Silent Flight and the South Bay Soaring Society (California). He was president of the Los Angeles LARKS and chairman of the LARKS' Fund Drive for the Los Angeles Model Airport. He also contributed to the design and layout of the Model Airport, working with The Los Angeles Department of Recreation and Parks and The L.A. Model Hobby Association.

Some of his other contributions include: an unofficial AMA world endurance record for indoor seaplanes (1927), world's smallest RC model (1962), first cross-channel RC model flight from California to Catalina Island (1957), and the world's largest RC plane using sport RC equipment (1972). He was a pilot for two U.S. Department of Defense contractors for RPV's from 1972 to 1976, providing one with a basic design used for airborne real time TV transmission.

Ken, like his fellow Hall of Famer, Maynard Hill, is one of those who has been instrumental in gaining appreciation from aeronautical scientists and engineers for the capability of model aircraft in research programs. He has thus done much to gain professional respect for model aviation as an adult activity.

Ken's distinguished career with Lockheed ended with his retirement in the fall of 1977. He is now applying his abundant energy to free-lance writing and modeling.

We are proud to have Ken Willard as a member of the RCM family and congratulate him for receiving this well deserved honor. □



Ken Willard was test pilot for Lockheed's RTV-1 program. Vehicle shown weighed 340 pounds, had 12' wingspan, and was powered by a 24 H.P. snowmobile engine.



It's the peanutiest! Willard's .020 powered R/C Peanut Scale SE-5 is one of the world's smallest R/C planes.

# MICROCOMPUTER-CONTROLLED PATTERN PLANES

By Svante Berglund

I have noticed in your magazine, that the authors very often begin their articles by testifying that they are not really beginners, but have 40 years or so of experience in the field. Here is my list of qualifications:

I started with model flying at the age of 10; at 15 years old, full size gliding; for 10 years, from 18 years of age, I was a jet pilot in the Swedish Air Force, then some private piloting and gliding. During these last years I have returned to model flying and so, for me, the circle is closed. I especially appreciate R/C gliding here in Switzerland because it offers many possibilities to combine flying with walks and picnics in the mountains together with my family.

However, to the subject: During the next decade our society will be increasingly penetrated by microcomputers. Our cars will have a microcomputer to control or supervise the ignition, fuel mixture, brakes, instruments, etc. Many of our measuring instruments already have microcomputers to perform calibrations, tests, and other tasks, to make the instrument easier to use. There is a long list of applications for these small technical wonders. We may, of course, also ask how these new components could be used in radio control model flying.

From time to time one can read articles about electronic sequencers which generate control signals to perform certain aerobatic maneuvers. For example: You connect a little box to the buddy-box connector of the transmitter; you press a button and your pattern ship makes a perfect roll. It is a very natural improvement to use a microcomputer instead to generate these control signals.

My ideas are based on using an Intel 8748 microcomputer (Figure 1) which has an 8 bit central processor with 1K (1K=1024) words of 8 bit read-only, 64 words of data memory, etc. It has also an interval timer with 8 bits which is especially useful in this application. All that on one chip (40 pins) and only a single 5v power supply is needed. We also need to connect 2K of read/write memory to the processor.

The digital part of our transmitters generates a sequence of 5 pulses (for a 4 servo system). After that there is a sync pause and the sequence is repeated again. The time between the first and the second pulse defines the position for servo 1. It is 1.5 ms (typical for the servo in neutral position) while

1 ms and 2 ms give the extreme positions. Assume that an analysis of a 2 second long maneuver shows that the servos move, as shown in Figure 2 (continuous line). These movements can be approximated by a staircase which can easily be generated by the computer. As mentioned before, this microcomputer has an internal timer which works in the following way: the timer, which is in fact a counter, can be loaded with a number 0-255 decimal. (The computer has, of course, binary notation and 255 is the highest number which can be represented in an 8 bit word.) At a given start command it starts to count down with a certain frequency which we are free to select. When the counter comes to zero it interrupts the central processor in the computer. We now select the frequency so that if we load the counter with 150 we interrupt the processor every 1.5 ms; the frequency must in fact be:

$$\frac{150}{5 \cdot 10^{-3}} = 100\text{KHz.}$$

That interrupted signal will also trigger a monostable which modulates the RF of the transmitter. Let us now load 4 memory cells in the computer with the numbers 150, 100, 200, 175. At time zero we trigger the monostable and load 150 into the counter. After 1.5 ms it triggers the monostable and interrupts the central processor which then loads 100 into the counter, etc. After we have loaded all the 4 numbers, we let the processor go into a wait-loop for about 8 ms to generate the sync pause and then go back and load 150 into the counter again, etc. We have now generated a sequence, which sets servo 1 in a neutral position; 2 in extreme left, 3 extreme right; and 4, half right (Figure 3). We now repeat this sequence during 250 ms. After that time we select a new block of 4 words from the computer memory, because we want a new setting of the servo every 250 ms (Figure 2). To generate the sequence in Figure 2 we thus need to store in the computer memory the following sequence: (156, 168, 165, 156); (172, 194, 175, 169); (190, 198, 175, 175); (194, 170, 175, 169); (181, 130, 175, 157); (166, 115, 175, 153.); (155, 130, 158, 152); (150, 147 154, 150). How much memory is needed? Not so much. To store 5 different maneuvers, each 10 seconds long and 10 maneuvers each 5 seconds, we need  $5 \times 10 \times 16 + 10 \times 5 \times 16 = 1600$  memory locations, which is a cheap

memory nowadays.

We also need some simple peripherals, one keyboard (10 buttons, 0-9), one display (3 numerical characters) and a simple portable cassette recorder. We need all of this to be able to do modifications in the number-sequences on the field. The cassette tape will also serve as a permanent store of the programs. As mentioned before the 8748 has a read-only memory with 1K words. Here we can store an editing program which will be used to facilitate the manipulation of the number sequences, which can be quite long. It can also make some checks on the numbers; for example, give a warning if we enter a number smaller than 100 and larger than 200, because these numbers will try to move the servo outside the extreme positions.

Of course, the pilot cannot be replaced by a system like this. Take-off and landing cannot be done under computer control. What one can hope to do is one aerobatic maneuver, probably maximum 10 sec. long, starting from a given initial situation, straight and level at a certain altitude and a fixed speed. After that the plane must be flown to a new reference situation by hand. As mentioned in the title of the article, this method of control can be used only for pattern planes because they have neutral stability, are heavy and less affected by turbulence, and have motors which run reliably. Somebody may argue that the plane will move step-wise because the servo arm moves step-wise. But this will not be a problem. First, one can do some electrical filtering of the control signals to avoid over swing of the servos and then the mechanical inertia of the plane will do the rest to get smooth movements.

The disadvantage with a system like this is that it is an open loop control system. We apply it by using certain demands of the computer but there is really no check that the model behaves as we want. We must make a landing, change our parameters and try again. One can, of course, close the control loop and have sensors of orientation and velocity in the model whose outputs would be sent back by telemetry to the computer. The wanted and actual movements of the model could be compared and the computer could immediately do the corrections to get the perfect maneuvers. In this way the computer could force the model through long sequences of very complicated maneuvers. Such a system is, of course,

### ON CHIP FEATURES

- 8 BIT CPU
- 1K WORDS OF PROGRAM MEMORY
- 64 WORDS OF DATA MEMORY
- 27 I/O LINES
- INTERVAL TIMER EVENT COUNTER
- OSCILLATOR AND CLOCK DRIVER
- RESET CIRCUIT
- INTERRUPT CIRCUIT

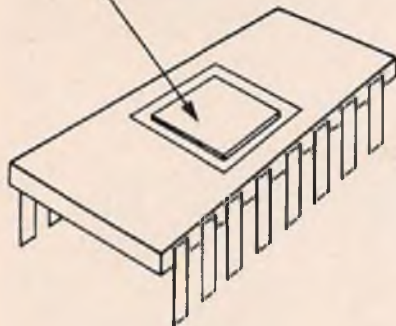


FIGURE 1

too complicated for a pure amateur. However, there is another more simple possibility. One could use the eyes and brain of the pilot as an error amplifier. One could modify the signals from the computer with the signals from the normal control sticks on the transmitter in such a way that the computer generates the ideal control sequence and the pilot only concentrates to make corrections to get the perfect pattern.

With the exception of the last ideas, we have, up to now, not assumed any modifications of our actual transmitters. We have just connected the signals generated by the computer to the buddy-box connector of the transmitter and we have a switch to select manual or computer control. It is, of course, also possible to completely replace the pulse generating circuits in our actual transmitters with the microcomputer. We would then also replace the potentiometers on the control sticks with, for example, code discs which directly generate numbers understandable for the computer. We could then, by programming, introduce several new features for manual flying --- for example, changeable sensitivity of the servo response. It would be easy to program a nonlinear servo response. We would also get another method of reading control sequences into the memory. We let the expert pilot fly our plane through a difficult maneuver and we program the computer to read the stick positions every 250 ms and store the values directly into its memory.

Now, why build a system like this? I find it to be a technical challenge to incorporate modern electronic components into our R/C equipment.



FIGURE 2



FIGURE 3

Already today people have slow roll buttons and snap roll buttons, etc., on their transmitters. All these things can be integrated in the system, but we get more freedom to make changes and add new features. Maybe this system also can be a help for the expert pattern pilot to analyze his difficult maneuvers and systematically change the control combinations. One thing is obvious. Every time one starts a control sequence, the settings of ailerons, rudder, elevator and power of the motor will come in exactly the same way.

I have tried to show that it is already technically and economically feasible for a person with background in R/C flying, electronics and computer programming to introduce computer control in R/C flying. I, myself, have that kind of experience, but for the moment I have put this project on the shelf and returned to my gliders. I also know that in the future even the smartest computer system can never predict the behavior of my gliders in the air. Even in the future my gliders will be controlled only by myself and the winds. □



# IT'S THE NEXT BEST THING

By T/Sgt. Dave Sheeder

USAF Photos By S/Sgt. Bob Wickley

Master Sergeant Joe Kutcher "pilots" Hunter's Ryan during a test flight.

**T**achikawa AB, Japan — Take it from Charles Hunter, building a radio controlled model airplane is no breeze.

"I really didn't know what I was getting myself into," the Air Force master sergeant said. "It was just too big a project for the first try, but, after I got involved, I couldn't put it down."

Hunter was ushered into radio controlled models via the Ryan STA Super 200 Special — a one-fifth scale of Claude Ryan's 1936 design.

Ryans, the 38 year old sergeant explained, were purchased by the U.S. Army and designated XPT-16. As the country drifted toward war, orders for Ryans soared. They were to be used to support the fledgling pilot training program.

Long since dropped from the military inventory, Ryans, today, number only about 30. Some, however, are still used in air shows around the country. Because of their scarcity and unique design, the value of the light aircraft has jumped more than four times its original \$5,000 cost.

Hunter's decision to build a scale model of the Ryan was no accident.

"I was sixteen . . . cutting grass at Ft. Lauderdale Airport in exchange for private pilot lessons . . . when I saw my first real, honest to goodness Ryan," he



Hunter makes final adjustments prior to a test flight at Tachikawa AB, Japan.

reminisced. "It was just sitting there with a \$900 price tag on it. I wanted it bad, but, my Dad said no way."

As the years passed, so did Hunter's hopes of owning a Ryan; until, he arrived at Yokota AB last spring to join the 475th Civil Engineering Squadron.

"One day shortly after I got here, I walked into the Yokota Hobby Shop and there it was," he continued. "Not the real thing, of course, but, it was a Ryan . . . a scale model do it yourself kit of the plane I'd always wanted to own. If I couldn't have the real one, I'd have the next best thing."

That was the beginning of what the sandy-haired sergeant calls the longest and most frustrating, yet rewarding, year of his life. Almost to the day, it took him 12 months to build the popular sport plane — a job that was accomplished almost entirely on his dining room table.

It took more than 700 hours of working during lunch hours, after duty hours in the evenings and on weekends to complete the job. Also, it took infinite patience and a pocket full of money. To date, Hunter has invested more than \$350 in his Ryan.

"I think my wife showed the most patience," he mused. "She didn't ask too many times about when we were going to get a new centerpiece for the table."

In every detail, Hunter's model is "super scale." It's 18" high, 54" long, has a 72" wing span, and weighs 9 pounds. Powered by a 60 Erya 1.3 horsepower engine, the craft features a special manifold with exhaust pipes.

to page 142



*A view of the detailed cockpit of Hunter's Ryan --- a 1/5 scale model of Claude Ryan's 1936 design.*



*A couple of young spectators admire Hunter's handiwork.*



*Tinkering with his \$350 toy, Hunter says it took him more than 700 hours to build the radio controlled model.*



*Hunter, his Ryan and daughter Renee.*



*"The Black Sheep Squadron" must be every scale modelers favorite program. TV star Robert Conrad sent this autographed photo to all those who replied to his recent RCM ad asking for letters to NBC urging the program to be kept on the schedule.*



*Bud Atkinson took an Airtronics Acro-Star kit and added the scale look of the Avia 534 WW II Polish fighter. This qualifies the biplane for the 10% scale bonus awarded in the IMAC Aerobatic Biplane events.*



*Bud Hall of Waterloo, Iowa, built this sharp Waco "E" from the Sterling kit. The "E" is the ultimate and most valued development of the Waco cabin series. Only 5 are still on the FAA register and some of these are not in flying condition.*

## Differential Makes A Difference!

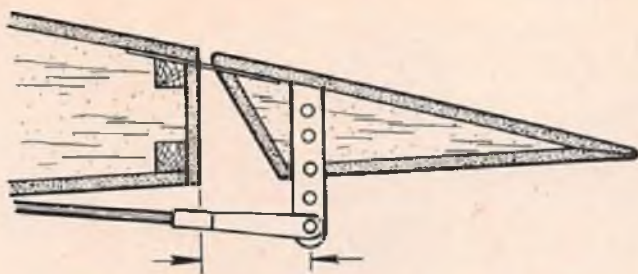
**S**ome R/C fliers assume that ailerons should always be hooked up with equal up and down movement on either side of neutral. This is the easiest way and most standard pattern designs seem happy with equal aileron movement. In fact, some pattern designers are opposed to differential, as unequal movement is called. On pattern's fairly light wing loading models, laid out to the requirements of a cut and tried formula, emphasizing symmetry between upright and inverted flight, tinkering would be daring and might be unprofitable. But this doesn't prove a case can't be made

for aileron differential, particularly on scale models.

Let's take a look at why. As one aileron goes down and the other goes up, lift is increased on the first wing and decreased on the second, causing the aircraft to roll in the direction of the raised aileron. Simple, except the problem here is that the down aileron also creates a certain amount of drag at the same time, which pulls the nose of the aircraft toward the down aileron side — just the opposite of the desired turn. At best, in some R/C models, this spoils the looks of maneuvers (unless opposite rudder is fed in) and at worst can louse up controllability completely.

The cure for this disease is to

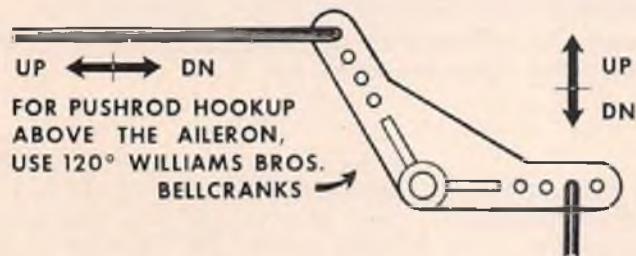
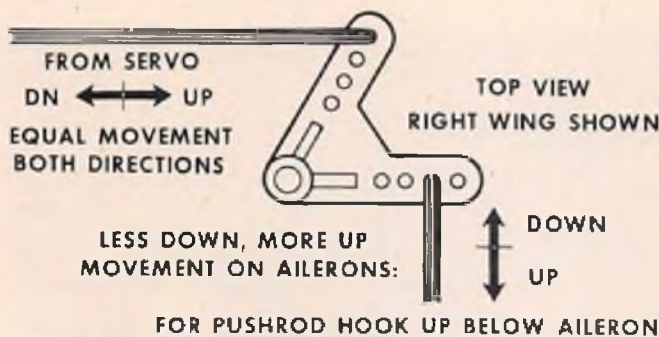
introduce a correction such as changing the movement of the ailerons so that the one going down moves less than the one going up, creating less drag in the process. You may be flying with a differential in movement already and not realize it. Figure 1 shows a common type of aileron construction used on many scale models as a building convenience. (In at least one full size prototype, this is the exact scale cross section, the only difference being that the hinge has an even more practical location on the top surface of the wing, instead of below the planking. The designer of the Shinn 2150, now back in production in Phoenix as the Varga Kachina, must have been a modeler!) The rearward location of the



THE GREATER THE DISTANCE FROM HINGE TO HORN, THE GREATER THE DIFFERENTIAL.

FIGURE 1

WILLIAMS BROS. 60° BELLCRANK HOOKUP



FOR SERVOS THAT RUN OPPOSITE TO THE DIRECTION SHOWN ON THE DRAWING, REVERSE THE BELLCRANKS.

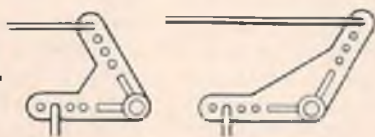


FIGURE 2

horn behind the hinge point in Figure 1 gives less down movement and more up. The farther back the horn is placed, the greater the difference between down and up. This principle can also be applied to other aileron cross sections.

Williams Bros. make 60 and 120 degree nylon bellcranks which produce differential movement. Figure 2 shows hookup of the bellcranks to the ailerons. Note that the amount of movement can be increased or decreased by moving to appropriate pick up holes, as is shown here for the aileron pushrod. The servo pushrod can also be shifted. Moving to other holes does not affect the differential, which is set by the angle of the horn.

Back in the early days of pattern flying, another way to eliminate the effects of adverse yaw was often used. Ed Kazmirski put Frise ailerons on his pioneer "Orion" and others followed the example. He said at the time that the aileron hinging of the Piper Apache inspired him to try the idea. Figure 3 shows the Frise aileron configuration. Any time you pick a scale subject having Frise type ailerons, be sure and use them. They will get extra scale points during judging as well as improve flying performance. As for Ed, he dropped Frise ailerons from his next design, the classic "Taurus", and opted — as everyone soon did — for the simplicity of strip ailerons that Harold deBolt had

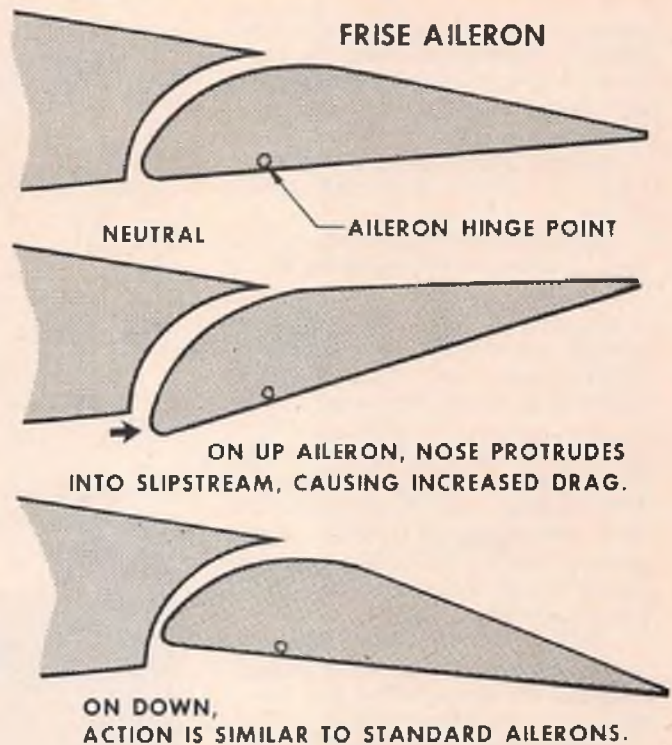
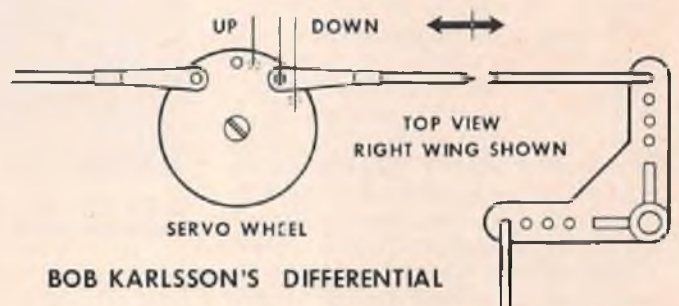
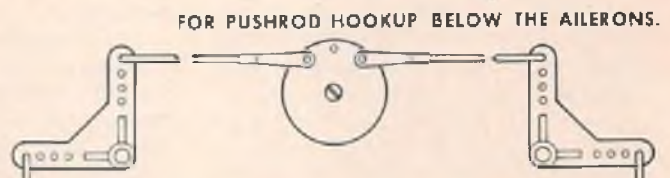


FIGURE 3



BOB KARLSSON'S DIFFERENTIAL



FOR PUSHROD HOOKUP ABOVE THE AILERONS, REVERSE THE BELLCRANKS. FOR SERVOS THAT RUN IN THE OPPOSITE DIRECTION, USE THE "FOR PUSHROD HOOKUP BELOW AILERON" DRAWING BUT HOOK THE PUSHROD ABOVE THE AILERON.

VICE VERSA FOR BELOW AILERON HOOKUP.

FIGURE 4

popularized. Differential can be easily introduced into strip ailerons by bending the wire horns away from the servo if the horns are below the wing (as on a high wing model) or toward the servo if they are above the wing (as on a low wing model).

Bob Karlsson, Scale Contest Board representative from AMA District IV and a long time scale and pattern flier, believes in differential. Bob told me in a letter, "Differential aileron deflection is very often required in scale models. I've flown a model Smith Mini-Plane that at half speed turned the wrong way, due to the high drag of the down aileron! Our Curtiss Wright Jrs. required almost no down aileron at all. Most parasols



behave this way, especially if they have dihedral. The more dihedral, the more differential required. We had a guy who put ailerons on an old deBolt Champ. It would not turn at all with ailerons. When all dihedral was removed, it responded fairly well. Differential made it almost normal."

Incidentally, the Smith Mini-Plane Bob refers to was not built from the Sig kit.

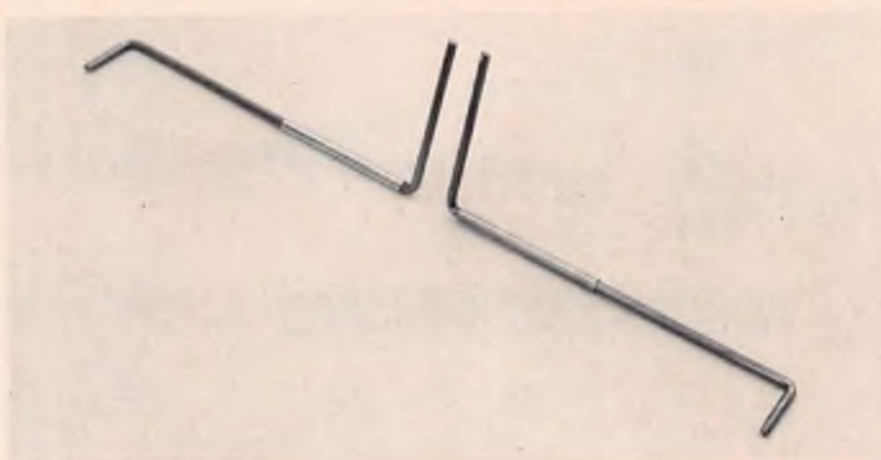
Karlsson feels that the required amount of differential is hard to determine in advance, so he has worked up the system shown in Figure 4, using a rotary servo wheel. For equal up and down movement, the aileron pushrods would be hooked into the center hole. The farther to either side of the center hole the pickup points are moved, the wider the differential between up and down movement. It can be carried to the point that no down movement of the aileron at all takes place.

I've always incorporated differential aileron movement in my scale designs because full size practice and theory said it was the way to go. Even though some were fairly heavy, they flew and maneuvered in a docile and no-vice manner. Given my below average piloting coordination, that is the type of flying I'm interested in. When checked out by better fliers, aerobatics did not seem to be adversely affected. So a question suggests itself: "Is equal movement of ailerons really the best for the specialized requirements of pattern aerobatics or is this just a common consensus opinion that has not been tested recently?" I know there are some dedicated pattern fliers who put in many long hours of practice trying different model set-ups. It would be interesting to hear from any who happen to have strayed to reading this column and can comment on observations of performance with and without differential. When it comes to models, regardless of what a theory book says, there is no substitute for some practical, rule of thumb trials of what works and what doesn't work.

This kind of discussion could prove to be of interest to both scale and pattern builders. The 1978 Tournament of Champions shake-up into an entirely new class of competition, combining features of scale and pattern, might be the handwriting on the wall for the future. There are a lot of pattern fliers doing something unusual — poring over 3-views of possible subjects for this developing trend. So even if the present "groove on a track" style of pattern flying requires no consideration of differential, that specification may soon be changed to something more scale-like. And I am convinced that most scale models fly in a more scale-like manner when differential is used — just as it is used by most full-scale aircraft.

★

*Thank you friends for all those cards*



**To create differential on strip ailerons, bend the horns. Photo shows a pair bent toward the servo for a low wing model. Bend away from the servo for a high wing installation.**



**A top view of a low wing with differential horns installed on strip ailerons. The more the horns are bent, the greater the differential.**

*and letters!*

My nomination for the most consistently interesting and informative column appearing anywhere in the model press is Clarence Lee's "Engine Clinic", right here in RCM. Much of the best material in this excellent feature comes in Clarence's reply to questions. Now I can't hope to equal his unique efforts, but perhaps I have forgotten something useful on scale research, design or building that a letter from an RCM reader will bring back to the surface. Send in your questions and we'll pick the best of them to appear in the column. I'll undertake to answer personally any that aren't used in print if a self addressed stamped envelope is enclosed. This will have to be within reason and the limits of my time. For example, I'd be glad to try to remember all I've seen on a particular airplane you intend to build next, but not for the ones you plan for the next ten years! At least not until you've built the first one and sent in some pictures.

Speaking of pictures, there are a lot of fine scale models that are never seen in print because of the simple absence of a photo. After all that work, isn't it essential that a good picture be taken of the completed gem, safe from the ravages

of the fickle finger of flying fate? If you can't take pictures, look up a relative or friend who does. All rules about scale model pictures are secondary to the major rule: Get the model out in the open, away from clutter and busy backgrounds, so that we can see it.

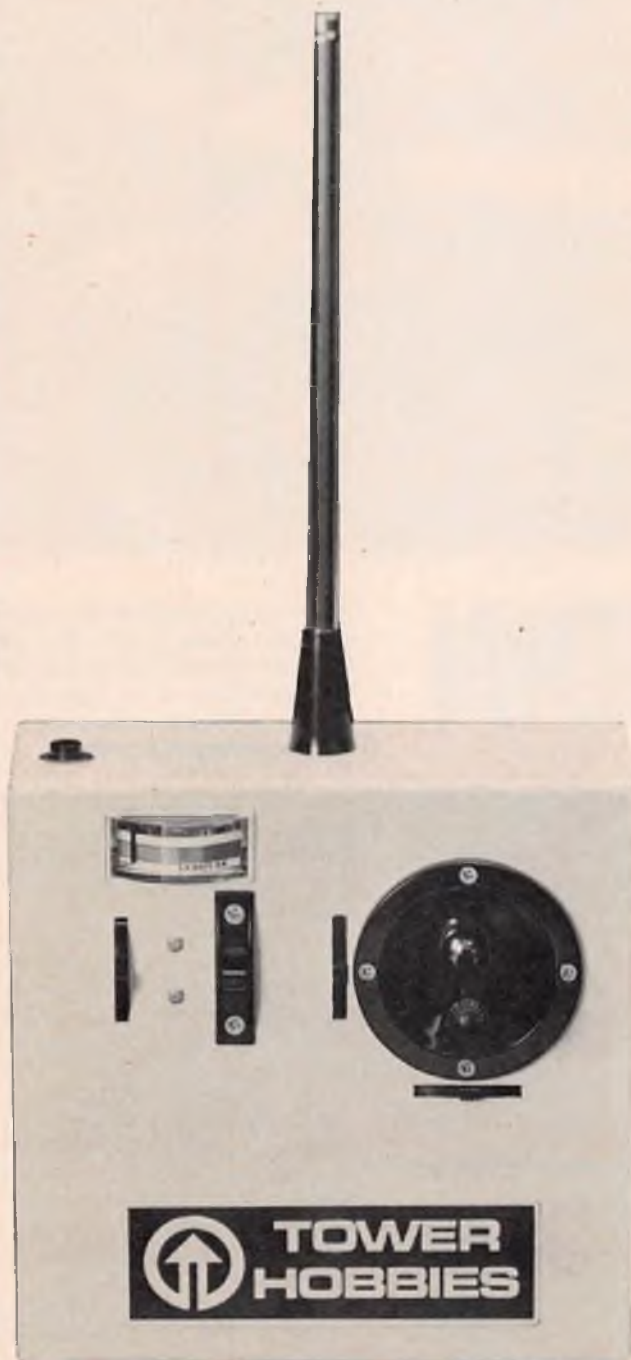
Send in some prints, we'll use all we can with the column. Black and white is most useful, but a really sharp color photo on smooth paper can sometimes be converted to black and white and made to do. If you were really shooting for top notch color for reproduction in print you wouldn't want to use color negative film anyway, color transparency film is much better. Also consider this — many decades after a color print has faded to an indistinguishable blob, a black and white print will still be as good as new. So keep that in mind before allowing the color photo to take over your family album completely.

We'd also like to hear your opinions on rules, ideas for better ways of scale building, experiences with models, etc. Remember, a columnist is no better than his correspondents let him be. So help me keep my allocation of RCM's valuable space filled with interesting items about scale. □



# RADIO SPECS

## TOWER HOBBIES 3 CHANNEL



**MARKETED BY  
TOWER HOBBIES  
P.O. BOX 778  
CHAMPAIGN, ILLINOIS 61820**

## FEATURES

### TRANSMITTER

- Number of Channels: Three.
- Case Material: Vinyl Clad Aluminum.
- Type Gimbals: Closed.
- Type Pots: Wirewound.
- Power Supply: 9 Volt Dry Battery (not furnished), Convertible to Nicads RF and Battery Voltage.
- Modes Available: N/A
- Frequencies Available: All 27 and 72 MHz frequencies.
- Weight: 2 pounds 1 ounce with dry batteries.
- Size: 5-11/16" x 5 3/4" x 2 1/4" (14.45 x 14.61 x 5.72 cm).
- Unique Features: Battery Check Meter Circuit.

### RECEIVER

- Case Material: Nylon
- Size: 2.78" x 1.36" x .83" (7.06 x 3.45 x 2.11 cm).
- Weight: 1.7 ounces.
- Type Decoder: CMOS
- Type Front End: Double Tuned RF Section.

### SERVO S

- Case Material: Nylon
- Size: TH-1411 2.5" x .76" x 1.50".
- Weight: 1.4 ounces.
- Output: 17 oz./in.
- Output Controls: 0.5 seconds transit time for 100° rotary travel.
- Type Amplifier: IC Bridge Type.
- Motor Size: 16 MM.
- Servos: 2 per system.

### SYSTEM

- Airborne Power: 4.8 Volt 450 mah Nicad Pack (Rechargeable).
- Type Connector: Kraft.
- Type Charger: Hi Rate.
- Servo Trays: None.
- Shipping Container: Foam Box.
- Service Available: Many authorized service stations around the country.
- Warranty: 180 days.



# MISS GRANDIN

By Ed Happich

**M**iss Grandin is a large 81¾" wingspan flying boat, designed for a .60 engine and which is a refined version of the original sport design first built in 1967. Five have been built to date and two are in excellent condition and are still being flown.

Lake Grandin, for which the design has been named, is a fresh water lake, comprised of 900 acres in the town of Interlachen, Florida. Living in a cottage on the East shore of the lake, where I am pleased to call home, I do all of my building and flying there.

Although this design is not recommended for the beginner, any experienced kit builder should have no difficulty with the construction methods used, especially if he has strip planked any round or oval fuselage or nacelle surfaces in other modeling endeavors. It was not conceived with acrobatics in mind, although it has performed such maneuvers as loops, wing overs, Cuban Eights, spins and consecutive horizontal rolls. The gas tank installation does not permit inverted flight. Touch and Go's, as well as full stall, full stop landings, are

a joy to perform. Because of the deep "V" hull and concave forward bottom, it will land easily on the water, even in a moderate surface chop. The water rudder is completely effective in crosswinds and is retractable for beaching. The completed model, ready to fly without fuel, should weigh in at approximately 9½ pounds or less, depending on the covering and paint job used.

The cabin area at the wing rest is completely sealed watertight. The wing

*ABOVE: Miss Grandin resting in its transport cradle. RIGHT: Mrs. Dee Ector, a flight hostess for Eastern Airlines, shows off the sleek seaplane with Lake Grandin, Interlachen, Florida, in the background.*

floats are designed to rip off on a poor landing, however, no wing structural damage will result. Simply replace (two) 1/16" plywood splints, secured with rubber bands.

If you have been curious enough to read this far, why not continue? Check the plans; the parts will fit. Build it, and you will be rewarded with many hours of relaxing fun. Furthermore, you won't be flying by yourself for long.

## CONSTRUCTION

**Hull Jig:** In my opinion, the time spent building a jig which will insure a perfectly aligned hull, and facilitate ease of building, is not merely desirable, but a necessity. It can be built in two nights time once the materials have been purchased.

Study the full size plan of the jig. With a ruler and drafting triangle, precise positioning of frame notches and base securing blocks can be accomplished.

**Hull Construction Using The Crutch Method:** For those who do not want to build the hull jig, the crutch method could be used although it has not been used on any of the prototypes.

---

## ABOUT THE AUTHOR

Ed Happich is the average Sunday Flyer type who has loved and enjoyed the R/C hobby since 1955 when Howard Bonner won the 1955 Nationals at Los Alamitos, California with his "Smog Hog" design. He attended that National competition and went to the hobby store in the hangar and bought a DeBolt "Live Wire Cruiser" kit, a Bonner "Varlcomp" escapement, a Babcock single channel hard tube receiver and a Fox .25 engine and was on his way. Ed figures he has been buying part interest in the local hobby shops ever since.

---

*By using the hull center line shown on the side view as a reference, 3/16" x 1/2" notches can be cut in each frame at the appropriate height and two pieces of 3/16" x 1/2" balsa used as a crutch. Once the frames are glued to the crutch, the keel and bottom chines are glued in place. The wing seat doublers and top longerons are next, with the 1/8" x 1/4" balsa cross members following. This brings you up to the point of applying the hull side sheeting.*

**Hull Construction:** All frames are constructed from 1/8" sheet balsa, except frames No. 5 and No. 7, which are sawed from 1/8" plywood and 3/32" plywood respectively. Select medium hard balsa to construct the balsa frames. It should be noted that hull frames Numbers 2, 3, and 4 must have extension pieces glued to the front sides in order to reach the base balsa securing blocks for "T" pinning. Extension pieces are cut from 1/8" balsa and are 5/8" x 4 1/2" long. They are later cut off flush with original length of side frame, with a razor saw, when the hull is removed from the jig. Cut the forward keel from hard 3/16" sheet balsa, then (two) forward chines from 1/8" sheet balsa and, finally, the wing rest doublers from 1/4" sheet balsa.

Before locating the frames in their respective notches in the keel plate, I recommend that the top edge of the keel

plate be rubbed with candle wax. This will prevent excess glue from accidentally bonding the keel to the jig. Having done this, the frames are placed in the slots. Place frame No. 1 against the front vertical surface of the vertical keel plate and, with the keel notch in the frame flush with the keel plate top surface, "T" pin in place.

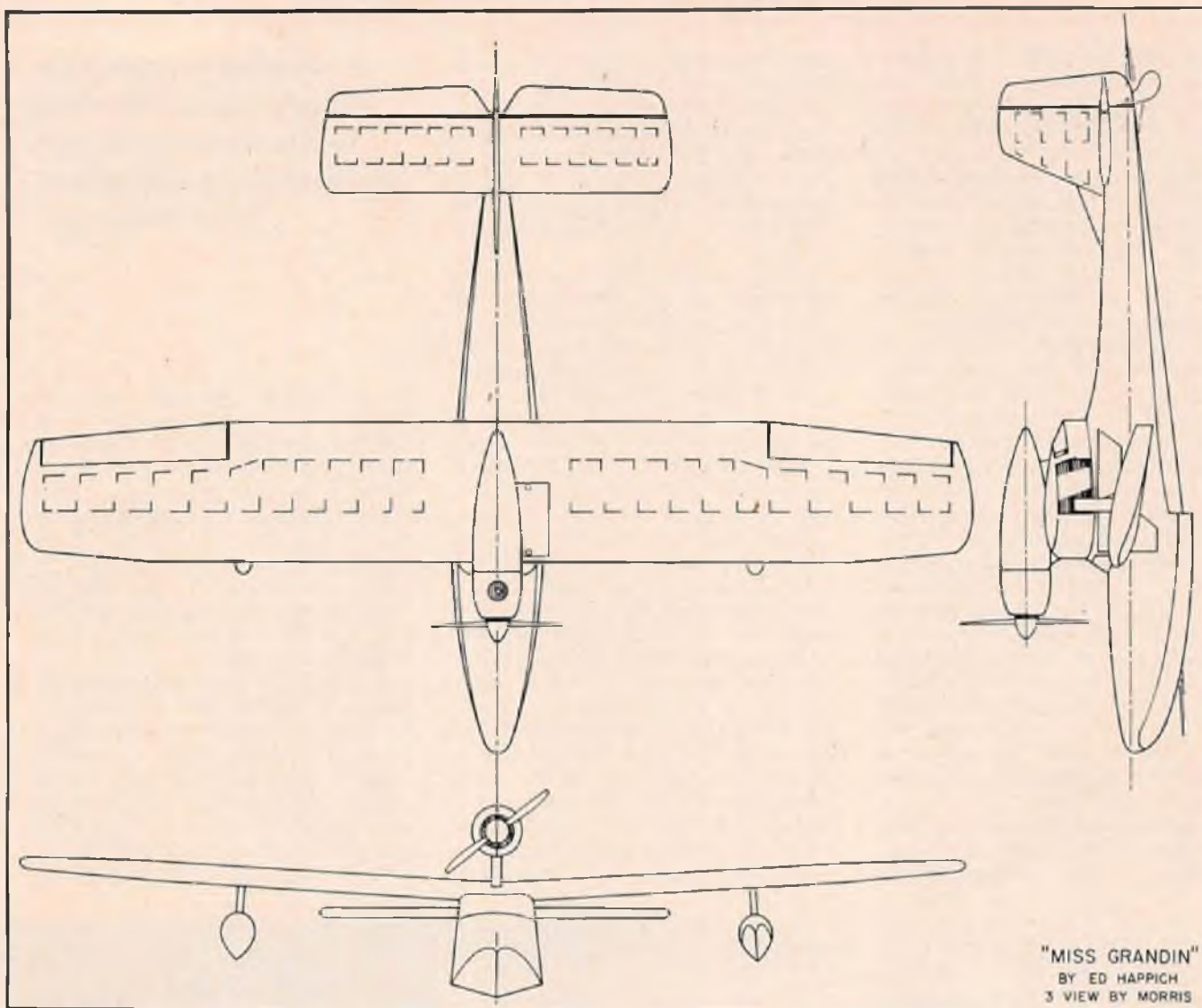
Proper alignment of all frames is mandatory. This is accomplished in two steps: First, all frames are made snug in the keel plate slots by folding waxed paper as shims, and in sufficient layers, over the bottom cross numbers. 1" to 1 1/2" wide strips will do fine. Check that all frames are plumb to base board. Proper placement of the 1/2" balsa securing blocks should insure this. Now, with a pair of dividers, check that the distance from the chine notch in each frame to the base board measures the same distance on both sides of the frame. We cannot tolerate the frame to pendulum right or left, without causing an unwanted bulge in the side at that point. As each frame is checked in this manner, "T" pin the frame to the balsa block on the base board to maintain rigid alignment. Next, bevel the tail post to the proper dimensions, cut to the exact length and pin it to the rear vertical surface of the keel plate. Apply two or three thicknesses of wax paper shims to prevent gluing to jig. At this time, install

**If you want a spectacular aircraft, both on the water and in the air, try this .60 powered flying boat with an 81 3/4" wing span.**

the 1/4" x 3/16" after body keel strip. Apply "T" pins through the keel into the keel plate of the jig. Add the forward and after chines, the sheer rails and the 1/4" balsa wing seat doublers. I used Titebond glue for this assembly to this point. Let dry thoroughly. This completes the basic framing construction of the hull before applying the sheeting. You have probably noticed that the framing has now gained considerable strength.

In order to arrive at a reasonably close pattern for cutting the sides which are cut from 1/8" balsa sheet, cut a piece of paper to a rectangle of 1' x 5'. Brown wrapping paper will do, however, I used drafting paper vellum. With masking tape, secure the paper to the tail post on one end and to No. 1 frame on the other. Stretch it as snug as possible. Using





"MISS GRANDIN"  
BY ED HAPPICH  
3 VIEW BY MORRIS

finger tips, crease paper along perimeter of hull side framing. Remove paper, and trim with scissors to allow approximately  $3/8$ " excess on all sides of creased lines. Side sheeting required is as follows: two pieces of  $1/8$ " x  $6$ " x  $48$ "; two pieces of  $1/8$ " x  $2$ " x  $36$ "; and two pieces of  $1/8$ " x  $4$ " x  $10$ ".

Lay the  $1/8$ " x  $6$ " x  $48$ " sheet on a flat surface and butt glue the  $1/8$ " x  $2$ " x  $36$ " to the bottom of the larger sheet  $3$ " from the left end. Extend the larger  $1/8$ " x  $6$ " x  $48$ " by adding  $10$ " of the  $1/8$ " x  $4$ " x  $10$ " piece by use of a 30 degree angle scarf splice as shown on the plans. Apply a  $2$ " wide  $1/8$ " doubler to reinforce the splice. Make two sides, one left and one right. Insure doublers are reversed on one side so that both doublers face inboard. Lay the paper pattern on the top of side material and trim each side carefully to the lines of the pattern.

The side sheeting may be applied to the frame more easily if the base board is "C" clamped to the workshop table top in a vertical position, thereby permitting the sheeting to be glued, clamped and pinned while in a horizontal plane. Apply glue, insure that the sheeting is tight against the framing and side edges of all

frames. Let dry 30 minutes and turn base plate over to opposite side and repeat the process. After both sides are dry, excess sheeting can be trimmed and sanded in preparation for application of the bottom sheeting. Add a  $3/16$ " x  $3/16$ " spruce strip to the top edge of the forward balsa  $3/16$ " keel. Start bottom strip planking with  $1/16$ " sheet balsa, the first piece being cut to the pattern shown on the plans. Planking should start adjacent to the keel and progress outward to the chine. Use pins on each strip added at each frame. I recommend "Duco" Cement as it is fast drying and waterproof. Two ply is required to complete forward bottom. Now, the bottom hull sheeting of  $3/32$ " x  $4$ " x  $48$ " balsa can be applied from step aft. When entire hull bottom has been covered, it is now ready to be removed from the jig. Double check that all "T" pins have been removed from hull frames, keel and tail post. Apply even upward pressure and, with a slight rocking motion, lift the completed hull shell from the jig.

Before proceeding with further construction of the hull, waterproof the inside bottom (bilges if you please),

including an area  $2$ " up the sides with Hobbypoxy No. 2 or fiberglass resin. This applies from the trailing edge of the wing forward.

**Transporting Cradle:** Constructing the cradle at this time will permit it to be used for supporting the hull, without damage, or dents during the remaining work to be done on the top of the hull. Check plans for full size templates and construction details of the cradle.

Cut formers for hood deck T1, T2, T3, T4, and T5 and also 5A. Next, set the hull in the cradle and razor saw extension pieces, glued to the side of frames of F2, F3, and F4, flush with the top of the frames. Re-cut sheer rail notches if required. Now glue the top formers of the hood deck directly on top of "F" hull frames. Former T5 glues directly to the front side of 5A. Glue  $1/2$ " x  $1/4$ " pieces to top of bow sheer rails and to side edges of former T1 through T5. Check cross section of frame No. 2 on plan for clarity of top deck and sheer rail construction details. Add  $3/16$ " x  $3/16$ " square balsa stringers. Top deck  $1/8$ " strip planking is now added. When completed, sand and radius top decking to sides to conform to curvature of the

windshield template shown on the plans.

Using windshield front and side view templates, saw and carve the windshield blocks. Balsa grain should run horizontal. Sand with fine sandpaper and glue in place. Use filler to apply a small fillet and insure a smooth fit. I use "Dap" vinyl spackling paste.

Carving the bow blocks would be appropriate at this time. Cut the top and side view templates of the bow blocks from the plans. Laminate two blocks of balsa 2 1/4" x 5" x 5". The glue line should run vertical and the balsa grain fore and aft for ease of carving. Using a flat wood bit, drill a hole into the back of block, slightly top of center, 1 1/8" in diameter and 1 3/4" deep to receive lead ballast.

Using a scrap of pine 2 x 4, a small piece 6" long will do, drill a 1 1/8" hole through side of 2 x 4. Cap the hole on one side with a scrap of 1/8" plywood, by nailing with small brads. You now have a mold to pour the lead. Pour the molten lead into the hole until filled, and a slight crown appears - - - do not overfill! When cold, split wood with a chisel and epoxy lead casting into the rear of the balsa bow block.

Glue the weighted block to face of F-1. Make certain lamination glue line is centered on the center line of the bottom keel. With a ball point pen, project a line as a continuation of the chine. When carving and sanding, keep the keel stem and chine line sharp, no radius! A piece of 1/4" PVC pipe approximately 8" long wrapped with No. 80 grit sandpaper to help shape the concave bottom surface. Finish up with fine sandpaper as usual.

At this time, place hull upside down in the cradle and sand strip planked portion from step forward. Fill, if needed, with "Dap" spackling compound. Cover forward hull bottom, including bow block, with Midwest lightweight fiberglass cloth and brush resin smooth.

**Tail Surfaces:** Horizontal stab — Since the construction is extremely conventional, no further instructions are deemed necessary. The vertical stab is built entirely of 3/8" material and can be built on a flat surface. Do it to it!

The rudder is laminated as shown on the plans. The center 1/8" sheet grain runs horizontally and the 1/16" outside laminations run vertically. The cavity formed on the bottom permits horizontal retraction of the 1/16" plywood water rudder. All surfaces are covered with silk and doped.

**Nacelle and Pylon:** The plans show, in detail, the construction of the pylon and nacelle. I have used this construction successfully on all previous models and prefer not to change to a crutch and carved block method of construction.

Start construction by laminating 1/4" plywood to 1/8" plywood to obtain 3/8" thickness required for the pylon. Use 6-32 blind nuts behind the 1/4" plywood firewall to secure the "CB" alum. motor

mount and drill a hole for the throttle pushrod and fuel tubing before starting assembly. Be sure to elongate the throttle pushrod hole. Construct a fuel tank next. Cut a 3/4" square tab at bottom, back wall of a 14 oz. tin can (I used a tomato sauce can), to permit tack soldering of 1/8" brass pick-up tube to bottom. This having been done, bend tab back flush and cover with a 1" x 1"

on the right throttle side, soft soldering in place. Horns are soldered 90 degrees apart. Cut torsion rod to proper length. The original horn which is factory silver soldered, is connected to the clevis and cable going to the throttle servo. Epoxy 3/16" ply bearing blocks to rear side of firewall as shown; control end play with 3/32" wheel collars. The distance from the center line of the torsion rod to the hole used in the horn for clevis attachment should be 1/2" both horns. Radius ends of sawed off horns before installing on firewall.

Epoxy firewall to 3/8" ply pylon, insuring angle is 90 degrees. Before adding gas tank and formers, complete throttle installation.

Solder Du-Bro clevis to Du-Bro flexible throttle cable. Be sure it's a good job, as you cannot get to it later! Attach clevis and cable horn on left side of pylon as per plans. The horn should be within 1/16" from side of pylon. Insert nylon housing and sew to pylon with nylon thread. Drill through pylon with No. 52 drill for this purpose. Mark two parallel lines 3/16" apart to indicate on the pylon the exact location where all nacelle frames are to be glued. Next, epoxy gas tank in place. Use scraps of wood cut as wedges to hold securely in pylon. Make certain the vent line is pointing straight up and that the fuel suction line is centered in hole previously cut in firewall. The remainder of the pylon is constructed using "Duco" cement. Add frames N-1 through N-7 at this time. When dry, clamp bottom end of pylon into table vise and, with a narrow sand block, lightly sand frames to proper bevel. Commence strip planking. I started the first strip at top center and worked around to the pylon in each direction. Add tail cone block to nacelle and carve to shape. When completed, sand, fill, and apply several coats of Aero-Gloss sealer and set aside to dry.

**Wing Floats:** Cut template of side view and top view from the plans. Using the side view template, cut to shape the two center 3/8" sheet pieces first. Cut out lightening holes as shown. Cut to shape four 1" thick blocks and, finally, four pieces of 1/4" x 3" x 9" doubler blocks. Permanently glue the 1/4" x 3" x 9" doubler blocks to the 1" blocks. Temporarily tack glue the 1" blocks to the center 3/8" piece. Easy on the glue, as the 1" blocks must be separated later. Once the glue is dry, use top view template and transfer outline and band saw to shape. Carve both blocks to identical symmetry and, using a 3/4" x 8" piece of PVC wrapped with No. 80 grit sandpaper, will be very helpful in shaping the concave "V" bow.

When shaping and sanding is completed, cut apart and hollow as shown on plans. If you are fortunate enough to own a Dremel Moto-Tool, use a ball burr and the job is made easy, but oh! what a mess on the floor. Use care

## MISS GRANDIN

Designed By: Ed Happich

### TYPE AIRCRAFT

Sport Seaplane

### WINGSPAN

81 3/4 Inches

### WING CHORD

11 3/4" (Avg.)

### TOTAL WING AREA

978 Square Inches

### WING LOCATION

High Wing

### AIRFOIL

Semi-Symmetrical (2415)

### WING PLANFORM

Constant Chord - Double Tapered Tips

### DIHEDRAL, EACH TIP

2" At 36" Station

### D.A. HULL LENGTH

56 3/4 Inches

### RADIO COMPARTMENT AREA

(L) 9 1/2" X (W) 2 1/2" X (H) 2 1/2"

### STABILIZER SPAN

31 7/8 Inches

### STABILIZER CHORD (incl. elev.)

8 3/4" (Avg.)

### STABILIZER AREA

207 Square Inches (Approx.)

### STAB AIRFOIL SECTION

Symmetrical

### STABILIZER LOCATION

Top of Hull

### VERTICAL FIN HEIGHT

9 Inches

### VERTICAL FIN WIDTH (incl. rudder)

10 1/4 Inches

### REC. ENGINE SIZE

.60-.61 cu. in.

### FUEL TANK SIZE

16 Ounce

### LANDING GEAR

N/A

### REC. NO. OF CHANNELS

4

### CONTROL FUNCTIONS

Rud., Elev., Throt., Ail.

### BASIC MATERIALS USED IN CONSTRUCTION

Hull	Balsa & Ply
Wing	Balsa & Ply
Empennage	Balsa
Weight Ready-To-Fly	148-156oz.
Wing Loading	21.9-23 oz./sq. ft.

doubler patch. Sweat solder in place. Solder the pick-up tube well at the front wall of the tank and solder vent. Pressure test under water and never worry about it. The tank will last years!

Before starting assembly of the nacelle, install the throttle torsion rod, horn and bearing assembly now. I used a Midwest steel elevator control horn 6" wide and cut the long horn exactly in half, using the cut off piece for the horn



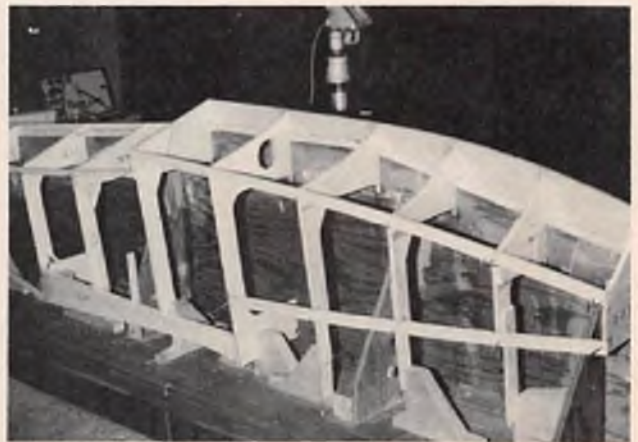
Close up of hull jig showing blocks to secure hull frames.



Author's hull jig on work bench. To date, five hulls have been built on this jig.



Basic frame work of hull has been completed at this point.



Note temporary extensions of bow frames to reach base board (see text).



Base of hull jig is "C" clamped in vertical position for ease of installing side sheeting.

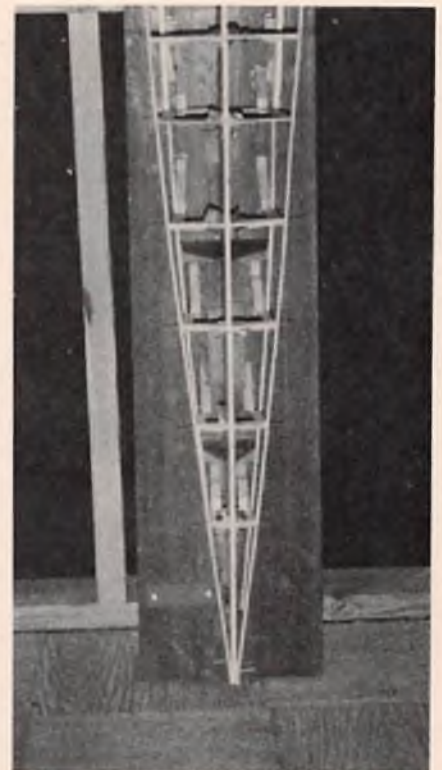
around the forward keel and concave areas. When completed, re-glue the outside sections to the center piece and install 3/8" x 1" bass wood float strut. Every time you walk past these beauties in the shop admire them, and brush on another coat of dope!

**Wing Construction:** Cut out all of the ribs from medium 3/32" sheet. Score halfway through all aileron ribs where shown by the dotted line on the plans. Later, when the wing is completed and the aileron is removed from the wing, this scored line is cut completely through, and the front 1/8" aileron cap piece is glued in place. All ribs shown on the plans have two holes 2 1/8" apart. These 1/4" holes fit steel rods which I

use on an A-justo-jig. **Note:** If builder does not have a wing jig, the wing can be built as a straight chord wing which can be more easily built on a flat board. Also, 3" of wing can be omitted on each side, making a total span of 3' each panel, plus wing tips. This will result in a slightly higher wing loading, however, this will present no problem. In this case, make sure wing float position remains the same distance out from the centerline of the wing.

Before starting actual construction of the wing, cut out all ribs and set the wing dihedral angle for 2" at 36" out from the centerline. Place the two center ribs of 3/16" sheet 3/8" apart plus two shims of ordinary label writing paper. Using a piece of 3/8" x 3" x 3" sheet balsa as a spacer, plus the paper shims, place between the center ribs and insure the dihedral angle is bisected equally at each wing panel. Use care as the pylon and engine nacelle is later glued between these center ribs.

Place ribs on jig as shown on plans. Add front and rear, top and bottom spar. Saw eight 1/8" ply dihedral braces, glue and clamp in place. Rip or sand to shape the 3/16" leading edge capstrip and glue in place. Remove 1/8" from front edge of 3/16" center ribs and install 1/8" ply L.E. doubler to back edge of 3/16" L.E.



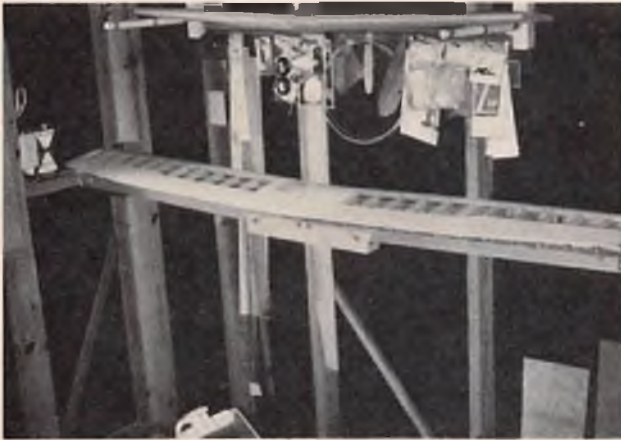
Jig set aside on floor while frame work is drying.



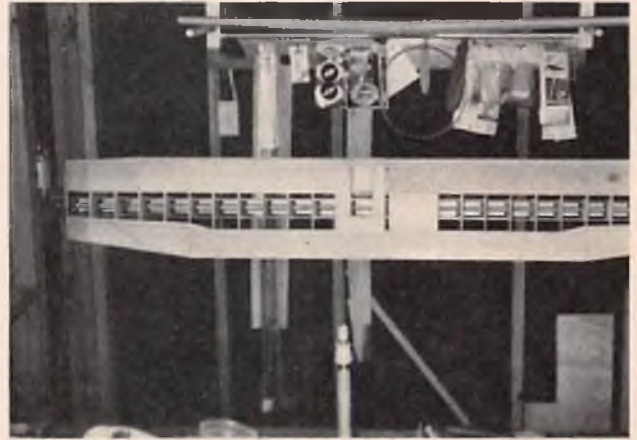
*Side and bottom sheeting complete. Set aside over night to dry prior to applying fiberglass cloth and resin.*



*Stab framed & sheeted on top only. Ready to turn over and complete bottom side.*



*Near completed wing in jig. Ailerons ready to be cut loose with razor saw.*



*Planform of wing in jig. Wing can be shaped and sanded while still in jig.*



*Shows servo compartment and slot for engine pylon.*



*View of nacelle and pylon after strip planking. Not difficult but takes time.*

capstrip.

The wing 3/32" sheeting can now be applied. Start out with the bottom trailing edge sheeting. The entire trailing edge is cut from 4" wide and 48" length 3/32" sheet. Glue bottom T.E. sheet without cutting aileron taper allowing edge of sheet to extend 1/8" beyond tip of rib as shown on plans. Glue and pin in place. When dry, using a straightedge, cut taper in aileron and again allow 1/8" beyond tip of rib. Now top T.E. sheeting

can be applied. When dry, cut aileron taper as before.

Pylon and nacelle can be cemented to wing at this time. Check dry fit. Make sure pylon can be pushed through center ribs flush with the bottom. You will have to cut 1/8" slot in rib to permit throttle cable to align with torque arm of servo. When okay, glue permanently in place, using epoxy.

Leading edge sheeting can be cut from 4" x 36" length sheet, as it is

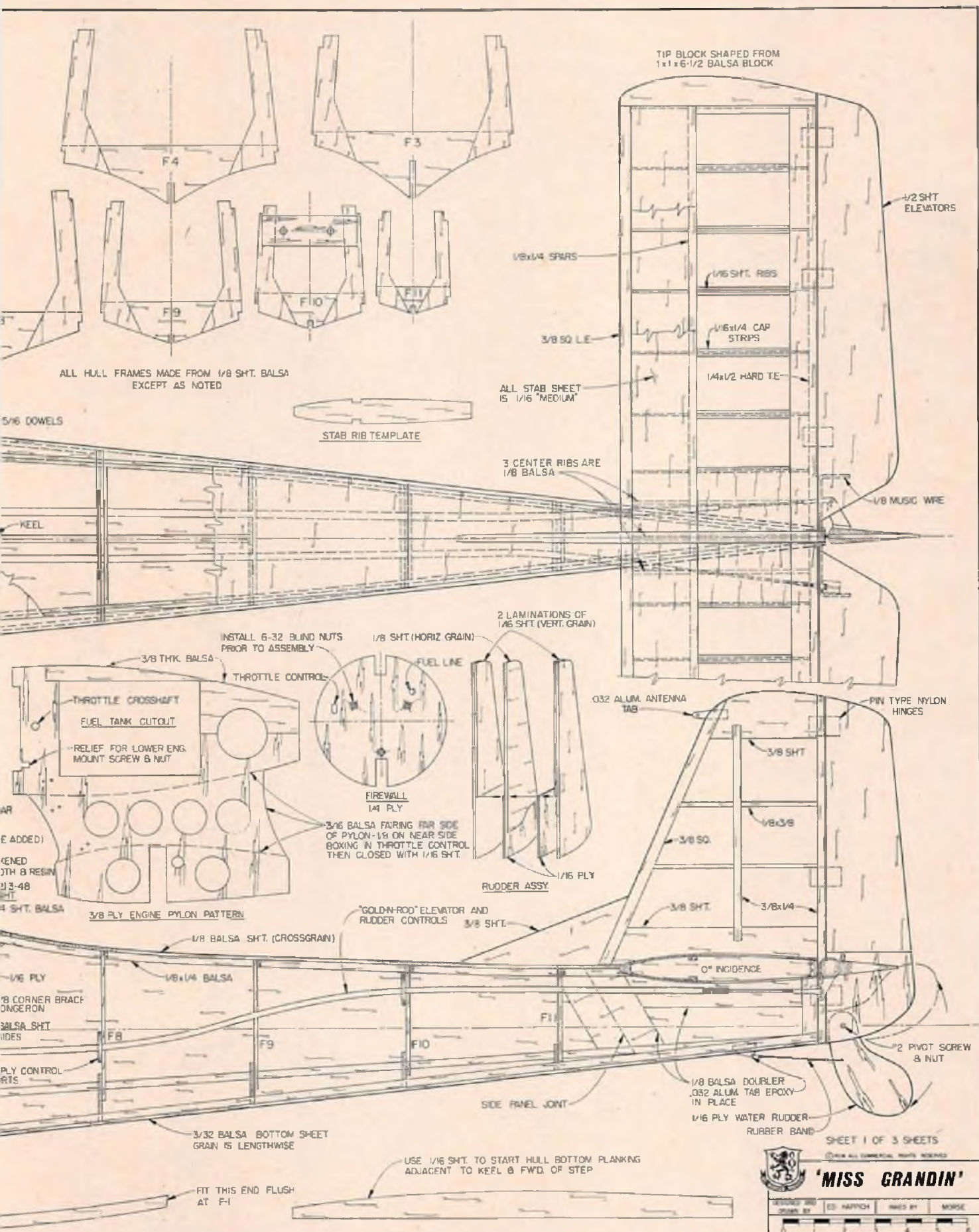
applied in two pieces. There is a butt joint where the L.E. taper begins. Pre-cut and check before gluing. Go to it! Only seven more pieces to go and L.E. sheeting is complete.

All center section 3/32" sheeting, top and bottom can be applied now, as well as the top rib capstrips. Sand L.E. capstrip with a sand block to prepare for gluing 3/8" x 1" L.E. into position. A butt splice is made at point where taper

**text to page 134**







TIP BLOCK SHAPED FROM  
1x1x6-1/2 Balsa Block

F4

F3

F9

F10

ALL HULL FRAMES MADE FROM 1/8 SHT. Balsa  
EXCEPT AS NOTED

5/16 DOWELS

STAB RIB TEMPLATE

1/8x1/4 SPRS

1/16 SHT. RIBS

3/8 SQ LE

1/16x1/4 CAP STRPS

1/4x1/2 HARD TE

ALL STAB SHEET IS 1/16 "MEDIUM"

3 CENTER RIBS ARE 1/8 Balsa

1/2 SHT ELEVATORS

1/8 MUSIC WRE

INSTALL 6-32 BLIND NUTS  
PRIOR TO ASSEMBLY

1/8 SHT (HORIZ GRAIN)

2 LAMINATIONS OF  
1/16 SHT. (VERT. GRAIN)

3/8 THK. Balsa

THROTTLE CONTROL

FUEL LINE

FIREWALL  
1/4 PLY

3/16 Balsa FAIRING FOR SIDE  
OF PYLON-1/4 ON NEAR SIDE  
BOXING IN THROTTLE CONTROL  
THEN CLOSED WITH 1/16 SHT.

RUDDER ASSY.

1/16 PLY

.032 ALUM. ANTENNA  
TAB

PIN TYPE NYLON  
HINGES

3/8 SHT

3/8 SQ

3/8 SHT

3/8 SHT

3/8x1/4

0° INCIDENCE

#2 PIVOT SCREW  
& NUT

1/8 Balsa SHT. (CROSSGRAIN)

1/16 PLY

1/8x1/4 Balsa

1/8 CORNER BRACK  
DINGERON

3/16 Balsa SHT  
SIDES

PLY CONTROL  
RTS

3/32 Balsa BOTTOM SHEET  
GRAIN IS LENGTHWISE

SIDE PANEL JOINT

1/8 Balsa DOUBLER  
.032 ALUM. TAB EPOXY  
IN PLACE

1/16 PLY WATER RUDDER  
RUBBER BAND

SHEET 1 OF 3 SHEETS

© 1988 ALL COMMERCIAL RIGHTS RESERVED



'MISS GRANDIN'

DESIGNED BY	ED. HAYCH	BUILT BY	MORSE

PLAN NO 732

FIT THIS END FLUSH  
AT F-1

USE 1/16 SHT. TO START HULL BOTTOM PLANKING  
ADJACENT TO KEEL & FWD. OF STEP







If the mail bag is any indication, there are quite a few people having the same problem reported by Mr. Hansen in the April issue. If you recall, we briefly discussed charging techniques for 12 volt motorcycle and gel cell batteries. It seems that none of the chargers sold in the R/C industry for this purpose do what the manufacturers recommend. The net result is relatively short battery life. This month we'll discuss gel cells and charging techniques in detail and hopefully come up with a procedure that will assure that you have 12 volt power when you need it. I've chosen to emphasize gel cells because I think they are better for our purposes, but most of the comments also apply to lead acid motorcycle batteries. I don't want to give the impression that I have spent the last five years researching gel cells and that I have come to all these conclusions through hours of test and evaluation. I have done some testing, but the bulk of material presented is taken from documents published by Eagle-Picher Industries and Globe-Union, two leading manufacturers. I'd like to thank Gerald Cromer of Cayce, South Carolina for passing on the info.

### The Gel/Cell

The Gel/Cell is a registered trade mark of Globe-Union, but has become a generic term for all batteries of the sealed, gel type electrolyte construction, regardless of manufacturer, just as nicad is used to describe all nickel-cadmium cells even though it is a registered trade mark. So when I speak of gel cells, I'm speaking of that type of battery and not just those built by Globe-Union. The gell cell is a lead-acid battery and has basically the same chemistry and, therefore, pretty much the same terminal voltage — as the conventional lead-acid battery. The differences and advantages are significant and make them attractive for modeling use. The biggest difference is the reduction in maintenance. Water or electrolyte is never added. No need to check liquid levels. The next attractive feature is that they are spill proof. No corrosive liquids to leak out. And they can be operated and charged in any position.

The conventional lead-acid battery, such as the motorcycle batteries used

for years, contains antimony to strengthen the grids. The antimony is a contaminant and will eventually be deposited on the negative plates which leads to short battery life. The gel cells use a lead-calcium alloy, free of antimony and should have a life five times that of a conventional lead-acid battery.

The open circuit voltage of each cell is approximately 2.12 volts. A six cell battery as is used for starters and field charging of R/C equipment, would then have a no load voltage of 12.72 volts. This will vary with the state of charge and temperature, but is pretty constant.

The cells are rated at room temperature at a 20 hour discharge rate. This means that a 5 amp-hour battery will last for 24 hours if the discharge current is 5/20 amps or 250 milliamps. It does not mean you can pull 5 amps for one hour. In fact, you will get only about 62% or,

.62 x 5 = 3.1 amp-hrs. at the one hour rate. Table one provides some data that will let you estimate the capacity you can expect to get out of your battery at different rates.

TABLE ONE

Discharge Rate	Capacity (% of Rated)	End Voltage (Volts/Cell)
20 hr.	100%	1.75
10 hr.	97%	1.70
5 hr.	88%	1.65
1 hr.	62%	1.5
.5 hr.	52%	1.0

The efficiency decreases as the temperature decreases. For example, we will get 5 amp-hrs. out of our cell at 70°F with a 250 milliamp load, but only 90% or 4.5 amp-hrs. at 40°F and only 70% or 3.5 amp-hrs. at -5°F. So if you are going to crank away at your stiff old engine, back in Ohio in the winter time, don't expect miracles out of your gel cell.

The life of the cells can be greatly affected by the service condition and the charging method. A number of service categories can be defined such as deep cyclic, shallow cyclic, and float. If you are going to use the gel cell to recharge your electric powered airplane, you will probably discharge it from 50% to 100%

each time you go out. This would be considered a deep cyclic service. If you use it for starting your engine, glow plug and recharging your R/C system, you probably will remove 5% to 50% in each outing which would be considered a shallow cyclic (unless you were in Ohio in the winter as we mentioned earlier). Float is defined as the condition where you are using insignificant amounts of current continuously, but are also charging continuously as you might do in a fire/smoke detector or intrusion alarm or as we might suggest for the winter or other periods when we are not using our gel cells. Some manufacturers actually make different batteries for the different services in order to increase life.

### Charging Phenomena & Recommendations

To achieve the optimum performance and life, the charging method must be adjusted to the conditions of service. If you overcharge, the water in the electrolyte is decomposed and the battery is aged prematurely. The gel cell has a re-sealable vent to prevent pressure from building up, but it does not allow you to add water. Undercharging can also eventually reduce the available capacity of the battery. The following is a direct quote from the Globe charging manual. "To assure maximum Gel/Cell service life and capacity, and favorable recharge times consistent with charger safety and economy, Globe battery recommends a constant voltage — limited current charging technique."

Generally, the voltage should be set at 2.4 volts per cell and the current limited to 3 to 4 times the 24 hour rate. For example, our 5 amp-hr. battery had a twenty hour rate of 250 ma so the charge current should be limited to a range of 750 ma to 1.0 amp. In the deep cyclic service, a 2.5 volt per cell constant voltage is recommended; and 2.3 volts per cell is recommended in the float mode.

A temperature compensating charger is recommended to enhance charge efficiency. Values for various modes of service are shown in Figure 1.

Let's try to define what this 12 volt charger should do, one more time. We want to set its output to a constant potential or constant voltage of 13.8v (6 x 2.3) to 15v (6 x 2.5), depending on the type of service, when the

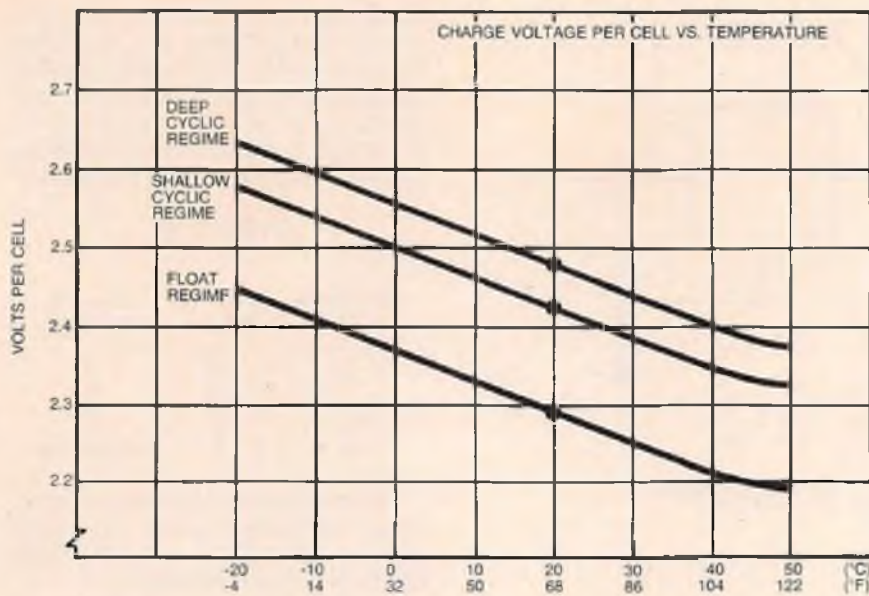


FIGURE 1  
CHARGE VOLTAGE PER CELL VS. TEMPERATURE

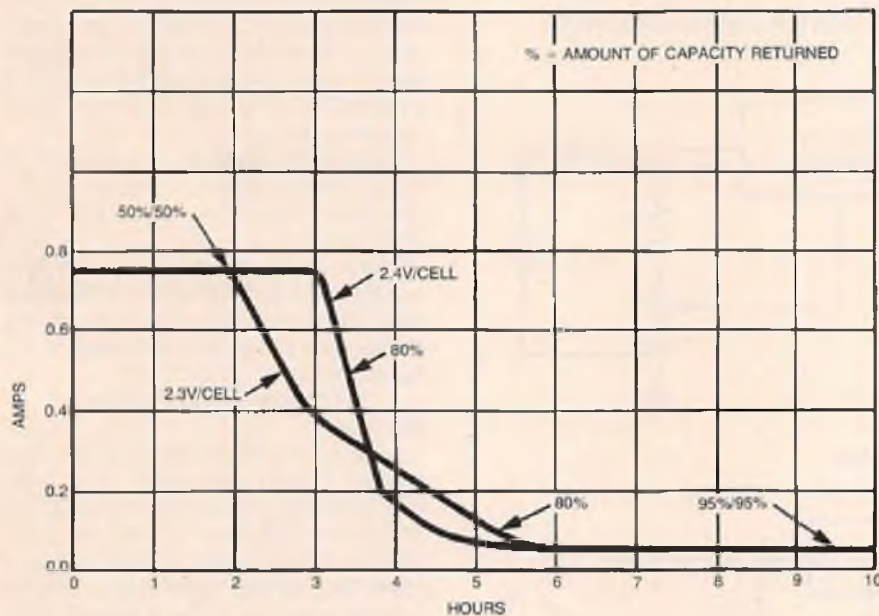


FIGURE 2

temperature is in the 65° to 70°F range. We want to limit the maximum current to .75 to 1.0 amp. A typical charge current vs. time graph would look like Figure 2.

Notice how the current remains constant for the first few hours and then tapers off to almost nothing when the battery is 95% recharged. The current limiting device actually protects the charger, because a gel cell that is discharged at a high current rate could draw several amps when connected to an unlimited charger.

The battery is fully charged once the current stabilizes at a low level for a few hours. Notice that two things determine when a battery is fully charged — the final current level and the **peak** charging voltage while this current flows. Notice that I emphasized **peak**. The battery

acts like a big capacitor and actually loads the charger when it is drawing current. Therefore you have two choices for setting the charger output voltage. Set it with a fully charged battery connected or get a large, low leakage capacitor (5000 to 10,000µf). In either case, the voltage you read on your DC voltmeter will be the peak voltage that your charger can deliver with that setting.

Before we get into chargers, let's talk about charging batteries that have been stored in a discharged state. According to Globe, these may initially appear to be "open circuited" or will accept far less than normal current when the charger is connected. They recommend leaving it connected and usually the battery will start to accept larger and larger amounts

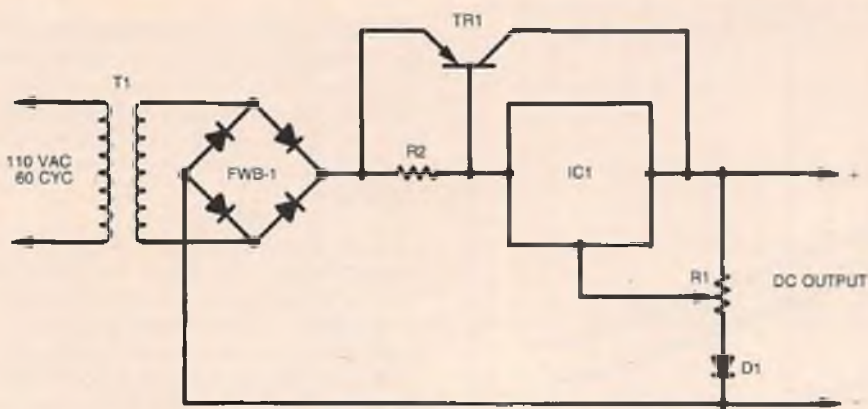
of current until the normal current level is reached. On future recharges, the battery will then behave normally. They do warn that if it is stored for an extended period in the discharged state, there is a risk that the battery cannot be recharged.

### Chargers

Quite often charger cost is the primary consideration. This usually results in the choice of a constant current charger. The battery is then forced to accept a constant amount of current regardless of its needs. You can build a cheap charger at the expense of recharge time or service life if the current is not properly set. Globe recommends a trickle charge of .5 to 2.0 milliamps per rated amp-hour. For our 5 amp-hr. battery, this would yield a maximum of 10 milliamps. At that rate, it would take forever (not quite) to recharge. So what most manufacturers are selling are chargers with charge rates in the .5 to 1.0 amp range, which means they must be disconnected or they will boil away the electrolyte and dry out the battery. The problem then, as Mr. Hansen pointed out, is when to disconnect. You could build a charger that would charge at a constant 750 ma for 3 hours and then switch to 10 to 20 ma or so, but why not do exactly what the manufacturer recommends? Figure 3 is a circuit recommended by Eagle-Picher for high capacity batteries. It can be used in this form for lower capacity batteries or you could eliminate R2 and TR1 if you've only got a 5 amp-hr. battery. Without TR1, IC1 will limit the current to about 1 amp. Most of Globe's recommended circuits involve discreet components and are therefore more complicated from a construction standpoint, without adding to performance.

Globe does show one circuit with a three terminal integrated circuit regulator as shown in Figure 4, but interestingly enough, recommends a current limiting resistor in the output and, therefore, do not depend on the limiting properties of the IC. A better way is suggested by reader Clell Dildy of Panama City, Florida. His circuit shown in Figure 5 is based on a circuit recommended by National Semiconductors.

The current limit is set by the 1.5 ohm resistor across the base emitter of the 2N2222. When the voltage across it reaches approximately .6 volts, the transistor starts turning on and bypasses the current through the 2.4K resistor, thereby lowering the voltage across the battery and therefore the charge current. This circuit will, therefore, limit at .6 divided by 1.5 or 400 milliamps. I'm not sure why Mr. Dildy picked this value instead of using a 1 ohm resistor which would yield a current of 600 milliamps, anyway, he says he has used this circuit many times to



NOTE: TR1 SHOULD HAVE AN ADEQUATE HEATSINK

\* IMPORTANT: TO ADJUST OUTPUT VOLTAGE, USE A 10,000 MICROFARAD CAPACITOR IN PLACE OF THE BATTERY.

T1 241-7-16 (SIGNAL TRANS. CO.)  
 FWB1 MDA952-1 (MOTOROLA)  
 TR1 MJ2955 (MOTOROLA)  
 IC1 MC7805CP (MOTOROLA)  
 R1 10K POT (BOURNS)  
 R2 15 OHM (OHMITE)  
 D1 F2 (SARKES-TARZIAN)

FIGURE 3  
 12 VOLT BATTERY CHARGER — FOR 15-30 AH CAPACITY BATTERY

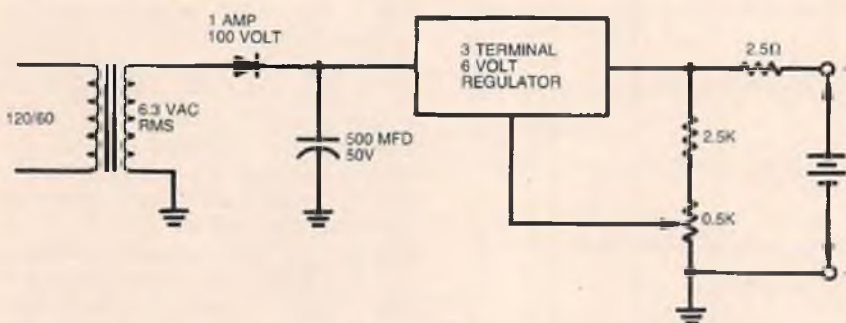


FIGURE 4  
 6 VOLT CHARGER

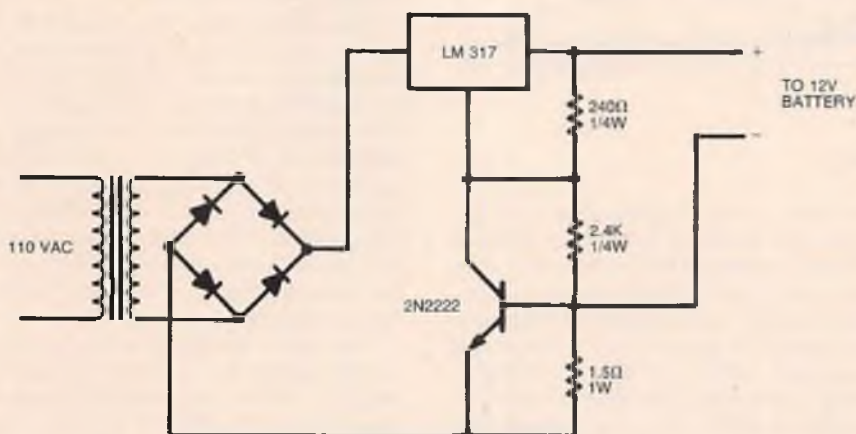


FIGURE 5

charge gel cells in his business. He could very well have smaller cells than we are used to using.

The big decision is to decide on what output voltage to set for our typical modeling application. Looking at Figure 2, I'm tempted to recommend using the 2.3 volt per cell level, inasmuch as most

of the time we will charge at least overnight or a minimum of 8 hours. As you can see, our battery will be charged sufficiently in 6 hours, but we are essentially in a float mode so we could leave the charger on continuously without overcharging. In fact, we could leave it connected all winter and never

worry about the battery self discharging and then deteriorating due to the fact that it is stored in a discharged condition.

We need to talk a little about self discharge. The rate is significantly influenced by the storage temperature. Table 2 gives you a feel for the problem.

TABLE TWO

Temperature (°F)	Loss Per Day (%)	Loss In 6 Months (%)
30°	.07	13
60°	.13	23
80°	.25	45
100°	.5	90
120°	1.1	100% 90 days

The message is, if you choose not to build a float charger to keep your gel cell charged up, store it in a cool place and/or recharge it periodically.

The next problem is to accurately set the output, because most people don't have voltmeters that are too accurate. I get the feeling reading the literature that the difference between 2.3 and 2.4 volts per cell is significant, but I must admit I don't really know. To be safe, it might be wise to set the voltage on the low side if you want to leave it connected continuously.

These same chargers can be used on your motorcycle battery. The "accepted" voltage is 14.4 volts for a 12 volt system.

We've tried to hit everything you might want to know about your 12 volt batteries and the recommended charging techniques, but if anyone has anything to add, we'd all welcome it.

#### Transistorized Ignition

Dear Sir,

I wish to thank you for your very fine column "Radio Spectrum". It is very informative and up to date. My problem is ignition engines in reference to interference in radio control. I know many fine articles have been written, but can you give us your version of a transistorized ignition system.

Thank you very much.

Sincerely,  
 H. Botkowsky  
 Brooklyn, New York

I'm afraid I'm not up to speed on the latest state of the art in model ignition engines. I have seen articles that recommend the usual 10K resistor in series with the high voltage lead to the plug and complete shielding of the coil, capacitor and batteries; but I haven't any personal experience. Mr. Botkowsky's letter implies that going to a transistorized ignition system will solve your radio interference problems. At first glance, I would not think the fact it is transistorized would help solve the problem. How about hearing from some of you that have successfully licked ignition interference. I'm sure with the cost of glow fuel going up and the size of

# RC FLYING AND THE LAW

*I have never encouraged, pleaded, or implored our readers to read an article in RCM before, but for your own sake, please read this one!! . . . Pat Crews*

**By Arthur J. Sabin  
Assoc. Prof. of Law**

## PART V

**A**t the time of the year that you are reading this article, the chances are that your flying site is in "full bloom" — lots of spectators, lots of action in the air, perhaps a contest or two. It is a good time to take a hard look at the safety precautions and standards maintained at your flying field to see whether there hasn't been some "slippage". We tend to get more relaxed, perhaps more sloppy as the summer wears on about things like maintaining safe flying standards.

Let me argue the case for the necessity of maintaining and carefully monitoring the safety aspects at your flying field. It is imperative that the first priority be that of safety considerations; these translate into insisting on proper transmitter use (impounding or other precautions to make certain that frequency is clear for any particular pilot), insisting that planes be carefully inspected before they are allowed to fly; that novices have assistance (whether they like it or not) to insure that their flying is safe and that spectators are kept well away from the flight line. A number of clubs have utilized the idea of appointing a committee as the "Safety Team". These people are specifically appointed and empowered to watch over all safety considerations at the flying site. They have the designated power to ground anyone who they feel should not be flying because their plane is not right, because that person has not demonstrated sufficient capacity to fly alone and an instructor is not available or because an individual has violated safety precautions in their flying.

If shock value is needed, consider what has happened to one of our flying fraternity in the now famous (perhaps infamous) Pennsylvania case. The events, themselves, are deceptively simple; the pilot had flown for a number of years and seemed thoroughly familiar with the plane he was flying on the date in question. The plane went out of control and apparently seriously injured a woman who was a spectator at a swimming meet some distance away. He reported the accident to the A.M.A. and to his homeowner's insurance carrier. As you may remember from reading previous columns in which this matter was treated, the homeowner's insurance carrier refused to honor the claim stating that the exclusion which appears in every homeowner's policy from any liability for accidents involving "aircraft" applied to this radio controlled model! Of course, the A.M.A. carrier disagreed. Remember that your A.M.A. insurance (which is part of your A.M.A. Membership) is secondary coverage; that is, it picks up on coverage up to one million dollars after the limits of the homeowner's policy. If you don't have a homeowner's or tenant's policy, then the A.M.A. insurance picks up from the first dollar of liability.

The two insurance companies hassled over whether the homeowner's policy excluded radio controlled models under that "aircraft" exclusion and eventually the A.M.A. carrier sued the homeowner's carrier to get a court determination as to whether that exclusion was applicable to radio controlled models.

To the amazement (and chagrin) of the A.M.A. carrier, their attorneys and Academy officials, the court ruled in favor of the homeowner's carrier to the effect that the exclusion **included** radio controlled aircraft. That case is now on appeal in the Pennsylvania courts and should be decided within a few months. The implications of that case pose a real threat, I believe, to all R/C pilots because if the lower court is sustained and our homeowner's or tenant's policies are held to exclude coverage when we are flying our R/C models, then it looks pretty certain that the cost of the A.M.A. insurance which will now become **primary** will skyrocket. This is important to us because to fly without liability insurance is really stupid.

The case has now developed further with suit filed by the woman that was hurt, her husband and their child. You might immediately ask, what's the husband and the child got to do with this if they weren't injured. The answer is that the husband has alleged that he suffered damages by way of loss of services, society and consortium of his wife as a result of her injury. That's not at all unusual in personal injury cases; what is interesting and unusual is that the child also has joined in this lawsuit

with allegations that the child was seated within five feet of her mother, that she was put in fear of immediate and serious harm and that thereafter she suffered a severe and prolonged occurrence of psychological trauma.

The complaint filed by the injured woman, her husband and on behalf of their child runs in excessive of **thirty pages** of legal size paper! In addition to suing the R/C pilot, the manufacturer of the kit, the distributor of the radio control system, as well as the retailer were joined.

Of particular interest and importance are the allegations against the R/C pilot. Reproduced here is the actual language drawn from the complaint; these are only a few of the allegations, but they are particularly significant to anyone who flies R/C models because they define acts of negligence for which an R/C pilot can be held liable. In each case I have deleted the name of the actual defendant and inserted the words "R/C Pilot" because these are the allegations that can be made against you or me with respect to defining what actions or inactions carry potential liability. They are as follows:

(1) In that the Defendant "R/C Pilot" on the date in question negligently and carelessly **failed to inspect** the model airplane prior to its being flown by the Defendant, his agents, servants or employees, when reasonable inspection of the airplane would have shown that it was not in proper operating condition.

(2) That Defendant "R/C Pilot" negligently and carelessly permitted the **motor or other working parts** of the model airplane to be in a state of **disrepair** when Defendant "R/C Pilot" could or should have, by the exercise of reasonable care, have ascertained the condition of the motor or other working parts of the model airplane or its component parts.

(3) That Defendant "R/C Pilot" through his agents, servants and employees negligently and carelessly permitted **improper parts** to be installed into the working apparatus of the model airplane when Defendant knew or could have known by the exercise of reasonable care that the parts were not fit for the proper operation of the model airplane in question.

(4) That the Defendant "R/C Pilot" negligently and carelessly permitted the said model airplane to be **flown without having it inspected** by an expert prior to its flight.

(5) That the Defendant "R/C Pilot" negligently and carelessly permitted said model airplane to be **flown in an area** next to or adjacent to an area where members of the **public**, such as your Plaintiffs herein, **were congregating**, when Defendant "R/C Pilot" knew or should have known that it

to page 120





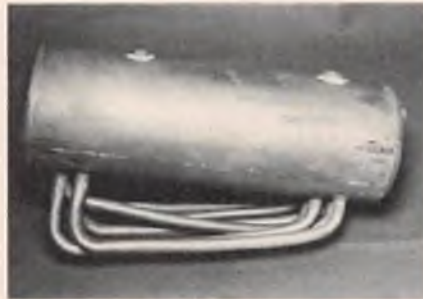
■ sometimes wonder whether other modelers get as frustrated as I do about time. Wouldn't it be wonderful if only there were eight days a week instead of seven, about 26 or 27 hours a day? Then maybe I could do about half the things I want to do. And if you think you have seen this sort of comment before, then you are right.

The reason I bring it out for another airing is because of a big parcel I have just received, containing something which it has been my ambition to own ever since I started modeling (a few more years ago than I care to remember). It is a steam engine. Not any steam engine, but Stuart Turner Double 10 with reversing gear. Now, to those among you who know nothing about steam engines, this won't seem very exciting, and I can just imagine some of you sitting there saying, "Well, so what's all the fuss about?" To understand, it is necessary to know that Stuart Turner is just about one of the oldest model steam engine manufacturers in the world — they go back to the end of the last century — and that their products are known all over the world, and are considered a bit like the Rolls Royce of the steam field.

I have absolutely nothing against the modern Japanese steam engines, quite the contrary, because they have brought steam within the reach of the uninitiated, and helped to popularize it. But, in my opinion, they just cannot compare with the mechanical grace and solidity of Stuart Turner's impressive models. They are well-proportioned, and while they have that delightful look of Victorian old-worldiness about them, they also breathe power in every line.

There are many models available, some of them miniature replicas of old machines, and some destined to be used in boats, but they have one thing in common, they are all working models. There is even a twin cylinder job that can be used to power a full size boat, up to about 16' in length.

Most of the engines are available in three different modes, and this is a very good idea, because in this way all tastes are catered to. In the first place, for the modeler who has a lathe and the necessary skill and knowledge, the engine can be sold as a rough set of



*The Stuart-Turner Bancroft 504 boiler, showing water tubes.*



*The boiler showing water gauge, check valve and pressure gauge. The tap on top is the steam take-off valve, masked by the safety valve.*

castings. This allows the man who wants to build from scratch to do so and, if he is a competent workman, to end up with an engine he built himself, and of which he can justifiably be really proud. (If he finds any real problem, for an additional charge, Stuart Turner will supply the part in question already machined). The second option is to buy a complete kit of parts, already machined, drilled and tapped. There is some work to be done



*The Double 10 engine and boiler mounted "dry", to see what it looks like. Note the size by comparison with the servo bottom left.*



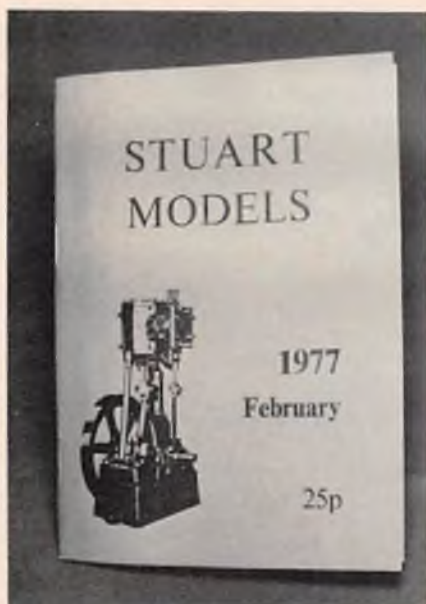
*The boiler parts, including the long, cast-iron chimney.*



*Layout of the parts of the Double 10 engine, less reversing gear. It looks very impressive, but goes together like a construction set.*

with a file, and then the assembly. This is the option I have chosen, and I will explain why.

In the first place, I don't have a lathe, and if I did, I wouldn't have the skill to use it. In the second place, I like building, and this is a way to at least be able to say that I put the thing together myself. Third, it is an excellent way of getting to know any engine. And, finally, there is the financial



**The Stuart-Turner catalogue, just full of goodies for the steam enthusiast!**

side. While the castings cost 15 Pounds in England, the machined parts cost 45 Pounds. This is a lot more expensive, but stick around — the third option is to buy the machine complete, ready to run, and in this case it costs 109 Pounds! So, not only do I get the fun of building it — knowing that the machining is accurate, and I only have to follow the instructions for it to work properly, but I also save myself some money.

Stuart Turner also make boilers, and every single accessory necessary to build the finished power plant — and that includes suitable propellers. In other words, the complete service for the steam enthusiast and, believe me, they are really helpful and good guys.

Over the next few months, I shall be building the engine and boiler, and installing it in a suitable model boat, and I'll be telling you how I got on. I wish to say right away that I am not an expert in steam, far from it; the idea is to help anyone who is considering having a go at steam themselves, and to help just a little in popularizing a form of modeling which is coming back into general interest. One of the good things is that there is a club, the Stuart International Model Engineers Club, with members all over the world, including a whole lot in the States, and some of those boys are really clever people. I hope to get in touch with a couple of them, so that in the case of troubles, we shall have a panel of real experts who can help us along whenever anything goes wrong.

For those of you who want to know a bit more about these engines, here are some addresses for you to write to; they all stock Stuart Turner parts and kits: Caldwell Industries, Lulling, Texas 78648; Cole's Power Models, P.O. Box 788, 1355 Church Street, Ventura, California 93001; Carolus Engines,

3082 South 200 East, Bountiful, Utah 84010; Pen-Models "The Steam Shop", 366 Kerr Street, Oakville, Ontario Canada; Western Scale Model Supply, 1769 — 15th Avenue South, Seattle Washington 98144; Modern Engineering Co., 1695 West 5th Avenue, Vancouver B.C. Canada; And the address of the S.I.M.E.C. is 54, Berkshire Road, Henly-on-Thames, Oxon England.

The photos show the parts of the engine and the boiler, and I also took one of a dry-run fitting of the engine. It's just like a construction set, and I can see no difficulties at all in my attempt to build a really powerful and sturdy steam engine, capable of driving a model boat up to 6' long. We'll talk more about this as the work progresses.

★★★



**The Mocontrol Electronic Speed Controller, with by-pass relay. Neatly made, and first tests are already promising.**

The other new item I have to talk about this month is an electronic speed controller from Galler Electronic Industries. The model I have is the MOVb, which is pretty versatile. It gives progressive forward speed, dynamic braking, and reverse. In addition, there is a by-pass relay which cuts in at the top end of the scale, giving the full accumulator voltage across the motor terminals for maximum speed. This is particularly important at the lower voltages. If the motor runs on 12 volts, and the speed controller drops half a volt, percentage-wise, this doesn't make a lot of difference. But with a motor running on four or six nicads, percentage-wise the drop is far greater, causing a loss of top end speed. The by-pass relay completely eliminates this power loss, thus making the unit a must for competition work. The controller, according to the instructions, which are very complete, will handle 10 nicads (12 volts nominal) at up to 15 amps, but this latter figure would appear to be for intermittent use only.

I shall be trying this control unit shortly, together with the Workrite Controller, which will give us an interesting comparison between two totally different systems of governing the speed of electric motors. In the meantime, if anyone is interested, they

can get in touch with Galler Industries, P.O. Box 87, South Walpole, Massachusetts 02071.

★★★



**The Super Cycle, after two years of use. This is one item I wouldn't be without, and I consider it a very worthwhile investment for any serious modeler.**

I have just been informed that I am to run in the World Endurance Championships again, this time in England. (It's not that I am the greatest, it just looks like no one else is sufficiently interested!) Anyway, with this prospect in view, I decided that I had better check on the capacity of my radio batteries. Like all good modelers, I had sent all my radio gear back to the manufacturer during the winter for revision and any necessary maintenance, but this of course did not include testing battery capacity. So, I hooked them all up to the Supercycle, and set the discharge. Not too good! Okay, so I recycled everything three times. That is to say, I discharged all batteries down to 1 volt per cell, and then recharged at the 14 hour rate, and repeated the action three times. To be quite honest, the results were astonishing. In terms of time, the capacity improved by about 35% on average, which is very appreciable.

Having done this, I dug out some very old pence cell nicads that I have had around for a very long time, and did the same thing. To tell the truth, I have been on the point of throwing them in the waste-bin for over a year, but like all modelers, I have a psychological blockage when it comes to throwing things away. Anyway, those cells, connected up in banks of four, have all been re-cycled, and are still usable. Not, I hasten to add, as good as new cells, but pretty useful even so.

The moral of this little story is simple — don't throw any old nicads away, or at least, not until you have tried re-cycling them. Not everyone will own a Supercycle, but if any of you are thinking of investing in one, then don't hesitate. I have had mine for two years now, and since I also fly planes, run cars and crash choppers, I reckon that it has justified its retail price a couple of times over, in terms of material that didn't crash, and nicads that have been given a new lease on life. (It's not the

to page 108



# TRANSITIONING

R/C Piloting To Full Scale Flying

PART IV

PHOTOS COURTESY OF BEECHCRAFT & CESSNA AIRCRAFT CORP.

By Arthur J. Sabin

**A**t this point in this series I have to assume that you have seriously contemplated undertaking the training necessary for your private pilot's certificate, the license that allows you to pilot your own full scale airplane for business or pleasure. You've examined a number of important facets, hopefully all that have been raised in this series and you have sought out a pilot training facility. The purpose of this article is to review what to expect in terms of the sequence from becoming a student pilot to obtaining that certificate, passing along ideas and suggestions that may be of value to you.

Let me begin with a very pragmatic tip. When you take flight instruction as part of your pilot training program, you are, in effect, renting an airplane and the services of your instructor. Generally you will be charged for the actual time (to tenths of an hour) as measured by a meter that begins running once the airplane engine is started. Most probably you will sign a contract for the rental of that plane for the lesson. Now here's the advice: the company or service from whom you are renting that plane generally insures itself and its instructor for any personal injury or property damage that could occur with respect to third person's property or life. Plainly put, they have insured themselves and their instructor if a plane should collide with another or should end up in someone's backyard doing property damage or injury. Furthermore, the service will normally pick up the tab for insuring you as to injuries you do **to the plane you are flying**. But that's as far as they go. They do **not** insure you with respect to **injuries to other individuals or property damage** that could occur when you are flying either with your instructor or after you have soloed. The same is true after you get your license. The tip is to get insurance as soon as you begin your pilot training which will insure you for personal injury and property damage you might inflict upon others. There are a number of insurance companies that offer that kind of insurance, though the usual insurance broker-agent is not familiar with it. Either use them to get the right insurance or insure directly with a company that offers this kind of coverage to student pilots. Should something happen, you don't want to end up saddling yourself or your estate with a huge lawsuit that could literally wipe out you or your estate. Remember that your homeowner's policy specifically excludes any damages or injury done when you are piloting or even a crew member of a private type airplane.

Here's another good piece of advice concerning your student pilot undertaking: if you find that you and your instructor don't "groove" for any reason, personality or otherwise, don't hesitate

to make a change. Most often there are a number of flight instructors available and they do (or certainly should) understand how important matters of personality and style are in this intense process of learning how to fly. If it doesn't work with an individual or particular flight training school, make a move and do so before you get discouraged or too far into bad habits.

Assuming that you are enrolled, either with an instructor or through a club or with a flight school, what should you expect? Just as important is the question, what do they expect of you?

You should expect, and they expect you, to devote a great deal of time to this learning process. Yes it can be done in a matter of months and there is an incredible low number of hours of training in flight necessary to qualify you to take the flight examination. Don't be deceived by those numbers; almost all individuals require more than the minimum in terms of flight training and will not feel comfortable unless they have sufficient training. Most instructors and schools recommend a minimum of two lessons per week which will mean devoting as least two hours or more for each session; that does not mean that you will be in the airplane flying for two hours, only that you must minimally set aside two hours for any particular lesson. As you go on, you are going to want more time blocked out including half days or even full days for cross-country training.

For those two hours, you figure on time spent indicating what this lesson will consist of, the pre-flight inspection that is always necessary, getting off and away from the airport, doing the flight maneuvers or taking you through the material for that lesson and then the return.

In addition to that two hour block of time, especially where you have enrolled in a flight training course as offered by aircraft manufacturers, you have to figure on study time with the audio-visual aids film strips, cassettes and the like. Generally you're best off to get there an hour or and an hour and a half before your lesson to use those audio-visual materials. Sometimes you can get a set for home study; most often the material stays at the base of operations. This study is part of your ground school training.

At home you will be studying lessons using a text and a workbook. You will use a flight computer for working flight problems. You will find material reasonably well organized and most of it totally new and very challenging. You will spend a great deal of time studying those materials. At this point it should be mentioned that a number of local colleges and high schools as well as owners or operators of airports offer ground school instruction. You may want to supplement your work with this

kind of involvement or you may find that this is what you will rely upon for ground school where you are working with an individual flight instructor rather than as part of any specific course. But in any event, there is plenty of study ahead of you, probably some 200 hours between the time you begin and the time you take your written private pilot's license examination.

Before you solo which is generally an event that takes place after between ten and twenty hours of dual flight instruction, you have to have a medical certificate from a specially appointed FAA physician. Naturally, the examination is to determine whether you should be flying from a physical condition standpoint. On the back of that medical certificate, is your student pilot license which must be carried at all times when you fly. It is that student pilot's license that is endorsed by your certified flight instructor when you are ready to solo.

You can see that what you will be undertaking is a program of instruction that integrates learning everything from the theory of flight to meteorology and air navigation at the same time that you are taking lessons and actually flying the plane. While there are some who go through a ground school and take the private pilot's written examination prior to ever getting into an airplane, or vice versa, never get near a book until after they have soloed, the better combination is to do both.

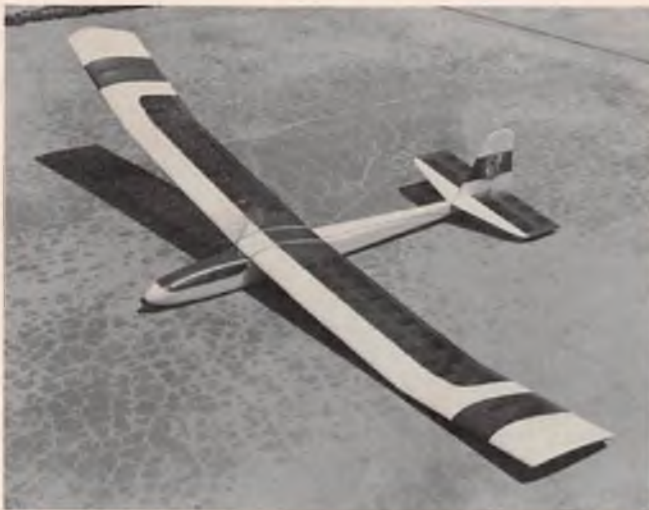
Assuming you are enrolled in a flight training course, you will have quizzes along the way which essentially test your ground school training and workbook exercises along with aspects of the knowledge you should have obtained from flying the plane. These quizzes or examinations are given during intervals during the flight training course and then, by the end of the course, there is usually a final examination reviewing all of the course and preparing you for the private pilot's examination.

Once you have completed your flight training course which would include reaching the plateau of soloing, continuing with dual instructions as well as solo practice and your ground school work, you will be ready for that written examination given by the FAA in order to certify you as a licensed private pilot. The written examination is a multiple choice examination and really quite difficult and in some respects, tricky. The idea is to test your knowledge of rules and regulations relative to flying as well as to correctly plan and execute a cross-country flight, this time on paper. There are a number of ground school courses offered on an accelerated basis, that is, companies who offer 18 or 20 hours of intense ground school instruction over a weekend followed by your taking the exam.

to page 106

# RCM PRODUCT TEST

**Bridi Hobby Ent.  
SOAR BIRDY**



In our view, one of the most outstanding features of this kit is the simple construction required. This quality, coupled with good balsa, accurate machine cut parts, and easy to read and follow building instructions make this kit an ideal one for the person new to R/C flying. Hi Johnson's "Supertape" was used to join the plywood doubler to the balsa sides of the fuselage. To date there has been no evidence of splitting, lifting, or curling on the sides that were joined with this tape. The main adhesive used was Wilhold Aliphatic Resin, except for those areas like the wing center section which were joined with epoxy. In areas where a quick bond was needed, we first used Hot Stuff. Then, for additional strength, these joints were painted with a coat of the aliphatic resin. It was covered with white and transparent red Solarfilm, with metallic blue MonoKote and gold DJ's Multi Stripe for trim. We started building the Soar Birdy after a Sunday flying session and had it ready to go for the following Sunday. The total building time was 21 hours over the one week period. Simple, easy, and quick going.

Because we were working to build a competitive sailplane and wanted to bring it in under the manufacturer's flying weight, lightening holes were drilled in the elevator and light geodetic construction was used in the tail. And, to strengthen the trailing edge of the wing so the elastics wouldn't cut into it, a piece of piano wire was glued in place and wrapped with a piece of light glass cloth and epoxy.

The Soar Birdy sets up as shown on the plans and should offer the Novice or Expert an excellent flying sailplane beginning with the first flight. We set the throw of the control surfaces at minimum for the first time up with the C.G. at the

to page 106

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging		•				Pre-Shaped Parts	•				
Plans		•				Parts Match to Plans		•			
Written Instructions		•				Overall Parts Fit		•			
Quality of Hardwood	•					Ease of Assembly	•				
Quality of Fiberglass			NA			Fidelity to Scale			NA		
Other Materials		•				Flight Performance	•				
Accessories			NA			Overall Appeal	•				
Die-Cutting			NA								

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

## SPECIFICATIONS

Name	SOAR BIRDY
Aircraft Type	Sailplane
Manufactured By	Bridi Hobby Enterprises, Inc. 1161 East Sandison St. Wilmington, California 90744
Mfg. Suggested Retail Price	\$19.95
Available From	Both Mfg. & Retail
Mfg. Recommended Usage	Sport & Competition
Wing Span	78 Inches
Wing Chord	8 Inches
Total Wing Area	624 Square Inches
Fuselage Length	40 1/4 Inches
Radio Compartment Dimensions	(L) 7 1/2" x (W) 2 1/4" x (H) 2 1/2"
Wing Location	Shoulder Wing
Airfoil	Flat Bottom
Wing Planform	Constant Chord
Dihedral	2 1/2 Inches
Polyhedral	1 1/8 Inches
Stabilizer Span	18 Inches
Stabilizer Chord (incl. elev.)	7"
Total Stab Area	90 Square Inches
Stab Airfoil Section	Flat
Stabilizer Location	Top Of Fuselage
Vertical Fin Height	6 1/2 Inches
Vertical Fin Width (incl. rud.)	7 Inches
Mfg. Rec. Engine Range	NA
Recommended Fuel Tank Size	NA
Landing Gear	Neoprene Skid
Recommended No. Of Channels	2
Recommended Control Functions	Rudder & Elevator
Basic Materials Used In Construction	
Fuselage	Balsa, Ply & Spruce
Wing	Balsa & Pine
Tail Surfaces	Balsa & Spruce
Hardware Included In Kit	Tow hook, hatch screw, 2 nylon horns with screws
Plan Size	43 1/2" x 20" (2 sheets)
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (10 pages)
Construction Photos	No
Kit Includes	Shaped Parts
Mfg. Rec. Flying Weight	26 Ounces
Wing loading based on rec. flying wt.	6.0 oz./sq. ft.

## RCM PROTOTYPE

Weight, Ready To Fly	24 Ounces
Wing Loading	5.5 oz./sq. ft.
Covering & finishing materials used	Solarfilm & MonoKote
Engine Make & Disp.	NA
Muffler Used	NA
Radio Used	Cox Sanwa 3 Channel
Tank Size Used	NA

# RCM PRODUCT TEST

## PFM TEAM SPECIAL



**T**he Team Special is a .60 powered sport biplane that is kitted in England by PFM. (PFM stands for Pat French Models.) It is being distributed in USA by Mid-Am Distributors, 348 Murray Drive, Lexington, Kentucky 40505. (606) 252-4102. Distribution in Canada is by Model Craft Hobbies, Ltd., 1660 Matheson Blvd., Mississauga, Ontario L4W 2K6. (416) 625-4410

The Team Special is a pleasing aircraft with a distinctively different styling. It is a rugged design that withstands the rigors of sport flying quite well. It should find wide acceptance among the sport biplane enthusiasts. Being a biplane; it is naturally not a beginner's airplane, yet any RC'er with minimal building and four control function experience shouldn't have any difficulty in constructing and flying a Team Special.

The plans, while rather basic, do however provide sufficient assembly instructions to enable the builder to construct this aircraft in an easy and rapid manner. Both wings are constant chord, pre-sheeted foam and the airfoil is semi-symmetrical. The top wing is swept back with no dihedral or ailerons. The bottom wing has 2½" of dihedral and pre-cut ailerons for which the nylon control cable tubing is already installed. Both wings are pre-sheeted with a hardwood veneer about 1/32" thick (we believe it is called obechi). This type of sheeting is very nice to work with; it sands easily, is not heavy, and accepts either a painted or film finish equally well. The quality of the sheeting and foam cores is excellent. The fuselage turtle back is of the same pre-sheeted foam construction. The tail surfaces are all of pre-cut balsa sheet. The fuselage is constructed of balsa and plywood in conventional sheet side/bulkhead fashion. When assembled, it is a very rugged unit with its internal

to page 100

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging		●				Pre-Shaped Parts		●			
Plans			●			Parts Match to Plans			●		
Written Instructions			●			Overall Parts Fit			●		
Quality of Hardwood	●					Ease of Assembly		●			
Quality of Fiberglass			NA			Fidelity to Scale			NA		
Other Materials		●				Flight Performance		●			
Accessories			●			Overall Appeal			●		
Die-Cutting				NA							

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

### SPECIFICATIONS

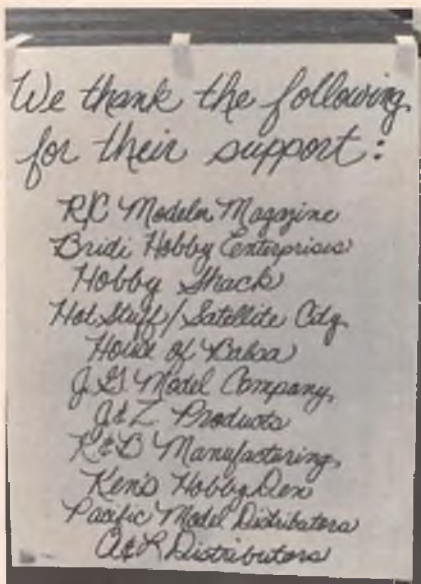
Name	Team Special
Aircraft Type	Sport Biplane
Manufactured By	PFM (Pat French Models) England
Distributed By	See Text
Mfg. Suggested Retail Price	\$109.95 USA
Available From	Retail Outlets
Mfg. Recommended Usage	General Sport
Wing Span	Top 62" — Bottom 58½"
Wing Chord	Top 10¼" — Bottom 10½"
Total Wing Area	1230 Square Inches
Fuselage Length	52 Inches
Radio Compartment Dimensions	(L) 9" x (W) 3" x (H) 5¼"
Wing Location	Biplane
Airfoil	Semi-Symmetrical
Wing Planform	Constant Chord (Top wing swept back)
Dihedral	2½" (Bottom wing only)
Stabilizer Span	22¾ Inches
Stabilizer Chord (incl. elev.)	9½ max. (elliptical shape)
Total Stab Area	160 Square Inches
Stab Airfoil Section	Flat
Stabilizer Location	Top of Fuselage
Vertical Fin Height	8 Inches
Vertical Fin Width (incl. rad.)	11" max.
Mfg. Rec. Engine Range	.60-.61
Recommended Fuel Tank Size	10-12 Ounces
Landing Gear	Conventional
Rec. Number of Channels	4
Recommended Control Functions	Rud., Elev., Throt., & Ail.

### Basic Materials Used In Construction

Fuselage	Balsa, Ply, Foam, Hardwood veneer
Wing	Foam, Hardwood veneer
Tail Surfaces	Balsa
Hardware Included In Kit	Very Complete
Plan Size	53" x 29" (1 sheet)
Building Instructions on Plan Sheets	Yes
Instruction Manual	No
Construction Photos	No
Kit Includes	Shaped Parts
Mfg. Rec. Flying Weight	128-136 Oz.
Wing loading based on rec. flying wt.	15.0-15.9 oz./sq. ft.

### RCM PROTOTYPE

Weight, Ready To Fly	128 Ounces
Wing Loading	15.0 oz./sq. ft.
Covering & finishing materials used	See Text
Engine Make and Disp.	Merco .61
Muffler Used	Kavan
Radio Used	Westport Int. Variant
Tank Size Used	12 Ounces



*We thank the sponsors!*

# 1ST ANNUAL WESTERN STATES REGIONAL RC CHAMPIONSHIPS

Photos & Text By Bill Simpson

**T**he first Pattern and Sport Scale contest of the season in the west, the rain-delayed Western States Regional Championships, (yes Martha, it does rain in Southern California), was held on March 18-19, 1978 at Mile Square Park in Fountain Valley, California. Co-hosts were the Rockwell Eagles R/C Club and the San Gabriel Valley R/C League.

Mile Square was a Marine Basic Training Field during World War II. Following the war it was used for helicopter training. The Marines discontinued use of the field about ten years ago and the buildings were razed. Mile Square is now under the control of the Orange County Department of Parks. There are about a dozen clubs in

the Mile Square Association which administer the facility. R/C clubs use the main 2,000 ft. runway. The area is large enough to hold Free Flight, U-Control and R/C contests at the same time.

The flying site is surrounded by an 18 hole golf course and grassy park areas with rivers and streams stocked with fish, baseball diamonds, bicycle paths, barbeque and picnic areas, playgrounds, etc. The ocean is seven miles to the west with some of California's finest beaches. Disneyland, Knott's Berry Farm, and other Southern California attractions are 20 minutes away.

Five rounds were flown under partly cloudy skies and 70 degree weather. There were 59 entries with pre-Novice

drawing the most --- 13. Pre-Novice was limited to those who have never flown in a sanctioned Pattern contest. Fixed gear only and no tuned pipes were allowed. A simplified Novice Pattern was flown. It gave some new people a taste of Pattern competition and some of them were surprised at how well they did. No question that this event will bring more flyers into Pattern competition. Try it in your area!

The winner of Novice Class, Rick Horn, was flying in his first Pattern contest. He looked more like an Expert than a Novice. We'll be hearing a lot more from him!

RCM Associate Editor, Jim Oddino, won Master Class with a Curare with a  
to page 100



*Tony Arand's Spitfire had a battery problem and couldn't compete.*



*Corsair entered by Bud McKnight.*



*Betty Stream did her usual masterful job running the desk.*



*Jim Oddino fires up his Curare.*



*The pit area. There were 59 entries.*



*Don Lien's winning AT-6. Won both static and overall.*



Joe Bridi fires up his UFO. His son, Dave, assists.



Dave Wilson, last year's Novice Class NATS winner, flies before judges Dick Corman and Chuck Beardsley.



Don Weitz fires up his Dirty Birdy. Joe Bridi assisting.



Rick Horn won Novice Class in his first try in pattern competition. His wife, Mary, calls. The judges are Ed Paige and Don Butman.



The Scale Squadron turned out in force.



Rick Horn, winner of Novice Class, fires his Dirty Birdy. His wife, Mary, assists.



Marty Wittenberg, winner of Advanced Class at the NATS last year, fires his Dirty Birdy. Jim Kimbro assists.



Buddy McKnight's Corsair lifting off.



Dave Wilson, 1977 NATS winner in Novice Class, fires his Dirty Birdy.



Don Lien, scale winner, prepares his AT-6 for flight.



Don Lien's AT-6 coming in for a landing.



Contest Director John Garabedian did a masterful job. Shown here with USPJA Judge Ralph DePalma.

MASTER								
NAME	1	2	3	4	5	6	7	8
Garabedian	200	200	200	200	200	200	200	200
DePalma	200	200	200	200	200	200	200	200
Garabedian	200	200	200	200	200	200	200	200
DePalma	200	200	200	200	200	200	200	200
Garabedian	200	200	200	200	200	200	200	200
DePalma	200	200	200	200	200	200	200	200
Garabedian	200	200	200	200	200	200	200	200
DePalma	200	200	200	200	200	200	200	200

Master Class totals.



The winners!



The judges were all members of the United States Pattern Judges Association.



# COMBAT

By Blaine Rawdon



**L**aunched off the ridge with a hard toss, the squat gliders float in the breeze to gain altitude. Soon they bank, roll, zoom, and dive furiously. Chasing each other in formation, the planes Split-S, wing over, loop and roll, trying to touch the long thin streamer dragging behind each plane.

This is radio controlled combat, slope soaring style. Crazy, you say? Well, maybe a little. Fun? You bet. Challenging? It sure is. Expensive? Not necessarily.

The San Fernando Valley Silent Flyers feel that successful contests incorporate the popular aspects of sport flying. In a progressive program to include more types of sport flying in its contest calendar, the SFVSF runs a wide range of R/C sailplane contests, including goal and return, altitude, speed/distance, and combat.

Bill Watson, a long time member, saw potential for a combat contest in the great popularity of aerobatic flying on the slope as well as in pick-up combat contests he had had with other members of the club. Also, Watson likes innovative ideas. "After a while, thermal soaring and normal slope soaring become routine, but when you have to watch the other guy's plane more than your own, and when you have to maneuver yours without looking at it, it can never be boring." The problem was to devise a contest that encouraged club participation, and discouraged mid-air collisions.

By the time the contest date rolled around, the rules and the bolder pilots were ready.

## The Rules:

- (1) 3-4 planes fly per heat.
- (2) 5-10 minutes per heat.
- (3) Each time a plane touches an opponent's streamer, 1 point is scored for the attacking plane.
- (4) Each time mid-air contact occurs, 2 points are subtracted from **both** pilots' scores.
- (5) Everybody flies the same number of times — the greatest sum wins.
- (6) Any F.A.I. legal sailplane may be used.
- (7) The streamers must be equal in length and material. (We used 18' of 1/4" white magnetic tape leader.)

(8) During a heat, airplanes may be re-launched or replaced, but the original flight pack must be in the re-launched plane.

## The Planes:

The airplanes must be very maneuverable, fairly fast, and rugged. Bill Watson explains, "Having an extremely durable airplane that reacts as fast as you think means that you can fly recklessly with minimal consequences." Michael Bame, one of the flyers, adds, "Everything happens so fast, flying must be a spontaneous thing. When you see a chance, you must take it. If you think about it, it's too late." So, Michael brought out a quick little 3' span ship that seemed to be at a disadvantage dragging the long streamer around. Nobody told Mike, though, so he managed to win in his class! Rich Hardy used a 6' span rudder and elevator Rubber Ducky that had the advantage in altitude and speed potential, but lacked the immediate response necessary for a combat ship. It unfortunately met its match attempting a subterranean escape. Harold Buyer brought a 6' aileron aerobatic airplane, probably the fastest plane in attendance, and maneuverable enough to be very competitive. The balance of the pilots brought a plane produced by Bill Watson, the Cheetah. This is a 4' span aileron ship with an indestructible polyethylene fuselage, and paper covered foam wings and tail. Not as fast as the larger planes, it compensates with remarkable maneuverability, low cost, and great crash-worthiness.

The contest was very exciting to watch and outrageous fun to fly. It turned out that even with the long streamers, it is much easier escaping an attack than scoring a cut. Since the attacking pilot must keep track of his plane, his victim's plane, planes attacking him, and the ground, it is very difficult to mount an extended attack. Most attacks took the form of grabbed opportunities, diving, or turning into a streamer. Rick Pearson says, "My strategy varied according to the number of flyers. With just one other flyer, I'd just stay on him constantly. With three other guys, you get high, pick and choose your shots, get in and get out to avoid mid-air. You can't watch more than one plane at a time."

The best escaping maneuvers usually were diving in combination with turning, or maybe a Split-S. Unanticipated or tricky maneuvers, such as turning in towards the hill, were often successful in shaking off attackers. Climbing maneuvers were risky, leaving the streamer hanging in the breeze, just asking to be hit.

At the beginning of the contest, mid-air were frequent. Later in the contest, the flyers became more cautious in attacking, as it became obvious that reckless flying was earning them negative scores! Mike Reagan: "I mixed it up with everybody! I'd sit and wait for them to

come after me and then we'd go at it! I was always after someone - - - Pearson likes to win. He just sat up there, out of the way, then he'd dive down through everybody, make a cut, and then climb back out."

The contest, as all SFVSF club contests, was flown in two classes, Expert and Sportsman. In the Expert category, Rick Pearson mopped up, using his opportunistic strategy. Mike Reagan finished second on the virtue of his large number of cuts. Harold Buyer seemed to have more than his fair share of mid-air, perhaps because his plane was bigger than most. Your author was eliminated in the first round by a broken servo gear due to a foolish aileron servo installation. Bill Watson, ever the wild man on the slope, was on his second plane after nine mid-air at the end of the contest — the best way to finish last! The Sportsmen were more cautious from the start, and their higher scores reflect this. "It's as much avoiding having your streamer cut as cutting one — I think that may be why I did so well," says Sportsman Class winner Michael Bame.

The results, after three rounds of about 10 minutes each, were:

	Expert Class		
	Cuts	Mid-air	Score
1) Rick Pearson	9	2	5
2) Mike Reagan	10	5	0
3) Harold Buyer	2	3	-4
4) Blaine Rawdon	0	2	-4
5) Bill Watson	6	9	-12
Sportsmen			
1) Michael Bame	3	0	3
2) Dick Hardy	1	0	1
3) Rich Hardy	0	0	0

After all these mid-air, all but two of the planes were approximately flight-worthy, albeit with a few new dings and wrinkles. Mike Reagan was enthusiastic, "Everyone was hitting me! Man! Five mid-air without getting knocked out of the air! I really dug having a disposable airplane. I want to see more!"

To summarize the contest, it is fun to watch and just great to fly. Rick Pearson adds, "It's far better to fly with four planes at a time — it's more exciting. That's hard to imagine since two planes are so exciting!"

To win, you must have a strong predatory sense, with an even stronger instinct for self-preservation. The planes need to be simple and resilient. The wings are the most vulnerable part of the plane. Head-on mid-air are much worse than same-direction love taps. The aileron servo should be in the wing to best protect it. Try to fly close to yourself. At closer range, it is much easier to judge depth, so cuts are easier and mid-air are less frequent.

If you fly on the slope, and this sounds anything like fun, give it a try! Start on a day when the lift is light, so the planes are slower, until you get the hang of it. Then go for it, Ace! □



*The planes and flyers after the contest. Left to right: Rich Hardy, Bill Watson, Harold Buyer, Mike Reagan, Rick Pearson (kneeling), Michael Bame, Dick Hardy.*



*Michael Bame launches his little 3' span original as Dick Hardy awaits a gap in the traffic. Sport flyers on clear frequencies continued to use the hill.*



*Rick Pearson, high man, has Mike Reagan in serious trouble. Bill Watson banks sharply to join the fray.*



*Harold Buyer makes a diving attempt at Bill Watson's camouflaged Cheetah. Note the length of the streamers.*



*Diving out of the sun! A general shot of the territory at Malibu's Snake Hill. The planes are too far away here to accurately judge depth.*



*Bill Watson's plastic fuse Cheetah after a very solid centerpunch. The dent could be easily popped back out.*



*Rick Pearson puts the heat on Harold Buyer. A good maneuver for Buyer here would be a full-down elevator cut-away.*



*The immediate aftermath of a Watson-Reagan midair. Note the skewed wing and broken fin on Watson's ship. It spun four times and recovered even though the fin came off.*

**If You Want A Safe Return  
On Your Investment ....**



**Lean Towards Cirrus  
You Can Depend On It!**

# CIRRUS Hobby Shack 700 Series

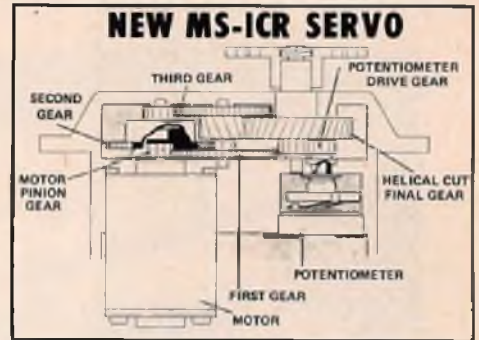
Everyone makes investment decisions as they go through life: some are major ones, and a few are less important. Just the fact that you are looking at and reading about Cirrus says that you're ready to make a decision on a new radio control system. We feel that, for your overall enjoyment in the years to come, the investment in a radio system is an important one.

## Dependable, Beautifully Styled, Quality Craftsmanship Economical.

show off to your friends. In owning a Cirrus System you'll have one of the finest radio systems offered in America that will insure you safe flights for more fun over many years.

### Make The Smart Investment.

If you're not the gambling type, we can assure you that buying a Cirrus is one of your safest and smartest moves. Cirrus Systems have been one of the biggest sellers in America this last year. We have climbed to the top because we have taken the gamble away from the new radio investor in offering these outstanding Cirrus Systems at economical prices. We can sell them to you at sensible prices because they come directly to you from our warehouse, and thus we have eliminated the so-called 'middle men' who force prices up. Notice that we said economical, not cheap, for Cirrus are as good as and in some cases better than our competition. It's just a smart investment to want a Cirrus, as modelers all over America have found out.



Featuring the new innovative design utilizing "Helical Cut" final gear in a servo allowing more bearing surface for smoother mesh, less noise, better wear for ultimate reliability. This is a compact three wire servo that is still rugged and lightweight providing high power output with high resolution and low power consumption. It has two monolithic IC's, 74 transistors, 13 diodes, and 79 resistors for a total of 165 parts. Size - L: 41.5 mm, H: 35.5 mm, W: 19.5 mm.



The Cirrus Radio Systems' new features are: new triple tuned front end receiver; the RF amp is controlled by AGC (Automatic Gain Control), and the three and four systems have a new BA-633 decoder chip. The six channel alone features a double sided, copper clad, fiberglass PC board with the same decoder as our previously successful Cirrus radios, which in fact does have a special Custom Made chip. It's the only system we know of having a single conversion receiver with triple tuning, which causes high image rejection plus high rejection of intermodulation distortion.

### Invest Some Time.

It's natural that you may want to shop around, and we think you should. We suggest that you invest some time in comparing Cirrus with other radio systems. Ask a modeler who owns a Cirrus and find out if he feels he made the right investment. After investing your time we know you'll make the best choice for the most return.

### You Deserve A Safe Return On Your Investment.

When you select a radio system you want quality, dependability, up to date engineering design, back up service and warranty, and that's why we know that Cirrus is your best investment. You get innovative design features. You get a triple tuned front end receiver for high image rejection. You get a handsome appearing system that you'll be proud to own and

<b>CIRRUS SPORT THREE RADIO SYSTEMS INCLUDE:</b> 3 channel receiver, 3 channel transmitter (dry), 2 servos, airborne battery pack (dry), switch harness, servo trays, frequency flag, instruction booklet, and FULL 180 day warranty. 27 or 72 MHz.		
<b>CIRRUS THREE CHANNEL SYSTEM (DRY) WITH 2 SERVOS</b> <b>\$109<sup>99</sup></b>	<b>CIRRUS THREE CHANNEL SYSTEM (DRY) WITH 3 SERVOS</b> <b>\$129<sup>99</sup></b>	<b>CIRRUS THREE CHANNEL SYSTEM (DRY TRANS., AIRBORNE NI-CAD &amp; CHGR.) W/ 2 SERVOS.</b> <b>\$129<sup>99</sup></b>
<b>CIRRUS SUPER SPORT FOUR RADIO SYSTEMS INCLUDE:</b> 4 channel transmitter with Ni-Cads, 4 channel receiver, 2 mini servos, Ni-Cad airborne battery pack with charger for both transmitter and receiver, servo trays, switch harness, frequency flag, instruction booklet, and FULL 180 day warranty. 27 or 72 MHz.		
<b>CIRRUS FOUR CHANNEL ALL NI-CAD SYSTEM WITH 2 SERVOS.</b> <b>\$159<sup>99</sup></b>	<b>CIRRUS FOUR CHANNEL ALL NI-CAD SYSTEM WITH 4 SERVOS.</b> <b>\$189<sup>99</sup></b>	
<b>CIRRUS SUPER SPORT SIX RADIO SYSTEMS INCLUDE:</b> 6 channel receiver, 6 channel transmitter, all Ni-Cads in the transmitter, and a Ni-Cad airborne battery pack, separate charger for the batteries, 4 Cirrus Mini-Servos, servo trays, instruction booklet, frequency flag, and a FULL 180 day warranty. 27 or 72 MHz.		
<b>CIRRUS SIX CHANNEL ALL NI-CAD SYSTEM WITH 4 SERVOS</b> <b>\$209<sup>99</sup></b>		

C.O.D. or  
CHARGE CARD



## Hobby Shack®

18480 BANDILIER CIRCLE, FOUNTAIN VALLEY, CA 92708

Shopping By Mail Is Fun And Easy

Add \$3.00 Postage & Handling. Calif. Residents Please Add 6% State Sales Tax.

For Fast C.O.D. Service  
Phone ----

Area 714  
963-9881



# RCM PRODUCT TEST

## Fliteglas Models DELUXE TRION



**T**he Deluxe Trion kit, from Fliteglas Models, is truly impressive for a pattern ship. All the parts are carefully placed within the box to avoid damage while shipping. I can attest to this for when U.P.S. delivered the kit, it looked as though it was used as a stage for the heavyweight polka party. Not one piece in the box was damaged.

The quality of the fiberglass is excellent, with the surface being almost flawless. The belly pan fit nicely and only a minor amount of fitting was necessary.

The hardware in this deluxe kit was quite complete and of excellent quality. It included: hardwood maple landing gear blocks, wing hold-down blocks, fiberglass center section reinforcement tape, horns, clevises, nylon screws, hinges, blind nuts, aileron torque rods, nose gear steering arm, engine control assembly, fiberglass wing tips, and sheet metal screws with landing gear retainers.

If I had to find fault with one thing in the kit, it would be the quality of the balsa sheeting used for the wings. It was what I would consider average. It was employed in the Deluxe Trion's construction but required a bit more work than I would have liked to see.

The plan sheet is half size, but well thought out and very thorough. The instruction booklet was very well sequenced and, if followed, aids in clearing up any doubts in the construction.

The foam cores are very accurate and a good grade of foam is employed. No trimming was necessary.

In most pattern ships, the firewall has to be installed. The Deluxe Trion has this installed and well fortified.

Very plus features are the incidence marks located on the fuselage sides. These are molded into the fuselage.

I personally prefer the canopy being molded into the fuselage for this eliminates any fussing at fillet lines, etc.

to page 100

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging	●					Pre-Shaped Parts	●				
Plans		●				Parts Match to Plans			NA		
Written Instructions	●					Overall Parts Fit	●				
Quality of Hardwood	●					Ease of Assembly	●				
Quality of Fiberglass	●					Fidelity to Scale			NA		
Other Materials			NA			Flight Performance	●				
Accessories	●					Overall Appeal	●				
Die-Cutting			NA								

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

### SPECIFICATIONS

Name	Deluxe Trion
Aircraft Type	Pattern
Manufactured By	Fliteglas RR #1 Box 324 Neoga, Illinois 62447
Mfg. Suggested Retail Price	\$104.95
Available From	Both Mfg. and Retail Outlets
Mfg. Recommended Usage	Competition
Wing Span	64 Inches
Wing Chord	13" (Root)
Total Wing Area	672 Square Inches
Fuselage Length	55" (incl. spinner)
Radio Compartment Dimensions	(L) 11½" x (W) 3¼" x (H) 3½"
Wing Location	Low Wing
Airfoil	Symmetrical
Wing Planform	Double Taper
Dihedral	1 Inch
Stabilizer Span	23 Inches
Stabilizer Chord (incl. elev.)	8½ Inches
Total Stab Area	152 sq. in.
Stab Airfoil Section	Symmetrical
Stabilizer Location	Mid Fuselage
Vertical Fin Height	9 Inches
Vertical Fin Width (incl. rud.)	8" (Avg.)
Mfg. Rec. Engine Range	.61
Mfg. Rec. Fuel Tank Size	12-16 Ounce
Landing Gear	Tricycle (retracts rec.)
Recommended No. Of Channels	5
Recommended Control Functions	Elev., Ail., Rud., Throt.

#### Basic Materials Used in Construction

Fuselage	Fiberglass
Wing	Foam core, Balsa sheeted
Tail Surfaces	Vertical stab. built as part of fuse., Horizontal stab. same as wing

#### Hardware Included in Kit

Plan Size	24½" x 43¼" (1 sheet)
Building Instructions on Plan Sheets	Yes
Instruction Manual	Yes (7 pages)
Construction Photos	No
Kit Includes	Shaped Parts
Mfg. Rec. Flying Weight	120 Ounces
Wing loading based on rec. flying wt.	25.7 oz./sq. ft.

### RCM PROTOTYPE

Weight, Ready To Fly	8½ lbs.
Wing Loading	29.1 oz./sq. ft.
Covering & finishing materials used	See Text
Engine Make & Disp.	Kraft w/Perry pump & carb
Muffler Used	Kraft
Radio Used	Kraft Signature
Tank Size Used	12 Ounces

# RCM PRODUCT TEST

**Southern RC Prod.  
SOUTHERN KITE**



**T**he "Southern Kite" is the first competition sailplane to be kitted by Southern R/C Products, manufacturers of many fine competition pattern planes.

The "Kite" builds fairly quickly for the experienced modeler, but the beginner may find the directions a little too general to guide him over some of the rough spots. The machining of the balsa and plywood is outstanding, parts fit was very well due to the close tolerances held in making the kit. Accessories included in the kit are an EK adjustable towhook, Goldberg control horns, and Snap Links, and three 10-24 nylon bolts. When building the wing, we went ahead and put in the necessary modifications for the spoilers to be added at a later time. The only other modifications we made to the structure was to replace the 1/4" balsa fillet rib with 1/8" plywood fillet ribs. We found that fatigue cracks formed around the wing rods when using the balsa fillet ribs.

The only fault with the kit is that the wing span is only 136" instead of 144" as advertised, and the wing area is 1077 sq. in. instead of 1200 sq. in. It appears that this may have been an engineering oversight when they produced the kit. If you want a 142" span, just cut one set of ribs, and add one more rib bay to each wing tip. Our prototype is 136" and it flies just fine.

One unique feature of the Kite is that the tail section is held on by three nylon bolts. This makes it convenient to transport or store the fuselage. The other benefit of this feature is that the stab can be shimmed for flight trim, just like trimming a free flight model.

In the flying department, the Kite proves to be very docile, ideal for beginners, yet it proves to be one of the more maneuverable open class sailplanes going. We are presently flying the Kite with only 2 channels and have no trouble putting it very close to the spot on landings. If you are a competition flyer, you may want the spoilers, but the sport flyer won't find them necessary. On the tow line, the Kite is very easy to handle, the wings are so strong you will rarely even flex them on the launch. With the design of the wing, you will break the tow line before you even come close to folding the wings.

Overall, the Kite is a rugged, durable sailplane that the sport flyer will enjoy and the competition pilot will turn in many a max flight.

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging	•					Pre-Shaped Parts	•				
Plans			•			Parts Match to Plans	•				
Written Instructions			•			Overall Parts Fit	•				
Quality of Hardwood	•					Ease of Assembly		•			
Quality of Fiberglass			NA			Fidelity to Scale			NA		
Other Materials		•				Flight Performance	•				
Accessories		•				Overall Appeal		•			
Die-Cutting			NA								

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

## SPECIFICATIONS

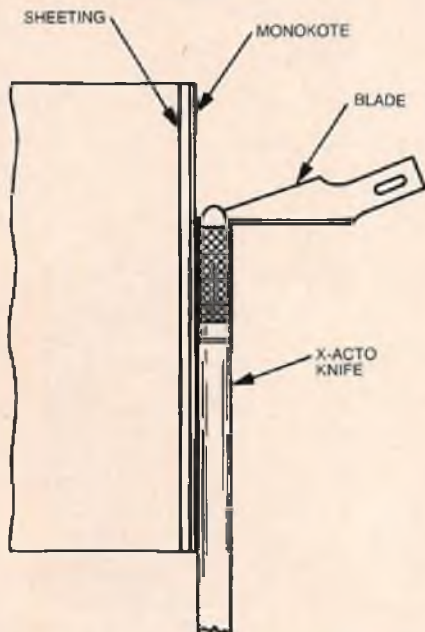
Name	Southern Kite
Aircraft Type	Open Class Sailplane
Manufactured By	Southern RC Products, Inc. Rt. 3 Box 47, Nims Lane Pensacola, Florida 32503
Mfg. Suggested Retail Price	\$74.95
Available From	Both Mfg. & Retail
Mfg. Recommended Usage	Competition
Wing Span	136 Inches
Wing Chord	9 1/4 Inches
Total Wing Area	1077 Square Inches
Fuselage Length	58 Inches
Radio Compartment Dimensions	(L) 10 3/4" x (W) 2 1/8" x (H) 2 1/2"
Wing Location	Shoulder Wing
Airfoil	Flat Bottom (NACA 6412)
Wing Platform	Constant Chord - Inner panel Swept T.E. - outer panel
Dihedral	6 Degrees
Polyhedral	6 Degrees
Stabilizer Span	28 Inches
Stabilizer Chord (incl. elev.)	6" (Avg.)
Total Stab Area	165 sq. in.
Stab Airfoil Section	Flat
Stabilizer Location	Top Of Fuselage
Vertical Fin Height	6-1/2 Inches
Vertical Fin Width (incl. rud.)	5-1/4" (Avg.)
Mfg. Rec. Engine Range	NA
Recommended Fuel Tank Size	NA
Landing Gear	Skid
Recommended No. Of Channels	2-3
Recommended Control Functions	Rudder, Elevator
Basic Materials Used In Construction	
Fuselage	Balsa, Ply
Wing	Balsa, Plywood & Spruce
Tail Surfaces	Balsa, Spruce
Hardware Included In Kit	See Text
Plan Size	60" x 36" (3 sheet)
Building Instructions on Plan Sheets	No
Instruction Manual	Yes
Construction Photos	Yes
Kit Includes	Machined Parts
Mfg. Rec. Flying Weight	72 Ounces
Wing loading based on rec. flying wt.	9.6 oz./sq. ft.

## RCM PROTOTYPE

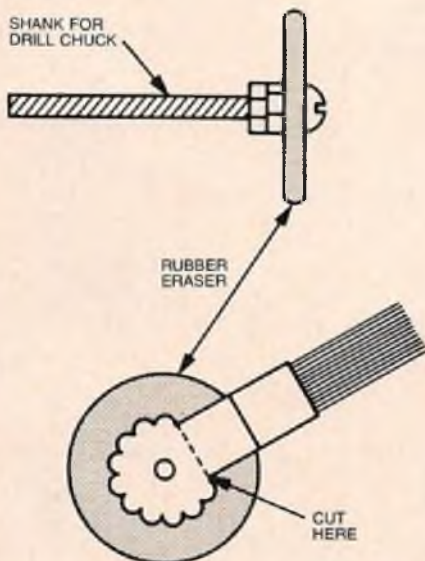
Weight, Ready To Fly	72 Ounces
Wing Loading	9.6 oz./sq. ft.
Covering & Finishing materials used	Balsarite, Monokote & DJ's
Engine Make & Disp.	NA
Muffler Used	NA
Radio Used	World Engines Expert
Tank Size Used	NA

# FOR WHAT IT'S WORTH

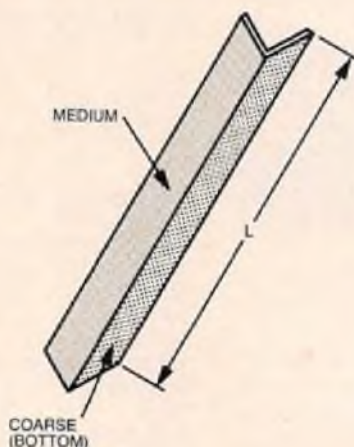
After minor damage to your covered aircraft, the job comes for trimming around the damaged area. No one likes to cut the sheeting and weaken it, especially cardboard covered wings. So to keep from cutting too deep, one can reposition the blade on the X-Acto knife as shown in the sketch. Ronald E. Varner Sr. of Great Falls, Montana has used this method many times and it works very efficiently.



To polish small parts, David Koelzer of Kansas City, Kansas, has taken the round rubber eraser from the type found in most office supply houses and mounted it on a bolt with lock nuts. This can be chucked into your drill or Dremel tool and makes a good abrasive polishing wheel. As shown in the sketch, the brush part can be used to apply the polishing compound to the area to be polished.



Charles Silver, a member of the Rams Club in Seattle, submitted his idea for an excellent sanding tool. This tool can be made from aluminum angle stock readily available at any hardware store. By contact cementing different grades of sandpaper on each side you have a versatile tool to accurately sand leading and trailing edges, wing sheeting, wing saddle, etc. The advantage of this tool is its low cost, light weight, two different sanding surfaces, very accurate straight edge and plane surfaces. Also, since the aluminum angle is sold in 6' lengths, the tools can be cut to fit the job, see sketch. Cut the 6' length into two pieces, one 11" and one 22" long, with the remaining piece as a long straight edge.

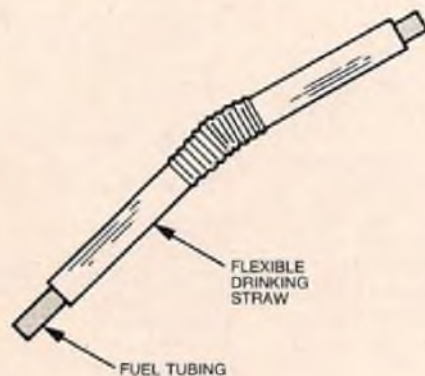


MATERIAL: 1" x 1" x 1/16" ALUMINUM ANGLE (6 FT. LENGTH) APPROX. \$3.50

SEVERAL SHEETS OF SANDPAPER (MEDIUM, COARSE, ETC.)

CONTACT CEMENT

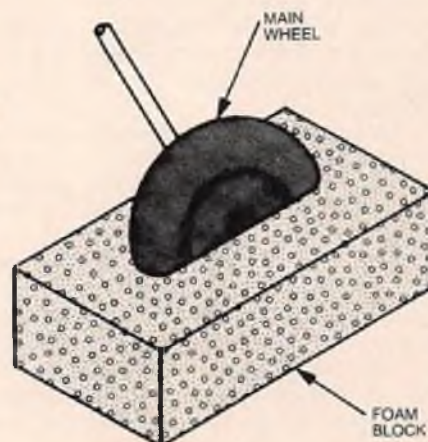
Thomas F. Manners of Apollo, Pennsylvania, discovered a plastic flexible drinking straw to be a useful item. To make 90 degree bends or greater in fuel tubing, Tom recommends using a plastic drinking straw. You can bend the straw in any position desired. Most any angle can be achieved, even an off-set if necessary. With the fuel tubing inside the straw, it will remain



open and not become pinched shut due to sharp bends. See sketch.

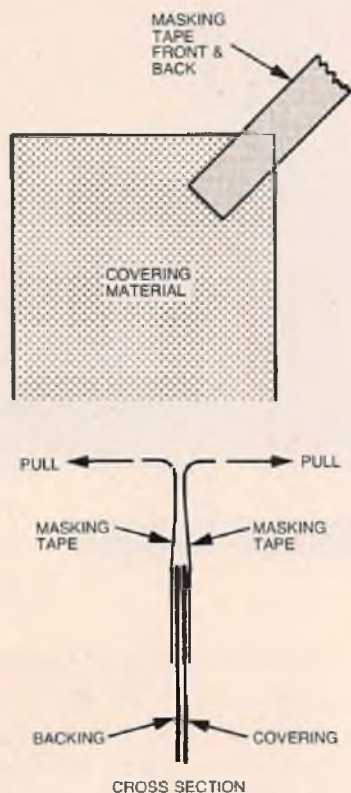
To connect an R/C car body to the chassis without using the out of scale body pins supplied with most car kits, you can use Velcro fasteners which are available wherever fabrics are sold. This two part fastener, which is used in place of buttons and zippers in clothing, works great to fasten car bodies to their chassis. L. Jeffrey Daniels of Browns Valley, Minnesota, has never had the body come loose while running his car under the most severe conditions and track roughness and yet the body may be easily pulled loose when the need arises to get inside to work on the chassis or radio gear. Jeffrey makes an "L" shaped bracket from brass strip and attaches it to his plastic front bumper and to the plastic radio tray on his 1/8 scale Associated RC 100 Chassis. Next, epoxy a small piece of one side of the Velcro to the bracket and epoxy the other side directly to the body inside, directly across from where the body will contact the bracket. The body can be easily slipped over the chassis and positioned. Then a slight finger pressure on the body is all that is needed to connect the two pieces of Velcro firmly. By pulling on the body at the same spot, the two parts of Velcro will come apart to easily remove the body. This method of attaching the car body to the chassis has been most satisfactory.

Worried by those bumps and thumps in the trunk or back of your station wagon? To keep his fuselage from rolling back and forth on the way to the flying field, Slim Modin of Massapequa, New York, fits foam blocks to the main wheels. Cut the inner hole to a snug fit over the wheel using a sharp pair of pointed scissors such as barber's shears. The hole may be cut all the way through without reducing braking efficacy.



# FOR WHAT IT'S WORTH

It is sometimes necessary to use a piece of heat-shrink covering material which does not have the starter edge necessary to remove the backing. Dr. Thomas J. Pekarna of Le Sueur, Minnesota, solved the problem by applying two pieces of masking tape to the film as shown in the diagram, one on front, one on back, running across a corner if possible. Press together firmly and pull apart. It may be necessary to re-do it two or three times but the backing will release.



Recently, J.G. Alexander of Slemon Park, P.E.I., Canada, encountered the problem of stripped motor mount screw holes in an a/c using wooden beam mounts. After searching for a simple but safe method to re-mount the engine, he came up with the following method.

- (1) Drill out the original motor mount screw holes to size for either a 10-32 or 1/4-20 screw tap.
- (2) Tap the holes and screw in a nylon bolt the full depth of the motor mount material.
- (3) After the bolt is in place, 'Zap' it, and then cut it off and trim it flush with the mount.
- (4) Place the engine in position and locate new screw hole positions on top of the nylon inserts.
- (5) Drill holes in the inserts to suit the screws to be used for mounting the engine.
- (6) Install the engine and tighten it

down. The mount is now as good, if not better, than new.

He personally used 10-32 nylon inserts with #6 self-tapping screws to re-mount an O.S. Max .40 Sch. in a pattern aircraft and to date have encountered no problems with the screws loosening or stripping out. However, one must be careful not to over-tighten the screws or you will shear the tops off of them.

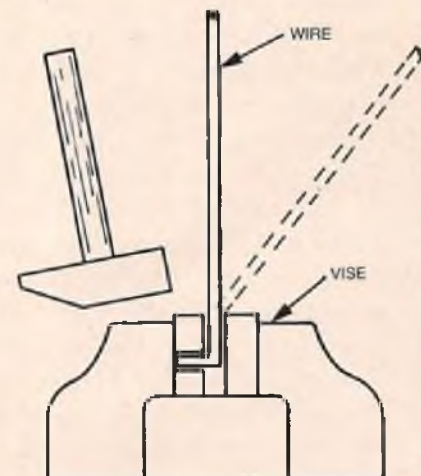
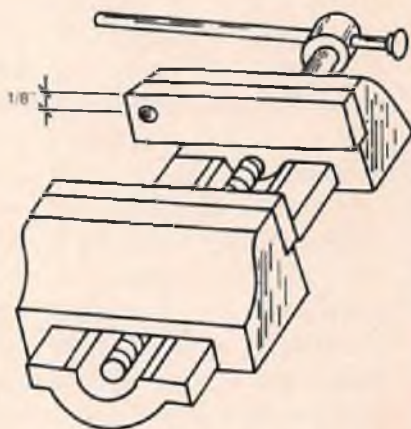
One of the handiest tools that a model builder can have in his shop is the X-Acto razor saw. This super fine tooth saw will cut just about anything from small balsa sticks to maple motor mounts. Its only problem is that its teeth are raked forward, making it cut on the push stroke. This frequently causes the teeth to grab hard, while the builder, having applied excessive force, bends the blade in half, loses his balance as the handle twists, and falls crashing into the center of the almost completed monster old-timer all stick construction fuselage whose last longeron he was trying to trim off. Lee fought this condition many times, and just recently in front of a good friend, and another long-time modeler. His comment was, "Ya Dumb S#\$!!" Fifteen seconds later, he handed the saw back with the blade reversed so that the teeth raked backwards, and cut on the pull stroke! The blade of the saw is held into the sheet metal backbone merely by two light punchmarks through the backbone and blade. To reverse the blade teeth, and put an end to years of frustration and collapsed stick fuselage models, simply chuck the blade up in a vise, pop the sheet metal backbone off the blade by prying up, turn the backbone around 180°, and tap it back onto the blade. Grab a centerpunch and repunch the punchmarks, and you now have an X-Acto saw that is the beautiful, well-behaved tool that makes any craftsman weep with joy. Lee Taylor of Roseville, California, sent this mod to us with the frustration that it took him 25 years to do something so simple and then it had to be shown.

From Earl Haury of Houston, Texas, comes this suggestion on how to prevent hoses from blowing off the fittings of pneumatic powered retracts. Simply place a drop of cyanoacrylate type adhesive (Hot Stuff, Zap, etc.) on the fitting before installing the hose. This has solved all his problems.

How often have you needed a small amount of fluid of some kind at your fingertips? Here is a solution that comes from Elmer Lohrey of Paris, Texas, on how you can do it. Take the Hot Stuff

bottles with the black plastic caps; take out the tube when the bottle is empty. Put the black plastic cap back on and put it in some hot water to remove the label. Then drill the bottle out with a 3/16 drill, clean the bottle with fuel. Take a small brass or plastic tube 1/2" long and about 1/8" diameter; cut the outer end at a 45° angle. Drill the black plastic cap to fit this tube. Insert the tube in the cap and Hot Stuff it in. Do not remove the gasket inside the cap. This bottle can be used for oil, fuel, water or any liquid, or to prime small engines. Put a label on each bottle.

Cheapest and easiest method for a "Z" bend in your pushrod wire comes from Can Kurdoglu of Istanbul, Turkey. Drill a hole in the jaw of your vise as shown in sketch. Make your first 90° bend on your wire, then stick this tongue in the hole and finish your "Z" with a hammer. Hammer lightly to avoid breaking wire.



Send your hints & kinks to R/C Modeler, P.O. Box 487, Sierra Madre, Ca. 91024 & win a free 1 year subscription to RCM.



# FRANK G. TALLMAN III

**F**rank G. Tallman III died in an airplane crash on the night of April 16, 1978. Mr. Tallman's distinguished career in aviation began with his first solo flight in 1938. He was the last living pilot who had flown the entire spectrum of aircraft types ranging from a replica of a 1908 Curtis pusher through modern jets. His piloting talents were equally at home in aircraft such as the WW I Sopwith Camel, Golden Age Travelairs and Wacos, everything from WW II, and most of the modern machines. He has shared many of his experiences in his book, "Flying The Old Planes," published by Doubleday.

Tallman was a U.S. Navy pilot during WW II — flying dive bombers and transport aircraft. He retired from the Naval Reserve in 1956 with the rank of Lieutenant Commander.

Frank's long romance with airplanes was probably best known for his work with the movie industry. The majority of the stunts involving full size airplanes that have been seen in movies over the past two decades were flown by him. These wild aerial stunts were actually meticulously planned and precisely executed activities to achieve the desired effect. The lengthy list of movie credits include "It's A Mad, Mad, Mad, World" in which he taxied a plane into a glass wall of a restaurant and flew a twin engine Beech at 160 miles per hour through an open hangar. He then flew the same Beech through a billboard. Incidentally, the large billboard was constructed of balsa wood.

In December of 1963 Frank G. Tallman's lifetime dream of a historical museum of the air was realized. This museum, located at the Orange County Airport in Santa Ana, California, under the name of



## In Memorium

Frank Tallman's Movieland of the Air Museum, contains an outstanding collection of antique and modern aircraft that have been gathered from all over the world.

With the opening of the museum, model airplane enthusiasts quickly discovered a warm, considerate facet of Frank Tallman. A typical example involved a prominent modeler, Col. Bob Thacker. Bob was starting an R/C model of the Sopwith Camel and had heard that Tallman had flawlessly restored a full size Camel from original factory drawings. Not only was Bob provided with all the information needed, along with access to the Camel, he was also shown a most accurately constructed model of the

Camel that Frank Tallman was building. Tallman's appreciation for model craftsmanship has led to numerous models being made a part of the museum's permanent exhibits by Southern California modelers.

In 1965 the museum co-sponsored an R/C Scale contest with RCM. The ground judging and display were held at the Movieland of the Air Museum. The very first West Coast Model Airplane Trade Show (MATS, later became MACS) was held at the museum with displays positioned among the full size aircraft.

We are saddened at the loss of Frank G. Tallman, III; aviator, modeler, and a wonderful person. □

1920 — 1978

# TOWER IS TOPS!

**WHO IS TOWER HOBBIES?** Tower Hobbies is the largest, finest, fastest, friendliest, and the most progressive Radio Control Mail Order Company in the United States. Tower Hobbies is not a little hobby shop that sells mail order as a sideline, but rather we are a highly specialized and efficient volume merchandiser. Tower's quantity purchasing and efficient order processing add up to fantastic savings and excellent service for our more than 35,000 active customers. Very simply, Tower Hobbies is the only R/C supply company you'll ever need!

**REPUTATION** - Tower Hobbies has been courteously and honestly supplying modellers since 1971. Tower is a reliable company that you can depend upon for excellent quality, low prices, and outstanding service. Don't take a chance dealing with those little "here today - gone tomorrow" companies when you can deal with the best at no extra cost. Tower Hobbies is NUMBER ONE because we know that you are the most important part of our business. And that is something we never have nor ever will forget!

**DISCOUNT PRICES** - Tower Hobbies is the most competitive company in the hobby. Your hobby supplies cost you less from Tower because our volume purchasing and sales allow us to work closer than anyone else in the business. We would rather sell 10 radios at \$10.00 profit each than to sell one radio at \$100.00 profit - and that means super savings for you! Tower sells only brand new, brand name merchandise and we sell it at super discounts. Can you think of any reason why you should pay more for exactly the same product elsewhere?

**FAST SERVICE** - Tower Hobbies is the home of fast service! As soon as we receive your mail order or take your order over the phone we begin to process it immediately. We check your file (or make a new one for new customers), check over your order, computer process it, check it again, pick it, pack it, and then ship it within 24 hours. You receive exactly what you ordered in a carefully wrapped package that is courteously delivered by United Parcel Service (or Parcel Post if requested) within 1 to 5 days depending upon where you live. You never have to leave home - no heavy traffic, stuffy crowds, or discourteous salespeople when you deal with Tower Hobbies!

**TOLL FREE PHONES** - Tower Hobbies was the first to offer Toll Free "800" phone service to its customers. With the Toll Free lines you can call Tower at no charge to yourself to place orders, check on availabilities, check current prices, obtain professional advice, or whatever. Your telephone is a straight connection to the largest and finest R/C inventory in the United States - it's fast, easy, and free of charge.

**COMPUTER POWER** - Tower was the first and as far as we know still the only mail order company in the hobby to keep track of inventory, remember backorders, and process all orders with a computer. This enables us to keep errors to an absolute minimum which means that you don't have the headache of receiving wrong merchandise, being billed incorrectly, or having your backorders forgotten or misplaced. Tower processes your order quickly and correctly this time, next time, and everytime!

**EXTENSIVE INVENTORY** - Tower Hobbies has the largest and most complete inventory of radio controlled model airplane supplies and related accessories in the United States. Tower carries over 150 manufacturers lines including: Airborne, Ace, A.F.I., Airtronics, A.H.M., A-Justo-Jig, Allied Hobbies, Ambroid, Andrews, American Helicopters, Austin Craft, Badger, Banner, Bauer, Bolectra, Bridi, B.W.T., C.B. Associates, Custom Model Prod., Concept, Coverite, Cox, Craft Air, D&B, DAE, Devcon, Dodgson, Dremel, DuBro, Dumas, Economy Plus, Edson, Enya, Eveready, Exhib'air, Fliteglas, Fox, Fuseite, Futaba, Gas Model Prod., Goldberg, G.M.C., Graupner, Grish, Halco, Hobbypoxy, Hot Stuff, House of Balsa, Jemco, Jensen, K&B, Kavan, Kraft, Kwik-Cote, Lanier, Legionair, Leisure, Lenco, Long Island, Maco, Mark's Models, M.E.N., Microflame, Mich. Hobby, Mile High Models, Midwest, Milman, Miller, Model Dynamics, Monokote, M.R.C., Neal's, Bud Nosen, Octura, O.S. Max, Pactra Aerogloss, Panavise, Pacer, Perry, Platt, Powr-mite, Prather, Proctor, Power Pacer, R&S, R/C Guide, Rocket City, Rev-up, Robart, Rhom, Royal, 60 to Go, Sanwa, Scozzi, Seafector, Semco, Sherline, Sig, Simmons, Skyglas, Slimline, Bob Smith, Solarfilm, Soarcraft, Sonic Systems, Southwestern, Spickler, Su-Pr-Line, Southern R/C, Sta-Brite, Stafford, Sterling, Supertigre, SonicTronics, Sullivan, Superpoxy, SureFlite, Tatone, Titebond, Tomco, Top Flite, Tower, Trexler, Universal, V.K., Williams Bros., Webra, Wing Mfg., Wilhold, World Engines, Westcraft, X-Acto, Zinger, Zap and more!



The front office file area is a busy place! Over 35,000 active customer files fill up 70 file cabinets. Can we make a file for you?



The warehouse final checking and packing area processes over 350 packages each day. You'll enjoy receiving packages from Tower!



Good afternoon - Tower Hobbies! Part of our phone staff answering our Toll Free lines. We want to take your orders, answer questions etc.



Our computer operators enter your order on the terminals. The computer quickly and accurately generates an errorless invoice just for you.



Now where did those rear valve ABC schnurflus with Perry pumpers go? Tower has the largest and finest R/C inventory selection available.



## TOWER HOBBIES

P. O. BOX 778

CHAMPAIGN, ILLINOIS 61820

800 637 7686

800 252 3336

217 384 1010



# TOWER

P.O. BOX 778

CHAMPAIGN,

## TOWER HOBBIES SIX & THREE CHANNELS

Tower Hobbies digital proportional radio control systems are absolutely the finest value radios on the market today. Take a close comparative look at the Tower systems against *any* other brand and you will quickly see that you get unquestionably the most radio for your money with Tower!

**QUALITY :** Tower radios are made for us by Kraft Systems in California. They are manufactured to our exacting specifications which include the latest technology of design, the finest components, precision assembly, and outstanding quality control. Kraft is the World's finest R/C systems manufacturer and Tower Hobbies is the most reputable R/C distributor in the industry - the combination of the two guarantees you the finest possible product and service all at the lowest possible price.

**WARRANTY :** Tower radios are warrantied for 180 days from the date of first purchase. Five convenient warranty service centers are located across the Country for fast, dependable, and precise service.

**COMPATIBILITY :** The Tower 6 and Tower 3 components are fully compatible with the previous Tower 5 model as well as the entire line of Kraft Systems radios (except for the "A" series). This gives you the greatest accessory and feature availability in the industry - interchange flight packs, servos, chargers, trays, output arms, or anything from the Kraft lineup of outstanding products.

**COMPONENTS :** The Tower 3 channel comes standard with two KPS-14 servos and a lightweight 450 MAH ni-cad receiver battery pack, giving an airborne pack weight of only 7.9 ounces. The Tower 6 channel comes with your choice of four KPS-14 or KPS-15 servos and a powerful 550 MAH receiver battery pack, giving an airborne pack weight of only 11.9 ounces with 14's and 13.5 ounces with 15's. Both systems come with lightweight slimline receivers that make for very convenient installations. Both switch harnesses have external receptacles for charging convenience.

**FEATURES :** Both Tower systems feature a dual function meter that allows you to check RF and absolute battery voltage. This allows you to monitor your flying time in addition to being able to check for possible cell malfunction. This deluxe feature is usually only found on systems in the \$500.00 price range.

**POPULARITY :** Tower radios enjoy a high degree of popularity at flying fields all across the country. When you show up at the field with a Tower radio your flying buddies will know that you are a no-nonsense flyer that demands top quality equipment but at down to earth prices. Your choice of a Tower radio says a lot about your astute ability to recognize true value - it shows you're a smart shopper!

**APPEARANCE :** Tower Hobbies radios are attractive. There is just something very elegant about that rich ivory color accented with black trim pieces. But that's in keeping with the total quality feel of Tower radios - that first class feeling. We just don't think that a radio should look weird or strange - because we feel that the radio you fly is a reflection of your own personality. With Tower Hobbies radio control systems you go first class in quality, performance, and appearance.

**PRICE :** Tower Hobbies radios give you absolutely the maximum amount of radio for the least amount of money - and that's value! There is nothing cheap about a Tower radio. The design is the latest, the manufacturer is the finest, the quality is peerless, and the service is second to none. So how then can the price be the lowest in the industry? Simple. Tower's tremendous buying power allows us to create economies due to volume - and there are no middlemen between us and the manufacturer to artificially jack up the price. You're paying the bottom dollar price for the top of the line product. We can't think of any reasons why you should pay more to get less.

**ORDER NOW ! !** Both systems are in stock for immediate delivery on the 72 mHz frequency of your choice. Call Toll Free right now for immediate COD delivery or send your order in the mail along with purchase amount plus \$2.00 for postage. If you are not 100% satisfied with your Tower radio after receiving it then simply send it back in original condition within 10 days for a full purchase price refund.

## TOWER SIX

The Tower 6 channel transmitter comes in the popular 2 stick closed gimbal configuration. Standard equipment includes a fully proportional fifth channel, toggle switch sixth channel, choice of four KPS14 or KPS-15 servos, slimline high range receiver, ni-cad batteries in both transmitter and receiver, charger, switch harness, servo trays, full servo accessories, and a dual function meter that indicates both RF and absolute battery voltage.

This is a top of the line complete radio system that is perfect for all radio control applications. From 1/2A to pattern ships, it offers all the performance you could ever ask for.

Six channels, top performance, high quality, and outstanding service after the sale - all at the lowest price in the hobby. Can you think of any reason why this shouldn't be your next radio? Retail \$350.00 Stock #TOW88462

**ONLY \$199.95**

## TOWER THREE

The Tower 3 channel transmitter comes in the popular single stick closed gimbal configuration. Standard equipment includes a fully proportional third channel, two KPS-14 servos, slimline high range receiver, ni-cad receiver battery, charger, switch harness, servo accessories, and a dual function meter that indicates both RF and absolute battery voltage. The dry cell transmitter (battery not included) can easily be converted to ni-cad operation by adding ni-cad pack.

This is a top of the line complete radio system that is perfect for small aircraft, gliders, boats, and cars. It's lightweight, yet very rugged.

Same outstanding performance, quality, and service as in our 6 channel and again all at the lowest price in the industry. This is the system that makes sense for the beginner that needs three or fewer channels.

Retail \$210.00 Stock #TOW88231

**ONLY \$119.95**

# HOBBIES

ILLINOIS 61820

PHONE  
TOLL FREE

800-637-7686  
ILLINOIS RESIDENT ONLY  
800-252-3336





# TOWER

P.O. BOX 778

CHAMPAIGN,

## \$\$ SUPER SPECIALS OF THE MONTH \$\$

SPECIAL STOCK NUMBERS MUST BE USED FOR PRICE TO BE HONORED. NO BACKORDERS TAKEN IF OUT OF STOCK.

SPECIALS GOOD UNTIL JULY 15th, 1978 ONLY

BE A SMART SHOPPER; COMPARE OUR PRICES. HERE IS JUST A SAMPLE OF OUR LOW PRICES. WE HAVE THOUSANDS MORE JUST AS GOOD!

**BUD NOSEN 28%  
TRAINER OFF**



This 8.5 ft. wingspan all wood, fast building trainer is designed for a .60 size engine & 3 or 4 channel radio.

**RETAIL NOW ONLY \$57.58  
\$79.95 Stock #NOS74008**

**BRIDI RCM 34%  
TRAINER 60 OFF**



This popular all balsa trainer has a 58" span and takes a .40 - .60 engine. High quality, flies great.

**RETAIL NOW ONLY \$41.58  
\$62.95 Stock #BRI74002**

**LANIER 36%  
COMET II OFF**



This popular almost-ready-to-fly features a 63" span and takes a .50 - .61 engine. Great trainer.

**RETAIL NOW ONLY \$37.48  
\$58.50 Stock #LAN74105**

### Radio Sale!

	Retail Price	Tower Price
FUTABA		
2GA	99.95	69.98
2E	139.95	94.98
2F	139.95	94.98
3F	179.95	119.98
3FN	199.95	132.98
4FN4 S-17	269.95	174.98
4FN4 S-16	299.95	194.98
5FN	349.95	219.98
6FN S-17	319.95	204.98
6FN S-16	359.95	229.98
7GN	579.95	394.98
KRAFT		
KP-2AS	129.95	88.98
KP-2AW	129.95	88.98
KP-4A	299.95	194.98
KP-5C&5CS	375.43	279.98
KP-6A	329.95	224.98
KP-7C&7CS	515.43	369.98
SANWA		
2 CH	109.95	69.98

	Retail Price	Tower Price
S&O Battery Tester	24.95	16.18
Coverite Balsarite	2.95	1.98
Cox Tee Dee .051	20.95	13.68
Craft-Air Windrifter	47.95	28.78
Craft-Air Sailer	129.95	84.48
Craft-Air Butterfly-NEW!	49.95	32.48
Craft-Air VM-2 Voltmeter	24.95	14.98
Dubro Prop-Drive Unit	100.00	66.98
Dumas Big Swamp Buggy	28.95	18.58
Dumas Hot Shot 21-Glass-NEW	67.95	44.18
Fox-ALL RC ENGINES-40% OFF		
Futaba S-16 Mini Servo	39.95	29.98
Futaba S-17 Std. Servo	29.95	22.48
Futaba S-7 Waterproof Servo	39.95	29.98
Goldberg Senior Falcan	59.95	35.98
Goldberg Skylane 62	59.95	35.98
House of Balsa-ALL KITS-30% OFF		
Jemco Corsair	58.50	46.78
Jensen Ugly Stick	62.50	39.98
K&B .35 RC	34.95	22.78
K&B .40 RC Pressurized	95.00	56.98
K&B .19 RC	50.00	29.98
K&B .61 RC Pressurized	115.00	68.98
K&B .21 Outboard Marine	99.50	59.98
K&B .21 RC Inboard Marine	69.50	41.68
K&B .21 RC Schneurle w/muff	67.50	40.48
K&B .40 RC FR RE Schneurle	110.00	65.98
Kraft .61 RC w/muffler	99.95	71.98
Kraft KPS-1411&1511 Servos	44.95	34.98
Mark's Wanderer	19.95	12.98
Mark's Bushwacker w/access.	52.95	31.78
MEN Trainer (.15-.25)	31.95	20.48
Midwest Klampon Kai Outboard	44.95	29.18
Midwest Cardinal-ARF	29.95	19.48
Midwest Sweet Stik	39.95	24.78
Midwest Attacker	39.95	25.98
Midwest RK-40 Ducted Fan	48.95	33.98
Monokote-Reg. & Trans. Colors	9.00	4.98
Dave Platt-ALL KITS-30% OFF		
Robert Super Pumper	17.95	10.78
Royal Corsair	94.95	73.98
Solarfilm-ALL REGULAR COLORS-3.98/roll		
Spickler Quikie 500	43.95	29.98
Sterling Puddle Jumper	16.95	11.18
Sterling Fladgling	41.95	26.48
Sullivan Deluxe Starter	39.95	25.98
Sureflite Foam J-3 & Spitfire	34.95	22.78
Top Flite Freshman Trainer	49.95	29.18
Top Flite P-51	57.95	38.88
Tower 12 volt gel/cell battery	26.95	18.98
Tower No. 64 Rubberbands-1/4 lb	1.25	.68
Tower No. 11 Knife Blades (5)	.80	.38
Wescraft B-17	495.00	399.98
X-Acto No. B7 Knife & Tool Set	29.95	20.98

	Retail Price	Tower Price
AFI Analyzer-Rapid Charger	38.95	27.28
Airtronics O-Tee	21.95	15.38
Airtronics Aquila	49.95	34.98
A-Justo-Jig wing & fuse jig	54.95	36.98
Badger 200-1 Air Brush Kit	29.95	19.48
Bridi-ALL WOOD KITS-34% OFF		
Bridi-ALL GLASS KITS-33% OFF		

ALL SPECIAL PRICES ARE SUBJECT TO CHANGE IF RETAIL PRICES CHANGE DURING SALE PERIOD.

TOLL FREE



COD PHONE ORDERS - TOLL FREE

OUTSIDE ILLINOIS ONLY	800 637 7686
ILLINOIS RESIDENTS ONLY	800 252 3336
WEEKDAYS	9 00 A.M. to 5 00 P.M.
EVENINGS*	6 00 P.M. to 9 00 P.M.
SATURDAYS	10 00 A.M. to 5 00 P.M.
*CLOSED FRIDAY EVENING AND SUNDAY	

HOW TO ORDER BY MAIL

Write down all the items you want along with their stock numbers and prices. Add \$2.00 to the merchandise total to cover postage, handling, and full insurance. Send payment in Money Order or Check only (Personal Checks may be delayed to allow for clearance). Foreign orders add \$10.00 (excess will be refunded with order). Satisfaction always guaranteed.

### 1978 R/C CATALOG

The all new 1978 Tower R/C catalog features over 3000 products from over 150 manufacturers. All at super discounts. Send for your copy now!

**ONLY \$1.50**  
(Free with order)



### CALL TOWER TOLL FREE!!

FOR NEW PRODUCT INFORMATION  
FOR CURRENT PRICES  
FOR CURRENT AVAILABILITY  
FOR SUPER FAST SERVICE  
TO SAVE MONEY ON ALL OF YOUR R/C NEEDS.

# HOBBIES

ILLINOIS 61820

PHONE  
TOLL FREE

800-637-7686  
ILLINOIS RESIDENT ONLY  
800-252-3336

## \$\$ SUPER SPECIALS OF THE MONTH \$\$

SPECIAL STOCK NUMBERS MUST BE USED FOR PRICE TO BE HONORED. NO BACKORDERS TAKEN IF OUT OF STOCK.

SPECIALS GOOD UNTIL  
JULY 15th, 1978 ONLY

<p><b>DA ENTERPRISES</b> 36% <b>SERIES IV</b> OFF <b>POWER PANEL</b></p>  <p>The all-in-one power panel!</p> <p>Supply power to starter, plug, pump, etc., as well as fast charge your radio at the field!</p> <p>RETAIL NOW ONLY \$22.48 \$34.95 Stock #DAE90000</p>	<p><b>BRIDI RCM</b> 34% <b>TRAINER 40</b> OFF</p>  <p>This popular all balsa trainer has a 52" span and takes a .35 - .49 engine. A high quality kit.</p> <p>RETAIL NOW ONLY \$36.28 \$54.95 Stock #BRI73007</p>	<p><b>COX TD .049</b> 38% <b>STD. ENGINE</b> OFF</p>  <p>A super hot 1/8 A engine ideal for free flight, control line, 1/8 A R/C, and more. Limit of 2 per order.</p> <p>RETAIL NOW ONLY \$ 12.98 \$20.95 Stock #COX01049</p>	<p><b>FUN</b> 22% <b>BUGGY</b> OFF</p>  <p>This is the Siguma-Ace .19 size dune buggy distributed by Leisure Electronics. See the Dec. RCM article for more details.</p> <p>RETAIL NOW ONLY \$139.98 \$179.95 Stock #LEI90000</p>
<p><b>BOLINK</b> 20% <b>ELECTRIC</b> OFF <b>CAR</b></p>  <p>This 2 channel 1/12 scale electric car comes already assembled with 05 motor, nicads, &amp; charger &amp; goes over 25 mph.</p> <p>RETAIL NOW ONLY \$79.98 \$99.95 Stock #BOL90094</p>	<p><b>CRAFT-AIR</b> 33% <b>FIELD BOX</b> OFF</p>  <p>It's ready to use, not a kit, made of lightweight indestructible polyethylene. 22" long &amp; holds everything. A SUPER BUY!</p> <p>RETAIL NOW ONLY \$19.98 \$29.95 Stock #CRA90100</p>	<p><b>CRAFT-AIR</b> 35% <b>HI - START</b> OFF <b>HEAVY DUTY</b></p>  <p>Features reel, tubing, towline, parachute, stake, tow ring, and strong construction. For sailplanes of 100" wingspan and larger. Limit 1.</p> <p>RETAIL NOW ONLY \$25.98 \$39.95 Stock #CRA20020</p>	<p><b>AIRTRONICS</b> 30% <b>OLYMPIC II</b> OFF</p>  <p>This 99.9" span trainer is capable of contest competition. All balsa with pre-cut parts. An excellent quality sailplane.</p> <p>RETAIL NOW ONLY \$34.98 \$49.95 Stock #AIR71208</p>
<p><b>ZINGER</b> 35% <b>WOOD</b> OFF <b>PROPS</b></p> <p>Two popular sizes--Stock up now on these high quality props!</p> <p><b>10X6 WOOD PROPS(6)</b> RETAIL NOW ONLY \$5.48 \$8.40 Stock #ZIN17663</p> <p><b>11X7 WOOD PROPS(6)</b> RETAIL NOW ONLY \$6.28 \$9.60 Stock #ZIN17675</p>	<p><b>POWER PACER</b> 20% <b>BATTERY</b> OFF <b>TESTER</b></p>  <p>A new ni-cad battery tester, cyclor, and charger. Works great!</p> <p>RETAIL NOW ONLY \$47.98 \$59.95</p> <p>9.6 volt Stock #PWR80096 6 volt Stock #PWR80060</p>	<p><b>KRAFT KP-6A</b> 34% <b>6 CHANNEL</b> OFF</p>  <p>6 channels, open gimbals, 4 servos, nicads, trays, harness, charger &amp; 1 yr. warranty make this all new Kraft radio a super value.</p> <p>RETAIL NOW ONLY \$224.98 \$339.95 Stock #KRA88262</p>	<p><b>SONICTRONICS</b> 36% <b>ELECTRIC</b> OFF <b>FUEL</b> <b>PUMP</b> <b>MODEL</b> No. 1250</p>  <p>This outstanding fuel pump operates on 12 volts. High quality.</p> <p>RETAIL NOW ONLY \$8.98 \$13.95 Stock #STR54249</p>

ALL SPECIAL PRICES ARE SUBJECT TO CHANGE IF RETAIL PRICES CHANGE DURING SALE PERIOD.

## CALL TOWER TOLL FREE

CONTINENTAL UNITED STATES [EXCEPT ILLINOIS]:

800-637-7686

ILLINOIS RESIDENT ONLY:

800-252-3336



# TOWER

P.O. BOX 778

CHAMPAIGN,

## \$\$ SUPER SPECIALS OF THE MONTH \$\$

SPECIAL STOCK NUMBERS MUST BE USED FOR PRICE TO BE HONORED. NO BACKORDERS TAKEN IF OUT OF STOCK.

SPECIALS GOOD UNTIL JULY 15th, 1978 ONLY

<p>ZAP ZAP ZAP ZAP 50% OFF</p>  <p>Zap is a Super Cyanoacrylate adhesive that is super fast setting. Large size comes with extra applicators. Limit of 6 per order.</p> <p>RETAIL \$3.50 NOW ONLY \$1.78 Stock #SOR32050</p>	<p>PACER X-30 ADHESIVE 50% OFF</p>  <p>X-30 is super glue like Hot Stuff, Zap, etc except that it has a 30 second set time that allows for last minute fittings &amp; adjustments. Also, its higher viscosity enables it to make filllets. Limit 6 per order.</p> <p>RETAIL \$3.50 NOW ONLY \$1.78 Stock #PCR32030</p>	<p>GOLDBERG HANDI TOTE 34% OFF</p>  <p>This flight box is compact yet has room for everything you need. Limit of 1 per order.</p> <p>RETAIL \$14.95 NOW ONLY \$9.98 Stock #GBG90000</p>	<p>HOT STUFF 44% OFF HOT STUFF</p>  <p>Hot Stuff is an instant bonding cyanoacrylate super adhesive that is a must for modelers. Stock up now at this super price.</p> <p>RETAIL \$3.50 NOW ONLY \$1.98 Stock #HOT32001</p>
<p>K &amp; B .40 RC ENGINE 40% OFF</p>  <p>The most popular .40 ever made! Features a Perry carb.</p> <p>Quantities are limited. Limit of 1 engine per order until sold out.</p> <p>RETAIL \$67.50 NOW ONLY \$39.98 Stock #K&amp;B01040</p>	<p>DU-BRO KWIK FILL FUEL PUMP 36% OFF</p>  <p>RETAIL \$10.95 NOW ONLY \$6.98 Stock #DUB20191</p>	<p>HOUSE OF BALSA 30% OFF P-51D (.29-.40)</p>  <p>This all-balsa sport, stand-off scale ship is absolutely outstanding. The hottest new seller of the year.</p> <p>RETAIL \$54.95 NOW ONLY \$38.48 Stock #HOU73000</p>	<p>K &amp; B .61 R/C ENGINE 40% OFF</p>  <p>Limit of 1 engine per order.</p> <p>This outstanding engine features a Perry carb and muffler.</p> <p>RETAIL \$90.00 NOW ONLY \$53.98 Stock #K&amp;B01161</p>
<p>TOWER HOBBIES R/C LONG GLOW PLUGS 50% OFF</p>  <p>These excellent glow plugs feature an idle bar. Made by the world's finest plug manufacturer especially for Tower. 6 plugs per package. Limit of 2 packages per order.</p> <p>RETAIL \$7.20 NOW ONLY \$3.58 Stock #TOW15006</p>	<p>STERLING 1/2 A CORSAIR 40% OFF</p>  <p>This all balsa 36" span kit features special hardware and decal sheet. .049-.10 engine and 2 Ch. radio.</p> <p>RETAIL \$29.95 NOW ONLY \$17.98 Stock #STE72036</p>	<p>TOP FLITE HEAT GUN 36% OFF</p>  <p>This fine quality heat gun features a 3 position switch, nozzle attachment, 2 speed heat control, and long motor life. Great for Monokote, Solarfilm etc. Limit of 1.</p> <p>RETAIL \$27.95 NOW ONLY \$17.98 Stock #TOP45301</p>	<p>DUMAS 24" HOT SHOT TUNNEL HULL 40% OFF</p>  <p>This die-cut mahogany and birch plywood kit is designed for a 3.5 cc outboard like K&amp;B's.</p> <p>RETAIL \$26.95 NOW ONLY \$16.18 Stock #DUM70400</p>

ALL SPECIAL PRICES ARE SUBJECT TO CHANGE IF RETAIL PRICES CHANGE DURING SALE PERIOD.

TOLL FREE

COD PHONE ORDERS - TOLL FREE



OUTSIDE ILLINOIS ONLY 800 637 7686  
ILLINOIS RESIDENTS ONLY 800 252 3336  
WEEKDAYS 9 00 A.M. to 5 00 P.M.  
EVENINGS\* 6 00 P.M. to 9 00 P.M.  
SATURDAYS 10 00 A.M. to 5 00 P.M.  
\*CLOSED FRIDAY EVENING AND SUNDAY

### HOW TO ORDER BY MAIL

Write down all the items you want along with their stock numbers and prices. Add \$2.00 to the merchandise total to cover postage, handling, and full insurance. Send payment in Money Order or Check only (Personal Checks may be delayed to allow for clearance). Foreign orders add \$10.00 (excess will be refunded with order). Satisfaction always guaranteed.

### 1978 R/C CATALOG

The all new 1978 Tower R/C catalog features over 3000 products from over 150 manufacturers. All at super discounts. Send for your copy now!

ONLY \$1.50  
(Free with order)



### CALL TOWER TOLL FREE!!

FOR NEW PRODUCT INFORMATION FOR CURRENT PRICES FOR CURRENT AVAILABILITY FOR SUPER FAST SERVICE TO SAVE MONEY ON ALL OF YOUR R/C NEEDS.

# HOBBIES

ILLINOIS 61820

PHONE  
TOLL FREE

800-637-7686  
ILLINOIS RESIDENT ONLY  
800-252-3336

## \$\$ SUPER SPECIALS OF THE MONTH \$\$

SPECIAL STOCK NUMBERS MUST BE USED FOR PRICE TO BE HONORED. NO BACKORDERS TAKEN IF OUT OF STOCK.

SPECIALS GOOD UNTIL  
JULY 15th, 1978 ONLY

### 12 VOLT MOTORCYCLE BATTERY



These are high quality, heavy duty motorcycle batteries that are perfect for all electric starters. Brand new. Limit 1/order.

RETAIL NOW ONLY \$13.48  
\$26.95 Stock #TOW19000

50%  
OFF

### 12 VOLT BATTERY CHARGER

To go with your 12 volt motorcycle battery, or any other 12 volt battery, we now have this high quality charger that does a perfect job. Safe and easy to use. Works great with battery at left. UL approved. Limit 1 per order.

RETAIL NOW ONLY \$6.98  
\$13.95 Stock #TOW19100

### COX READY TO FLY CESSNA CENTURION

This all molded foam scale model comes complete with a Cox .049 engine, prop, push rods, horns, and all other fittings already installed. 36" span, Cox 2 Ch. recommended.

RETAIL NOW ONLY \$38.48  
\$54.95 Stock #COX72401

The Cox/Sanwa 2 channel radio fits perfectly into this model. Buyboth and be in the air within one hour!

RETAIL NOW ONLY \$69.98  
\$109.95 Stock #SAN88522



### DREMEL MODEL 381 MOTO-TOOL WITH FULL ACCESSORIES

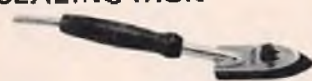


The Model 381 is the ultimate in hand grinders. It features variable speed control, ball bearings, and full accessories. Limit 1 per order.

RETAIL NOW ONLY \$43.98  
\$69.95 Stock #DRE34381

37% OFF

### SEALECTOR CUSTOM MODEL SEALING IRON



This custom model is great for covering with Monokote, Solarfilm, etc. It features adjustable temperature, teflon shoe, and a handy stand. Excellent quality.

RETAIL NOW ONLY \$14.98  
\$22.40 Stock #SEA45202

33%  
OFF

### MILLER No. 2017 SPRAY SET



Complete set includes a 12 foot air hose, compressor, spray gun, air brush, and nozzles.

RETAIL NOW ONLY \$44.38  
\$73.95 Stock #MLL62017

40%  
OFF

### SULLIVAN ELECTRIC STARTER



The Sullivan electric starter is a high torque, high R.P.M., 12 volt starter. Limit of 1 per order.

RETAIL NOW ONLY \$23.98  
\$36.95 Stock #SUL12200

35%  
OFF

### KRAFT KP-4A 4 CHANNEL



4 Channels, open gimbals, 4 servos, ni-cads, trays, harness, charger, and 1 yr. warranty make this all new Kraft radio a super value.

RETAIL NOW ONLY \$194.98  
\$299.95 Stock #KRA88242

35%  
OFF

### DEVCON 5 MINUTE EPOXY IN ECONOMY 9 OZ. SIZE



Now in squeeze bottles for your convenience. Limit of 3 per order.

RETAIL NOW ONLY \$3.48  
\$5.80 Stock #DEV32209

40% OFF

### DREMEL 572 MOTO SHOP

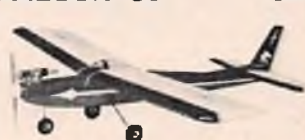


This deluxe saw features a complete accessory set of blades, discs, etc. and flexible shaft. Limit of 1.

RETAIL NOW ONLY \$58.88  
\$89.95 Stock #DRE34572

35%  
OFF

### GOLDBERG FALCON 56



This all time best seller is now re designed with ailerons. 56" span, 15 - 35 engine, all balsa construction. An excellent trainer.

RETAIL NOW ONLY \$23.98  
\$39.95 Stock #GBG72015

40%  
OFF

ALL SPECIAL PRICES ARE SUBJECT TO CHANGE IF RETAIL PRICES CHANGE DURING SALE PERIOD.

## CALL TOWER TOLL FREE

CONTINENTAL UNITED STATES [EXCEPT ILLINOIS]:

800-637-7686

ILLINOIS RESIDENT ONLY:

800-252-3336



All items appearing in Showcase '78 are press releases supplied by the manufacturer of the product and/or their advertising agency unless otherwise specified. The appearance of an item in Showcase '78 does not necessarily constitute an endorsement of that product by R/C Modeler Magazine.



### DU-BRO BAFFLE PLATE SET

Du-Bro Products' new baffle plate set contains the same items that are included with the universal Muff-L-Aire --- baffle plates, washers, keys and bolts ... everything necessary for replacement parts for your universal Muff-L-Aire. Or it can be used in conjunction with the new 6" muffler extension stock to build your own muffler. Available at \$2.95 (1 per plastic box — bagged) from Du-Bro Products, Inc., 480 Bonner Road, Wauconda, Illinois 60084.



### PORSCHE TURBO 935 CARS

With all the many new radio controlled cars being introduced, it is sometimes difficult to sort out the validity of the claims being made for their racing capabilities. Now Pro-Cision has the ultimate in true simultaneous competitive racing ... three big fully assembled 1/12 scale Porsche Turbo 935 cars, complete with dual-stick transmitters. Each transmitter is on a different frequency so the cars can be raced together. The three Porsches each have different configurations to enhance the realism of competitive racing. One of the cars is a scale reproduction of the famous Martini Racing Team Porsches, accurate down to the decals. The Pro-Cision Superhetrodyne Circuit provides radio controlled variable steering, variable

speeds forward and reverse, also neutral. The dual stick transmitter even has trim adjustments for super-fine control of acceleration and steering. The Pro-Cision Porsches have special circuitry that allows use of either regular alkaline batteries or rechargeable nicad batteries. A built-in jack allows the optional Pro-Cision charger to plug into the car to recharge batteries without removing them from the car. Built-in battery power indicator light system on both car and transmitter shows when power is low. The Pro-Cision Porsches incorporate most every deluxe feature available in battery powered R/C racing. The complete package including the transmitter gets a driver into competitive racing at about \$125.00. There is good reason why Pro-Cision calls these completely assembled cars "the ultimate in battery powered R/C racing." For information call Sandy Walkes at (213) 651-1770. Or write Pro-Cision Products, 6501 Flotilla, Los Angeles, California 90040.



### MODEL SAIL & POWER BOATING BY REMOTE CONTROL

"Model Sail & Power Boating ... By Remote Control" was written by George Siposs for the hobbyist interested in Model boating. It is easy to understand even by beginners in boat modeling. It covers all types of boat modeling — sail and powered, electric and internal — combustion engines. There is no attempt to teach the reader how to assemble one particular type of boat model, and it doesn't advocate one specific method of construction. Instead, the author considers all modern techniques, and includes sufficient theory to insure that the reader will

understand the basic principles behind the operation of various models and systems. For those interested in racing competition, the intricacies of this fascinating aspect are fully covered including how to prepare for a race, how to run a boat, and how to adjust it for optimum performance. To help the beginning hobbyist, there is a chapter on the workshop, including recommendations for tools and other useful gadgets. Racing clubs and activities are covered, too. The author tells how to organize a club, conduct a meeting, and plan activities. Also included is information to introduce the reader to the national organizations (AMYA, IMPBA, and NAMBA). A total of 192 pages with 103 illustrations included in this Tab book No. 693. Available from Tab Books, Blue Ridge Summit, PA 17214. Priced at \$7.95 hardbound and \$4.95 paperback.



### SINGLE-STICK THREE WITH MIXER

Custom features like a standard electronic mixer, full nicads, deluxe metal-clad receiver and top of the line servos make the Millcott Specialist 3-channel system really stand out in today's plastic, no-frills radio market. The flier who wants a "small" radio need no longer be compromised in quality or performance. The Specialist transmitter case is vinyl-clad metal, with compact styling (5.15" x 5.6" x 1.8"), and it features a quality Dunham semi-open gimbal assembly ... no awkward two-stick configuration. The built-in meter aids in monitoring the nicads. The trims are mechanical, and the transmitter exclusively uses conductive plastic pots for optimum reliability. The Specialist's bi-directional electronic mixer comes as standard equipment — the only 3-channel radio on the market to

be so equipped. Engaged at the flip of an internally mounted switch on the transmitter, the mixer permits direct pushrod attachments, without cumbersome and unreliable mechanical gadgetry in the airplane. The flier can order either of two coupling modes: an interconnect of the two primary stick outputs, for operations like "ruddervators" (rudder/elevator) on V-tailed models, or "elevons" (elevator/aileron) on flying wings; an interconnect of the proportional third function with the aileron stick output to provide flaperon (flap/aileron) action. Millcott will gladly custom tailor the unit to your specific mixing requirements. The airborne unit is essentially identical to that used in the Specialist six and eight channel systems. The receiver features a metal case, for maximum crash resistance. The maximum performance servos are the miniature MC-2 type, with their proven reliable circuitry and beefy gear train. They are compact enough to fit almost any 1/2A or sailplane installation, yet they deliver enough thrust to fly .60 sized models. When ordering, the flier can specify reversed or standard clockwise rotation. Even the various plugs are custom matched for optimum voltage and current transference, with combination of ITT Centiloc and Deans connectors used. Both the transmitter and receiver batteries are guaranteed for one year. While 500 mah batteries are standard, the flier may specify 225 or 450 mah cells. A battery charger and servo trays are also included. The U.S. made Specialist Three carries a full six month warranty. Available on any 72 MHz or six meter frequencies. For further details, see your dealer, or contact: Millcott Corporation 1420 Village Way, Unit E, Santa Ana, California 92705.



### "KANT-STIK"

One of the most difficult items for a modeler to obtain has been Polyvinyl Alcohol (PVA), the only reliable mold release for fiberglass and epoxy work. To answer this need, Idea Development, Inc., is now offering "Kant-Stik", a professional grade PVA in powdered form that has an indefinite shelf life until mixed with water. Once mixed, Kant-Stick, like all PVA's, has a shelf life of one year. Sold with complete directions for mixing and use, Kant-Stik

is available in one pint mix sizes, direct only from Idea Development, Inc., P.O. Box 7399, Newark, Delaware 19711. (Pint mix \$4.00, Two for \$7.00, Postpaid).



### SIZES & SHAPES

K & S Engineering, 6917 W 59th St., Chicago, Illinois 60638, is proud to announce an attractive assortment of Sizes & Shapes. This assortment of numerous sizes & shapes includes hard to find Brass, Copper, & Aluminum tubing. Product is packaged in see-thru poly bags designed for pegboard display. A necessary item for modelers, scratch-builders, etc. Stock No. 707 at a price of \$3.95.



### TROPHIES

Solid walnut plaques with rubbed laquer finish. Graphics printed in black on silver brushed aluminum plates with a separate dedication plate supplied and engraving available. 3 sizes with 9" x 12" available to depict pattern, scale, soaring or pylon activity. 7" x 9" and 5" x 7" suitable for all-class use. Priced \$20.00, \$17.00 and 14.00 respectively, post paid. C.O.D. phone

orders will be accepted. Available direct only from Vantage Designs, 235 Blue Rock Road, West Chester, Pennsylvania 19380. Phone (215) 436-0254.



### TUBING CLAMPS

Delps Hobby Products, Inc., has a new product to present. Tubing Clamps. The tubing clamps will provide clamping of tubing in the fuel, retract, and/or water cooling system of your model. There are three sizes to match various sizes of tubing; small, AP-737; medium, AP-738; and large, AP-739. These sizes correspond with 1/8", 5/32", and 3/16" fittings and tubing over them. They are made from stainless steel wire and are reusable. The tubing clamps are packaged 10 clamps to a package, and retail at \$1.55, \$1.60, and \$1.65 respectively. Available from hobby shops or direct from Delp's Hobby Products, Inc., P.O. Box 82, Perkasio, Pennsylvania 18944. Add \$.50 for postage and handling.



### NEW CVR UNIT

MRC-Mabuchi Electric Power System features new CVR unit. The System makes electric flight for 09 size models a reality. Most modelers and flyers in particular, have always been enamored with the prospect of electric flight. All at once it means clean, efficient and virtually noiseless power. However, until the advent of the MRC-Mabuchi system, there have always been a number of drawbacks. There was a need for separate batteries for motor and radio.

to page 98

# SUPER TIGRE X45 FRONT VALVE



MR. GAROFALI'S NEW X-45 HAS FRONT IN-  
DUCTION AND REAR EXHAUST. MR. ROE  
CONFIRMS PROTOTYPE TEST LESS PIPE  
ON 15% NITRO. 10/6 - 14,500; 9/6 - 15,500;  
11/7 - 12,500. THE X-45 FEATURES  
PINNED RING RUNNING IN ABC  
SLEEVE AS DOES THE NEW X-60.  
ST PIPE IS NOW AVAILABLE  
MUFFLER IN THE WORKS.  
TEST SHOW EXCEPTIONAL  
BALANCE & VERY LOW  
VIBRATIONS. PRICE  
LESS THE MUFFLER

\$85

# World Engines

# WORLD'S

## BEST HOBBY DEALERS

### ARKANSAS

Sherrill's House of Hobbies  
3004 West 13th Street  
Little Rock, AR. 72204

### CALIFORNIA

Covina Hobby Center  
140 N. Citrus Ave.  
Covina, CA. 91722

Evert's Model Shop  
1636 Ocean Park Blvd.  
Santa Monica, CA 90405

Franciscan Hobbies  
1935 Ocean Ave.  
San Francisco, CA 91127

Hobby Co. of San Francisco  
5150 Geary Blvd.  
San Francisco, CA. 94118

Hobby Warehouse  
4128 1/2 South St.  
Lakewood, CA 90712

Jim's Hobby Shop  
120 W. Holt Blvd.  
Ontario, CA. 91761

Smith Bros. Hobby Ctr.  
8941 Reseda Blvd.  
Northridge, CA. 91324

Smith Bros. Hobby Ctr.  
16217 Victory Blvd.  
Van Nuys, CA. 91406

T & A Hobby Lobby  
3512 W. Victory  
Burbank, CA 91505

### COLORADO

Custom Hobbies  
2408 E. Platte Ave.  
Colorado Springs, CO. 80909

Tom Thumb Hobby Center  
7020 E. Colfax Ave.  
Denver, CO 80220

### CONNECTICUT

Al's Hobbies  
54 Chestnut Hill Road  
Norwalk, CT. 06854

Bristol Hobby Center  
641 Farmington  
Bristol Plaza  
Bristol, CT. 06010

### FLORIDA

Action Hobbies  
4301 N. Dixie Hwy.  
Ft. Lauderdale, FL 33334

Art's Hobby Shop  
103-34 Atlantic Blvd.  
Jacksonville, FL. 32211

Farmers Sundries & Hobbies  
4926 E. Broadway  
Tampa, FL. 33605

Field's Hobby Shop  
602 S. Edgewood  
Jacksonville, FL. 32205

Garand Hobbies  
606 Wood Rd.  
Seffner, FL. 33584

The Hobby House  
360 Hwy. 17-92  
Maitland, FL 32751

### HAWAII

The Hobbistat  
1423 Tenth Ave.  
Honolulu, Hawaii 96816

### ILLINOIS

Al's Hobby Shop  
129 West First St.  
Elmhurst, IL. 60126

M & M Radiomodels  
5544 W. 147th St.  
Oak Forest, IL. 60452

Stat & Wing Ltd.  
1914 B. Round Barn Rd.  
Champaign, IL. 61820

Stanton Hobby Shop  
4736 Milwaukee Ave.  
Chicago, IL. 60630

West Side Hobby  
2629 West Main St.  
Belleville, IL. 62221

### INDIANA

D & P Hobby World  
154-13A W. Hively Ave.  
Pierre-Marie Mall  
Elkhart, IN 46514

Heuberger's Hobby Shop  
3 Biks N. US 6 on Ind. 331  
Bremen, IN. 46505

Hobbyland  
343 Lincolnway West  
South Bend, IN 46601

Jackson Enterprises  
118 N. 3rd St.  
Lafayette, IN. 47905

Matchler's Hobbies  
107 E. Market  
New Albany, IN. 47130

Spencer's Craft & Hobby  
2015 Ewing St. Rd.  
Seymour, IN. 47274

### KANSAS

Campbell Electric & Hobby  
1003 E. 11th Street  
Concordia, KA 66901

Modeler Hobby Shop  
1726 S. Hillside  
Wichita, KS. 67211

### LOUISIANA

Hub Hobby Shop  
2618 S. Broad Ave.  
New Orleans, LA. 70125

### MASSACHUSETTS

Fisher R/C  
17 Salmi Road  
Frammingham, MA. 01701

Ray's R/C Specialties  
12 Sherman St.  
Worcester, MA. 01610

### MICHIGAN

Hobby World  
1049 28th St. S.W.  
Grand Rapids, MI. 49509

Joe's Hobby Center  
17900 E. 10 Mile Rd.  
E. Detroit, MI. 48021

Joe's Hobby Center  
7845 Wyoming Ave.  
Dearborn, MI. 48126

Joe's Hobby Center  
33419 Grand River Ave.  
Farmington, MI. 48024

### MICH. Cont

Rider's Hobby Shop  
115 W. Liberty St.  
Ann Arbor, MI. 48106

Rider's Hobby Shop  
920 Trowbridge Rd.  
E. Lansing, MI. 48823

Trackside Hobbies  
418 Main St.  
Rochester, MI. 48063

### MINNESOTA

Medical Center Cycle  
9640 W. Broadway  
Minneapolis, MN. 55428



SUPERTIGRE X - 60

### ARIZONA

R/C Engineering  
P. O. Box 1451  
Scottsdale, AZ. 85252

### CALIFORNIA

Authorized Radio Control Ser.  
915 N. Main St.  
Orange, CA 92667

L. R. Taylor & Co.  
10711 Baile Ave.  
Chatsworth, CA. 91311

### GEORGIA

Hobby Distributors  
P. O. Box 102  
Avondale Est., GA. 30002

### ILLINOIS

Stanton Hobby Shop  
4736 Milwaukee  
Chicago, IL. 60630

### MICHIGAN

Pete Waters  
31219 Kendall  
Livonia, MI. 48154

### MISSOURI

C. W. Reed  
5408 Woolson Rd.  
Raytown, MO. 64133

### NEW JERSEY

J. A. Denke  
526 Doremus Ave.  
Glen Rock, N. J. 07452

### OHIO

Country R/C  
12450 Amity Road  
Brookville, OH 45309

## SERVICE EXPERTS

Lt. G's Hobby Shop  
4409 Mahoning Ave.  
Warren, OH 44483

### PENNSYLVANIA

Warren Hobby Shop  
1027 Pleasant Drive  
Warren, PA. 16365

### SOUTH CAROLINA

Bill's Teletronics  
1451 Bonner Ave.  
Columbia, SC 29204

### TEXAS

Wilson's Hobby Shop  
2205 W. Beauséjour  
San Angelo, TX. 76901

### CANADA

Charles Law  
Dundas Hobby Supply  
16 Sleepy Hollow  
Dundas, Ontario, Canada

### ENGLAND

World Engines, Ltd.  
Unit 10, Paramount Est.  
Sandown Rd.  
Watford, Herts, England

### ITALY

G 2 Models  
Via A. D. A. Mestre, 31  
Mestre, Venice, Italy

### GERMANY

World Engines of Germany  
Helmut Holt  
4690 Heine 2  
Hauptstr. 5  
West Germany

### MINN. cont

Moon's Hobby Shop  
Miracle Mile Mall  
Rochester, MN. 55901

### MISSISSIPPI

H & B Models  
319 West Main  
Tupelo, MS. 38801

### NEBRASKA

Clark Bartlett's Hobby Town  
134 N. 13th St.  
Lincoln, NB. 68508

### NEW HAMPSHIRE

Fitts Photo & Hobby Shop  
Kings Hwy Plaza  
Stratham, NH. 03885

### NEW JERSEY

Hobby Hut  
567 Rte. 23  
Pompton Plains, NJ 07444

Paul's Hobby Sport & Marine  
540-546 Peterson Ave.  
E. Rutherford, NJ. 07073

### NEW YORK

Brown's Hobby Center  
6031 Broadway  
Brox, NY 10471

Madel Hobbies  
351 Altamont Ave.  
Schenectady, NY. 12303

### NORTH CAROLINA

The Hobby House  
1617 Ashville Hwy.  
Hendersonville, NC. 28739

### NORTH DAKOTA

McGiffins  
1228 9th Ave. S.  
Grand Forks, N.D. 58201  
701-772-5311 or 772-5380

### OHIO

Airport Hobby Shop  
1889 Triplett Blvd.  
Akron, OH. 44312

Hobby Stop  
4907 Summit St.  
Toledo, OH. 43611

Lafayette Escadrille Hobbies  
1414 South Ave.  
Toledo, OH. 43609

National Hobby, Inc.  
5238 Ridge Rd.  
Cleveland, OH 44129

Mark Riba Cabinets  
32084 Detroit Rd.  
Avon, OH 44011

W-K Hobbies  
19 N. Main St.  
Centerville, OH 45459

Wife's Hobby Shop  
712 Bristol  
Lima, OH 45804

### PENNSYLVANIA

Graff's Hobby Shop  
115 E. State St.  
Quarryville, PA. 17568

J. C. R/C Hobbies  
23 Easton Rd.  
Willow Grove, PA 19090

Skelly Sporting Goods  
2227 W. Market St.  
York, PA. 17404

### SOUTH CAROLINA

Bill's Teletronics  
1451 Bonner Ave.  
Columbia, SC 29204

### TEXAS

H. Hobbs  
4615 Banister Lane  
Austin, TX 78745

Stew's Hobbies  
1301 Custer Rd., Suite 250  
Plano, TX. 75075

### VERMONT

The Hobby Shop  
RFD No. 1, Rue 7  
Swanton, VT 05488

The Hobby Shop  
Burlington Square Mall  
Burlington, VT. 05401

Midway Shop  
57 Main St.  
Middlebury, VT. 05753

### VIRGINIA

Bob's Hobby Center  
3002 W. Cary St.  
Richmond, VA. 23221

Davis Hobby Supplies  
3594 Griffin St.  
Portsmouth, VA 23707

### WASHINGTON

B & B Hobbies (Bruce Batch)  
907 E. Francis  
Spokane, WA. 99207

Fingrove Model Supply  
10611 - 136th St., E.  
Puyallup, WA 98371

Stewart Enterprises  
429 W. Chelan St.  
Wenatchee, WA. 98801

### WISCONSIN

Pope's Hobby Land  
640 S. 3rd St.  
Wausau, WI 54401

### CANADA

B & B Wholesale Alberta, Ltd.  
1902-27 St., S.W.  
Calgary, Canada

Calgary Hobby Supply  
3928 Edmonton Trail N.E.  
Calgary, Alberta, Canada

Can-Air Hobbies  
2363 Beauhien St. East  
Montreal, Quebec, Canada

Le Modèle Réduit Em.  
265, Larouche  
Arvida, Quebec, Canada  
548-2136

Marcoux Hobbies  
5 Duchesnay  
Beauport, Que., Canada

### ITALY

G 2 Models  
Via A. D. A. Mestre, 31  
Mestre, Venice, Italy

# World Engines

8960 ROSSASH AVE., CINCINNATI, OHIO 45236 TELEPHONE (513) 793-5900 TELEX 214 557

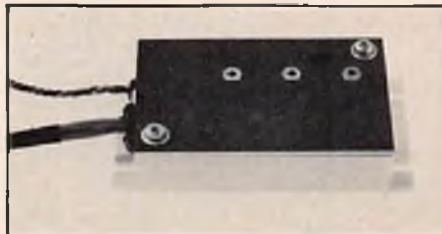
The chance of losing power in flight when the battery runs down and thereby losing the craft was always present. The need to recharge for long periods away from the field made electric inconvenient. Complicated wiring to assemble, and often a need to shop around for various components, made electric power bothersome. The MRC-Maubuchi system for 09 models will put an end to all of that. Advanced technology in the form of a revolutionary CVR (cut off voltage regulator) as well as a fast charger (you can use your car's cigarette lighter) and special motor make electric flight (not to mention boating and car racing) a reality. The system, which comes complete in one box (nothing extra to buy, no fancy wiring to conquer) consists of special purpose, high-efficiency motor complete with prop drive nut; nickel cadmium 9.6 volt 600 mah battery pack with internal thermal circuit breaker and plug-in polarized connectors . . . with enough power for both radio and motor. Best of all it will fast charge from your auto cigarette lighter right there on the field . . . and with the MRC-Mabuchi charger (also included) it will do it within 25 minutes. The charger with built-in ammeter (when used in conjunction with the rest of the system) has a cutoff to prevent overcharging. Perhaps the most important element of the system is the CVR. For one thing it allows the one battery to power radio, motor and servos. This eliminates the need for a bulky extra receiver battery. It also eliminates the need for a separate fast charger for the radio. The CVR also monitors battery voltage and cuts power to the motor long before the voltage drops too low to operate the radio. This means you'll always have enough power for the receiver to glide your plane down. The CVR's servo controlled on-off switch also allows you to glide between periods of powered operation. Add one more thing . . . with other electric power systems you've always had to guess when to shut the motor off so as not to damage the batteries. With MRC-Mabuchi, the CVR automatically prevents deep discharge which could otherwise shorten battery life. There are certainly more features. But most important, this system offers a true opportunity for you to enjoy electric flight as it was meant to be. The hassles have been engineered out. The package is complete and available at your hobby dealer. If he can't help you, write to Model Rectifier Corporation, 2500 Woodbridge Ave., Edison, New Jersey. Price \$129.98.

## WING SOX

Attention RC glider enthusiasts, GBS



Enterprises has manufactured a custom fit transport bag to carry your RC glider wings from home to the field. For the serious minded RC glider pilot, this is the ultimate in protecting your wings during transport and storage. Both wings and removable stabilizers fit neatly into cleverly designed pockets with fit and stress in mind. The handle placed at balance point is large enough to fit over the shoulder leaving hands free. Made of absorbent washable polyester. Wing Sox are for Windrifter SD 100, Cirrus, and ASW 15. Wing Sox are individually patterned to each model sailplane. Also available are Aquila, Olympic II, ASW 17, Super Monterey, Centurion II, Libelle, Mid West Hawk 8", Hobie Hawk 10", Paragon, Wanderer, SB-10, Sallaire. There are five bright colors to choose from; red, yellow, orange, royal blue, and black. Wing Sox sell for \$19.95 and can be ordered direct from GBS Enterprises, P.O. Box 1701, Burbank, California 91507. Checks, B of A, and Mastercharge accepted.



## ELECTRIC SPEED CONTROL

Astro Flight, Inc., 13377 Beach Ave., Venice, California 90291, features a compact solid state speed control which plugs into the receiver and offers full proportional speed control from off to full power. It has a 20 amp rating enough for all their systems except the Twin 25. Available at your hobby shop or order direct from Astro Flight. Price is \$59.95.

## ON-BOARD IGNITION SYSTEM

L & L Electronics, P.O. Box 13434, Albuquerque, New Mexico 87112, has developed the first successful "On-Board Ignition System" for Radio Controlled airplanes and boats. In addition to adding realism to planes and boats, the performance and life of engines and plugs is increased by maintaining more stable cylinder

temperature. Completely solid state, the system can supply much higher current than comparable sized nicad or dry cell units. The unit will work for both 1.5 and 2.0 volt glow plug systems, including twin engine aircraft. Engine performance is improved at all speeds by aiding maximum combustion. The system is capable of supplying up to 12 amps for 1.5 volt plugs, and up to 40 amps for 2.0 volt plugs. It can be recharged from most 4.8 and 9.6 volt chargers currently on the market. The system has provided up to three days of flights without being recharged in aircraft such as the RCM Trainer, Sig Kadet, and a scale P-51D. Total system life is approximately 500 complete discharge/charge cycles. L & L Electronics will announce a field accessory to provide fast charging from a car or similar battery. Weighing less than 8 oz., (excluding glow plug connector) the automatic current regulation drastically reduces the failure of one engine on twin engine planes caused by the plug cooling off during flight. The unit is available through dealers or direct from manufacturer. The suggested retail price is \$19.95 and comes complete with 90 day limited warranty, instructions, and all necessary parts excluding a charger and glow plug connector.



## SE-2S SWITCH-TYPE SAIL CONTROL

The unit pictured on the left shows the SE-2S switch type sail control attached to the standard model airplane type servo. It shows the connecting actuating rod and the ball link assembly attached to the actuating switch. The unit on the right is the SE-2P proportional sail control which is shown plugged into a standard radio control receiver. The cable on the right hand side of each of these models is for the 12.5 volt drive circuit battery. This feature gives you the tremendous power of 80 in./lbs. of torque. Available from Sail Engineering, P.O. Box 8439, Richmond, Virginia 23226.

## DEVCON 5 MINUTE EPOXY

Devcon's famous 5 Minute Epoxy is more economical than ever, packaged in two 1 pint cans totalling 1 pound combined weight. Included are two heavy plastic measuring spoons, and

# showcase '78



instruction sheet. This epoxy can be mixed right out of the can, or can be used to refill smaller containers. Both cans are packaged together in a convenient red and white display box and are priced at \$9.50. For more information, write Du-Bro Products, Inc., 480 Bonner Road, Wauconda, Illinois 60084.



## PHOTO T-SHIRT

The Photo T-Shirt is based on new technology that enables us to reproduce a single full color image on a basis that is economically feasible. Any color or black and white image can be reproduced as a transfer for application to a T-shirt, jacket or other cloth article. The reproduced image will withstand repeated washing without cracking or peeling. Required are a sharp photo print, 35mm slide, or original art and the T-shirt size. Only \$8.95 each. Lettering, special effects and club shirts are also available on a request for quote basis. This is a fantastic way to promote our hobby/sport. Available from A & V Enterprises, 100 W. 9th St., Knapp Bldg., Suite 303, Rochester, Indiana 46975.

## FLIGHT PACKS FOR BEGINNING RC'ERS

Heath Company, the world's largest

manufacturer of electronic kit products, has announced the latest addition to its line of radio control products and accessories, the Delta Products Cessna Skyhawk R/C model airplane. The Skyhawk, designated RP-1172 by Heath, is offered with complete 3, 5 and 8 channel R/C systems at special discounted prices. It is also available separately. According to a company spokesman, the Skyhawk systems are ideal for beginning R/C pilots because they include everything needed for operation except fuel and starting battery. The Skyhawk features hot molded wing, tail and fuselage sections and has a 48" wingspan. Fuel capacity is from 4 to 6 ounces, and the aircraft is complete with a .25 cubic inch engine. Full R/C systems featuring the Skyhawk and radio control gear start as low as \$239.90 mail order. For further information, write for a free catalog to: Heath Company, Dept. 350-550, Benton Harbor, Michigan 49022.



## RTC TRAINER 40

The RTC Trainer is a superb 4 channel trainer from RTC Models, P.O. Box 792, Escondido, California 92025. It is docile and stable enough for the novice flyer, yet capable of lively sport flying too. It features balsa and foam construction and comes complete with engine mount, main and nose landing gear, clevises, threaded rods, steering arm, control horns, bolts and nuts, hinges, and aileron torque rods. The wing is supplied in two pieces. Just join the wing, cover, install control surfaces, install engine, tank, wheels, and radio equipment. Instructions are included. It is priced at \$79.95 at your dealers; if not available, order direct. Add \$2.00 for shipping. California residents add 6% tax. Specifications: Construction, balsa and foam wing; Radio, 3 to 4 channel; Engine, .29 to .45; Wing Area, 555 sq. in.; Weight (without radio), 1 1/4 lbs.

## NEW G.E. BATTERY PACK

General Electric has produced a new Battery Pack that's loaded with power and is not much larger than a standard battery pack! It provides 1.4 amps of current for 1 hour compared to the normal 500 mil-amps. It comes with a 3 wire lead with a center tap and rated at 4.8 volts. It's a great pack for large scale airplanes or gliders where extra battery life is required. Size: 1 1/8" square by 1 3/4"

high; weight is approximately 7 ounces. Available from Rova Dist. Co., W242 N4251 Hy. F, Pewaukee, Wisconsin 53072. Price — \$24.95 — Shipping free.



## LIGHT TELECOMMAND UNIT

The Light Circuit produced by J.M.M. Electronics, 23 LaPort, Arcadia, California 91006, will turn on or off lights and similar electrical devices from the 5th channel toggle switch on the transmitter. This unit can be used in airplanes, boats, cars and helicopters and will be offered in several forms: (1) Unit only; (2) Unit plus lights and wire loom; (3) Unit with wire loom, lights and nicad battery. All forms will have complete instructions and will have plugs for Kraft or Futaba receivers. The Light Circuit will operate from a receiver battery for unit IC power only. Any accessory will have its own power supply. Navigation lights will stay on and strobe will blink. Strobe time is scale to the Bell Jet Ranger helicopter. The lights are bright enough to see in full sunlight.



## NEW FIBERGLASS HOT SHOT 21 TUNNEL OUTBOARD MODEL

Here's another exciting new boat from Dumas Products, Inc., 901 East 17th St., Tucson, Arizona 85719. "The Model Boat People" . . . a longer, wider, pickle fork version of the famous Hot Shot which came out last year. The new Hot Shot 21, in easy to build fiberglass, is designed for the K & B 3.5 outboard and has demonstrated great speed and handling characteristics in pre-production testing. The Hot Shot 21 is a very realistic model of current, full size "clamp on" tunnel hull race boats, and is available at hobby shops. □

from page 82

The ship was finished with red, white, and black K & B epoxy paint over 3/4 ounce fiberglass cloth. Fliteglas Models liquid masking film was used for painting the trim. The ease of working around compound curves makes this method of masking a really unique process. If you haven't tried it, by all means do so on your next painting project. Rom Air retracts were used with a unique addition of Fliteglas in-line air restrictors. This is a new item put out by them and they work beautifully. It brings the gear up nice and slow without the usual slam so accustomed to with this unit. At first, one has doubts as to whether the gear is actually up and locked, but have no fear.

The Kraft Signature was installed and functioned perfectly. There is plenty of room for the radio and retract assembly. The radio installation is really quite elementary and not a problem.

The ship turned out heavier than recommended but this does not seem to hinder performance in any way. It has been my experience in very windy contests that a ship with a heavier wing loading and the power to pull it will fair up better and not be bounced around as much as the lighter ships.

The beauty of this ship is truly impressive. It has a distinct design format and is not the run of the mill pattern ship. There is a lot more lateral area than found on other pattern ships and this is probably why it holds a knife edge so effortlessly.

Compared to other ships, the horizontal stab seems shorter. I'm not really sure how the designer arrived at these dimensions but they work.

I mounted the engine vertically to eliminate the possibility of shearing off the muffler in the advent of a landing gear failure. It has also been my experience that the vertically mounted engine (without the Perry pump and carb) will have more consistent power settings.

Being a tricycle gear ship, the ground handling was excellent. I fly from a turf farm field and this didn't pose any problems. On the turf, I apply the maximum amount of power initially, due to the fact that the grass has a great deal of drag and the gradual increase of power would let the ship get too far away visually. Lift-off is smooth and gradual with no hunting or seeking the intended flight path. With this engine and pumper, the ship has more than enough power. Altitude is achieved quickly and set up for maneuvers achieved gracefully.

Being a pattern flyer and having built most ships to date, I feel that this ship will be a real contender in the up and coming season.

Rolls are done without the application of elevator, or very little at best; they are quite axial and the loss of altitude is minimal. Loops are a thing of beauty. The ship will climb straight up all day if elevator deflections are not employed. Pattern loops are achieved easily and effortlessly with large loops posing no problem. Stall turns, inverted flight and all around pattern flight sequence can best be described excellent. Much of the performance of this type pattern plane depends on the flyer, but I feel that the Fliteglas Deluxe Trion will definitely give you the "razor's edge".

Landing, being one of the most important maneuvers, should be carefully evaluated in any pattern ship. The Deluxe Trion, with its thick airfoil wing, approaches the touch-down "X" nice and slow. Aileron response at this slow speed is good all the way in with the only notice being that the sensitivity decreases as the speed does. □

**WESTERN STATES CHAMPS**

from page 76

Rossi engine. Associate Editor, Joe Bridi, was 2nd, flying his new "UFO" with a prototype K & B Schnuerle engine. Joe flew better than I've ever seen him fly. He has a winning combination going there. Third Place finisher, Don Weitz, flies a Dirty Birdy with an OPS engine. Joe Zingali was using a new HP "Gold Cup" engine and turning 15,000. That thing is a real powerhouse!

Our thanks to Contest Director John Garabedian, assisted by Noel Allison and Betty and Suzi Stream at the desk. Judges from the All United States Pattern Judges Association were used.

Thanks to our sponsor, R/C Modeler Magazine, and to Bridi Hobby Enterprises, Hobby Shack, Satellite City, House of Balsa, JG Model Co., J & Z Products, K & B Manufacturing Co., Ken's Hobby Den, Pacific Model Distributors and A & L Distributors who contributed to make this contest a success. Each contestant received a packet of about \$15.00 worth of merchandise plus a raffle ticket of over a thousand dollars worth of prizes.

Proceeds from this year's contest have been placed in a trust account to be used for promotion and awards in following years.

The Los Angeles Times, in its classified section under "Aircraft", publishes a "Plane Talk" section with announcements of up-coming events, contests, etc., as a public service. They also print similar announcements under other headings. For a month prior to the Western States Championships, they ran the contest announcement on an average of every other day. With a daily

circulation of over a million, we got some pretty good publicity! Check the classified section of the paper in your area for a similar section. It really brings out the spectators and helps sell the hot dogs!

Garabedian and Company have a winner here. Mark this one on your calendar for next year. You won't be sorry.

**RESULTS  
MASTER CLASS**

Jim Oddino  
Joe Bridi  
Don Weitz

**EXPERT CLASS**

Bill Simpson  
Don Thomey  
Marty Wittenberg

**ADVANCED CLASS**

Bob Davalos  
Troy Allen  
Dave Wilson

**NOVICE CLASS**

Rick Horn  
Lonnie Roberts  
Leo Untz

**PRE-NOVICE**

Glen Dean  
Don Sliger  
Enrique Romero

**SPORT SCALE**

Don Lien — AT-6  
Jerry Ortego — Corsair  
George Killeen — AT-6 □

**TEAM SPECIAL**

from page 75

... plywood doublers and external diagonally applied balsa sheet reinforcing. Landing gear is fully formed, soldered and painted ready to install. The plan sheet instructions are printed in what we "Colonials" refer to as "British" English or the Queen's Lingo. For example, what we refer to as a self-tapping or sheet metal screw is called a PK screw. An adhesive called Copydex is a type of contact cement. The differences in terminology such as these are in no way a hindrance and the plan sheet even includes a construction detail for an optional "Dolly bird wing walker" mount. Translated: This refers to a music wire post mount for the attachment of a "Barbie" type doll to the top wing in order to simulate a female air show wing rider. It's a novel idea that should appeal to those involved with club R/C shows or demonstrations.

We made several modifications to our Team Special, all but one of which are not necessary but simply reflect a personal preference. We elected to attach the wings with nylon bolts rather than using the included heavy rubber bands and dowels. The plans call for the wing tips to be vertically sheeted with 1/8" balsa. Being a constant chord wing

to page 102

# KING

of the  
low-priced  
field



Not only is the KP-4A competitively priced with the imports, it is U.S. manufactured and backed by the famous KRAFT reputation for quality and service.

A full one year limited warranty protects your investment.

Write for our free catalog.

**KRAFT**  
SYSTEMS, INC.

*Manufacturer of the World's Finest Proportional R/C Equipment*

450 West California Ave., P.O. Box 1268, Vista, California 92083. (714) 724-7146



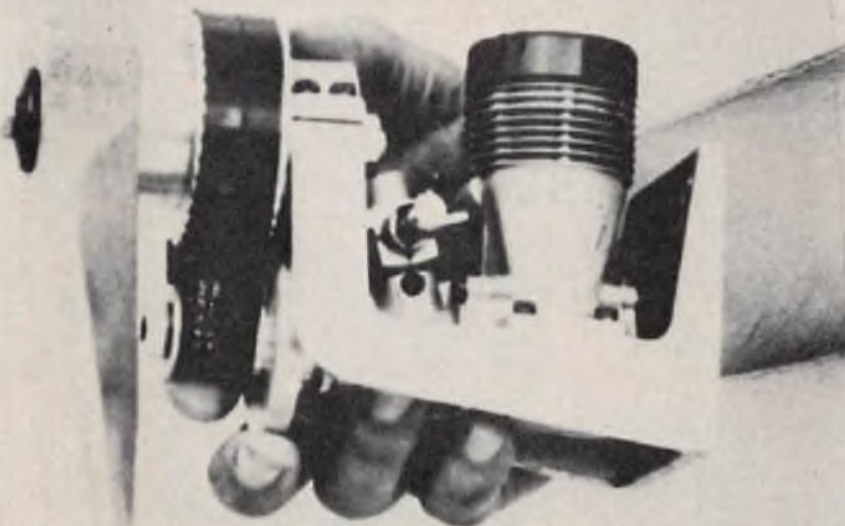
# TURN YOUR 60 INTO A 120!

WITH A

## 60 Maximizer

Fits Smaller Engines, Too

LOOK HOW COMPACT IT IS!



IT'S HARD TO BE HUMBLE  
WHEN YOU'VE GOT A WINNER

Sales have been fantastic, and with good reason! Superior design and construction lead to outstanding performance in any product and the 60 MAXIMIZER™ has it all in abundance, WITH IMPROVEMENTS!! A NEW ONE PIECE ECCENTRIC SHAFT FOR MORE ACCURATE ALIGNMENT AND A HEAVIER DAMPNER FOR EASIER STARTING.

Your super size airplane will REALLY perform with the 60 MAXIMIZER™ and your smooth reliable 60. No need to buy a super size engine you can't use if you change airplane size. Simply swap your engine.

The 60 MAXIMIZER™ fits engines with 1/2" shafts and adapts to 5/16" shafts or smaller engines. Construction is a sturdy cast aluminum alloy frame, balanced parts, Aircraft quality bearings and long life double belts for engine safety. Weighs only 21 ounces.

Check with your dealer or order direct. Free literature for a stamped envelope. Price still \$85.00.



**Stewart Aircraft Corporation**

11420 State Route 165 SALEM, OHIO 44460

TELEPHONE: 216/332-0865

### TEAM SPECIAL

from page 100/75

with rounded tips, this results in a wing tip with a very blunt appearance. We built the tips up with additional laminated balsa sheeting in order to produce a more pleasing vertical radius. The Team Special in all other respects, possesses very clean and pleasing lines. The kit includes 1/16" plywood sheet aileron horns which are to be epoxied into the ailerons. We replaced the plywood horns with Carl Goldberg (large) nylon horns. While the plywood horns will undoubtedly work, we felt that the clevis holes will eventually wear excessively and, as they are permanently imbedded into the aileron, that the nylon horns were a better choice. The only change that we made and would classify as being essential; was in the engine mounting method. The plans indicate that the engine should be mounted with the provided self-tapping screws (PK screws) to the 3/8" plywood engine mounting plate. The plans state that this mounting method is sufficient for any .61 engine installation. Undoubtedly, many modelers have used and are using, this method with no problems. However, we believe that mounting the engine with 6-32 socket head screws, lock washers, and blind nuts, is a far superior and, certainly, a much safer mounting method. Our Team Special was powered with a Merco Black Streak .61 engine. We did go American on the radio installation by using Westport International's Variant System.

The wings were finished with white Solarfilm. The kit also includes pre-cut red fascal pressure sensitive sunburst wedges for trimming the Team Special with a sunburst pattern. The fuselage and empennage were finished with K & B Super Poxo enamel. The ready to fly weight of our Team Special was 128 ounces.

The Team Special is a good flying aircraft. It is slightly larger than most comparable sport biplanes, however, much of the additional size is in additional wing area. The combination of ample wing area, rugged construction, and clean lines, results in a sport bipe that is well suited to Sunday flyer use and is docile, yet fully aerobatic.

On take-off, the tail lifts very rapidly and rudder response is excellent. Lift-off is smooth and realistic. The Team Special will fly at 1/2 to 2/3 throttle with ease and has no apparent "nasty" tendencies.

In summarization, the PFM Team Special is a good flying sport biplane, that has a different look and is designed to take a lot of use and abuse. It is in all

to page 106

# MISSION TO GIBRALTAR

BY  
KEN WILLARD

The fascinating true story of Ken Willard's World War II adventures as the weather officer assigned to General Eisenhower on Gibraltar. The specific mission — "make observations of the state of the sea, and forecast the conditions expected to exist for the allied forces' North African invasion landings."

With the passage of time, this top secret assignment has been "declassified" and can now be told — the conflicting forecasts; the dangerous flights of the Lockheed Hudson, ten feet above the crests of gigantic waves several hundred miles at sea; the brushes with death; and the almost unbelievable coincidences that led to survival.

That, and much more, including some hilarious anecdotes about personal experiences along the way — a taxi dancer, a furious staff officer, a non-plussed French general, and other interludes.

It's a documentary. No story line. Just what happened. And a thoughtful query at the end that any reader might ask of himself as well. Don't miss it.

Available soon, at your favorite hobby shop, or direct from RCM Anthology Library Books. Order Now! Price — \$4.50.

**ORDER YOUR COPY TODAY!!!**



**MISSION TO GIBRALTAR**  
**\$4.50 POSTPAID**

**R/C MODELER MAGAZINE**  
P.O. Box 487  
Sierra Madre, California 91024

**Cash, Check or Money Order Only.**  
**No billing service.**  
**allow 3 to 4 weeks for delivery.**

Enclosed please find \$\_\_\_\_\_ for \_\_\_\_\_ copies of MISSION TO GIBRALTAR @ \$4.50 each (U.S.A. 1st Class \$5.50). California residents add 6% sales tax. Orders outside U.S.A. \$5.50 (Air Mail \$7.50). APO's and FPO's postage free.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

# BUD NOSEN MODELS

INCORPORATED

BOX 105, TWO HARBORS, MINNESOTA 55616

All kits feature all wood construction, fast assembly, huge rolled plans, assembly instructions, machine and die cut parts, all necessary hardware and much, much more. Designed for .60 engines on up. Write for our illustrated catalog—50¢.

## 9' PIPER J-3 CUB



Standoff Scale  
Formed ABS  
cowling Kit -

**\$119.95**

3 or 4 Channels  
Flies like a  
trainer Kit -

**\$99.95**

## 9' CHAMPION CITABRIA



## 9' AERONCA "CHAMP"



1/4 size Standoff  
scale 3 or 4  
Channels Kit -

**\$99.95**

3 or 4 Channels  
No foam or  
plastic Kit -

**\$79.95**

## 102" BUD NOSEN TRAINER



## 8' CURTISS JN-4D JENNY



Standoff scale  
4 Channels  
required Kit -

**\$129.95**

1/3 size Standoff  
scale 4 Channels  
required Kit -

**\$129.95**

## 8' 1933 GERE SPORT



## 9' "MR. MULLIGAN"



1/4 size Standoff  
scale 3 or 4  
Channels Kit -

**\$139.95**

1/4 size Standoff  
scale Molded  
cowling Kit -

**\$169.95**

## 10' CESSNA 310 TWIN



**AUSTRALIA**  
EK Logictrol Australia  
44 Macquarie Road  
Earlwood 2206  
Sydney, Australia

**SWITZERLAND**  
Blue Max  
Modellflug-Technik AG  
Alte Landstrasse 122  
CH-8800 Thalwil Switzerland

### OVERSEAS DISTRIBUTORS

**SOUTH AFRICA**  
Radio Control World  
202/4 Oceana House  
Lower Burg St.  
Capetown 8001 So. Africa

**CANADA**  
John Klassen Hobby Central  
400 Cuyler Street  
Thunder Bay, Ontario

# *Bud Nosen's* spectacular

## 102" P-51 D

KIT \$169<sup>95</sup>



- Stand-off Scale
- 2.75" equals 1'
- 102" Span
- 16.5# flying wt.
- 1800 sq. in. wing
- 26 1/4" chord at root

- 4 channel radios required
- Designed for .60 engines with prop driver
- Very stable flyer
- Proof of scale 3 views
- Kit includes 21" canopy

- No foam or plastic
- 6" spinner is not included available direct only \$16.95
- Huge rolled Plans
- Machine and die-cut parts
- Decals not included

# BUD NOSEN MODELS, INC.

Box 105

Two Harbors, MN 55616

catalog 50¢

# Softglas...IT'S DIFFERENT!



**INTRODUCTORY OFFER**  
**\$7.95** per Qt.  
postpaid  
Dealer Inquiries Welcome

**Sealer-Filler-Primer For Balsa Wood Models**

**- - A Breakthrough In Surface Preparation - -**

Softglas is the complete one-step surface primer, filler and sealer for a variety of materials, especially Balsa WOOD. Sands similar to primer! Won't clog sandpaper. Easy to apply. Use it under lacquer, epoxy, enamel, poly or dope. Dries hard, fast and flexible. Apply with brush, roller or spray.

## OHIO SUPERSTAR MODEL PRODUCTS

5630 Cherokee Dr., P.O. Box 2522, North Canton, Ohio 44720

Please send \_\_\_\_\_ quarts of SOFTGLAS @ \$7.95 qt.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\$ \_\_\_\_\_ payment enclosed (Ohio res. add 4% sales tax)

If not completely satisfied, return unused portion within 31 days of receipt and receive full refund.

### TEAM SPECIAL

from page 102/75

probability the quickest to assemble, all wood and foam biplane kit available today. If you are contemplating building a sport biplane, the Team Special is "bloody well" worth considering.

### SOAR BIRDY

from page 74

spar. When properly set up, the nose should hang level or slightly nose down. The C.G. was achieved without the addition of any ballast.

For the first launch, a lightweight Hi-Start was used. A heavy duty Hi-Start isn't recommended for this sailplane. It went straight up the line with only minimal rudder corrections — while holding full up elevator. Trimming it was also no trouble. As a matter of fact, the wind began to blow early that day and we got it trimmed out for a 15 mph wind with only the addition of 1/4 ounce so it would penetrate — which isn't bad for an airplane that has a wing loading of only 5.5 oz. per sq. ft.!

To our surprise, the Soar Birdy out-towed most of the Standard Class sailplanes that were flying. We recommend that the novice use the towhook location as shown on the plans. For the competitor, however, the towhook should be located at the front spar or 1/4" behind it. While this makes the aircraft slightly less stable on the tow, it will give you 10 to 15 feet of additional altitude on the launch, which is so important in competition.

The landings are extremely stable, making this sailplane a good choice for

someone who is working on their Level I for LSF. We made three spot landings all within the 80 to 90 foot range. The reaction to lift is very positive, with no tendency to spiral or dive out of very strong thermals at either low or high altitudes. It turns extremely tight, flat, and symmetrical turns, either into the wind or with it. Because it exhibited no tendency to tip stall, no washout was used. When the rudder and elevator throw was increased, we were able to do rudder rolls, spins, loops, and fly upside down.

While we are very pleased with the way the sailplane flies, we did encounter one rather serious problem. When we felt we had the aircraft finely trimmed and flying exactly as we wanted it to, we flew in a 2 meter contest. During one flight, we got hit with a 20-25 mph wind gust, and the wing failed. It broke clean at the center section where the two pine spars butt glue together. It seems obvious that the dihedral brace must be beefed up if the sailplane is to survive unexpected wind conditions or even novice launches up a winch. Besides that, broken wings are hard on radios!

With a beefing up of the wing at the center, we very highly recommend the Soar Birdy as an easy building and great flying sailplane both for good fun flying for the Novice or points at contest time for the competitor.

**Manufacturer's Response:** Bridi Hobby Enterprises sincerely appreciates RCM's detailed and objective new product testing program. In our continuing efforts to provide quality R/C model aircraft kits and as a way of responding to RCM's findings, we have, as of April 17, 1978, modified the Soar Birdy kits by changing from two, 3-ply dihedral braces previously used, to

three, 5-ply braces. Furthermore, if any readers presently have a Soar Birdy kit that was supplied with only two dihedral braces, if they are returned to us, we will replace them with the three heavier braces. If any readers who have already built the Soar Birdy would tear off the words "Soar Birdy - Building Notes" from the instructions provided in the kit, a new wing kit will be forwarded to them by return mail at no expense. Write to Bridi Hobby Enterprises, 1611 E. Sandison St., Wilmington, California 90744.

### TRANSITIONING

from page 73/72

If you have taken your flight training through a club or perhaps with an individual flight instructor, these accelerated training schools are popular. On the other hand, as indicated, there are a number of ways of preparing for that written examination with lots of texts, different kinds of schooling and instruction available.

Once you pass that written examination (a passing score is 70%) you are then qualified to take the flight test or "check ride" with a specially assigned FAA pilot. His job is to put you through the wringer in order to assure the FAA, other pilots and ultimately yourself that you are indeed ready to be a licensed pilot. If you pass your check ride, you are then issued a license and you become a licensed pilot. It is at that point that you can begin to carry passengers and you are free to fly based upon your proven ability.

Just how long will this process take? Of course you know the answer is going to be, "that depends". And indeed it does depend on a number of factors including how much time you can devote in the air and on the ground to your studies and practice, weather conditions as they would effect the amount of flying time you can get and, generally the events of your life as they influence your learning experience.

Under current regulations, the minimum is 40 hours of flight instruction and solo flight time including 20 hours of dual time with an authorized flight instructor, in turn that 20 hours including 3 hours of cross-country flying and 3 hours of night flying if you want night flying privileges; additionally 3 hours must be spent in preparation for the flight test within 60 days prior to the test.

That 40 hours must also include 20 hours of solo flight time with 10 hours of that 20 in solo cross-country flights with each flight having a landing more than 50 nautical miles from the point of departure and one with landings at three points, each of which is more than 100 nautical miles from each of the other two

points; additionally you have to have performed three solo take-offs and landings to a full stop at an airport with an operating control tower.

These are the minimums and while some are undoubtedly unprepared for their flight examination upon completion of these minimums, most take a good bit longer in terms of logged air time than these minimums. One aspect of these minimums deserves special comment; you will notice the point about making three solo take-offs and landings at an airport with an operating control tower. This is to insure that you have experience at something other than some tiny airport in a remote section of the country without much traffic. The presence of a control tower means a significant level of traffic. I believe it is wise to consider taking your training at an airport with a significant amount of traffic and certainly a control tower in order to get used to dealing with traffic situations and communicating with control towers from the beginning of your pilot training. To go the other route, that is, to take all of your training at an uncontrolled airport with very little traffic doesn't really prepare you for the demands that must be encountered if you're going to do any amount of flying, as well as handle the flight examination.

In this flight training sequence, I'm often asked what is the most difficult aspect of flight instruction for the student. The answer for most will be no surprise to R/C pilots; it's the landing. Here is where everything has to come together right; your physical coordination must groove with your visual perceptions and you must be able to use that marvelous computer-like mechanism we call a human brain to translate an incredible number of input needs into physical coordination and an accelerated judgmental process. All of this is a fancy way of saying that, just as we've all seen in those World War II movies of flight training, ability to land is the crucial "wash out" test. Just as in R/C flying, it is the threshold that makes the difference and, similarly, there are no two landings that are the same.

Certainly soloing is a frightening experience and, though not advertised, plenty of students quit rather than undergo the responsibility of flying by themselves. But once you've got the landing down and assuming you're able to find the airport (no mean trick!) and further assuming that you have confidence in the aircraft you're flying, the soloing is not as crucial a threshold as developing a consistent ability to perform good landings. If you can get those landings down, statistics indicate that four to six months is what it will take to get that private pilot's license.

The other aspect of this training sequence, which is often brushed over too light a stroke, is the matter of ground school training. Airplanes have become

# Shop by Mail

## at ALLIED HOBBIES

### SAVE! COMBINATION OFFER



**BRIDI RCM  
.40 TRAINER**  
52" span all-  
balsa kit

**K & B .40  
R/C ENGINE**  
#8011

**BOTH  
ONLY \$71.50**

### TOP FLITE MONOCOTE IRON

# MS-2 only ...  
**\$13.25**

### SAVE!

#### MONOCOTE COVERING

Opagues . . . . . \$5.25 per roll  
Transparents . . \$5.25 per roll  
Metalics . . . . . \$5.95 per roll  
\* minimum order, 3 rolls

#### SULLIVAN HT-1 STARTER

**\$23.95**



**KRAFT KP-2A**  
2 channel, single  
stick system  
includes: KPT-2A  
transmitter,  
KPR-2A receiver,  
2 servos, battery  
holders, switch harness  
\*batteries(dry)not included

complete system **\$89.93**  
... only

#### KRAFT KP-4A

4 channel, two  
stick system in-  
cludes: KPT-4A  
transmitter,  
KPR-4A receiver, 4 servos,  
rechargeable battery packs,  
wall transformer for built-in  
charging circuitry, switch  
harness, 2 servo trays,  
nicad  
batteries

### SAVE!

complete system **\$194.93**  
... only

## FREE! RC MODELER BELT BUCKLE



... with any order of \$100.00 or more, you get this solid pewter RC Modeler Belt Buckle, crafted especially for Allied Hobbies by Adina Silversmiths.

retail value **\$12.95**

Saving Specials are available at these convenient **ALLIED HOBBIES** stores . . .

6607 Rising Sun Ave/Philadelphia, PA 19111 • Ardmore West/Ardmore, PA • Colonial Mall/Harrisburg, PA • Echelon Mall/Voorhees Twncsp. NJ • Quakerbridge Mall/Lawrenceville, NJ • Village Mall/Horsham, PA • The Gallery/Philadelphia, PA • King of Prussia Plaza/King of Prussia, PA • Oxford Valley Mall/Langhorne, PA • Montgomery Mall/North Wales, PA • Park City Center/Lancaster, PA • Plymouth Meeting Mall/Plymouth Meeting, PA • Bazaar Shopping Center/Clifton Hqts. PA • Country Club Plaza/Willingboro, NJ • North Mall/Hanover, PA

## July

(prices valid only thru July 31, 1978)

## SAVING SPECIALS

Saving Specials available thru July 31st, over the counter, at all **ALLIED HOBBIES** stores . . . Stop in and Save! . . . out of our marketing area? . . . Phone or Write for FAST service!

- Minimum order \$10.00
- Add \$2.50 for postage and handling.
- Pa. residents add 6% sales tax.
- Include check or Money Order with order.
- Visa, BankAmericard or MasterCard accepted.
- No COD's or collect calls please.
- Supplies limited . . . offers valid only while supplies last.



# ALLIED HOBBIES

6607 RISING SUN AVENUE  
PHILADELPHIA, PA. 19111

**215-PI5-5777**





# All-Foam Ducted Fan Skyhawk



Prototype painted with  
Styromate Sealer  
and  
RS Perfect Paint

## The Only Stand-Off Scale 1/2A Jet

Midwest's Douglas A4D-1 Skyhawk is an all-foam kit that's inexpensive and easy to build.

A good, proven flyer designed for realistic jet flight, Midwest's Skyhawk is the latest in a great line of ARF (Almost Ready to Fly) foam kits.

The Skyhawk is the economical way to fly ducted fans. This kit takes 1/2 A-sized TD engines and is designed for Midwest RK 049 Axiflo. The kit comes complete with all-foam pieces, a vacuum formed canopy, a comprehensive hardware package and a large, full color sheet of authentic decals for a stand-off scale finish.

### SPECIFICATIONS:

Wing Span:	30 inches
Wing Area:	215 sq. inches
Weight:	27 oz.
Engines:	.049 - .051 (Cox TD)
Radio:	2 Channel (except brick-type)

See the Midwest Skyhawk at your hobby dealer today!



**Midwest Products Co.**  
400 So. Indiana St.  
Hobart, Indiana 46343  
219/942-1134

safer and thanks to radio navigation, getting from point A to point B does not involve the risks that it involved just a few years ago. But there is a great deal to learn and to learn quickly! Once again, what you must realize is that you are entering a different environment, an environment where the dimension of vertical space between you and ground places new demands upon your knowledge and ability to operate in that environment. There are a great many books, guides, sample tests and the like to prepare you for the written part of the certification or licensing process, but more importantly, the point is that you should really learn, not for the test but, for your own proficiency and competency as a pilot. That takes time and real effort. You should give the entire matter of undertaking the flying experience leading to licensing very careful thought. It should not be a spur of the moment type decision; too much is involved . . . the commitment is too great. Therefore, the best advice that can be given is to **take your time**. Talk to people, visit flight schools and flight instructors, read about flying (government publications and especially flying magazines) and evaluate realistically whether, to your world of R/C piloting, you want to move **yourself** as well as your airplane into the sky! □

### POWER BOATING

from page 71/70

Supercycle's fault I crash choppers, the darned things just won't do what I tell them to. I don't think they speak the same language!

★ ★ ★

Some of you may remember that some time ago I wrote about the K & B 21 outboard engine, and said at the time that this is probably the most logical form of power unit for a model boat, just as it is full size. Well, it is now well known that

to page 110

### CENTRAL AVIONICS

(formerly Kraft Central)

7843 Ramsgate Drive

KNOXVILLE, TENNESSEE 37919

HIGH QUALITY - PROFESSIONAL REPAIR AND PREVENTIVE  
MAINTENANCE SERVICE FOR:

**KRAFT - PRO LINE - TOWER - KSE - KGL - PCS**

Complete Parts and Replacements Inventory

Licensed and Certified Personnel

Independently Owned and Operated

Fast — Safe  
UPS Shipping

Carl Smith  
Sales-Service  
(615) 693-8605

### HELICOPTER ENTHUSIASTS

Goldcoast now has all 50 states

★ Toll Free Hot Line ★

We stock kits and full parts inventory for Schluter - Kavan - American R/C - Hirobo - Du-Bro. Plus a complete accessories selection.

For our full line color photo illustrated catalog, with toll free number and parts price list, send \$1.00 (First Class \$1.50). Include make and model of helicopter and engine for which parts list are needed!

**GOLDCOAST R/C**

**P.O. Box 230192**

**Tigard, Oregon 97223**



# WE'RE TAKING OFF IN NEW DIRECTIONS.

First off, we've changed our name. Dave Platt Models is now called Pica Products. That in itself is significant, but the big news here at Pica is the excitement of all the new ideas and products we're introducing.

Pica is improving and updating our existing line of kits. The Waco, the T-28, Spitfire and FW-190, all proven flyers and consistent contest winners, are undergoing renewal to keep them on top of advancing R/C technology.

We're expanding our line. Pictured above is the flagship of our new fleet of kits, the Duellist 2/40. The Rapier, an exciting new pattern ship, is just now coming off the drawing boards. Plus a whole series of new medium-sized kits is planned.

We've added a superior new fast drying glue and a revolutionary new type of filler. And we're going to introduce a group of custom R/C accessories in the near future.

We've got a new name and fresh new ideas. Now we're Pica Products, and we're taking off with innovations in modeling.

## Duellist 2/40

Wing span: 67"  
Wing chord: 14"  
Total wing area: 795 sq."  
Fuselage length: 54"  
Stabilizer span: 27"  
Verticle fin: 10-1/4"

Rec. engine: .23-.40  
Rec. fuel tank: 8 oz.  
Gear: Fixed or retract.  
Channels: 4 (5 w/ret.)

Control functions:  
Ailerons, Elevator,  
Throttle, Rudder.

Construction: Balsa.  
Plan sizes: 35" x 67"  
Instruction manual  
and construction  
photos included.

Kit includes: Die cut  
balsa, shaped parts,  
hardwood, plywood,  
aileron torque rods,  
hardware and  
sample fillit.

Flying weight:  
6-8 lbs.

The Duellist 2/40 has been designed as an easy-to-fly and safe handling twin engined R.C. model. Combining elegant appearance with simple structure, it's ideal for the modeler who has progressed through the usual trainers and pattern or low wing sport ships. As such, it offers a further level of enjoyment in the R.C. hobby, and a new accomplishment in flying skills to the builder.



## Pica Products

Innovations in modeling  
2657 Northeast 188 St.  
Miami, Florida 33180



Turn the page for  
more Pica Products...





**Are  
you  
in our  
"Flying File"?**

**Our flying file helps us help you.**

It contains records of your vital statistics (address, phone, type of Sunday flying or competition, etc.) which lessen confusion and mistakes in filling orders... But more important, it aids in understanding between the business end of R. C. Modeling and the consumer end (the flyers). Though we are flyers ourselves, we still want to stay in touch with flyers (and their problems) from around the World. We want an open line of communication working both ways so that no "Altitude Gap" will ever exist between us and the folks who make R. C. Modeling the greatest sport hobby in the world.

Call or write Bob, Tom or Gregg. If you don't have an order then just send us your problems and information on yourself, there's no obligation.

**BOB REUTHER'S**  
**HOBBY**  
**WORLD**

6602 HIGHWAY 100 • NASHVILLE, TENN. 37205 U.S.A.  
9:30 AM to 5:30 PM Monday thru Saturday (615)356-1225

**POWER BOATING**

from page 108/70

this engine has become a classic and there are even races which specify its use. I hear a whisper that K & B is working on a much bigger version, so keep an eye on the ads, because if it is as good as the 21, it will be well worth waiting for.

Seems like K & B is not the only one going this way, because AMPS, P.O. Box 449, Novato, California 94947, are also producing outboards. They produce a couple of standard versions, and specials. In the latter version, you send off your own engine — only front valve models are suitable together with quite a large check, because they aren't giving them away, and they will fit it into a custom made outboard motor. They are currently doing this to my trusty Rossi .60 FI R/C, and I can hardly wait to get my hands on it. At the time of writing, I have no idea what the result will be, but I do possess an AMPS outdrive, which I have used for a couple of years on a Webra .60, with no trouble, and if the outboard is up to the same engineering standards, then it should be quite something.

\*\*\*

A letter from a reader, who prefers to remain anonymous, has set the cat among the pigeons. He quotes me as saying that there is a "vast range" of small electric motors available on the market, but says that in looking through the ads, he can't find any — or at least, all he can find, and now I'll quote him, are "... either over priced toys or high power, fast battery drain, and expensive types." Well, Robert, what you say is partly true, but I think you are coming on a bit strong. In fact, there are very few ads for this type of motor, and I must confess that I was going on my own personal knowledge of what is available on the market, through my contacts with

to page 112

**FULL SIZE PLANS**  
**PLANES • BOATS • RADIO CONTROL**

**NEW UPDATED CATALOG**

Send 25 Cents for Postage & Handling

Models from Airtrails and American Aircraft Modeler 1952 to 1968. Designs by Musciano, Cal Smith, Plecan and Kochman.

**OUT OF PRINT PLANS ARE NOW AVAILABLE • PRICES ON REQUEST**

**HOBBY HELPERS**

P.O. BOX 217 GLENVILLE STA.  
GREENWICH, CT 06830

### SPITFIRE MK-9

Still the best combination of looks & performance you can buy. Nobody ever designed a more elegant ship than the Spitfire. The model flies superbly and has won countless stand-off scale contests. The standard kit builds into a Mk. 9. Plan includes details for other Marks, like the beautiful Mk. 22. Kit features: Machined and diecut balsa, formed LG, nylon fittings, metal parts & mouldings. Two full-size plans, complete radio & retract gear installation shown. Isometric diagram & illustrated instructions make building easy and fun. Six-color accurate decals. Span: 65", Area: 714 Sq. ", 4 to 6 channel. Engine: .40 to .60

### T28-B

Plenty of dihedral (7°) for lateral stability. Radial cowl prevents speed buildup in a dive. Large stabilizer and long tail moment give wide CG position tolerance. Special airfoil and washout maintain stability down to a very low speed. Tricycle LG makes good rough-ground handling and easy landings. Bright color schemes help pilot orientation in flight. Large flaps incorporated in basic design. Over 700 sq. ins. for light wing loading even when loaded with options. Kit features: Our now-famous detailed

plans (2 sets) showing flaps, retracts, RC equipment, etc. Beautiful 3-sheet detailed fuelproof decals. Machined & diecut balsa, formed wire Nylon fittings (flap hardware included), canopy and the best cowling ever put in a kit. Span: 65", Area: 710 sq. ", 4 to 6 channel. Engine: .60

### FW 190 D-9

The qualities that make a model a NATS winner are the same ones that Sunday sport-scale fliers look for. Exceptional appearance to start with, of course. The FW 190's stark and sinister shape has always excited modelers. But even more important are friendly flying qualities. Our designs have always emphasized safety at low speeds, and the FW 190 has inherited the ability to fly from 80-90 mph right down to a near-hover for landing. The wide-track gear makes it an ideal first "tail-dragger." Kit features: Full-size plans showing radio and retracting gear installation. Color schemes (and decals) for THREE different FW 190's. Separate 16-page instruction booklet with cutaway diagrams and in-depth flying hints. Diecut and machined balsa, nylon fittings, formed wire cowl, canopy, etc. Span: 65", Area: 730 Sq. ", 4 to 6 channel. Engine: .60



Nylon fittings. Formed wire landing gear & struts. Span: 60", Area: 950 Sq. ", 4 to 6 channel. Engine: good .40 to .60

### GLUIT

Answers the need of builders for a fast-drying aliphatic glue that is truly sandable. Gluit dries in an average of 10 to 15 minutes, depending upon the thickness of application. The result is a strong bond, easy to sand, making it perfect for butting balsa sheets and planing wings. Wood joints are stronger when made with Gluit than with epoxy.

### FILLIT

A brand new form of micro-balloon filler. It's concentrated, not "puffed-up," enabling it to be poured from a nozzle. This system allows you to accurately measure the portions to the precise density you desire. Fillit mixes readily with epoxies, polyesters, aliphatics, cellulose cements, in fact, use Fillit with any glue you wish. It forms a strong, ultra-light sandable solid. Even large wing fillets will cut down easily, quickly and smoothly.

### THE WACO

We chose the Waco F-3 as our biplane flagship because it best represents the "Golden Era" of the 1930's, when flying was an adventure. Add to this, easy, snag-free building and safe, gentle flying—the result of the thorough kit engineering and careful prototype development that are features of all Pica Kits—and you have a satisfying building and flying experience ahead of you. Kit features: Top-quality diecut and machined balsa and plywood. Full size plans. Separate instruction book with isometrics. Decals. Injection-moulded (Not vacuum-formed) plastic cowl, cowl blisters, and wheel pants.



2657 N.E. 188th Street  
Miami, Florida 33180  
Telephone 935-1436



# PICA PRODUCTS. INNOVATIONS IN MODELING.



RC Modeler  
magazine

CALLS

Model  
Airplane News  
magazine's  
Dave Linstrum

says:

Flying Models  
magazine's  
Frank Tiano

says about

Model Builder  
magazine's  
Dan Rutherford

RE:

**"HOT STUFF" "HOT STUFF" "HOT STUFF" "HOT STUFF"**

"A REVOLUTION IN  
CONSTRUCTION TECHNIQUE"

"THIS IS THE NUMERO UNO  
CYANOACRYLATE ADHESIVE  
AROUND THE WORLD"

"A BETTER CYANOACRYLATE  
JUST ISN'T AVAILABLE"

"THE ENTIRE MODELING  
WORLD HAS GONE NUTS  
OVER THIS GLUE"

**IN HOBBY SHOPS  
EVERYWHERE**

DISTRIBUTED BY:

ALL MAJOR DISTRIBUTORS:  
UNITED STATES AND CANADA

PLUS  
SELECTED DISTRIBUTORS  
OUTSIDE NORTH AMERICA

**HOT STUFF™**

**ALL  
STARS**

**CYANOACRYLATE  
SUPER  
ADHESIVES**

ORIGINAL CLEAR Formula

HS-1 3.60 PER UNIT

• 14.2 GRAMS (SINGLE BTL)

• 3 INCHES OF *Control Drop*

TEFLON APPLICATOR TUBING

• COMPLETE INSTRUCTIONS

HS-2 7 GM BTL \$1.95

HS-4 \$12.00 PER PACK

• 56.7 GRAMS 2 OUNCES

(ONE 56.7 GRAM BTL)

• 5 INCHES OF *Control Drop*

APPLICATOR TUBING

• COMPLETE INSTRUCTIONS

T-500 .50 PER PK

• 18 INCHES OF

CONTINUOUS TEFLON

*Control Drop*

APPLICATOR TUBING

FOR ALL HOT STUFF

ADHESIVES 10 PKGS/CD

**NEW HOT STUFF  
BLUE LINE**

**EXCLUSIVE  
FORMULA!!  
BLUE INSTANT  
ADHESIVE**

- 14.2 GRAMS (SINGLE BTL.)
- 3 INCHES OF *Control Drop*
- TEFLON APPLICATOR TUBING
- COMPLETE INSTRUCTIONS

HS-5

495

**Satellite City**

PO BOX 1935, ARLETA, CA 91331 PHONE (213) 899-2301

**POWER BOATING**

from page 110/70

the different manufacturers. So what about it, all you manufacturers and dealers --- there is a definite interest in electric power, and there are a lot of motors around, so how about telling everyone just what is available? Please remember that it is sometimes very difficult for isolated modelers to find material, depending as they do on what they read about; and one thing is sure --- if they don't know you've got it, they sure aren't going to buy it!

\*\*\*

Another letter comes from Donald M. Lippoth, in Maine, and this is just the sort of letter we need, because it brings up a problem that more than one modeler must be suffering from. Don has radio problems, both on deep V's and hydros, and he wants to know if it is the transmission set-up that is causing troubles. He uses a straight brass stuffing box, with no bearings, and a floating drive shaft, and thinks that this may be the cause of the trouble.

Well now, Don, this is where yours truly sticks his neck right out, and probably catches it pretty hot. It is well known that any metal chatter in a model

is very likely to cause glitching, but if your models are set-up correctly, then the drive shaft should not be touching any part of the stuffing box. Hence, this is not a source of radio "noise". What might be causing trouble is the coupling. However, this is not the real problem. In my humble opinion, the real culprit is the tuning of your receiver, plus vibrations, and here I am speaking from experience. In fact, I have had the same sort of trouble in the past, and have found a cure for it. I went to the radio manufacturer and told him just what was happening, whereupon he came to the conclusion that my radio receivers were

to page 114

**The LIBERATORS are here!**

**\$189.95**



MUSEUM SCALE — WING SPAN 90 INCHES, FOR FOUR .15 TO .25 ENGINES.  
RETRACTS — FOWLER FLAPS — BOMB BAYS — RETRACTABLE BALL TURRET  
MOLDED CANOPIES — TURRETS — COWLS — TURBOCHARGERS —  
MACHINE GUNS — Balsa CONSTRUCTION — FOAM WING — FUSELAGE  
ASSEMBLY JIG.

SEND STAMP FOR  
DETAILED BROCHURE  
AND NEW CATALOG.

**JACK STAFFORD MODELS • 12111 BEATRICE ST. • CULVER CITY, CA. 90230**

# NEW!

## FOUR WAYS TO IMPROVE A CHAMPION.

Cox/Sanwa's 8040 radio system helped Skip Miller become the 1977 World R/C Soaring Champion. And now, one of *four* advanced versions of the 8040 can help make you number one. Whether you're flying for sport or competition.

Want reliability and performance at a reasonable cost?

Then you want our new 8044 or 8054 system, available on all 72 MHz frequencies. The 8044 is four-channel. The 8054 has a fifth channel with toggle switch to retract landing gear.

Both inherit all the 8040's outstanding features while adding innovations of their own. Such as *totally new miniature servos* for easy installation in smaller models. These have everything you want in a servo—plus 60% more power than micro-servos offer!



Two more successors to the 8040 bring a new dimension to competitive flying. And if these new 8048 and 8068 systems *look* distinctive, wait till you see their features.

Including the low-force open gimbal sticks with a unique dirt-resistant design. Variable rate adjustment on aileron and elevator channels. Adjustable stick lengths to suit your own style.

And you get *new miniature ball bearing servos*—with a ball bearing output shaft plus an isolated, long-life potentiometer and waterproof case. There's even a modular gear train for easy servicing.

The 8048 provides four channels. The 8068 adds a proportional fifth channel, and sixth channel with toggle switch. Both are available on all 72 MHz frequencies.

All four systems feature the quality, engineering, craftsmanship, and affordable pricing that's made Cox/Sanwa famous. Behind each one stands a world champion. Pick the one that'll win for you.

All systems include transmitter, four miniature servos, receiver, dual charger, servo trays and accessories.

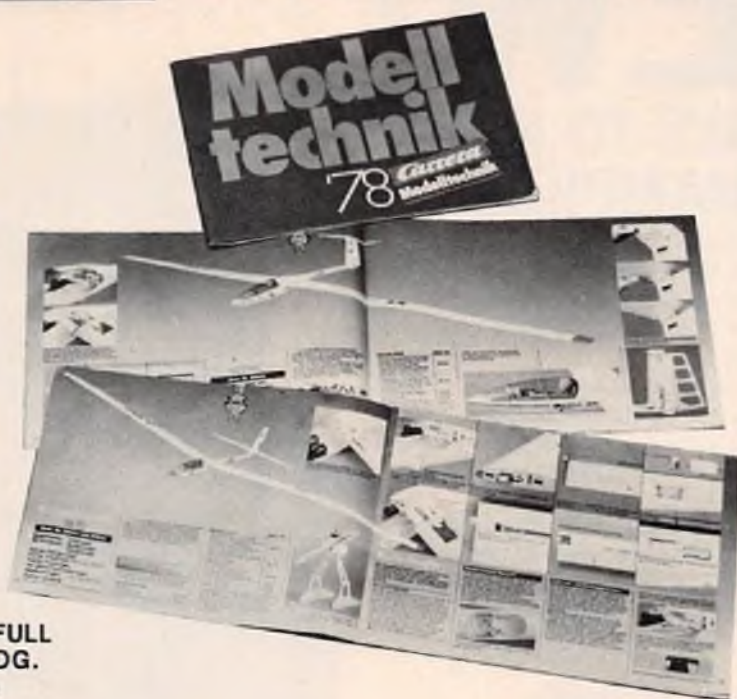


### Cox/Sanwa Radios, Airtronic Kits, Cox Engines.

Cox Hobbies, Inc. A Subsidiary of Leisure Dynamics, Inc.  
1505 East Warner Avenue, Santa Ana, CA 92702

# Carrera

## "PERHAPS THE FINEST ALMOST READY TO FLY R/C SAILPLANE KITS IN THE WORLD"



SEND 50¢ FOR FULL COLOR CATALOG.

(PRINTED IN ENGLISH)

CARRERA USA • BOX 566 • WESTMONT, IL 60059

### POWER BOATING

from page 112/70

too highly tuned.

The majority of radios are used for planes and, for this sort of work, the range has to be pretty good. With boats, it is rare for the model to get more than 200 yards from the pilot, so we just don't need that sort of range. Now, fine tuning makes some sets more liable to interference troubles and, in any case, we don't need it. So, he de-tuned all my receivers, and I have had no trouble

since. This has a second advantage, in that if you run with several other guys, you are less likely to pick up spurious signals from adjacent channels. However, a word of warning, Don, **do not** try to de-tune the receiver yourself, get it done properly, by a competent electronics engineer, and preferably by the manufacturer. Otherwise, you are liable to have greater troubles!

As for vibrations, it is not realized by too many modelers that they are as much of a nuisance, if not more, than in a plane, and for this reason, the radio gear must be isolated from them by some form of damping — the best is foam rubber. Use the rubber 'O' rings supplied

by the maker to mount the servos.

As far as the coupling is concerned, this should not be a real problem. However, if you want to go the whole hog, then the system I use is probably the ultimate. This involves mounting the engine on rubbers, and the tuned pipe; fixing the drive shaft tube to the hull with silicone rubber; and using a flexible drive shaft coupled to the engine with a solid coupling nut. This way, there is no vibration and, as an additional bonus, the noise level of your model will drop dramatically. To give you an idea, last year I ran a Mk I Racing Models Jumbo medium V hull, set up this way, using a

to page 116

alwan  
QUARTZ PULSER  
LAMINATED HARDWOOD

- ★ MIRROR SMOOTH LACQUERED & WAXED FINISH
- ★ 46" LAMINATED 4 PLY HARDWOOD
- ★ GLOSSY RED STRIPED TIPS
- ★ CORDLESS CLOCK, HANG ANYWHERE
- ★ **GUARANTEED**

includes hang hardware

## PROP CLOCKS



HUB FACE IS 5" IN DIAMETER  
BY 3/4" DEEP.

- ★ 3D GOLD NUMERALS
- ★ CORDLESS — Uses 2 C Cells.
- ★ FINEST USA QUARTZ PULSER MOVEMENT. SWEEP SECOND HAND. MAX. 3 MINUTE YEARLY ERROR

**PROFESSIONAL CRAFTSMANSHIP — FUNCTIONAL & DIFFERENT**  
personalized with your AMA number — \$3.50 additional, limit 7 numbers.

**AVAILABLE IN 4 MODELS** — Natural Fir \$89.50    Antique Dark Mahogany \$109.50

Light Birch or Maple \$149.50    Elegant Black Walnut \$199.50

**Direct Only: J.A. ENTERPRISES, 1422 TESLA DRIVE, COLO. SPRINGS., COLO. 80909**

Colo. res. add 3% sales tax. Send money order or certified check for fast service. Price subject to change. Shipped UPS freight collect. All orders promptly acknowledged, allow 2-3 weeks for shipping.

**ANY 10  
ISSUES  
\$10.00**

**A LIMITED NUMBER OF  
BACK ISSUES OF  
R/C MODELER  
ARE STILL AVAILABLE**

**additional  
issues  
\$1.25 each**

If RC is your thing, there's a gold mine of information in the back issues of R/C MODELER MAGAZINE you may have missed. Outstanding construction articles, step-by-step "how-to's", electronic articles, hints and kinks . . . virtually hundreds of ideas to help you save time and money in radio control. While the supply lasts, and it is definitely limited, select any ten issues listed below and they are yours for \$10.00 — and RCM will pay the postage. All issues on a first ordered, first served basis. RCM reserves the right to make substitutions if stock becomes depleted — no partial refunds — or you may list your substitutions below.

**SUPPLY IS LIMITED — ORDER YOURS TODAY!**

Send to:  
R/C MODELER MAGAZINE  
Back Issue Dept.  
P.O. Box 487  
Sierra Madre, Calif. 91024

NAME \_\_\_\_\_ Amount Enclosed \$ \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

U.S.A. orders / Please allow 2-3 weeks for delivery  
Foreign orders / Please allow 6 to 8 weeks for delivery  
OFFER EXPIRES AUGUST 31, 1978

1973		1974		1975		1976		1977		1978		Substitutions
<input type="checkbox"/> June	<input type="checkbox"/> Dec.	<input type="checkbox"/> Jan.	<input type="checkbox"/> July	<input type="checkbox"/> Jan.	<input type="checkbox"/> Sept.	<input type="checkbox"/> Jan.	<input type="checkbox"/> Oct.	<input type="checkbox"/> Feb.	<input type="checkbox"/> Sept.	<input type="checkbox"/> Jan.		1. _____
<input type="checkbox"/> July		<input type="checkbox"/> Feb.	<input type="checkbox"/> Aug.	<input type="checkbox"/> Feb.	<input type="checkbox"/> Oct.	<input type="checkbox"/> Feb.	<input type="checkbox"/> Nov.	<input type="checkbox"/> Mar.	<input type="checkbox"/> Oct.	<input type="checkbox"/> Feb.		2. _____
<input type="checkbox"/> Aug.		<input type="checkbox"/> Mar.	<input type="checkbox"/> Sept.	<input type="checkbox"/> Mar.	<input type="checkbox"/> Dec.	<input type="checkbox"/> Apr.	<input type="checkbox"/> Dec.	<input type="checkbox"/> Apr.	<input type="checkbox"/> Nov.	<input type="checkbox"/> Mar.		3. _____
<input type="checkbox"/> Sept.		<input type="checkbox"/> Apr.	<input type="checkbox"/> Oct.	<input type="checkbox"/> June		<input type="checkbox"/> May		<input type="checkbox"/> May	<input type="checkbox"/> Dec.	<input type="checkbox"/> Apr.		4. _____
<input type="checkbox"/> Oct.		<input type="checkbox"/> May	<input type="checkbox"/> Nov.	<input type="checkbox"/> July		<input type="checkbox"/> June		<input type="checkbox"/> June		<input type="checkbox"/> May		5. _____
<input type="checkbox"/> Nov.		<input type="checkbox"/> June	<input type="checkbox"/> Dec.	<input type="checkbox"/> Aug.		<input type="checkbox"/> Sept.		<input type="checkbox"/> Aug.		<input type="checkbox"/> June		6. _____

APPLICATION—1978 A.M.A. MEMBERSHIP

Academy of Model Aeronautics  
815 Fifteenth St., N.W., Washington, D.C. 20005

For Those 19 or Over by July 1, 1978—Check One Only!

- OPEN MEMBERSHIP—Includes all membership and competition privileges plus subscription to monthly Model Aviation magazine of at least 96 pages (includes 12-16 page "AMA News" section and also "Competition News" section) . . . . . \$17.00
- OPEN MEMBERSHIP—Same as above, except only 12-16 page "AMA News" section reprint from Model Aviation magazine . . . \$13.00

For Those Not 19 by July 1, 1978—Check One Only!

- Fill in Date of Birth: MONTH DAY YEAR
- JUNIOR OR SENIOR—Includes all membership and competition privileges plus subscription to Model Aviation magazine (see Open member description at left) . . . . . \$10.00
  - SAME AS ABOVE—Except "AMA News" monthly instead of magazine subscription . . \$6.00
  - SAME AS ABOVE—Except no "AMA News" or magazine subscription . . . . . \$3.00

FOR ALL AGES MAIN INTEREST (Check only one):  CL  FF  RC  Indoor  Scale  All

FAI STAMP  \$5.00\*  
\* Required for FAI team programs  \$1.00

INSTRUCTIONS: PRINT CLEARLY IN CAPITAL LETTERS. PUT ONE LETTER OR NUMBER PER BOX. SKIP A BOX WHERE SPACE WOULD NORMALLY APPEAR. REQUESTED INFORMATION MUST FIT WITHIN THE NUMBER OF BOXES PROVIDED. ABBREVIATE IF NECESSARY FOR FITTING.

FIRST NAME INIT. LAST NAME

MAILING ADDRESS (TYPICALLY NUMBER AND STREET)

MAILING ADDRESS CONTINUATION (USE ONLY IF REQUIRED FOR YOUR ADDRESS)

CITY STATE ZIP CODE

New  Renewal (number \_\_\_\_\_) 1978 Membership expires December 31, 1978

HQ Use only

AMA NO. \_\_\_\_\_

PUB \_\_\_\_\_

C1 \_\_\_\_\_

C2 \_\_\_\_\_

C7 \_\_\_\_\_

Reduced Rate for Partial Year Members. 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 the full current 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 year's rate and receive full membership for the following year, plus whatever days of membership remain in the year of application.

# THERE'S A REASON!



The outstanding popularity of K&B Fuel has continued through the years. The dominant fuel at the NATS and other prominent meets year after year, it has brought home more winners than any other

fuel... it is definitely "the Choice of the Champions".

Our 28 years of experience has proven to us the need for various types of fuel. Therefore, K&B continues to offer the widest range of glow fuels available—specially formulated to meet the demands of today's many engines, events, and geographical conditions.

*\*K&B Fuel is consistent in quality from can to can, and year after year.*



... alone, of all fuels has

# 28

# YEARS

of laboratory experience and quality control\*

"know-how"

## K&B GIVES YOU A CHOICE OF 7 FUELS

### K&B MODEL ENGINE FUEL with X2C OIL

K&B 100+ for Free Flight, U-Control and R/C Flying

K&B 500 for R/C Flying & R/C Race Cars — where both high and low speeds are required

K&B 1000+ for 1/2A Engines

K&B SUPER SPEED for going "all out"

### K&B MODEL ENGINE FUEL with CASTOR OIL

K&B 100 for Free Flight, U-Control and R/C Flying

K&B 1000 for 1/2A Engines

K&B F.A.I. 80/20 for Pylon, Free Flight and U-Control Speed—no Nitro. Qualifies for F.A.I. rules



**K&B MANUFACTURING**  
12152 WOODRUFF AVE., DOWNEY, CA. 90241



## ATTENTION! R.C. DEALERS

ORDER FROM OUR LARGE STOCK OF KRAFT RADIOS  
7 CH., 6 CH., 5 CH., 4 CH., 3 CH.,  
2 CH., — SERVOS — KRAFT ENGINES — AIR BORN UNITS — PLUS ALL ACCESSORIES

"CLOSED THURSDAYS TO GO FLY"

WE GUARANTEE PERSONAL ATTENTION TO EVERY ORDER  
BILL BOYD JOHNIE CASBURN



**Ks**

KRAFT SOUTHWESTERN, INC.  
P.O. BOX 8068 FT. WORTH, TEX. 76112

PHONE— AC 817/451-7537  
NIGHT— 429-3828 572-1452

## POWER BOATING

from page 114/70

Rossi .60. At 10 meters, the boat was measured at 76 dbs. Maybe this conveys nothing to you. Okay, put it this way. At 50 yards, with a gentle breeze blowing from behind me, I could not use the third servo to adjust the engine, because I couldn't hear it well enough! As I am currently in the process of building the boats which I intend to use in the World Champs, I will show you how it is done, step by step, bearing in mind that the noise limits for The Champs are 80 dbs at 10 meters, plus or minus 3 dbs for background noise. One thing is sure, here is one guy who is not going to be disqualified because his models are too loud! And, what's more, I shall not be losing any speed, as has been proved a few times over the past two years.

So there you are, Don, I think you should de-tune the radio receiver, then make sure that there is plenty of vibration damping around all the radio gear, and you will probably have no more troubles.

\*\*\*

Since I have already mentioned the World Endurance Championships, a few words here about them would not be out of place, especially since they may be of interest to some modelers. The event will last about 10 days, and will take place on a big water sport complex a few miles from Heathrow, London's main airport. Apart from the three two-hour races counting for the World Champs, there will be an American-style hydro race, and I believe that the organizers are looking for competent hydro racers. This event is being held in an attempt to show European modelers just what hydro racing is all about. There will also be a series of 10 minute electric endurance races — a field in which the British are pioneers. A series of demonstrations of scale models will fill in any dead time. Finally, on the second weekend, the Saxons club, to whom the lake belongs, will be organizing a series of two hour multi races, which should be as thrilling as the Championships themselves. This will be over a shorter course, so the racing is going to be very hairy! I am down to run in this, and have just laid the keel of a Super Dreadnought, capable of taking all the possible crashes!

In short, this should really be a very good meeting, so if anyone is interested in going, maybe they would like to contact the organizers at the following address: Model Boats, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE, England. If you do write, let them know whether you want to participate in the racing — apart from the actual World Champs, which are by

to page 120



# WAREHOUSE hobbies

P. O. BOX 8039 5821 E. ROSEDALE FORT WORTH, TEXAS 76112  
 PHONE: DAY 817/451-1570 NIGHT: 817/572-1452 CLOSED THURSDAY GONE FLYING!

## 77 MODEL LFX III

Fiberglass fuselage and 1/64 ply covered wing.

A Johnny Casburn Kit



**Special \$89.95**  
**Reg. \$139.95**

- Excellent plans
- This high performance pattern bird does every trick in both the AMA and FAI book.
- Completely prelabed
- Fiberglass fuselage
- 62 1/2" wing covered with 1/64" plywood (complete hardware in the Super Delux only)

## CASBURN KITS

Lucky Fly Supreme (139.95)	89.95
Super Lucky Fly II (89.95)	69.95
Little Lucky Fly II (.40 size) (79.95)	59.95
Super Tex .60 (89.95)	69.95
Super Tex .40 (79.95)	59.95
Little Tex (33.95)	19.95
Funett Trainer (69.95)	49.95
LFX III Super Delux (139.95)	89.95

## GLIDERS AND ACCESSORIES

Craft Air Drifter	\$19.95
Craft Air Windrifter	34.95
Craft Air-Sallaire	89.95
Legionair 140	84.95
Legionair 132	71.95
Legionair 100	57.95
Shuttle 78	33.95
Shuttle 100	39.95
Shuttle 132	49.95
Windfree	\$26.95
Wind Free	\$26.95
Aquilla	47.95
Square Soar	14.95
Heavy Duty High Start	29.95
All Others - Call for Price	

## ACE KITS

Ace Up Start (17.95)	13.95
All Star Bipe (24.95)	19.95
Pacer (19.95)	12.95
Wizard (18.95)	11.95

## SUPER TEX .60 AND SUPER TEX .40



A Johnny Casburn Kit

**Special**

.40 Size	.60 Size
\$59.95	\$69.95
Reg. \$79.95	Reg. \$89.95

- Easy to build fuselage
  - Hinges and many other accessories
  - Ready-made ailerons and formed gear
  - Read-i-built 65", 812 sq. in. wing ready to paint or monokote.
  - Easy to build for beginners
- THE BEST TRAINER EVER**

## FLIGHT GLASS

Saturn Basic	59.95
Saturn Delux	79.95
P51	Special 59.95
P-51 Deluxe	89.95

## ACCESSORIES

PORTA-SHADE	\$17.98
7 ft. tall; 60 sq. ft. room for modelers & airplane stuff!	
J.C. Power Panel (39.95)	\$28.95
12 volt Motor cycle Battery	\$13.95
Kraft Air ESV	\$15.95
Sonic Power Panel (27.95)	\$19.95
Sonic Electric Fuel Pump	\$ 9.95
Box - Wood-Built	\$21.95
Kit-unassembled	\$14.95
Robert Super Stand	\$ 3.95
Hobby Sprayer	\$39.95
Electric Sander	\$23.95

## RADIOS

Cannon Radios	
Tini Twin-3 chan. 2 servos	\$149.95
Tini Twin-3 chan. 3 servos	\$174.95
Kraft 7C	CALL FOR BEST \$ ?
Kraft 5C	PRICE ON \$ ?
Kraft-KP4 - KRAFT RADIOS	\$
E.K. Nimbus-4 chan. 4 servos	\$186.96
E.K. Nimbus-2 chan.	\$ 97.00

Call us for Super Price on Radios  
 Royal-Kraft-Cannon-E.K.

## SUPER/LUCKY FLY SUPREME

New! .60 size fiberglass fuselage and 1/64 ply covered wing.



**Special \$89.95**  
**Reg. \$139.95**

## GOLD MEDAL FORMULA FUEL

GOLD MEDAL FORMULA FUEL  
 10% NITRO CONTENT. 95.98 or gal. in cases 14 per case. 96.98 single gallon. 15% 96.98 per gallon in cases. Shipped Freight Collect. We use UPS when possible.

ASK ABOUT CLUB DISCOUNTS! **\$5.98**

## Zinger Props

Best Power/Best Quality  
 All 9" Props

List \$1.30	..... \$ .89
10" x 6"	
List \$1.40	..... \$ .99
11" x 7"/11" x 7 1/2"	
List \$1.60	..... \$1.19

## ENGINES

K & B 61-with pump and muffler	\$79.95
OS 40 SR with muffler	\$59.95
VECO 61	
with muffler	\$ 85.00
KB 40	\$ 62.50
O.S. .15 RC	\$29.95
OS 25 SR	\$ 52.95
OS 25 Reg. RC	\$ 36.95
	\$29.95
Kraft 60	\$ 99.95
Webra Speed	\$157.95
McCoy 35 RC	\$24.95
OS 60 SR	
with muffler	\$114.95
	\$82.95



**NEW QUADRA ENGINE-2 cycle, 2 cubic inches, 2 HP, comes complete with Prop. Adp., engine mount, muff, Pump type carb. .... \$121.50**

QUADRA: Props (18"x6", 17"x6") \$6.95 ea. Tank kit with clunk (one qt.) \$3.75 ea. Extra BCU-6 plugs \$1.95 ea. Neoprene fuel line (1/8") \$.85 ft. Throttle linkage adapter kit complete \$6.95 ea.

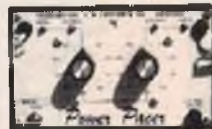
## NEW! NEW! NEW!



**"Johnny Casburn" Power Panel**  
 Reg. \$39.95  
**Introductory Price \$28.95**



**Pylon Brand Starter**  
 Std. \$23.95 Delux \$26.95



Taylor & Co.  
**Power Pacer**  
**Super Sale \$48.95**

## Special Prices on HB ENGINES



The finest German Precision Craftsmanship with PDP (Perry Directional Porting)

.12	..... 29.95
.15	..... 34.95
.20	..... 39.95
.25	..... 39.95
.40 PDP	..... 59.95
.61 PDP	..... 79.95

(All engines have ball bearings. Add \$7.98 for .40 and .60 mufflers.)

### SHIPPING INSTRUCTIONS

Specials based on present list prices, subject to change without notice

C.O.D. MONEY ORDER

CHECK

Texas residents add 5% Sales tax.

Shipping Charge \$2.00

Add \$3.00 for oversize and heavy boxes.

(FUEL SHIPPED UPS - COLLECT)

CHARGE IT!



IF WE DON'T GOT IT WE'LL GET IT FOR YA'

IF WE DON'T GOT IT WE'LL GET IT FOR YA'



# EMPIRE MODELS



How would you like  
to put this number  
in your plane.  
**MIDWEST AXIFLO  
DUCTED FAN 40**  
only \$33.



**DAVE PLATT**  
RC-2 T-28 B 56.75  
RC-3 FW 190 56.75  
RC-4 WACO F-3 56.75

**DUMAS Sail Boats**  
Hobie Cat 7.75  
Alcott Sun Fish 13.75  
30 Star Class 33.75  
45 Star Class 79.00  
Bingo 50/800 Fiberglass 180.00  
219 Lightning 14.25  
East Coast 12 Meter  
Fiberglass 168.00  
Probar Sail Unit 32.40

Dumas Hardware 25% Off  
Current List

**DUMAS Scale**  
PT-109 23.63  
Coast Guard Lifeboat 33.75  
Tuna Clipper 27.68  
Little Shelley Foss 25.65  
Shelley Foss 47.25  
Coast Guard 40' Utility 27.00  
Dauntless 43.20

**DUMAS Hydro & Deep Vee**  
AVL-1 Atlas Van Lines 7.85  
AVL-40 Atlas Van Lines 40 38.00  
Pay 'n Pak 27.00  
Hot Shot Tunnel Hull 21.95  
U-76 Hydro 36.00  
DV-20CF Deep Vee 20  
Competition Fiberglass 46.00  
DV-40CF Deep Vee 40  
Competition Fiberglass 66.00  
DV-60CF Deep Vee 60  
Competition Fiberglass 72.00  
DV-10 Mahogany 7.85  
Deep Vee 21 1313 34.99  
\*NEW\* Atlas Van Lines U-1 38.75  
\*NEW\* Hot Shot 21 49.75  
Glass Kit

**ENYA**  
60 B III BB R/C 70.95  
35 B III R/C 31.50  
19 V R/C 26.50  
15 IV R/C 23.95  
.29 B IV R/C 29.25

**FOX ENGINES**  
11500 15 ST. 13.50  
11600 15 Schn 18.23  
21600 15 Schn R/C 23.63  
21900 19 R/C 21.60  
22500 25 R/C 21.60  
13500 35 Stunt 17.55  
13600 36 17.55  
13700 36 BB Combat 30.38  
23600 36 R/C 23.63  
24500 45 R/C Schn 35.10  
26099 60 BB Eagle R/C 43.88  
27800 78 BB R/C 65.48

Fox Tanks Wheels All in Stock  
Mufflers 25% Off List

**GOLDBERG**  
Ranger 42 ARF 19.75  
Falcon 56 II 29.95  
Sr. Falcon 44.75  
Jr. Falcon 10.75  
Skylark 56 34.75  
Jr. Skylark 11.75  
Skylark 62 44.75

**HUGHEY BOATS**  
20 Rigger 84.95  
40 Rigger 92.50  
19 Hydro 66.75

**K & B**  
6711 19 26.95  
6712 19 R/C 33.75  
8450 3.5 F Rotor 41.75  
7860 35 Plain Bearing 21.95  
7861 35 R/C 25.65  
8600 5.8cc FF Racing 69.65  
8360 3.5cc R/C 48.50  
8382 3.5 cc Outboard 72.95  
9000 6.5cc R/C F/R 76.50  
9020 6.5cc STO F/R 63.95  
9030 6.5cc SR III R/R 67.50  
8011 40 R/C 39.75  
8360 40 R/C Pump 57.75  
9040 40 RSII Marine 72.95  
6525 61 R/C 49.75  
6535 61 R/C Pumper 64.75  
8500 4.9cc U/C 68.40  
8550 3.25cc U/C 41.00

**LANIER**  
Cornet II 39.75  
Transit 29.75  
Cessna 31.75  
Pinto 31.75  
Jester II 49.75  
Rebel Bipe 69.75

**MARKS MODELS**  
Windward 72 26.75  
Windfree 99 36.75  
Bushwacker w/o access 36.75  
Wanderer 16.75

**MIDWEST**  
106 Tri Squire 21.50  
109 Lil Tri Squire 13.50  
122 Das Lil Stik 22.28  
125 Cessna Cardinal 21.95  
126 Super Chipmunk 21.95  
128 Sweet Silk 27.95  
129 Cardinal Squire 47.25  
130 Strike Master 49.75  
131 Pilts Special 71.75  
134 Attacker 27.95  
\*NEW\* Love Machine 37.95  
215 Magician 15 10.25  
235 Magician 35 13.95  
236 King Cobra 35 17.25  
237 Mustang 35 17.25  
\*NEW\* AXIFLO  
Ducted Fan 33.08  
\*NEW\* Easy Flyer  
60 Trainer 71.75  
Heinkel He-162 53.95

**SIG**  
Kadet 27.68  
Kougar 35.60  
Komander 30.50  
Citabra 45.94  
Chipmunk R/C 47.52  
J-3 Cub 30.50  
Clipped Wing Cub 30.50  
Smith Mini Plane 39.60  
Doubler II 19.80  
Super Sport 15.84  
Liberty Sport 50.50  
Sig Minow 22.18  
Cessna 150 55.44  
Mustang Stunter U/C 22.18

**SOAR CRAFT**  
Magnum 12 105.30  
Glasflugel 604 81.00  
Diamant 72.90  
Libelle 64.80  
Centurion II 42.75  
Launch System 32.40

**STERLING MODELS**  
Min Fledgling 15.95  
Puddle Jumper 11.75  
Fledgling 29.75  
Corsair F4U 23.75

**STEVE MUCK**  
North Wind 40/60 Mono 54.81  
Lil Lightning 21 O.B. 44.76  
Bushwacker 20 Hydro 100.48  
Lil Northwind 20 Mono 52.07

**SURE FLITE MODELS**  
J-3 Cub ARF 22.75  
Eye Soar Glider 14.75  
Spitfire ARF 22.75  
7' Citabria 97.50  
A7-A Corsair II 21.75  
Baby Turkey 14.25

**TOP FLIGHT MODELS**  
P-51 Mustang 44.75  
P-40 Warhawk 44.75  
P-39 Aircobra 44.75  
P-47 Thunderbolt 59.75  
SES-A 44.75  
School Master 11.25  
School Girl 10.25  
School Boy 6.75  
\*NEW\* Freshman Trainer 34.95

**AIRTRONICS**  
Q-Tee 19.75  
Square Soar 22.75  
Gere Sport 36.75  
Questor 31.75  
Grand Esprit 92.75  
Aquila SI 62.75  
Olympic II 45.75  
Acro-star 69.75

**BRID!**  
T-10 Trainer 19.66  
T-20 Trainer 31.75  
RCM Trainer 40 38.61  
RCM Trainer 60 44.23  
RCM 15-500 28.08  
RCM Sportster 28.08  
Super Kaos 40 39.31  
Super Kaos 60 49.14  
Shrike Commander 129.87  
Dirty Birdy 40 42.12  
P-51 Mustang 94.77  
T-6 Texan 94.77  
Quickest 500 30.19  
RCM Basic Trainer 28.08  
Dirty Birdy 59.67

**CONCEPT MODELS**  
Barnstormer 59.95  
Super Fli 59.95  
Travel Air 59.95  
Air Scout 39.95



**GOV. SURPLUS 1.25 VOLT  
2 AMH WET NI-CADS**  
Perfect for engine starting  
reg. \$3.95 SPECIAL \$1.95

Want anything you don't see — call us!  
CALL (602) 881-1257 FOR IMMEDIATE SHIPMENTS.

Dept. A EMPIRE MODELS/P. O. BOX 42287/TUCSON, ARIZONA/85733

**WHITE SILK 36"**  
**WIDE \$2<sup>50</sup>** per yard

POSTAGE AND HANDLING and insurance orders up to \$5.00 add .95, \$5.01 to \$10.00 add \$1.50, \$10.01 to \$20.00 add \$1.95, \$20.01 to \$30.00 add \$2.50, \$30.01 to \$40.00 add \$2.95, \$40.01 to \$50.00 add \$3.50, \$50.01 to \$80.00 add \$3.95, over \$80.01 add \$4.50. Send money order or certified check for fast service. APO's welcome. Export welcome. Prices subject to change, some quantities limited. Note: some of the larger fiberglass kits are sent freight collect best way available. Reserve the right to clear checks.

- (a) C.O.D. within 48 continental states only. Please add \$3.00.
- (b) Outside 48 Continental States add \$10.00 for actual postage and handling, excess will be refunded. Arizona residents add 4% sales tax.
- (c) BankAmericard/Visa and MasterCard welcome.



**BUD NOSENS P-51**  
102" \$129.99



**THE FRESHMEN  
TRAINER R/C**



reg. 44.95  
**SALE**  
\$31.95



**LANIER COMET II**  
SPAN 63" \$39.75

**TOP FLITE/P-40** \$44.75  
60" WING SPAN/606 SQ. INCH AREA



**SWEET  
STIK**  
\$26.75

**SPEEDAIRE**

4" dia. Diaphragm Compressor. 1/12 HP motor, 7 ft. grounded power cord. Swedish steel reed valves. Delivers 0.58 CFM at 20 PSI, maximum 35 PSI.  
reg. 60.00 **SALE \$49.95**



**PAASCHE H-5  
AIRBRUSH  
TRAVELERS  
KIT—COMPLETE**  
\$35.95

**K & B .61R/C  
CAT. No. 6535  
with Perry Pump/  
Regulator** reg. 110.00  
**SALE \$64.75**



**SUPER KAOS .40**  
WING SPAN 52" **EMPIRES  
LOW PRICE**  
\$39.31



**SCHUCO**  
WET BATT CHARGER  
1.5 V./4.8 at 100 MIL. AMPS.

**PRICE \$4.98**



**C. G. FALCON 56 II**  
**SALE PRICE**  
\$29.95

**ROAD RUNNER MARINE  
OUT DRIVE UNIT  
COMPLETE**

Includes wedge rudder water pick-up drive cable .150, TFE cable housing, TFE bearing, shaft and jam nuts, mounting brackets good for 19-40

Hydro or Mono	\$33.50
.150 cable	1.00 per ft.
.130 cable	.95 per ft.
.186 cable for 40-61 engines	1.50 per ft.
TFE tubing for .130 cable	1.00 per ft.
TFE Tubing for .186 cable	1.10 per ft.
Many other available items. Call.	



**CENTURION II  
SOAR CRAFT**  
SPAN 100 inches/618 SQ. INCHES  
30 ounces. **EMPIRE'S PRICE**  
\$42.75

**COX 6 VOLT  
DC CHARGER**  
115 Volt 500 mill amp  
Perfect for charging 6 volt wet batt only **\$4.95**

We sell 1.25 volt 2 amp nicads, make your own 6 volt batt pack—perfect for operating Dumas 6 volt motors.  
**\$1.95** per cell  
**\$9.95** 5 cells

**DUMAS DAUNTLESS**

A real beauty. One of the famous commuter boats used on the Hudson River in New York. This is a big boat! Plenty of room for gas or electric power with twin screws. Wood construction kit with deck hardware included. Scale 3/4":1". Length 49 1/2" (126 cm) Beam 14" (36 cm) KIT #1211

**\$43.20**

**SPECIAL**

**LIMITED QUANTITY**

SUPER TIGER X-15 V.I. R/C	44.50
SUPER TIGER X-40	56.60

**50% OFF**

**LIL SWAMP BUGGY  
WITH COX BABY BEE  
049 ENGINE**

**LL SWAMP BUGGY** 50%  
WITH COX BABY BEE 049 ENGN.  
A rugged Florida Everglades swamp buggy. For free running or radio control. All birch plywood and mahogany. 18" Long—7-3/4" Wide. For .049 engine. Kit AB-3. 23.00 value

**\$11.50** only

SEND FOR 1978 R/C CATALOG \$1.50  
REFUNDED ON 1ST ORDER OVER \$10.00

Want anything you don't see—call us!

**EMPIRE MODELS**

CALL (602) 881-1257

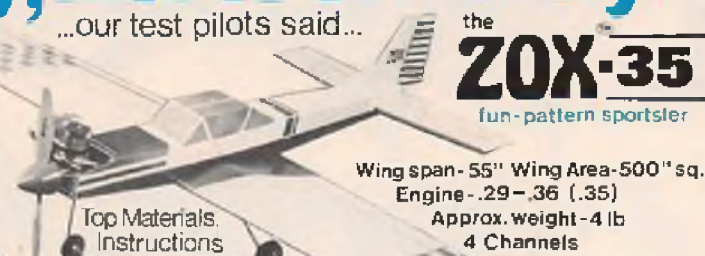
Dept. A P.O. BOX 42287/TUCSON, ARIZONA 85733

# "Hey, this is fun to fly!"

...our test pilots said...

The Kit of  
the Future...

- Fold & Glue construction
- Self-covering, paintable
- No Mess
- No Guessing
- Const. Photos



the  
**ZOX-35**  
fun-pattern sportster

**Aeromobis Design**

BOX 325  
NEW YORK, N.Y. 10009

**Super-Fast  
Delivery!!**

**Top Quality  
Hardware  
Complete**

Please send me \_\_\_\_\_ ZOX-35 kits at only \$29.95 each, plus \$2.00 shipping. N.Y. residents add 8% sales tax.

Enclosed is my check or money order for \$ \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

send  
now

only  
**\$29.95**

made in  
U.S.A.

Precision die-cut  
Foam-core, ply, balsa

© AEROMOBIS DESIGN 1978

## KRAFT ORANGE COUNTY

DISTRIBUTORS

&

WARRANTY SERVICE

FOR ALL KRAFT R.C. SYSTEMS

Warranty Repairs On  
TOWER TH-5 & TH-3 SYSTEMS  
Repairs On K.S.E., K.G.L.  
And P.C.S. Systems

Expert Repair & Factory Parts  
Contact: George Killeen  
Repair & Distributor Rep.

2817 E. Lincoln Ave. • Anaheim, Ca. 92806 • Phone: 630-5061

*Cool Power*  
Competition Fuels

## A FUEL THAT'S A LITTLE DIFFERENT BUT A LOT BETTER

COOL POWER FUELS ARE COOL CLEAN BURNING FUELS THAT LET YOUR ENGINE PERFORM ITS BEST AND LAST LONGER. THEY CONTAIN ALL THE TIME HONORED INGREDIENTS PLUS A FEW DIFFERENT FEATURES THAT GIVE THEM A DIFFERENT EDGE...

- ANTI-FOAMING
- WETTING ACTION THAT ALLOWS THE LUBRICANT TO FLOW MORE FREELY INTO BUSHINGS AND BEARINGS.
- SUPERIOR FILM STRENGTH AND ANTI-WEAR QUALITIES THAT CUT FRICTION AND ALLOW MORE POWER WITH LESS NITRO.
- MILD DETERGENT ACTION THAT HELPS PREVENT VARNISH EVEN WITH A MUFFLER.

	(Gallon)
FAI	7.95
5%	8.95
10%	10.95
15%	12.95
25%	14.95
40%	20.95
Helicopter	11.95

Give your engine a treat!!! Feed it Cool Power and you'll both be pleased. These are a few of the in-the-know people who do:

Rhett Miller      Ron Chidgle  
Dave Platt        Steve Helms

Cool Power is now available in metal cans as well as plastic bottles (\$1.00 more in cans).

MANUFACTURED BY **MORGAN'S HOBBY ENTERPRISES INC.**  
200 WEST LEE STREET  
ENTERPRISE, ALABAMA 36330

PHONE (205) 347-3525 (DAY)  
(205) 347-8221 (NIGHT TO 8 P.M.)

## POWER BOATING

from page 116/70

selection — and give some details. It should be a good excuse for a holiday in England, and maybe I shall see some of you there

As for those of you who don't go, well, see you all next time. □

## R/C FLYING AND THE LAW

from page 69

was dangerous to do so, in that the model airplane was likely to encounter downdrafts and/or other turbulent air currents which would cause it to lurch and move about suddenly, unusually and violently and cause it to go out of control and injure members of the public.

(6) That the Defendant, his agents, servants or employees, carelessly and negligently failed to control, pilot and operate the model airplane so as to keep same under proper control and carelessly and negligently failed to act in time to cause the airplane to resume normal flight while still at a safe distance above the ground and away from the premises of the swimming pool where the Plaintiffs were situated.

(7) In that Defendant "R/C Pilot" failed to use that same degree of care and caution that an ordinary person would or should and could have used under similar or like circumstances and carelessly and negligently failed to safely operate and land the said model airplane on the ground adjacent to the swimming pool as aforesaid.

(8) In operating the said model airplane at a dangerously low altitude under the circumstances.

(9) In violating the rules and regulations promulgated by the model airplane hobbyist community.

(10) In operating and flying his model airplane in such a fashion and in such a place, close to members of the public, and in doing so at such an excessive speed.

The purpose of all of this is, of course, to impress our R/C piloting fraternity with the need to be truly safety conscious, to realize that each of us could be the "R/C Pilot" against whom these allegations have been made. A court of law will sort out the legal issues and a jury will decide the factual matters that have been raised. Each of us should want to avoid allegations of negligency by making certain that our model is inspected and found to be in first class operating condition, that we are capable of flying that model with complete safety, that we perform all flying in conformity with the A.M.A. Safety Code and that we all take the matter of flying radio controlled models as seriously as, in fact, it is. If we really mean (and we should) that flying

to page 122

save

# super bargains!

WE PAY UPS



Not for the beginner, fast building last flying and manoeuvrable semi-symmetrical airfoil 4 Channel

**PHAETON BIPLANE** 22.99  
35-45 power 48" span Aluminum gear



Great Sunday Flier and it looks good too Aluminum gear

**TEMPO II** 17.99  
30-45 power 60" span ABS Wheel Pants 3-4 Channel



Basic Trainer and Sunday Flier for the man with limited building time  
STICK 40 WING KIT \$8.49  
STICK 30 WING KIT \$7.69

**2 SIZES**  
**SWIZZLE STICK 40** 13.99  
.30 - .45 POWER 60" SPAN  
**SWIZZLE STICK 30** 11.99  
.15 - .29 POWER 48" SPAN  
**FLOAT KIT** 9.99  
30" LENGTH FOR AIRCRAFT UP TO 6 1/2 LBS.



**SMOOTHIE** 19.99  
symmetrical airfoil 40-50 power 52" span Aluminum gear ABS Wheel Pants 4 Channel



**EXCALIBUR** 21.99  
symmetrical airfoil 40-50 power 52" span ABS Cowl 4 Channel

**About Our Kits**

All our kits are designed for fast building, are all Balsa with full-out diecut or machine cut parts (no printed parts-no foam) all kits come complete with rolled fullsize plans, necessary hardware, formed wire, canopy, ABS cowls and wheel pants

**SHEETS 36"**

1/16 x 2 (10 PK)	2.70
5/32 x 2 (10 PK)	3.33
1/8 x 2 (10 PK)	3.60
1/4 x 2 (10 PK)	4.50
1/16 x 3 (10 PK)	3.00
3/32 x 3 (10 PK)	3.60
1/8 x 3 (10 PK)	4.50
3/16 x 3 (5 PK)	2.50
1/4 x 3 (5 PK)	2.60
3/8 x 3 (5 PK)	3.59
1/2 x 3 (5 PK)	4.49
1/16 x 4 (10 PK)	4.80
3/32 x 4 (5 PK)	2.89
1/8 x 4 (5 PK)	3.33
3/16 x 4 (5 PK)	3.83
1/4 x 4 (5 PK)	4.22

**STICKS 36"**

1/16 x 1/8 (30 PK)	2.16
3/32 x 1/8 (30 PK)	2.25
1/8 x 1/8 (30 PK)	2.34
1/8 SQ. (30 PK)	1.80
3/16 SQ. (30 PK)	2.34
1/4 SQ. (30 PK)	3.60
1/4 x 3/8 (30 PK)	3.96
1/4 x 1/2 (30 PK)	4.32
<b>DOWELS 36"</b>	
1/8 DIA. (10 PK)	.60
3/16 DIA. (10 PK)	.70
1/4 DIA. (10 PK)	1.00
<b>STRIPS 30"</b>	
1/4 SQ. x 30 (20 PK)	1.99
1/4 x 3/8 x 30 (20 PK)	2.13

**MUSIC WIRE 36"**

1/16 DIA. (10 PK)	.70
3/32 DIA. (10 PK)	1.40
1/8 DIA. (10 PK)	1.90
5/32 DIA. (10 PK)	2.90
<b>BLOCKS 36"</b>	
1 x 2	1.00
1 x 3	1.47
1 x 4	2.20
2 x 2	1.47
2 x 3	2.22

**SHEETING 30"**

1/16 x 3 x 36 (10 PK)	2.50
3/32 x 3 x 36 (10 PK)	3.00
1/8 x 3 x 36 (10 PK)	3.80
1/16 x 4 x 36 (10 PK)	3.90
3/32 x 4 x 36 (10 PK)	4.79
1/8 x 4 x 36 (5 PK)	2.75

Light popular plywood 1/8 x 6 x 36 (5 PK) 3.99

AAA  
**BALSA**

**BASIC KIT**

A REAL BUY FOR THE SCRATCH BUILDER. KIT INCLUDES COMPLETE STICK AND WING KIT, ALL PARTS DIE CUT 1/16" CHORD x 60" SPAN, FORMED L/S PLUS BASIC MATERIALS FOR FUSELAGE AND TAIL INCLUDING:  
2 1/16x4x42  
2 3/16x4x21  
1 1/16x3x36  
1 1/16x12 LITE PLY

11.99

CALL FOR IMMEDIATE C.O.D. OR CREDIT CARD PAYMENT  
We accept PERSONAL CHECKS, BANK AMERICAN MASTER CHARGE  
or C.O.D. For amounts under \$15.00 add \$2.00 \$15.00 to \$30.00  
add \$1.00 over \$30.00 we pay handling. Wisconsin residents  
add 4% sales tax. C.O.D. orders add \$1.00. For Parcel Post shipment  
add \$1.00 if P.P. C.O.D. add \$3.00. Orders outside continental U.S.  
add \$6.00 we will refund. We pay UPS postage.



All orders are shipped 100%  
We do not back order or run out of stock

always 51+ quality from  
**balsa USA INC**  
PO BOX 164 MARINETTE WIS 54841  
call (906) 863-6421

# 1/2 A P-39



1/2 A Scale - 1/2 the work - 1/2 the time - 1/2 the price - \$29.95

See your local dealer first. Distributor and dealer inquiries invited.  
California residents add 6% sales tax.  
Foreign orders — U.S. currency on U.S. bank only.



2814 East 56th Way, Long Beach, CA. 90805

## R/C FLYING AND THE LAW

from page 120/69

R/C models is not "kid stuff", then we have to behave like adults.

Just how serious a matter is involved in insuring A.M.A. members can be gathered from the following statistics: in 1975 the A.M.A. paid \$25,000 for the liability coverage for its members; in 1976 it went up to \$38,000; in 1977 the price tag was \$55,000. The A.M.A. has now just announced that for 1978 it will cost the organization about \$175,000!

Just how long it is going to be before that huge cost will be passed on to the membership in the form of significantly higher dues would appear to be just a matter of time. For the A.M.A. plan, Lloyd's of London, is the new carrier, as administered by Albert H. Wohlers and Company. This administrative company is located at 720 Garden Street, Park Ridge, Illinois 60068. If an accident happens, assuming you are a member of the Academy of Model Aeronautics, you should do the following:

(1) Notify your homeowners' or tenants' policy carrier of the accident and fill out the correct claim reporting form.

(2) Call or write the A.M.A.'s insurance administrator — Albert Wohlers and Company; their telephone number is (312) 693-8710; report the accident and get a claim form. The A.M.A. has also requested that if personal injury, especially hospitalization is involved, they want to know about it and ask you to call them at (202) 347-2751.

(3) Notify your own attorney (perhaps this should be your first step) and be guided by his counsel with respect to handling the situation. He may ask you to get a list of witnesses with respect to the occurrence.

to page 126

STAND OFF SCALE

# BEE 30

## Sport Trainer

BUILD IT TODAY - RUN IT TOMORROW



## COMPARE QUALITY & PERFORMANCE

- Molded & Trimmed Plastic Parts
- Only 5 Structural Parts
- Assembles In One Evening
- Simple Photo Instructions
- Proven Tri-Hull Design
- Super-Flex Special Formula Plastic
- Virtually Unsinkable
- Molded Radio Mounting Box
- Molded Fuel Tank Mount
- Radio & Engine Can Be Installed After Model Is Completed
- Uses Any 2 Channel Radio

A.R.F.  
(Almost Ready to Float)

LENGTH 30"

**\$39.95**

DIO CONTROLLED  
**Ram** MODELS INC.

3631 N. KEDVALE AVE., CHICAGO, IL 60641

Dealer and Distributor Inquiries Invited

# DAVE'S CUSTOM MODELS



Now Bigger (to serve you) Better!



## JULY SPECIALS

### Bud Nosen Kits

<i>Citabria</i>	\$69.95
<i>Mr. Mulligan</i>	97.95
<i>Gere Sport</i>	89.95
<i>Aeronca</i>	69.95
<i>Cessna 310</i>	118.95

<i>J-3</i>	83.95
<i>Trainer</i>	55.95
<i>P-51</i>	118.95
<b>Concept</b>	
<i>Barnstormer</i>	149.95

### Big Engines & Drives

<i>Quadra</i>	114.50
<i>Quadra</i>	
<i>Self starter</i>	139.95
<i>Maximizer</i>	62.95

### DCM Scale Specials

**Stafford      Platt      Top Flite      Jemco      Proctor**

<i>Acrosport</i>	46.95	<i>Waco YMF-3</i>	52.95	<i>P-39</i>	41.95	<i>Corsair</i>	49.50	<i>Nieuport II</i>	109.95
<i>Comanche</i>	49.95	<i>Spitfire</i>	52.95	<i>P-40</i>	41.95	<i>Focke Wolf</i>	49.50	<i>Antic</i>	62.95
<i>Comanche Twin</i>	69.95	<i>T-28B</i>	52.95	<i>P-47</i>	55.95	<i>P-51</i>	49.50	<i>Antic Biplane</i>	73.95
<i>B-24 Liberator</i>	129.95	<i>FW 190</i>	52.95	<i>P-51</i>	41.95	<i>AT-6</i>	49.50	<i>Parasol</i>	64.95

### Sailplanes

<i>Paragon</i>	39.95	<i>1/4 Scale Jantar I</i>	289.95	<i>Coyote</i>	64.95	<i>CraftAir Viking</i>	53.95
<i>Aquila w/ glass fuse</i>	69.95	<i>ASW 15</i>	34.95	<i>Oly II</i>	34.95	<i>SD 100</i>	38.95
<i>Wanderer 99</i>	17.95	<i>Magnum 12</i>	94.95	<i>J-Bird</i>	35.95	<i>LegionAir 140</i>	72.95

### Helicopter Specials

We carry a complete line of American Revolution, Schluter & Kavan helicopter kits and parts. Call us for our low discount prices.

### RC Cars

<i>RC 100</i>	99.95
<i>RC 200</i>	149.95
We stock a complete selection of 1/8 scale parts.	

### RADIO SYSTEM Specials

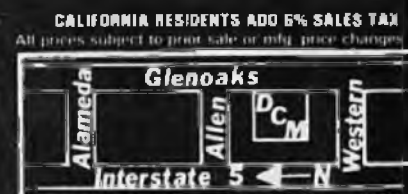
<i>Wanderer &amp; Kraft 2</i>	99.95
<i>EK Nimbus 4</i>	179.95
<i>Kraft Sport 4</i>	189.95
<i>EK Nimbus 2</i>	89.95

Also check on our large selection of ready to fly models.

BankAmericard, Visa, Mastercharge welcome! Call us at (213) 240-5810 for fast mail order service and our low prices on Cox-Sanwa, Kraft, Futaba, ProLine, E-K Radios or stop by Mon. thru Sun. at 1844 W. Glenoaks Blvd., Glendale, CA 91201.

### HOURS

<b>Mon-Fri</b>	10-7
<b>Sat.</b>	10-5
<b>Sun.</b>	12-5



# DIGITAL COMMANDER THREE CHANNEL SYSTEM KIT

SINCE ITS INTRODUCTION LAST SUMMER, our Three Channel System Kit has gained tremendous popularity in the field. Its flawless performance, easy assembly, sensible mechanical layout, and low price all have combined to make a radio system kit that is one of the best bargains in the industry today.

Now we are adding another dimension to this concept: transmitter conversion kits so the Three Channel System can be upgraded to five or seven channel operation . . . the builder can start at an economical novice level with a Three Channel System and, as he gains competence, he can add functions at a minimum of expense; none of his equipment is obsoleted.

The conversion contains an additional stick assembly, a new case, and complete instructions for performing the conversion. All existing electronics and hardware are utilized.

Since the receiver has eight channel capability, all that needs to be added is more wires and connectors plus additional servos for each additional channel.

If you didn't buy a Three Channel before because you knew you would want to go to more channels later, you no longer have any excuse.



THREE CHANNEL SYSTEM KIT WITH STANDARD FLITE PACK  
10G30 \$119.95



THREE CHANNEL SYSTEM KIT WITH MICRO FLITE PACK  
10G30M \$124.95



FIVE CHANNEL  
TRANSMITTER  
CONVERSION  
11G36 \$21.95

SEVEN CHANNEL  
TRANSMITTER  
CONVERSION  
11G37 \$26.95

## TRANSMITTER

- Expandable to more than three channels.
- Open gimbal two axis stick.
- Quality throttle stick with trim.
- Battery condition meter.
- Uses 9V dry battery.

## RECEIVER

- Double deck design for small aircraft.
- CMOS Decoder for low current drain.
- Eight channel capability.
- Light weight

## AIRBORNE BATTERIES

- GE 450 mah or 100 mah Ni-cds.
- Charger furnished.

## SERVOS (TWO FURNISHED)

- Quality D & R Bantam or Dunham Micro mechanics.
- High performance Signetic 544 amp.
- One comes assembled.

AVAILABLE ON ALL AMERICAN R/C FREQUENCIES.

# ACE R/C, Inc.

NOW, WHAT EVERYONE'S BEEN WAITING FOR!

# DIGIPACE I

A sophisticated piece of lab quality equipment for cycling ni-cd batteries. Accurate, dependable, and attractive.



--Automatic discharging and recharging of both receiver and transmitter batteries, simultaneously or independently.

--Switch for three different transmitter voltages, (6V, 9.6V or 12V).

--Switch for two different receiver charge rates, (20 ma or 50 ma).

--Four digit LED readout; no mechanical clock motors.

--Modern design and tight tolerance components insure total accuracy down to 1% and 1/10 of a minute.

--Available in kit form or assembled and tested.

34G15 Ace Digipace I, assembled \$94.95

34G16 Ace Digipace I, kit 79.95



## ACE R/C

BOX 511, HIGGINSVILLE, MISSOURI 64037

### SHIRT TRANSFERS

Be proud of your hobby! Put some iron-on transfers on your jacket, shirt, or jumpsuit. Works on any cotton or cotton blend material. "R/C Ace" is on a light purple background and looks good on blue, black, and white. It measures about 10" high.

"I Love R/C" is on a warm yellow background and looks best on green, brown, or yellow. It's also about 10" tall.

The Ace R/C logo measures about 4" X 10" and is red in the middle blending to blue. Looks good on red, blue, black, or white.

24K108—"I Love R/C" Shirt Transfer \$1.98  
 24K109—"R/C Ace" Shirt Transfer 1.98  
 24K110—Ace R/C Logo Shirt Transfer 1.49

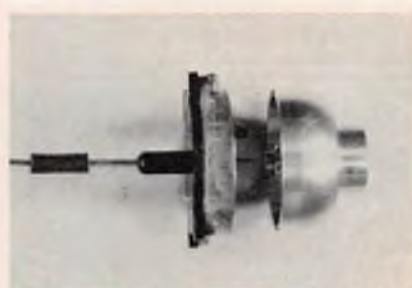


## 1/2A BLEND MODEL ENGINE FUEL

1/2A Blend, from Ace R/C, is specially formulated for use in model engines in the 1/2A or smaller category. It contains a high percent of nitro for strong, consistent performance but not so much that engine life suffers. Such additives as anti-oxidants, igniters, and detergents plus a non-foaming agent and a wetting agent produce a fuel that is perfect for all around use in 1/2A planes, cars, and boats.

Much study and experience went into the development of this top quality fuel which assures you peak performance and long life from your 1/2A engine.

16L440 Ace 1/2A Blend Fuel, 1/2 gal. \$10.95



### REED VALVE ENGINE THROTTLE

This simple, yet ingenious throttle designed by Ralph Cooney of Fourmost Racing Products will fit all Cox rear reed valve .049 engines: the Babe Bee, Golden Bee, Black Widow, and QRC.

It doesn't cut any RPM's off the top end as an exhaust restrictor would and affectively idles the engine down to less than 3000 RPM's—adds only a few grams of weight. Still allows use of a muffler.

50L630—Ace Reed Valve Throttle \$2.50



### STICKY FOAM

Protecting the receiver and battery pack in small airplane installations is always a problem because there is no room for a bunch of foam rubber.

Ace R/C has found a solution with this fairly dense black foam rubber that is only 1/8" thick and has an adhesive backing to adhere to the receiver or battery pack case so minimum room is taken up and yet the components are isolated from vibration and offered some crash protection. Also makes good wing saddle cushion material.

50L330—Ace Sticky Foam \$1.49  
 1/8" X 2" X 36" roll

Please send me your complete catalog. Enclosed is \$1.00 which is refunded on my first order. (Add \$.50 for 1st class mail return; add \$1.00 handling on all other orders.)

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

## ACE R/C, Inc.

BOX 511 B, HIGGINSVILLE, MO. 64037



We've got the wing your looking for

WING

WING'S EXCLUSIVE CUTTING METHOD, DEVELOPED BY SALPH ANDRE, MAKES OUR CORES SUPERIOR TO OTHERS.

WING'S EXCLUSIVE CUTTING METHOD, DEVELOPED BY SALPH ANDRE, MAKES OUR CORES SUPERIOR TO OTHERS.



CUSTOM WINGS CUT—  
FOUR PAIR \$30.00  
SEND TIP & ROOT AIRFOIL ALONG  
WITH FULL SIZE PLAN VIEW OF  
WING. (MAXIMUM WING SPAN 72"—  
MAXIMUM CHORD LENGTH 18").  
ALL CUSTOM WINGS MUST BE PAID  
FOR WITH ORDER.

NOTE: WRITE FOR SPECIAL QUAN-  
TITY DISCOUNTS FOR CLUBS &  
MANUFACTURERS.



1 1/2" RIFLEHAM BLOCKS

1 1/2" Density Virgin Expanded Foam Blocks, 33" x 12" x 5". For Making Wings, Fuselages and Stabs. \$12.00 Ea. 3 for \$30.00

NI Chrome Wire for Foam Cutting. The Same High Resistance Wire We Use for Production. Gives Extremely Smooth Cut — Long Lifetime. 20 Gauge — 15 Ft. Spool \$4.95 Ea.

SEE WING LEADING CHART HEVERT KIT



in stock!

JUST COOKED UP A NEW BATCH OF WINGS & STABS.

MORE NEW WINGS

- BRABBI SUN-FLI \$ 7.95
- SCOOTER (LITE LINE) \$ 7.95
- M.A.N. TRAINER \$10.95
- STERLING LANCER 6L-62 \$12.95
- SGO J-3 CUB CLIPPED \$12.95
- SGO J-3 CUB STANDARD \$13.95
- JACK STAFFORD \$15.95
- ACRO SPORT \$ 7.95
- FLEA FLI-10 \$12.95
- SEQUEL \$12.95
- ROYAL TOM \$12.95
- STERLING J-3 CUB \$ 7.95
- ROMBI F.O. \$12.95
- SGO LIBERTY SPORT \$18.95
- RCM RABBIT BIPE \$18.95
- NORWEST HE 100 \$10.95
- P.C.M. REVENGER \$13.95

MORE NEW STABS

- RCM P.O. STAB \$ 4.75
- TALIBUS STAB \$ 4.75
- FALCON 56 STAB \$ 4.75
- RCM REVENGER STAB \$ 4.75

- | SPORT/TRAINER        |         | SCALE                |         |
|----------------------|---------|----------------------|---------|
| NEW ERA II           | \$ 7.95 | TOP FLITE P-30       | \$12.95 |
| ANDREWS M/M MASTER   | \$ 7.95 | TOP FLITE P-61       | \$13.95 |
| RCM SPORTSTER        | \$ 7.95 | TOP FLITE P-80       | \$12.95 |
| BASIC TRAINER        | \$ 7.95 | WING ZERO            | \$12.95 |
| LOVE MACHINE         | \$ 7.95 | YK CHEERLEADER       | \$13.95 |
| ORION                | \$ 7.95 | ROYAL ZERO           | \$13.95 |
| NORWEST TRI-SQUIRE   | \$ 7.95 | DAVE PLATT T-200     | \$15.95 |
| STERLING CITABRIA    | \$ 7.95 | DAVE PLATT FW-190    | \$16.95 |
| BOX FLY              | \$ 7.95 | MIDWEST CARB. SQUIRE | \$13.95 |
| HEADMASTER           | \$ 7.95 |                      |         |
| J.R. BOSS FLY        | \$ 7.95 |                      |         |
| RCM TRAILER 40       | \$ 7.95 |                      |         |
| TRAINER MASTER       | \$ 7.95 |                      |         |
| QUICKIE 500          | \$ 7.95 |                      |         |
| SUPER KAOS 40        | \$ 7.95 |                      |         |
| LITTLE STICK         | \$ 7.95 |                      |         |
| SWEET STICK          | \$ 7.95 |                      |         |
| LANCER               | \$ 7.95 |                      |         |
| FALCON 18            | \$ 7.95 |                      |         |
| FALCON 56            | \$ 7.95 |                      |         |
| A-RAY                | \$ 7.95 |                      |         |
| M-RAY                | \$ 7.95 |                      |         |
| S/G #0MET            | \$12.95 |                      |         |
| S/G KADET            | \$ 7.95 |                      |         |
| MADE 8               | \$ 7.95 |                      |         |
| SOLO                 | \$ 7.95 |                      |         |
| M.A.N. TRAINER 40    | \$ 7.95 |                      |         |
| SURFITE TCO          | \$ 7.95 |                      |         |
| SPINKE AEROMASTER    | 1.99    |                      |         |
| DEBOLT JENNY         | \$10.95 |                      |         |
| SWEET STICK 600      | \$12.95 |                      |         |
| QUADRO SPORESTRING   | \$ 8.95 |                      |         |
| SID R/CMANDER        | \$12.95 |                      |         |
| TOP FLITE CONTENDER  | \$12.95 |                      |         |
| GAZARIGATOR          | \$12.95 |                      |         |
| RCM TRAINER 50       | \$12.95 |                      |         |
| SPORTMASTER          | \$12.95 |                      |         |
| UGLY STICK           | \$12.95 |                      |         |
| 55 FALCON            | \$12.95 |                      |         |
| STRIKEMASTER         | \$12.95 |                      |         |
| EVILANE 82           | \$10.95 |                      |         |
| J.R. FALCON          | 6.95    |                      |         |
| STERLING RIFMIRE     | 7.95    |                      |         |
| PHIL KRAFT SUPER-ELI | \$12.95 |                      |         |

WING-SKIN ADHESIVES

- These are all fast drying adhesives with excellent bonding strength.
- Super Adhesive \$12.95
- 4 oz. Can for Small Wing \$2.95
- 12 oz. Can for Large Wing \$3.95
- Nano-Stick Adhesive (Brush On) \$3.95
- 16 oz. Can for Large Wing \$3.95

BL-PLANES

- SKYBOLT \$15.95
- ACRO STAR \$15.95
- AEROMASTER \$15.95
- AEROMASTER TOO \$15.95
- RCM WAYFARER \$15.95
- MIDWEST DIT SPECIAL \$15.95
- RCM RODEO \$15.95



CONSTANT QUALITY  
TOTALLY MACHINE CUT  
ENVI

- ADD \$5.00 TO ANY WING AND GET THE FOLLOWING OBTAINING VALUE.
- 50ND BOARD WING SHEETING \$ 5.00
  - GLASS REINFORCEMENT TAPE FOR CENTER SECTION .75
  - ALLERON LINKAGE, BUSHINGS & HORNS 1.40
  - BALSA LEADING & TRAILING EDGES .80
  - PACKAGE OF HINGES 1.20
  - WING NOD D DOWN BOLTS 1.00
  - COPPER CUT OUT WIRE .25

ORDERING

HOW TO ORDER: SPECIFY TYPE OF WING AND SEND CHECK OR MONEY ORDER FOR REQUIRED AMOUNT. ADD \$1.50 PER KIT FOR POSTAGE & HANDLING IN U.S.A.

Good for \$1.00 on \$20.00 Purchase or More. (Ships Overseas Only)

Good for \$1.00 on \$30.00 Purchase or more. (Ships Overseas Only)

OUR SHOWROOM HOURS:  
9 a.m. - 5 p.m. MONDAY THROUGH FRIDAY  
15 MORGAN STREET  
CRYSTAL LAKE, ILLINOIS

SEND \$5.00 FOR COMPLETE PRODUCT CATALOG.

OR PHONE:  
FOR FAST SERVICE—CALL 815/658-0417  
LATE PHONE SERVICE NOW IN EFFECT!

ILLINOIS RESIDENTS ADD 8% SALES TAX.

ADDITIONAL \$.95 HANDLING CHARGE ON C.O.D. ORDERS.

SEND TO:  
WING MANUFACTURING  
P.O. BOX 33  
CRYSTAL LAKE, ILLINOIS 60014



R/C FLYING AND THE LAW

from page 122/69

To operate radio control models without insurance covering your potential liability for personal injury and property damage is utterly foolish. Regardless of how you feel about the value of A.M.A. membership, the one million dollars in "umbrella" insurance

(assuming you have homeowners' or tenants' insurance) or as your primary insurance carrier is a bargain, and, as indicated, is likely to cost more in the future. Without insurance, it is you who are going to have to pay for the cost of your defense including attorneys' fees, court costs and other costs such as expert witnesses, scientific tests and the like. Keep in mind that liability is based upon fault; therefore in any event,

whether you are insured or not insured, you must be at fault to be liable. The failure to behave as a reasonable person operating a radio controlled model would have behaved under the circumstances is the kind of fault we call negligence. Note that in the portion of the complaint reproduced in this article, those were all stating the specific acts of negligence as alleged against that to page 128



SAN ANTONIO HOBBY SHOP

2550 West El Camino Real - Mountain View, California 94040



ARE WE AMERICA'S LARGEST HOBBY SHOP? TRY US!

HUGE R/C DEPT. Airplanes, Cars, Boats, Helicopters, R/C Units Scale Kits, Gliders Engines, Small Parts Galore!

# SAILAIRE

- MACHINE SANDED RIBS
- FIBERGLASS FORWARD FUSELAGE
- ROLLED PLYWOOD TAIL CONE
- ALL HARDWARE
- CONTROL RODS



Wing Span . . . . . 150 in.  
 Wing Area . . . . . 1643 in.<sup>2</sup>  
 Flying Weight . . . . . 5 lbs. to 11 lbs.  
 Lifting Surface . . . . . 1931 in.<sup>2</sup>  
 Airfoil . . . . . Craft-Air—12% flat bottom  
 Wing Loading . . . . . 7 to 15 oz./ft.<sup>2</sup>  
 Surface Loading . . . . . 6 to 13 oz./ft.<sup>2</sup>  
 L/D (estimated) . . . . . over 20:1  
 L/D with spoilers deployed . . . . . 3:1

OVERALL WINNER OF THE  
 1976 SOAR NATS

SP-5 \$129.95

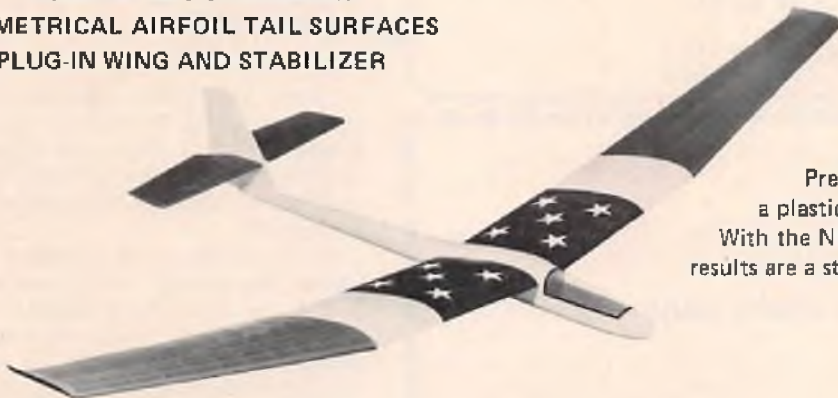
## SAILAIRE IS A SERIALIZED AND REGISTERED SAILPLANE.

Registered Sailable owners have been, and will be, individually contacted by the designer, Tom Williams, to advise them of any new technical developments which result from Craft-Air's on-going development program. This exclusive Craft-Air service is, of course, without charge. Just one more reason why the Sailable is the finest kit ever produced—made for those who care enough to fly the very best.

# Windrifter SD100

- BALANCED RUDDER
- FULL FLYING STABILIZER
- SYMMETRICAL AIRFOIL TAIL SURFACES
- PLUG-IN WING AND STABILIZER

Optional Spoiler Kit  
 SP-325 — \$3.95



Pre-formed, rugged plastic fuselage—made of a plastic new to model aviation: ASA (not ABS). With the NEW INSTA-BUILD assembly method, the results are a stronger, lighter and quicker built fuselage.

*—Not just an occasional win by the  
 supreme effort of a superb pilot!—*

In 1975, 1976, and again in 1977 the Windrifiers took more trophies than any other sailplane.

In 1977 Windrifter SD 100's won three regional grand championships: SC<sup>2</sup> (So. Calif. Soaring Clubs), TS<sup>3</sup> (Tri-State Soaring Society), Great Lakes Soaring League, as well as the AMA NATS (Std. Cl.).

More pilots have won more trophies with Windrifiers than with any other R/C sailplane—ever.

Wing Span . . . . . 99.8 in.  
 Wing Area . . . . . 903 sq. in.  
 Lifting Surface . . . . . 1042 sq. in.  
 Wing Loading\* . . . . . 6.38 oz./ft.<sup>2</sup>  
 Flying Weight\* . . . . . 40 oz.  
 Airfoil . . . . . Craft-Air 11½% flat bottom  
 \*Without ballast. Up to 4 lbs. ballast may be added.

SP-4 \$59.95

*Craft-Air, Inc.*

# are you ashamed of the finish on your model ?



**EDSON has published a 32 page, Full Color, Step by Step method...**

**Written by DAN DE LUCA WINNER OF THE 1976 TOLEDO SHOW**

Send Check or Money Order to:  
**Edson Enterprises Inc.**  
 17 Speer Place  
 Nutley, New Jersey 07110

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_  
 Zip \_\_\_\_\_

**Get your copy NOW \$5.95**

Add 50¢ for postage and handling. N.J. Res. add 5%.

**Edson ENTERPRISES INC.**  
 17 Speer Place  
 Nutley, N.J. 07110  
 (201) 661-2310

If dealer cannot supply you, order direct.



Dunham's EZ Mount Servo, mounting trays and special mounting clips eliminates over tightening grommets; provides proper shock mounting.

5 trays, as shown, fit Cannon CE4, Ace Dunham dual rack and rotary, Royal RS4 and RS5, Orbit PS4, PS6, PS8 and PS9, RS Systems RS4, Kraft KPS 12, Bantam, Mathes, and many others.

**GUARANTEED, EVEN FOR CRASH DAMAGE**

**5 TRAY PACKAGE — \$4.95**

## DUNHAM'S R & R

P.O. BOX 34002  
 1100 N. LAKE HAVASU AVE. SUITE I  
 LAKE HAVASU CITY, ARIZONA 86403

# The Competition Agrees... and Manufacturers Advise;

**Keep your engines clean!... But what a job!!**

- Gets those inaccessible areas 100% clean.
- Totally safe for Perry carbs.
- R/S solution reusable, non-volatile



The **SONI-CLEAN** System

Sonic waves penetrate and float away dirt and grit. No scrubbing necessary; will not harm plastic parts. Even old engines can look like new. Remember, *cleaner runs better, lasts longer!!!*

## Soni-Clean

P.O. Box 322, Port Washington, N.Y. 11050

Enclosed is my check or money order for \$34.95 plus \$2.00 shipping. N.Y. residents add 7% tax.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

only \$**34.95**

R/S solution included  
 Plus \$2.00 shipping

Additional cleaning solution

\$3.25 + \$1.25 shipping

Dealers inquiries invited

## R/C FLYING AND THE LAW

from page 126/69

defendant. Therefore keep two things in mind:

(1) You don't want to be negligent and therefore, in all aspects of your R/C modeling (from building the plane to flying it), you will keep and observe all safety precautions.

(2) Because all of us can (and are) negligent at one time or another, the law allows us to insure ourselves against our own negligence. Only a fool would not be so insured. Keep in mind, however, that this insurance is tied to your reasonable attempt to conform to safe conduct with respect to your models and flying. Don't forget the words in the A.M.A. insurance coverage that state that A.M.A. members receive general liability coverage, "whenever and wherever they operate model planes, boats and cars in accordance with the official A.M.A. safety code." Thus observing the A.M.A. safety code is more than just "being courteous"; it is a **condition** of your insurance.

Let's keep our hobby just that; let's not be the R/C modeler who has to answer charges of negligence and be involved in some horrendous lawsuit.

*Because of this article we are including an A.M.A. Membership coupon on page 115. . . Pat Crews* □

## RADIO SPECTRUM

from page 68/66

airplanes and engines increasing, more and more guys will turn to ignition engines. In fact, I know there are a few flying with self-starters; there is no question but what the big airplanes are impressive.

At the recent Birds Contest, Ron Gilman flew one of the quarter scale Cosmic Winds in both Masters and Stand-Off Scale. I was very much impressed, although he did lack power in the vertical maneuvers. The problem I see is one concerning transportation. You will need a big motorhome or trailer to transport these planes.

### Flite Life Correction

We got quite a few letters pointing out the error in the schematic of the Flite Life that we printed. At first I blamed it on the printer, but I'm not sure that it didn't come in that way and we failed to catch it. It should be obvious that you wouldn't jumper out a resistor and pot, but many people might not know how the circuit should be wired. Figure 6 shows the affected portion of the schematic with error and correction.

to page 130

*PRO-CISION* does it again...  
**VARIABLE SPEED CONTROL  
 RACING!**



1/12 SCALE PORSCHE 935 TURBO

**1/12 SCALE PORSCHE 935 TURBO**

Eliminate the high cost and the mess of gas power! Here's the ultimate in high-speed battery-powered R/C racing! Choose from three Porsches in three different racing configurations. Each with its own frequency for simultaneous racing. Completely assembled. Variable speed, reverse proportional steering with dual-stick transmitters. Trim adjustments for finite control of acceleration and steering. Battery power indicator lights on car and transmitter. Ni-Cad rechargeable batteries recommended for even more power. Plug-in Ni-Cad battery charger optional.



**EXCELLENCE IN RADIO CONTROL**

**PRO-CISION**

**POWER STREAKER.**



1/16 SCALE BMW 3.5 CSL



1/16 SCALE MASERATI BORA

1/16 SCALE BMW 3.5 CSL AND MASERATI BORA. Two different BMW's and two Maseratis...all on separate frequencies...True competitive racing with controlled acceleration. Reverse and proportional steering. Can use Ni-Cad rechargeable batteries.



**The heat warning indicator!**

Hot-Hed takes the guesswork out of engine settings and cowling air flow—A visible heat indicator applied in dots, Hot-Hed changes color when engine gets too hot.

**\$3.00 per half oz. bottle**  
(Comes with instructions)

**FORMICATOR**



Vacuum former for plastics—Easy to make your own cowls, wheel pants, canopies, etc.—Works with home oven and hose type vacuum cleaner.

**\$27.00 for complete kit**

(Instructions for assembly and use included)

**PLASTIC—Bulk Packs**

ABS Plastic Sheets for the Formicator—  
All sheets 8½" x 17"—Packs Only

THICKNESS	PCS. PER PACK	PACK PRICE
.020 (1/50")	30	\$13.00
.030 (1/32")	20	13.00
.045 (3/64")	13	13.00
.060 (1/16")	10	13.00
.090 (3/32")	6	13.00
Assortment Pack (see below)		13.00

Assortment Pack contains: 6-.020/ 4-.030/ 3-.045 2-.060/ and 1-.090 sheets. Any pack \$12.00 when ordered with the Formicator. ALL ABS is white only.

Over 3½ lbs. per pack

**\* ALL U.S. ORDERS SHIPPED POSTPAID SAME DAY RECEIVED**

**\* Send self addressed stamped envelope for further info on products**



**DIRECT ONLY FROM:**

**ID** Idea Development, Inc.  
P.O. Box 7399  
Newark, Delaware 19711

**Trouble getting it together?**

Stik-it! is an adhesive that's moldable, reusable, fuelproof—a million and one uses for field and bench. Won't let go until you want it to. Residue easily removable with lighter fluid.



**\$2.00 per two foot roll**  
(A lifetime supply!)



**HYDRALOCKS**

Hydraulic unit converts air driven retracts to hydraulic operation. Adjustable to give realistic retract speeds—stops gear "sag-out" and landing collapse. Use one for two wheel ships, two for three wheel type planes.

**\$3.00 per unit—2 for \$14.00**  
(Complete instructions included)



**Now... A PVA you can obtain!**

One of the hardest things for the hobbyist to find is PVA—(Polyvinyl Alcohol)—the only suitable mold release for fiberglass and epoxy. A dry PVA that is mixed with water, Kant-Stik is a superior mold release of highest quality.

**\$4.00 per one pint mix**

(Complete instructions for mixing and use)

**RADIO SPECTRUM**

from page 128/66

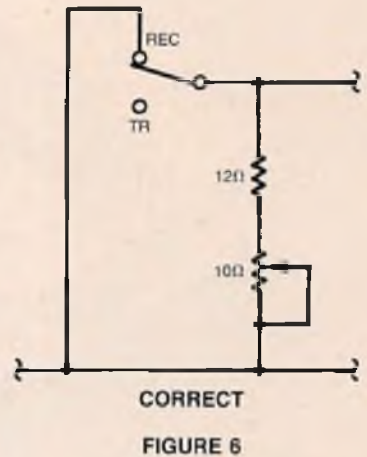
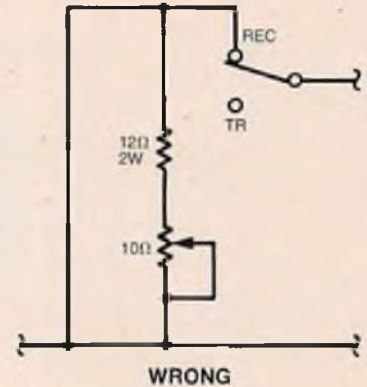


FIGURE 6

James Donovan, Louisville R/C Service Center, 5318 Cynthia Drive, Louisville, Kentucky 40291, offered to help anyone out with any questions on the Triac or Opto Isolators. We keep hearing about new automatic battery cyclers coming out with digital readouts but so far haven't seen any.

to page 132

**SOLO and SAKER: Solution Aeromodel's one-two punch for the beginning and novice R/C flyer.**



**\$46.95 SOLO MK II**

Basic trainer and sport model, builds fast, flies great, has wide 19" track main gear for superb ground handling. **Specifications:** Span 51", length 41", wing area 523 sq. in., weight 3½ to 4½ lbs., engine .20 to .40, airfoil symmetrical, radio required - four channel.



**SAKER \$56.95**

Advanced aerobatic trainer and sport model. Excellent choice for the novice flyer's first low-wing model. The Saker is easy to fly and very stable at all speeds. **Specifications:** Span 51", length 43", wing area 523 sq. in., weight 4 to 5 lbs., engine .29 to .40, airfoil symmetrical, radio required - four channel.

**SOLUTION AEROMODEL CO.**  
2258 Wyoming, NE.  
Albuquerque, N.M. 87112  
(505) 299-3016

DEALER DISTRIBUTOR INQUIRIES INVITED.

**Pactra**  
for a winning finish  
AERO-GLOSS • FORMULA-U  
AERO-POXY • SOLARFILM  
• BALSAWOOD  
• CEMENTS

7060 HOLLYWOOD BLVD., LOS ANGELES, CA 90028

# R/C MODELER MAGAZINE'S MODEL OF THE MONTH CONTEST

The Model of the Month Award Program is designed to encourage the sport and novice competition flier to submit details of his most recent kit or scratch-built model to RCM in order to encourage general model craftsmanship and the overall promotion of R/C flying.

Each month R/C Modeler Magazine will award a 371 Variable Speed Moto-Tool as illustrated in the photograph. The second and third place winners each month will receive a one year subscription to R/C Modeler Magazine or, if they are a subscriber, an extension of their current subscription.

**you could win . . .**  
**A NEW**  
**371 VARIABLE SPEED**  
**MOTO-TOOL**



FROM  
**DREMEL**<sup>®</sup>  
CREATIVE POWER TOOLS  
DREMEL MANUFACTURING CO.,  
4915 21ST STREET, RACINE, WI 53406

*Match the Speed to the job.  
5,000-25,000 rpm. Dial-A-Speed in a kit puts you in complete control of any project . . . grinding, carving, drilling, sanding, buffing, sawing, deburring, routing, polishing, engraving, sharpening, shaping . . . doing hundreds of crafts, hobby and do-it-yourself projects more precisely.*



## JULY WINNERS

### SECOND PLACE

**SAMLYLE**  
Gisborne, New Zealand

Scratch built original design model called "Echo". Sport pattern aircraft with 50" span and 42" length. Powered with a K & B .40 RR turning a ducted reverse pitch prop. Total weight is 87 ounces and controlled by a Heath five channel.



### FIRST PLACE

**GENE A. TUCKER**  
Albemarle, North Carolina

Scratch built Hercules C-130 transport painted with Perfect Paint to match North Carolina Air National Guard. Fuselage carved from styrofoam, covered with fiberglass cloth and then foam removed. Foam tail & built up wing. Powered by 4 O.S. Max. 25's. Span 70", length 51". Uses an EK Super Pro for controls including flaps.



### THIRD PLACE

**C. MISIEWICZ**  
Encinitas, California

Scratch built Zoegling from RCM plans. Covered with red and yellow MonoKote, with POD and fuselage painted with "Handyman" quick dry enamel. Wing span 73", weight 47 ounces. Radio is Kraft with KPS servos.

## RULES

### A. Model Aircraft Origin

- Any kit—wood, fiberglass, foam, or ARF kit is eligible. Any scratch-built aircraft built from magazine or original plans is also eligible.

### B. Category

- All types of radio controlled airplane models.
  - Scale
  - Pattern
  - Racing
  - Fun-To-Fly
  - Original Design

### C. Entrants to submit:

- Color photo or slide, size 35 millimeter or larger.
- Black and white glossy photos (any size) of both sides, top, rear, front, and bottom views.
- Close-up photos may be submitted on detail work if desired.
- A short write-up giving dimensions, weight, power, radio, etc.
- A statement that:
  - The submitter was the sole builder of the model.
  - Parts and/or accessories used were part of the kit or available to all modelers at retail outlets.
  - All non-available or special parts were built by the hands of the submitter.

### D. Judging will be on:

- Workmanship
- Quality of finish
- Attention to detail
- Subject of model or difficulty of the project will count in judging.

### E. Judging will be done by RCM Editors Don Dewey and Pat Crews.

### F. Persons not eligible

- Members and employees of RCM or any other model airplane publication.

### 2. Members and direct or indirect employees of Dremel Manufacturing Co.

- Members and employees of any manufacturer of hobby kits, hardware or supplies.
- Anyone engaged in the wholesale or retail distribution of hobby kits, hardware or supplies as a major source of income.

### G. Models not eligible for submittal are:

- Models that have been submitted for judging of workmanship at any major AMA sanctioned contest and have placed 1st, 2nd, or 3rd in that judging. Flying points as a final standing do not apply.
- Models that have been built for display purposes only.
- Models that have been built for manufacturers demonstration purposes.
- Models that have won a similar award in another publication.

### H. Entrants who have models that qualify under these conditions are eligible to enter. Included with the entry should be the entrant's AMA and FCC numbers, and also, the name of his club, if any.

### I. Prize Information:

- A Dremel 371 Variable Speed Moto-Tool will be awarded to the monthly winner. An illustration and description of the kit will be included each month along with the winner's name, address, club, etc. The second and third place runners-up will be awarded a one year subscription to R/C Modeler Magazine.
- Dremel Manufacturing Co. of Racine, Wisconsin will be notified of the monthly winner immediately after a decision is reached by the judges so that the kit award can be received by the winner prior to the issue of that month's RCM.

### J. General:

- All contest entries must be addressed to RCM Model of the Month Award Program, R/C Modeler Magazine, P.O. Box 487, Sierra Madre, California 91024.
- All photographs and materials submitted by the contestant will become the property of R/C Modeler Magazine and none will be acknowledged or returned.

This contest will be null and void in any state or locality where specifically prohibited by law.

# World's Finest Unit is backed by the World's Finest Service

- ALABAMA**  
Kraft Souffless!  
(Bill Johnston)  
456 East Main Street  
Prattville, Alabama 36067  
Phone: (205) 363-0813
- ALASKA**  
Arctic R/C  
(Darrin Vonken)  
3112 Seward Road  
Anchorage, Alaska 99501  
Phone: (907) 277-3733
- ARIZONA**  
Kohlsman Co.  
(Dennis Kohlsman)  
8213 N. 29th Avenue  
Phoenix, Arizona 85021  
Phone: (602) 955-8299
- CALIFORNIA**  
Kraft Orange County  
(George Kriese)  
2817E Lincoln Ave.  
Anaheim, Calif. 92806  
Phone: (714) 630-5061
- RCS Engineering  
(Larry Pullen)  
11015 Farnway  
Sun Valley, California 91352  
Phone: (213) 768-1519
- R. C. S. M. R.  
(Mr. John Heaver)  
7803 Haslins Avenue  
Redwood City, Calif. 94061
- L. R. Taylor and Company  
10711 Baile Avenue  
Chatsworth, Calif. 91311  
Phone: (213) 360-1178  
(213) 363-3778
- COLORADO**  
Kraft Rocky Mountain  
(Ira Y. Spang)  
P. O. Box 9919  
Colorado Springs, Colorado 80937  
Phone: (303) 581-2621
- IOM THUMB R/C SERVICE**  
(Lloyd A. Nicholson)  
7020 E. Collins Avenue  
Denver, Colorado 80220  
Phone: (303) 355-0847
- FLORIDA**  
Comtel Engineering  
(Dante Birch)  
P. O. Box 2608  
350 Thyme Street  
Sealight Beach, Florida 32937  
Phone: (305) 773-4218
- ILLINOIS**  
Midwest Model Supply Co.  
6429 W. 59th St.  
Chicago, Illinois 60638  
Phone: (312) 566-7101
- R. C. Avonics  
(Ray Karczynski)  
14 Andy Court  
Plainfield, Illinois 60544  
Phone: (815) 436-7808
- KANSAS**  
R. C. Electronics Repair Center  
(Loren Toppelas - Mike Murray)  
5471 E. Kelllogg  
Wichita, Kansas 67218
- LOUISIANA**  
Alan's Repair Station  
(Alan McCall)  
2303 Westlake Street  
New Orleans, Louisiana 70122  
Phone: (504) 843-1354
- MARYLAND**  
J. & L. Electronics  
(Joni Lawrence)  
12335 Woodstock Drive East  
Upper Marlboro,  
Maryland 20687  
Phone: (301) 627-4520
- MASSACHUSETTS**  
G. G. Electronics  
(Gary Garabian)  
497 Central Avenue  
Boston, Massachusetts 02771  
Phone: (617) 781-0288
- MICHIGAN**  
Kraft Midwest  
(Patric Waters)  
3129B Kendall  
Livonia, Michigan 48154  
Phone: (313) 425-6414
- MONTANA**  
Wenmar Electronics  
(Steve Marquis)  
2116 Missoula #2  
Helena, Montana 59601  
Phone: (406) 442-2395
- NEW JERSEY**  
Kraft Northeast  
(Toby Bonelli)  
200 Park Avenue  
Emerson, New Jersey 07630  
Phone: (201) 261-4736
- NORTH CAROLINA**  
Kraft Carolina  
(Marshall Sanderson - Clyde Long)  
3410 Baugh Street  
Raleigh, North Carolina 27604  
Phone: (919) 876-8479, 781-3532
- OHIO**  
Kraft Great Lakes  
(Jack Yarger)  
8787 Weller Road  
P. O. Box 2482  
North Canton, Ohio 44720  
Phone: (216) 499-8310
- TEXAS**  
Kraft Greater Southwest  
(Dwayne Brown)  
930 Vincennes Lane  
Richardson, Texas 75080  
Phone: (214) 231-6942
- Southwest R/C  
(Mike Negri)  
5800 30th Street  
Lubbock, Texas 79407
- Roddy's Electronic Service  
(R. B. Roddy)  
221 Grandpaw  
Corpus Christi, Texas 78404
- WASHINGTON**  
Quick Electronics  
(Don J. Loran)  
4314 136th Place SE  
Bellevue, Washington 98006  
Phone: (206) 748-3435
- PUERTO RICO**  
Servicio Elctronico  
(Carlos J. DeLeon)  
P. O. Box 7852  
Ponce, Puerto Rico 00731  
Phone: (809) 840-6878
- AUSTRALIA**  
Kraft Systems Australia  
(Larry Aquino)  
97 Glyn Street  
Belmont Victoria 3216 Australia
- AUSTRIA**  
Burdon 50  
A-4812 Pöndorf  
Austria
- CANADA**  
Dwight's Radio Control  
(Ken DeHoff)  
504-213, West Hill, Ontario  
M1E 2P9, Canada  
Phone: (416) 283-8314
- Manico Electronics, Ltd.  
(Tony Bryant)  
1118 Wall Street  
Winnipeg, Manitoba R3E 2S1  
Canada  
Phone: (204) 783-5408
- Norburn Model Aircraft Supply  
(Ms. L. Eckerley)  
5801 East Broadway  
No. 4 Parkcrest Shopping Plaza  
Burnaby 2, B. C., Canada
- Radiocraft  
(Sean Sarkas)  
4567 Beaulieu St.  
Montreal 408, Canada
- Walter Chikmoroff  
5031 Remickham Road N.W.  
Calgary, Alberta T2K 2P8  
Canada
- Calgary Hobby  
(Ken Smith)  
Postal Box 8 - Box 3173  
Calgary, Alberta  
Canada  
Phone: (403) 237-4664
- Creative Hobbycraft Stores Ltd.  
(W. R. Petch)  
43 Sixth Street  
New Westminster, B. C.  
Canada  
Phone: (604) 532-8511
- CENTRAL AMERICA**  
Dr. Julio Quevedo  
Clinica Del Centro Medico  
5a Av. 3-69, Zona 10, 99 Pinar  
Ciudad de Guatemala  
Guatemala
- Engineers Asociada  
(Mr. Ricardo G. Fox)  
Apartado Postal 587  
Tegucigalpa, D. C.  
Honduras
- DENMARK**  
Dan Modeler  
(J. Petersen)  
Arensholmvej 28  
DK-3650 Deltaparken  
Denmark
- ENGLAND**  
Gault Franklin  
98 Grainger Street  
Leicester, England
- GREECE**  
Hellenic Scientific  
Representations Ltd.  
(P. Savvas)  
10, Nymphos Str. and Iliada  
Athens, Greece
- HONG KONG**  
C. K. Tsai  
P. O. Box 1622  
Kowloon Central Post Office  
Hong Kong  
Phone: 3-726726
- ITALY**  
Integracchi S.r.l.  
00177 Roma  
Via Digaiano d' Istria 49/A  
Italy  
Phone: 27-13240 - 041811
- G. Di Modugno  
(Mr. Giuseppe Vignocchi)  
Via Galileo Galilei  
54100 Massa  
Italy
- JAPAN**  
Kato Model Aircraft Co., Ltd.  
No. 8-1, 2-chome, Esako-cho  
Saita, Osaka 584 Japan  
Phone: (06) 584-2634
- Sankyo Radicon Factory  
No. 19, Ohara-cho  
11abashi-ku, Tokyo, Japan  
Phone: (03) 980-7466
- MEXICO**  
Enrique Noguera Coronado  
Apdo. Post. 35 088  
Mexico 9, D. F.  
Mexico
- NEW ZEALAND**  
Kraft Systems N.Z.  
(Don Pitt)  
P. O. Box 4254  
35 Garthwood Road  
Hemilton, New Zealand  
Phone: 69 289
- PORTUGAL**  
Carla Vigante  
Rua Cidade Cadiz Ille 4.0° esq  
Lisboa 4, Portugal
- SOUTH AFRICA**  
Redipak (Pty) Ltd.  
Box 10095  
Johannesburg,  
South Africa
- Fun's Games  
(Mr. Gerry Levy)  
Flora Centre  
Onkavars Road  
Florida North  
Roodenap 1725  
Republic of South Africa
- SOUTH AMERICA**  
Antonio Baptista Rincon  
Calle 78 No. 12-77  
"Quinta Grande"  
Maracibo, Venezuela  
South America  
Phone: (061) 518-072
- Electronic Ltd.  
Carrera 688 No. 12-41  
P. O. Box 90, 671  
Bogota D. E. Colombia  
South America
- SINGAPORE**  
ECHO-SIDUES COMPANY  
(G. Kalidas)  
27 Mayflower Road  
Singapore 20
- SWEDEN**  
R/C Service  
(Bore Jonsson)  
Lavsödelagsgatan 30  
58258 Lidköping, Sweden
- Hobby Bergen AB  
(Bjorn Kronblad)  
Hantverkargatan 87  
Box 12102  
107 23 Stockholm  
Sweden
- SWITZERLAND**  
R/C Electronics A.G.  
(Rolf Jaeger, Josef Schuppert)  
Nemes Probststrasse 1  
Postfach  
8600 Dueschard  
Switzerland
- WEST GERMANY**  
M. Lichtblau  
Kraft Service Deutschland  
5 Köln 90, Alte Heide 28  
West Germany

FOR YOUR CONVENIENCE, WARRANTY AND NON-WARRANTY REPAIRS MAY BE PERFORMED AT THE ABOVE SERVICE STATIONS  
**KRAFT SYSTEMS, INC.**  
 Manufacturer of the World's Finest Proportional R/C Equipment  
 P. O. BOX 1268, 450 WEST CALIFORNIA AVENUE  
 VISTA, CALIFORNIA 92083 (714) 724-7146

## RADIO SPECTRUM

from page 130/66



We got kind of long winded talking about gel cells this month, but before we close, I had to mention a letter I got from Cathy Kay of Bishop Garcia Diego High School in Santa Barbara, California. She

started . . .  
*Dear Mr. Oddino,*  
*Since I am taking algebra, my dad gave me your problem to work. After much thought here is my answer:*  
 She proceeded to very logically set up the equations and solve the problem including the proper answer. (See May 1978 issue for problem and answer.) I was naturally impressed and thought I might pass on some words of wisdom to other young people who might come

across this column. I sat in a division staff meeting the other day when our chief scientist, who also leads our recruiting team, talked about prospects from the June graduating classes, at such places as Cal Tech, MIT, etc.  
 You'd think it was the Dallas Cowboys or Milwaukee Bucks getting ready for the annual draft. And just like in sports, statistics are important, so work for those good grades. People entering  
 to page 134



### ATTENTION RC GLIDER ENTHUSIASTS

Is your investment being held together by a rubber band? Tired of getting your wings dirty, scratched or even damaged while transporting them? **GBS Enterprises** has the answer: **Wing Sox**! The custom fit washable polyester transport bags are tailored for your wings. They come with stabilizer pockets for removable struts and a convenient shoulder strap so you can free your hands to do other things.

Wing Sox will accommodate any of these kits: Aquila • Olympic II • ASW 15 ASW 17 • Monterey • Super Monterey • Californian • Centurion II • Cirrus Libelle • Midwest Hawk 8" • Hobie Hawk 10" • Paragon • 970 • Sailaire Windriffer • SD-100 • Butterfly II • Viking Mark I • Viking Mark II • Windfree • Wanderer 72 • Wanderer 99 • SB-10

Wing Sox come in five (5) bright colors: **Red, Royal Blue, Yellow, Orange & Black.**

Order your **Wing Sox** today, mail in your check and order blank right now!!  
 Send it, before your rubber band breaks!!!

Wing \_\_\_\_\_ Color \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Card #

Exp. Date \_\_\_\_\_ Signature \_\_\_\_\_

Check ( ) MasterCard ( ) Visa ( ) B of A ( ) cards accepted.

**\$19.95**  
 California Residents Add 6% Sales Tax.  
 Postage is Pre-Paid

**GBS ENTERPRISES**  
 P.O. Box 1701  
 Burbank, Ca. 91507



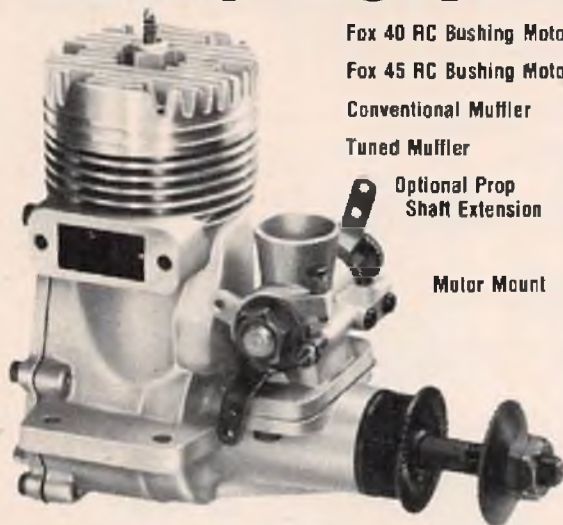
**HARDWARE**  
and  
**KITS** for r/c sailing

Mail order only, no dealers or distributors. For illustrated brochures describing all of our model yacht products, send \$1.00.

**Vortex Model Engineering**  
Department RCM  
210 East Ortega Street  
Santa Barbara, CA 93101



# Schneurle Power At Baffle Motor Prices



Fox 40 RC Bushing Motor	#24000	45.95
Fox 45 RC Bushing Motor	#24500	51.95
Conventional Muffler	#90223	7.95
Tuned Muffler	#90302	19.95
Optional Prop Shaft Extension	#90412 (1/2")	2.50
	#90413 (3/4")	2.50
Motor Mount	#50404	4.50

## Improvements For 1978

- Restyled Exterior with turned fins and glass bead casting finish.
- Steel Thrust Washer Standard Equipment.
- Smaller Carb Venturi Diameter for improved carb suction.
- Lighter weight mehanite piston for Fox 40 - Aluminum piston for Fox 45 - Both models run smoother and easier on plugs than older models.
- Improved head configuration improves power output.
- New conventional muffler available.

## Great Motors And Fox Backup Services Too!

- The new Fox Conventional muffler bolts on perfectly and fits most other models without alteration.
- If you fly Lanier type A.R.F., the Fox 45 will handle them easily - with the lighter engine the airplane balances better and the smooth new 45 is lots easier on the structure than any 60's.
- If you fly the ugly stick-sweet stick built up sport type models the new Fox 40 or 45 bushing motor offers you a degree of performance, reliability and economy that will be a pleasant surprise. Try it - you will like it.
- \$350,000 stock of parts to draw from - 99% of our phone orders are filled the same day.
- Partial crash insurance - any Fox Motor will be completely re-built, no matter how bad the crash, at a cost not exceeding 60% of a new motor.
- Free Advice - All phone calls for help are given top priority in our shop. Mr. Fox likes to take "trouble calls" whenever he can, otherwise one of our service specialists is always available.

## Fox Manufacturing

### Fox Model Airplane Products

5405 Towson  
Fort Smith, Arkansas 72901  
Phone 501-646-1656

## STAND-OFF SCALE CONTEST

JULY 16, 1978 — 8:00 a.m.

Samuel East Park; Mesquite, Texas (Hwy 80 and Beltline — East of Dallas)

Sponsored by: **The Dallas R/C Club**

★Sport Scale — AMA Rules    ★Non-Builder of Model Event  
Judges (static) are members of the Int'l Plastic Model Assoc.  
Sanction #230

For Further Information, Contact: **C.D. Buddy Irwin, (214) 223-7838**

## RADIO SPECTRUM

from page 132/66

engineering and science careers won't get the publicity that Tony Dorsett and Marques Johnson get in the sports pages, but believe me the real superstars in any field get recognized early on. Dorsett didn't decide to become a football star after he got to college, and probably wouldn't have made it if he had waited that long. So, if you want to be a superstar in any profession, start today. Especially those interested in radio, electronics, aerodynamics, engines, servos, etc., and don't forget your old friends in R/C when you are making technological breakthroughs. See you in the winner's circle, Cathy. □

## MISS GRANDIN

from page 61/56

begins. Since the taper portion of the wing is thinner, the excess L.E. material must be removed with razor plane, and sand to shape with sand block. Sand entire wing lightly with 400A sandpaper. This is the appropriate time to cut the ailerons free from the wing while it is still held secure in the jig. Once removed from wing, complete aileron 100% at this time to prevent chances of warping. Cap each end of the aileron with 1/8" sheet, after adding 3/16" sheet hinge support doubler blocks as well as 1/8" ply aileron horn support. Remove the wing from the jig. It's a long "son of a gun", so watch out for hangar crashes!

Add 3/32" ply float strut supporting plates. Glue reinforcing triangular gusset material and install float strut. Insure 45 degree angle on float strut; cut as shown. Also provide a generous horizontal slot, 1/8" x 1/4", at the precise location for the aileron bellcrank push wire before gluing float strut in place. Apply 3/32" sheeting around float strut as per plan.

The aileron bellcrank 3/32" ply platform can be installed now, as well as the bellcrank and the push wire from servo and clevis rod to aileron horn. Apply 3/32" balsa sheet around exit of rod to aileron horn; add tip blocks and wing structure is complete.

**Completion of Hull:** Install 1/8" balsa stab seat doubler to inside of hull on both sides. Glue top frame 1/8" x 1/4" top horizontal cross members to each frame station. Glue 1/8" x 1" ply cross supports for elevator and rudder Gold'N-Rod push tube housings. Cut slots for exits of push tube housings, and epoxy push tube housings in place.

to page 136

# MS READ-a-thon— a simple way to start youngsters reading.

The MS READ-a-thon is a nationwide reading program for boys and girls 6 to 14. That alone is a commendable project, yet it has another purpose, too: to raise money to help find a cure for multiple sclerosis.

How does it work? Young people who register are called “Mystery Sleuths” — enrolled in the search to solve the mystery of MS. Mystery Sleuths read books for their own pleasure. At the same time they ask relatives and friends to give them a donation — ten cents, a quarter, a dollar or more — for every book they read, which provides funding for MS research and patient services.



To date, over 4 million children have participated. More than 11 million books have been read, which has produced over 11 million dollars for the MS cause. The youngsters themselves get two important rewards — the enjoyment of reading, and the satisfaction that comes from helping others.

Originated and developed by the National Multiple Sclerosis Society, the MS READ-a-thon is supervised by local MS chapters in conjunction with local schools. It has the support of the U.S. Office of Education and the International Reading Association who consider the program to have unusual educational and social value.

If you're a parent or educator and would like to help, you can start an MS READ-a-thon for youngsters in your area. Just call your school or local MS chapter, or call toll-free (800) 243-6000.

## Kids can help, too!

National Multiple Sclerosis Society, 205 East 42nd St., N.Y., N.Y. 10017

## "COMPARE PRICES"

2 Channel Single Stick				3 Channel Dual Stick				5 Channel Single Stick			
LIST	OUR PRICE	SERVO	NICARD	LIST	OUR PRICE	SERVO	NICARD	LIST	OUR PRICE	SERVO	NICARD
Cox 8022	139.95	93	2 no	Cox 8033	229.95	148	3 yes	Logitrol LRB 1-5	310.00	197	4 Rx only
Logitrol Nimbus	135.00	99	2 no	4 Channel				6 Channel			
Cox 8020	99.95	72	2 no	Cox 8040	299.95	189	4 yes	Cox 8060	369.95	230	4 yes
Futaba FP-2GA	109.95	76	2 no	Futaba FP-4FN	299.95	190	4 yes	Futaba FP-6FN	359.95	227	4 yes
Futaba FP-2E	139.95	93	2 no	Futaba FP-4FN S17	269.95	175	4 yes	7 Channel Dual Stick			
2 Channel Wheel				Logitrol Nimbus	309.00	189	4 yes	Futaba FP-7G	579.95	392	4 yes
Cox 8021	139.95	93	2 no	5 Channel Dual Stick				Logitrol Super Pro	419.95	253	4 yes
Futaba FP-2F	139.95	93	2 no	Futaba FP-5FN	349.95	217	4 yes	7 Channel Single Stick			
3 Channel Single Stick				Logitrol LRB 2-5	285.00	179	4 Rx only	Logitrol Super Pro	440.95	270	4 yes
Cox 8031	159.95	104	2 no	Logitrol Champion	369.95	230	4 yes				
Futaba FP-3F	179.95	118	2 no								
Futaba FP-3FN	199.95	131	2 yes								
Logitrol LRB-3	159.00	104	3 no								
Logitrol Ranger	179.00	113	3 no								

MASTERCHARGE  
and  
VISA welcome

Call for fast CREDIT CARD service or send payment  
including \$2.00 postage, handling and insurance...  
Kentucky residents add 5% sales tax.

B. D. Hobby Warehouse  
1128 Orchard Avenue  
Louisville, Ky. 40213  
phone (502)968-9467

### MISS GRANDIN

from page 134/56

Make a template of the horizontal stabilizer seat and cut out top edge of hull sides to a zero degrees incidence fit. Sand as necessary for good fit. Hold stab in place and check for tilt. If okay, glue with epoxy and nail with several straight pins. Add 1/16" plywood doublers for rear wing dowels. Close in top of hull by gluing 1/8" balsa sheeting, with grain running crossways, from the trailing edge of the wing to the leading edge of the horizontal stabilizer. Align and glue the vertical stabilizer with the dorsal fin in place.

**This step is optional:** On all of my seaplanes, I cut strips of full scale aircraft fabric reinforcing tape cut 1" wide with pinking shears, to the appropriate length and glue this with Duco cement into the 90 degree areas formed by the vertical stab and the top of the horizontal stab; also the bottom of the horizontal stab to the side of the hull.

Taper to a point at both ends. This gives tremendous strength to the tail structure and prevents dope from bridging.

In the cabin area, use 1/4" sheet balsa for framing seat which receives 1/16" plywood watertight hatch cover. Note side pieces have slight curvature. Fabricate hatch cover from 1/16" ply, sand to close fit around perimeter. Glue 3/32" x 3/8" balsa stiffeners as shown. With hatch cover in position, drill 12 holes with 7/64" drill through hatch cover and 1/4" balsa seat. Remove cover and install 3-48 blind nuts with epoxy to bottom of hatch cover seat.

Make the servo, battery and receiver equipment board of 3/32" plywood. The board is 3" wide with a 2" tongue cut 3/4" back from the front edge. Epoxy a piece of maple motor mount stock 3/8" x 1/2" x 1 1/2" to back side of plywood frame F-5 after installing a 6-32 blind nut to bottom of block, as shown on the plans. This anchors rear end of equipment board. Mount trapezoid shaped 1/4" x 3/8" servo rails. Install piano wire hooks as shown to secure battery pack and receiver.

In order to permit easy installation and

removal of the equipment board, piano wire pushrods can be disconnected at the idler arm in the cabin and left attached to the servo. Plans show details of idler arms. Horizontal spacing between idler arms is maintained by cutting proper length spacers from 3/16" red Gold'N-Rod cable housing and slipping them over 1/8" piano wire axle for idler arms. Idler arm maple bearing blocks are then epoxied to the side frames of 6B then bolted with 2-56 screws. Make sure the holes for the 2-56 screws are drilled before gluing in place. Install switch harness and extension plugs for wing servos. Final alignment check: Before applying covering, now is the time to make that all important decalage check. Set hull in cradle. Strap on wing with several rubber bands. Slide hull forward or aft to set horizontal stabilizer at zero degrees incidence as referenced from a level table top. Once you have the same ruler measurement from the table top to the center of the stab leading and trailing edge, do not disturb the hull as you check the wing incidence for zero degrees also.

to page 141



## THESE TWO ELECTRONIC THROTTLES GIVE FULL SPEED CONTROL OF YOUR ELECTRIC MODEL...

These are the world's most advanced solid-state motor speed controls for electric-powered cars, boats, planes. They eliminate servos, cumbersome rheostats and micro-switches. Plug into receiver throttle connector. Unique "Unidrive" circuitry.

\*Pat. pend.



**Electronic Throttle Model ET-3**

Model ET-3 is the highest efficiency, fully proportional forward speed control. Controls Astrolight 02 thru 25, Dumas and Kroker motors and others rated 4.8-36V, 20 amps max. Works with positive or negative pulse receivers. No adjustments required. Extends flight time by as much as 300%. Same size and weight as a servo.

**Price \$43.95**



**Reversing Electronic Throttle Model RET-4**

Gives fully proportional forward and reverse control from only one channel. Controls Astroflight 05 & 10, Dumas, Vantec IM-4 and others rated 3.6-12VDC, 10 amps max. Compatible with all 1/12-scale electric cars.

**Price \$58.95**

**NO RISK 21-day trial.** If you are not **COMPLETELY SATISFIED**, we will immediately **BUY BACK** any items you purchase! Send check, money order or C.O.D. We pay postage. Or call our order taker right now: (213) 780-3020.

Send me my:  
 ET-3 \$43.95  RET-4 \$58.95

I enclose \$\_\_\_\_\_

(Calif. res. add 6%)

NAME \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

MOTOR \_\_\_\_\_

R/C EQUIP. \_\_\_\_\_

**VANTEC**

8070 Langdon Ave.  
Van Nuys, CA 91406

# NOW OUR COMPETITION WILL HAVE TO OFFER THEIR APOLOGIES IF YOU WANT A FOUR CHANNEL FOR \$169.99

**Hobby Shack**  
**aero sport**  
**4 channel**  
**4 Servo, All Ni-Cad**

- FULL NI-CAD SYSTEM WITH DUAL CHARGERS
- TRIPLE TUNED FRONT END RECEIVER
- 4—NS-ICR SERVOS

Order By Mail Or Call Us!  
**Hobby Shack**  
18480 BANDILIER CIRCLE  
FOUNTAIN VALLEY,  
CALIF. 92708

**\$169.99**

Add \$3.00 postage & handling. Calif. residents add 6% state sales tax.

**CHARGE-IT!**



Area 714  
963-9881



**First Class Quality  
At Real Economy Prices!**

# ★ Standard Hobby Supply ★

★ P.O. BOX 113 ★ DEPT RC ★ MAHWAH, N.J. 07430 ★

## AIRTRONICS

### S-TEE



36" Wing Span  
Req. .049 Eng.

**\$14.99**

w/ Cox TD .051 Eng. .... 28.99  
w/ Cox TD .051 Eng. & 2 ch. R/C(8020) 93.99

## Top Flite FRESHMAN TRAINER



Kit #RC - 20

**\$27.99**

Wing span: 48"  
Area: 504 sq. inches  
Engine Size: .29 to .40



## CESSNA CENTURION

1/2A READY TO FLY  
w/ 2 Ch. RADIO\*



36" Wing Span  
\*No. 8020 Set

**\$109.99**

Plane & Engine (w/o radio) ..... 40.99

## COX/SANWA

### 3 Channel

COMPLETE WITH:  
• 3 Micro Servos  
• Nicads & Charger



**Sale \$139.99**

### 6 Channel

COMPLETE WITH  
• 4 Servos  
• Nicads & Charger



**Sale \$209.99**

## dumas

### ATLAS VAN LINES U-1



36" Length  
16" Beam

**\$29.99**

Running Hardware Kit (2328) ..... 29.99

**BOTH FOR \$56.99**



Includes many more  
popular lines and all  
at low prices.

## WRITE FOR OUR CATALOG LISTING

Latest edition sent  
with every order.

Send no. 10 self-addressed  
envelope with 24¢ in stamps  
or coins.



### A REVOLUTION IN ADHESIVES "HOT STUFF"

1/2 oz. .... 2.35  
2 oz. .... 7.99  
4 oz. .... 14.99  
Blue Line 1/2 oz. 2.99  
Extra tubing (pkg.) .50

## DREMEL

MODEL 271 KIT .....	30.99	MODEL 381 KIT .....	43.99
MODEL 281 KIT .....	37.99	MODEL 219 Speed control ..	15.95
MODEL 371 KIT .....	37.99	MODEL 210 Drill press stand	15.95

### ENGINES & MUFFLERS

<b>K &amp; B</b>		<b>O.S. MAX</b>	
6525 61 R/C w/muffler ....	55.99	10 R/C schneurle w/muffler	24.76
6535 61 R/C w/muffl & pump	71.49	15 R/C w/muffler .....	30.36
7861 35 R/C .....	24.49	20 R/C w/muffler .....	31.96
8011 40 R/C .....	45.99	25 R/C w/muffler .....	33.56
8360 40 R/C w/ pump .....	60.49	25 R/C schneurle w/muffler	46.36
8380 3.5cc plane w/muffler ..	42.99	30 R/C w/muffler .....	38.36
		35 R/C w/muffler .....	39.96
		40 R/C w/muffler .....	54.99
		40 R/C schneurle w/muffler	65.99
		60 R/C schneurle w/muffler	89.99
		60 R/C schn. w/muffl & pump	110.99
		<b>COX</b>	
		120 Golden Bee .049 .....	9.30
		150 Black Widow .049 .....	9.75
		170 Tee Dee .049 .....	14.65
		200 Tee Dee .051 .....	14.65
		210 Tee Dee .09 .....	17.45
		<b>COX W/THROTTLE</b>	
		120-1 Golden Bee .049 .....	10.45
		220-1 Medallion .15 .....	19.95
		230-1 Medallion .09 .....	15.95
		240-1 Medallion .049 .....	13.25
		<b>TATONE MUFFLERS</b>	
		"columet" mufflers	
		EM-4 .09 to .19 .....	5.20
		EM-5 .29 to .40 .....	6.60
		EM-6 .45 to .80 .....	6.90
		300-A For all current .049 ..	4.49
		300-B For Cox TD .051 .....	4.49

### FOX

21600 15 R/C schneurle ...	24.47
21698 15 R/C schneurle 2BB	36.99
21900 19 R/C .....	22.37
22500 25 R/C .....	22.37
22900 29 R/C .....	24.47
23600 36 R/C .....	24.47
24000 40 R/C schneurle ...	29.99
24100 40 R/C schneurle BB.	42.99
24500 45 R/C schneurle ...	33.99
24600 45 R/C schneurle BB.	42.99
26099 Eagle (60 R/C) .....	42.99
26199 Hawk (60 R/C) .....	53.99

### FOX MUFFLERS

90212 Up to .15 .....	4.76
90222 .19 to .36 .....	6.36
90232 .60 .....	7.96
90242 .15 schneurle .....	4.76
90252 .40 to .45 schneurle ..	6.36
90301 .15 - tuned muffler .....	12.76
90302 .29 to .45-tuned muf.	14.96
90303 .60 - tuned muffler .....	18.71

## X-ACTO

No. 5082

Knife set w/ case  
(includes 3 knives  
& osstd. blades).



**\$4.29**

## MILLER SPRAY SET

#2017

• 12' hose

• Shading brush kit

• Spray gun w/pt. jars **\$44.99**



## DU BRO

KWIK GLOW  
Engine Card Set

**SALE \$1.50**



### LOW BOUNCE WHEELS:

175R 1 1/2" dia.	pair ..	1.90
200R 2" dia.	pair ..	2.10
225R 2 1/4" dia.	pair ..	2.25
250R 2 1/2" dia.	pair ..	2.40
275R 2 3/4" dia.	pair ..	2.55
300R 3" dia.	pair ..	2.70
325R 3 1/4" dia.	pair ..	2.90
350R 3 1/2" dia.	pair ..	3.05

**POWER PANELS**

7500 Mini Panel .....	11.99
7305 MK II Panel .....	14.99
7405 Dual Range Panel ...	17.50
7605 Series IV .....	24.50

## COVERITE

**PERMAGLOSS (38" X 43")**

White .....	6.39
Red .....	6.39
Blue .....	6.39
Orange .....	6.39
Yellow .....	6.39
Olive Drab .....	6.39
Aluminum .....	6.99
Black .....	6.39
Orange - Dayglow .....	6.99
Yellow - Dayglow .....	6.99

**SUPER COVERITE (38" X 47")**

White .....	4.98
Antique White .....	4.98

Balsarite (1/2 pt.) ..... 2.69  
Trim-it cutting tool ..... 1.19

**HARDWARE & ACCESSORIES**

**AIRTRONICS**  
 504 standard launch rail . . . 24.50  
 505 heavy duty launch rail . . . 25.75

**D.J.'S TAPE**  
 1/16" . . . 1.99  
 3/32" . . . 2.65  
 1/8" . . . 2.85  
 1/4" . . . 3.55  
 yellow, red, white, black, gold, blue

**DU BRO**  
 157 friction brake linkage . . . 2.65  
 160 prop balancer . . . 2.65  
 161 tank filter . . . 1.04  
 165 flex cable (20") . . . 1.20  
 191 kwik-fill fuel pump . . . 7.69  
 216 kwik hinge slotter . . . 1.75  
 234 1/2A steerable nose gear . . . 1.80

**CARL GOLDBERG**  
 HT-1 Handi tate . . . 11.75  
 RG-2 Twin gear retracts . . . 10.45  
 RG-3 Tri-gear retracts . . . 17.45  
 RPS-1 Retract power system . . . 20.99

**COX HOBBIES**  
 cessna centurion w/o R/C . . . 43.95  
 replacement fuselage . . . 18.95  
 replacement wing/tail . . . 11.65  
 eng. tank mount 049/051 #2440 . . . 3.90

**ROBART**  
 Ultra fueler . . . 3.19  
 Incidence meter . . . 10.99  
 Super pumper (1/2A-.15) . . . 11.99  
 Super pumper (.15-.45) . . . 14.99  
 Super pumper (.60-.78) . . . 17.99  
 1/2A Main gear retracts . . . 11.99  
 1/2A Tri-gear retracts . . . 17.99

**SONIC TRONICS**  
 220 fuel line-surgical sm. 24" . . . .58  
 221 fuel line-surgical lg. 24" . . . .63  
 225 fuel line-silicon sm. 24" . . . .72  
 226 fuel line-silicon lg. 24" . . . .81  
 231 seating tape 1/8"x3/8"x36" . . . .85  
 236 mounting tape 1/8"x1/2"x36" . . . .85  
 250 Mark V elect pump(2-6v) . . . 9.35  
 1250 Mark V elect.pump(6-12v) . . . 9.35  
 251 Silicon line-pump to tank . . . 1.50  
 253 Filtered fuel can pick-up . . . 1.55  
 --- Power panel-solid state . . . 19.50

**SULLIVAN**  
 push rod, 36" semi-flex (2) . . . 1.62  
 push rod, 36" flexible (2) . . . 1.44  
 push rod, 36" cable-.030 . . . 1.04  
 push rod, 36" cable-.058 . . . 1.04  
 2 oz. bulb pump . . . .99  
 4 oz. bulb pump . . . 1.20  
 Fuel adapt.-qt, 1/2 gal. container . . . 2.70  
 hi-tork for planes and cars . . . 25.99  
 hi-tork deluxe/aluminum hub . . . 27.99  
 rubber replacement adapter . . . .90  
 aluminum drive cone . . . 3.96

**RHOM**  
 2pc. main gear system . . . 55.99  
 2pc. main gear system-90° . . . 77.99  
 3pc. tri-gear system . . . 77.99  
 pressure gage . . . 12.00

**TATONE**  
 engine test stand w/ tank . . . 6.90  
 glow plug starter-nicad . . . 4.76  
 charger for above nicad . . . 5.55  
 engine prime w/fold top-1 oz. . . .86  
 nylon fuel tank filler w/cap. . . 1.49

**HOBART BRUSHES**  
 Camel Hair - Series #5171  
 1/2" . . . .50 1/2" . . . .70  
 3/4" . . . 1.10 1" . . . 1.40

**FOX GLOW PLUGS**  
 per doz. ea.  
 R/C Short or Long . . . 8.99 .92

**MISCELLANEOUS**

Glue knife . . . .81  
 Tack rag . . . .55  
 Epoxy brushes 6/pkg. . . .89  
 Sandpaper-assorted . . . .39  
 Mylar sandpaper-assorted . . . .79  
 Razor blades-sgle edge 8/pkg. . . .69  
 "T" pins - #16 (1oz.) . . . 1.49  
 "T" pins - #20 (1 oz.) . . . 1.29  
 Foam rubber 1/2x8x12 . . . .69  
 Foam rubber 1/2x8x12 . . . .85  
 Foam rubber 1x8x12 . . . 1.49  
 #64 Rubber bands-1/4 lb. box . . . 1.25  
 Gel battery - 12v, 4 amp . . . 16.99  
 Charger for above gel battery . . . 9.90  
 Starting belt-500 mm dia. . . .3.96  
 Heater starting stick . . . 1.07  
 1/2A mini starter (AFI) . . . 12.70

**ADHESIVES**

**AMBROID**  
 1 1/4 oz. tube . . . .54  
 4 oz. tube . . . .99

**TITEBOND**  
 4 oz. . . . .98  
 8 oz. . . . 1.45  
 16 oz. (pint) . . . 2.45  
 32 oz. (quart) . . . 3.60

**HOBBYPOXY EPOXY**  
 Formula 1-15 min. work time . . . 1.05  
 Formula 2-45 min. work time . . . 2.80  
 Formula 4-5 min. work time . . . 1.40  
 Quick fix- 5 min. foil packets . . . 1.05

**DEVCON EPOXY**  
 5 min. epoxy (2 1/2 oz.) . . . 1.89  
 2 in 1 applicator tube . . . 1.59  
 5 min. epoxy (9 oz.) . . . 3.89

**R/C KITS**

**ACE**  
 Allstar biplane . . . 17.99  
 High glider . . . 13.99  
 Whizard . . . 13.29  
 Dick's dream . . . 8.99  
 Alpha . . . 13.99

**ANDREWS**  
 A-ray . . . 29.99  
 H-ray . . . 26.99  
 Aeromaster . . . 49.99

**AIRTRONICS**  
 Square scar . . . 17.45  
 Q - tee . . . 15.35  
 Super questor . . . 27.95  
 Aquila . . . 48.95  
 Gera sport . . . 27.95  
 Olympic II . . . 34.95

**BRIDI**  
 100 Trainer 10 . . . 19.60  
 110 Trainer 20 . . . 24.50  
 120 Trainer 40 . . . 36.85  
 130 Trainer 60 . . . 40.95  
 150 RCM Sportster . . . 26.80  
 160 15-500 . . . 26.80  
 170 Tweedy Bird-19 . . . 26.80  
 200 Quickest 200 . . . 17.50  
 210 Quickest 500 . . . 28.80  
 220 Classic 40 . . . 36.85  
 240 Super Kaos 40 . . . 37.50  
 250 Super Kaos 60 . . . 46.90  
 260 Kaos . . . 44.90  
 --- RCM Wing Jig . . . 10.99

**CARL GOLDBERG**  
 G15 II Falcon 56 MK II . . . 26.59  
 G16 Sr. Falcon . . . 40.99  
 G18 Jr. Falcon . . . 10.49  
 G23 Skylane 42 . . . 11.99  
 G27 Skylane 62 . . . 40.99

**HOUSE OF Balsa (1/2A)**  
 "Pete" . . . 17.90  
 ME-109E . . . 21.00  
 Chipmonk . . . 21.00  
 P-47 Thunderbolt . . . 21.00  
 Bonanza . . . 21.00  
 P-51D Mustang . . . 21.00  
 P-39 Air Cobra . . . 21.00  
 Focke-Wulf 190A . . . 21.00

**JENSEN**  
 Das Ugly Stik . . . 41.99



**MIDWEST**  
 109 Lil Tri Squire . . . 15.99  
 122 Das Lil Stik . . . 21.99  
 125 Cessna Cardinal . . . 19.99  
 126 Super Chipmonk . . . 19.99  
 127 Mach 1 . . . 63.99  
 128 Sweet Stik . . . 26.99  
 129 Cardinal Squire . . . 57.99  
 130 Strikemaster . . . 46.99  
 132 Silent Squire . . . 26.99  
 134 Attacker . . . 26.99

**SIG MFG. CO.**  
 RC 3 Piper J-3 . . . 30.90  
 RC 26 Clipped Wing Cub . . . 30.90  
 RC 30 Citabria . . . 44.00  
 RC 31 Kadet . . . 27.50  
 RC 32 Komander . . . 30.90  
 RC 34 Skybolt . . . 48.75  
 RC 35 Kouger . . . 34.90  
 RC 36 Klipper . . . 16.40  
 RC 37 Super Sport . . . 15.50  
 RC 38 Smith Mini Plane . . . 37.90  
 RC 39 Cavalier . . . 30.90  
 RC 40 Doubler II . . . 19.50  
 RC 42 Kiwi . . . 29.50  
 RC 43 Colt . . . 16.40


**VK MODELS**  
 Sopwith Camel . . . 46.99  
 Cherokee . . . 46.99  
 Cherokee Babe . . . 25.99  
 Nieuport "17" . . . 46.99  
 Fokker Triplane . . . 46.99



**COX/SANWA RADIO CONTROL SYSTEMS**


	8020 2ch., 2 stk . . . 69.99	
	8022 2ch., 1 stk . . . 90.99	
	8031 3ch., 1 stk . . . 101.99	
	8033 3ch., 2 stk, 3 serv. . . 142.99	
	8040 4ch. . . 185.99	
	8060 6ch. . . 220.99	
	* includes nicads	

**SERVO**  
 Micro . . . 20.99      Std., High Torque, Retract. . . 33.00

**Tatone**  
  
 NICAD GLOW PLUG STARTER & CHARGER  
 Both \$7.99

**TOP FLIGHT**  
  
 2 SPEED HEAT GUN  
 \$18.99

**SEALECTOR**  
  
 CUSTOM IRON  
 \$15.60

**DU-BRO**  
  
 Kwik-Fill Fuel Pump  
 • Hand operated  
 • Pumps in and out  
 SALE \$6.80 No. 191



**dumas**

**BOAT KITS**

1201 PT 109 . . . . .	25.45
1203 Coast Guard Life Boat . . . . .	36.85
1204 Tuna Clipper . . . . .	30.15
1205 Trojan Cruiser . . . . .	40.20
1207 Shelly Foss . . . . .	50.25
1210 Coast Gd. Utility Boat . . . . .	29.50
1211 Dauntless . . . . .	39.55
1310 Pay'n Pak . . . . .	25.45
1312 Atlas Van Lines U-76 . . . . .	33.50
1314 Atlas Van Lines U-1 . . . . .	32.15
1315 Drag 'n Fly 20 Mark II . . . . .	26.80
1421 Competition Deep Vee 21 . . . . .	28.80

**RUNNING HARDWARE & ACC.**

2310 For 1201 for elect. mtr. . . . .	10.40
2311 For 1203&05 for elect. mtr. . . . .	35.00
2312 For 1207 for elect. mtr. . . . .	38.50
2317 For 1315 for .21/3.5cc . . . . .	45.50
2321 For 1421 for .21/3.5cc . . . . .	30.80
2322 For 1310 for .21/3.5cc . . . . .	21.00
2328 For 1312 or 14 for .21/3.5cc . . . . .	32.90
2329 For 1210 for elect. mtr. . . . .	30.10
2003 Speed Control elect. mtr. . . . .	14.40
2004 6 volt motor . . . . .	16.99
2005 12 volt motor . . . . .	16.99

**MISC. ACCESSORIES**

6v, 4 ampere wet cell . . . . .	6.99
6v, 4 ampere gel battery . . . . .	11.99
6v, 7 ampere gel battery . . . . .	12.99
Re-charger Pack - 6v . . . . .	9.90
Multi-charger (metered) . . . . .	14.99

**ZINGER MAPLE PROPS**

Dia. Pitch	6/pkg	ea.
7 4,5,6,7 . . . . .	5.19	.96
7-1/2 4,5,6,7 . . . . .	5.19	.96
8 4,5,6,7 . . . . .	5.62	1.04
8-1/2 4,5,6,7 . . . . .	5.62	1.04
9 4,5,6,7 . . . . .	5.62	1.04
10 4,5,6,7 . . . . .	5.99	1.12
11 5,6,7W,7,7W,7 1/2,8 . . . . .	6.91	1.28

**TOP FLITE PROPS**

	per doz	ea.
9 x 6 super maple . . . . .	8.82	.84
10 x 6 super maple . . . . .	9.66	.92
11 x 6 super maple . . . . .	10.92	1.04
11 x 7 super maple . . . . .	10.92	1.04
11 x 7 1/2 super maple . . . . .	10.92	1.04
11 x 7 3/4 super maple . . . . .	10.92	1.04
11 x 8 super maple . . . . .	10.92	1.04
12 x 6 super maple . . . . .	12.18	1.16

**SALE ENDS JULY 15, 1978**

(after which regular low prices will resume)  
 PHONE ORDERS: 201 - 825 - 2212  
 Mon - Sat 10am to 4pm, Fri. Eve 6 to 9pm  
 Sale prices on left page and above star bordered area,  
 supersede regular low prices in balance of ad or catalog.  
**PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

  
 (\$10. min.)  
 Must have expiration date  
**C.O.D. ORDERS**  
 Charge Card & C.O.D. orders - \$1.25 EXTRA

**SHIPPING & HANDLING**

U.S.		CANADA
0 - 29.99	1.70	4.00
\$30. & UP	2.80	5.40

N.J. Residents Add Sales Tax  
**FOREIGN ORDERS:** Add \$10.00 - Excess refunded, minimum order \$20.00  
 All Foreign - Payments by credit card, International or Postal Money Orders in U.S. currency only.

Presenting . . .

# STERLING MODELS' BIG BEAUTIFUL "Mk. II" Puddle Jumper

R/C Air Boat/Amphibian  
for .15-.35's



For Sport  
or  
Coast Guard Version

Run it on land Or in the water

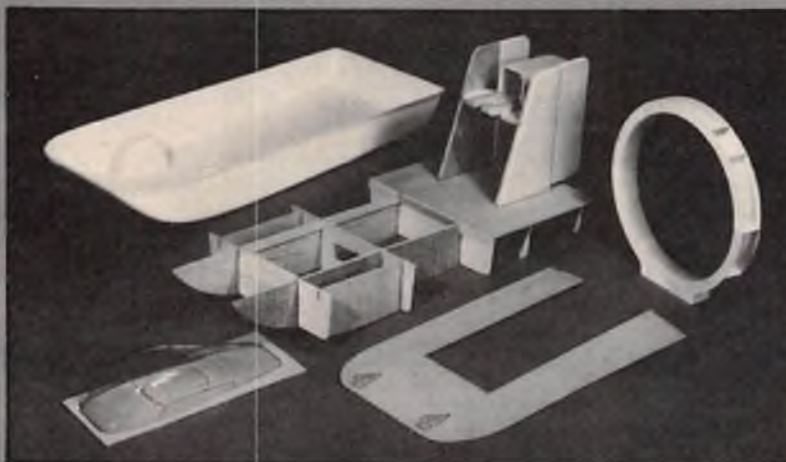
Kit B-27

Length 30" Beam 11"

\$39.95

### About The Kit:

Designed for 2 channel R/C or tether control and .15 to .35 engines. Maintaining top quality and simple construction. All Balsa and Plywood parts are accurately die-cut, with precision vacuum formed Plastic hull and cabin. Hardware package including R/C hardware. Full sized Plans, plus Decals for Sport model or Coast Guard version.



Frame Photo Reveals Simple-Rugged Construction

STERLING MODELS • 3620 'G' ST. PHILA. PA. 19134  
(If no dealer available, direct orders accepted — with 10% addition charge for handling and shipping (60¢ minimum in U.S., \$1.20 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. 50¢ enclosed
  - "Secrets of Model Airplane Building" including design, construction, covering, finishing, flying, adjusting, control systems, etc. 25¢ enclosed
  - "Secrets of Control Line and Carrier Flying" including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions 25¢ enclosed
- No checks. Only U.S. money orders or currency accepted

Name \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## NOW... Look for the Tank with the Bubble on Top. It Means Longer Flights All Around.

NEV-R-LEAK fuel tanks were never like this before—and never better. Now, they provide a FULL TANK SYSTEM and boost your flight time. You can fill your tank to the top; the bubble allows enough room for the air, with the tubing fitting neatly inside the bubble. All NEV-R-LEAK fuel tanks are being converted over to this new, patent-pending design.

Here's more good news on these upgraded tanks. All tanks, except those smaller than 4 oz., include Klapper-Klunk ('stiff-arm' klunk) and klunk pick-ups—choose your own system.

NEV-R-LEAK fuel tanks have been the standard favorite for years. Made even better with the bubble-top FULL TANK SYSTEM, now—more than ever—they'll become the only tanks you'll ever want to use.



- A. Enough space for air in bubble
- B. Fill tank to the top
- C. Tube goes up into air bubble

**12-INCH LENGTH OF SULLI-CONE TUBING FREE WITH EVERY TANK**

### MISS GRANDIN

from page 136/56

Checking the wing in the same manner as the stab, if you obtain the same measurement from the table top to the center of both L.E. and T.E., your decalage is zero degrees and no changes need to be made. Anything else is unacceptable and must be corrected by trimming the hull wing saddle until the wing incidence does check zero degrees. Engine thrust is zero degrees down and 1 degree right.

**Finishing:** The original model was

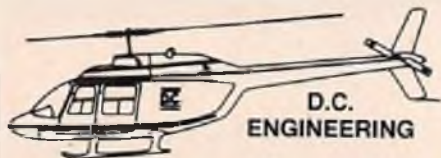
covered with silk and given a twelve coat Aero-Gloss paint job. Finishing is a matter of personal preference and the choice is left up to you.

**Flying:** First off — make sure that all important radio gear is working properly. Be sure of your batteries and have a fresh charge. Check all controls, both with engine off and engine running at all speeds. Vibration can cause erratic servo operation.

Spend a little extra time to make sure that engine idling is reliable. Check throttle response for smooth acceleration. Now the past verbage is old information to most of you and should hardly be necessary to repeat.

However, don't assume anything after the hours of burning lights and labor of love you have endured on a project such as this.

The time is at hand, crank your engine, turn on the radio switch and set the bird in the water. Taxi around for a minute or so, you will notice the water rudder is very effective. Hold full up elevator while taxiing and it is desirable to take advantage of ailerons also when making 180 degree turns to a down wind heading if there is any appreciable wind. That is, lower the aileron on the side you wish to turn. The drag of the fully lowered aileron will create drag and assist the plane to turn.



Parts and Custom Parts for Your Helicopter

Complete parts inventory on Kavan Jet Ranger, Alouette II, Schluter Heli-Boy and Heli-Baby.

#### HELICOPTER COMBO SPECIALS

Alouette II and Webra Speed .40

List \$338.00 — Special \$255.00

Jet Ranger and Rossi .60

List \$565.00 — Special \$465.00

Schluter Heli-Boy-222 — \$339.95

### DISTRIBUTOR FOR VARIANT RADIOS Call for prices on Standard or Custom Variant

New From D.C. Engineering  
The Practical 40 Prop Drive Unit

Check these features:

1. Unique one piece, rugged lightweight construction.
2. New Heavy Duty bell design, much stronger than current rubber bells.
3. Compact, installs in any airplane designed for a 60.
4. Takes 14", 16", 18", 20" props.
5. Develops 10 1/2 lbs. thrust on 16-5" prop.
6. Lightweight — 11 ozs. less engine & prop; 24 ozs. with engine & prop.
7. Only \$79.95.

All Orders Add \$2.50 Postage & Handling, Except Kits - Ohio Residents Add 4% Tax

**D.C. ENGINEERING** 355 Geneva Ave., Tallmadge, Ohio 44278 (216) 633-2905





# 1978 NRCHA NATIONALS

THE NATION'S LARGEST & MOST PRESTIGIOUS R/C HELICOPTER MEET

## PLACE

Alum Creek State Park  
Just North Of Columbus, Ohio

## WHEN

July 21, 22, 23 — 9 A.M. Each Day  
(Pre-Registration Desired)

## CONTEST DIRECTOR

Dwyane P. Stephens N167E  
5911 Olentangy River Rd.  
Worthington, Ohio 43085 (614) 846-7495

## HONORARY C.D.

William H. Curtis

## ENTRY FEE

\$15.00 (To Be Paid At Contest)

## AWARDS

Cash, Prizes, Trophies

## CLASSES

Novice, Sportsman, Masters and HOT DOG!

*The Hot Dog Class is new this year and will be comprised of aerobic maneuvers such as loops, rolls and etc. Those who wish to fly in Hot Dog must compete in Masters. However, contestants will be permitted to use two helicopters — one in Masters and another one in Hot Dog.*

## REQUIREMENTS

AMA & FCC Licenses — Gyros NOT permitted

*This year the contest has been expanded to 3 days and 4 classes and the flying will consist of everything from precision hovering to all-out aerobic maneuvers. Regardless of the level of your flying skill, there is a place for you in the 1978 NRCHA Nationals. Read the "Hover" column in this magazine for more contest details.*

**Please Note:** Camping facilities are available at Alum Creek State Park. Hotel and motel accommodations are readily available.

## REGISTER NOW!!

### 1978 NRCHA NATIONALS

#### CONTEST DIRECTOR:

Dwyane P. Stephens,  
5911 Olentangy River Rd.  
Worthington, Ohio 43085  
(614) 846-7495

15.00  
ENTRY FEE

The Nation's Largest  
& Most Prestigious  
R/C Helicopter Meet

Name \_\_\_\_\_ Model(s) \_\_\_\_\_  
Address \_\_\_\_\_ Radio(s) \_\_\_\_\_  
\_\_\_\_\_ Freq. \_\_\_\_\_  
Phone \_\_\_\_\_ AMA \_\_\_\_\_ NRCHA \_\_\_\_\_

Let the plane seek the wind line. A seaplane is like a wind vane, it always weathercocks into the wind. If the take-off course is clear, hold full up elevator and open the throttle smoothly. Hold a slight amount of right rudder pressure until the plane climbs up onto the step. "Miss Grandin" will plane and leave the water gracefully as the Grumman "Albatross". Enjoy! □

## IT'S THE NEXT BEST THING

from page 50

more than 1,000 simulated rivet heads on the fuselage and fixed "cat's paw" landing gear.

Hunter uses a 5 channel radio control transmitter and receiver to operate five servos: aileron, flaps, rudder, stabilizer and throttle.

The balsa wood fuselage is covered with silk, and is finished with 6 coats of dope, 2 coats of wax and polished to a high luster. The color scheme is red and white, with a black and white checkerboard design under the wings.

That Sunday, Hunter's plane made its third flight over the taxiway at Tachikawa AB. It was, however, not piloted by its builder. The sergeant explained that he hasn't mastered the delicate operation of radio control flying.

"Even though I haven't flown it myself, I really got a kick out of watching it take-off for the first time," Hunter said. "I just couldn't believe it . . . I still can't believe that it got off the ground. But when it did, man, did I feel relieved and very satisfied."

As Master Sergeant Joe Kutcher put the Ryan through slow roles, easy dives and lazy loops, there was no doubt that Hunter's handiwork is a product of skill, labor and love. Kutcher, who has flown radio control models for 13 years, noted that the plane has only a few "bugs" that can easily be corrected.

To help learn how to fly his Ryan, Hunter has joined the Kanto Modelaires — a club designed for radio controlled plane and car buffs.

If he puts as much effort in flying as he did in building, the enthusiastic hobbyist should solo soon. □

## WHING DING II

from page 44/40

whatever you have. The stick was made of 3/32" OD aluminum tubing with a piece of black fuel tubing for a handle. The foot rests were made of brass shim stock, soldered to pieces of 1/16" music wire which were Hot Stuffed inside aluminum tubing which went through the balsa nose piece.

to page 44



Left:  
**.60 REV-OLUTION II**  
 MOUNTED ON NEW  
 TRAINING SYSTEM



Right:  
**.40 REV-OLUTION**  
 MOUNTED ON NEW  
 TRAINING SYSTEM

# NEW!

## TRAINING SYSTEM

WITH SHOCK ABSORBING LANDING GEAR

FOR AMERICAN  
 REV-OLUTION, REV-OLUTION II,  
 HUGHES "500", & JET-RANGER

LIGHTWEIGHT, RUGGED  
 ALL METAL CONSTRUCTION



### \$34.95

COMPLETE KIT

Assembles in Minutes

(EASILY ADAPTABLE TO OTHER 'COPTERS)

NOW YOU CAN TAXI, DO TOUCH-  
 AND-GO'S, RUNNING TAKE-OFFS  
 AND LANDINGS! (WHEELS RO-  
 TATE IN DIRECTION OF MOTION)

EASIER HELICOPTER TRIMMING  
 REDUCES TRAINING TIME  
 SIMPLIFIES LEARNING



Left:  
**AMERICAN .60**  
**JET-RANGER**



Right:  
**AMERICAN .40**  
**HUGHES "500"**

AVAILABLE IN COMPLETE KIT, FIXED PITCH OR  
 RIGID ROTOR COLLECTIVE WITH MECHANICS  
 (With or Without Engine) - OR IN FUSELAGE KIT  
 ONLY FOR INSTALLATION OVER .60 REV-  
 OLUTION II. CALL OR WRITE FOR PRICES.

AVAILABLE IN COMPLETE KIT, FIXED PITCH  
 COLLECTIVE WITH MECHANICS (With or  
 Without Engine) - OR IN FUSELAGE KIT  
 ONLY FOR INSTALLATION OVER .40 REV-OLUTION.  
 CALL OR WRITE FOR PRICES.

### ADD AIRCRAFT LIGHTS AND FLOATS FOR REALISTIC DETAIL!

- A002 - FLASHING LIGHTS - 1 Ea., Red, Clear, & Green Bulbs, Sockets, On-Off Switch, Hook-up Wire - Less Battery. **\$17.95**
- A003 - FUEL WARNING LIGHTS - 2 Bulbs, On-Off Switch, Sockets, Hook-up Wire, Tank Mounting Hardware - Less Battery. **\$18.95**
- A004 - STROBE EFFECT LIGHT - 2 Bulbs, On-Off Switch, Sockets, Hook-up Wire. Uses 9-Volt transistor battery - NOT Included. **\$16.95**
- A005 - RECHARGEABLE BATTERY With 2 Connectors, for operation of Flashing Lights and Fuel Warning Lights. **\$19.95**
- A005A - LIGHT/BATTERY COMBINATION (A002, A003, & A005). **\$53.95**
- A006 - FLOAT KIT - Complete with Mounting Hardware. White with Red or Blue Trim. **\$22.95**



**American**  
 RC Helicopters, Inc.

23811 Via Fabricante - Suite 102 Mission Viejo, California 92675

Available at Your Dealers or Direct  
 Dealer Inquiries Invited

Prices Subject to Change

Telephone (714) 837-2676

# The safe grinding wheel TUF-GRIND



Reinforced to prevent breakage and shattering. Strong enough to cut and grind just about anything — steel, fiberglass, plastics, wood, and so on.

It's the toughest and safest grinding wheel available.

Fits all standard motorized grinding tools.

Package of two \$1.98



2814 E. 56th Way, Long Beach, CA 90805



\$54.95

## FLY "MISS VINTAGE"

- 3 or 4 Channel
- .25 to .35 Engines
- 59" Wing Span
- 4-4½ lbs. Flying Wt.
- Easy to Build & Fly
- Super Hardware
- Rolled Full Size Plans
- Step by Step Instructions

### MICHIGAN HOBBY HANGAR

ORDER DIRECT 460 W. Broomfield Rd.  
Mt. Pleasant, Michigan 48858  
Mich. Res. add 4% Tax  
Dealer Inquiries Invited

## WHING DING II

from page 142/40

Using multi-channel equipment, I would not want to recommend this plane as a typical beginner's plane. I did not go into detail about covering the wings with silkspan or, even better, with silk. Applying these coverings does take quite a bit of technique; furthermore, arranging the radio gear in the fuselage is not easy either.

The more I think of single channel, Ace type, the more I think it might be a fabulous challenge. When you get rid of all the weight back of the Center of Gravity and move everything forward, the plane would balance easier. There would be no problem running the torque rod down the boom and the rudder is set high enough to be wig-wagged. If anyone does single channel the WD-II, whether it is successful, or not, please let me know through RCM; it would be interesting to communicate with you regarding your experiences.

As for flying, it putt-putts around the field at a safe speed and is an instant attention getter. I would not recommend Immelmans or outside loops but, it is a real fun flier and I hope you get a lot of enjoyment out of your Whing Ding II. □

## SUPER PARASOL

from page 35/32

covering and set aside.

### Wing Struts:

The wing struts are made from 1/4" x 1/2" x 12" spruce. The end attachment fittings are constructed similar to a control pushrod; with a "Z" bend at one end and a threaded nylon clevis for adjustment on the other. Do not omit these wing struts as they are functional.

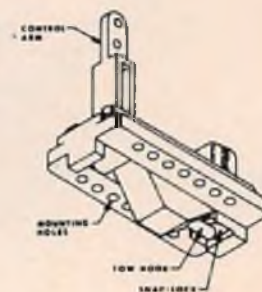
### Tail Surfaces:

The tail surfaces are constructed directly over the plan, which is self explanatory. When dry, remove the respective surfaces and sand smooth and round off all exposed edges and movable surfaces as shown on the plan, and cut the hinge slots and fit the hinges in place, but do not glue, as it is much easier to permanently install the hinges — after the surfaces have been covered. Finish sand the tail surfaces in preparation for covering and set them aside.

### Fuselage:

The two main fuselage sides are constructed directly over the plan, using the shaded segment of the plan side view. The top 3/16" square stringer runs the entire length of the fuselage. The sides are made entirely from 3/16"

## PRO-TOW Releasable tow hook.



Has snap lock feature for easy tow line hook up.

Will work on elevator or spoiler servo.

Will work on loads to 40 pounds plus.

Features a locking system that is non critical. Mounting holes will allow plus or minus 1/2" adjustment.

Order Stock No. 72

Price \$4.98 ea.

See your dealer or order direct  
add .25¢ for post. & handling

### ROCKET CITY SPECIALTIES

103 Wholesale Ave., N.E.  
Huntsville, AL 35811

NEW! NEW! NEW!

SAVE MORE! ENJOY MORE!

## \* NEMOH \*

### New England Mail Order Hobbies

600 N MAIN ST. EAST LONGMEADOW, MA 01028

COD. 1-413-785-5688 COD.

••SAME DAY SHIPMENT••

### \*GRAND OPENING SPECIALS\*

Rx 4 Channel Nimbus Radio  
Sig Kadet, K&B 40 R/C Engine  
Retail \$392.45 OUR PRICE \$258.  
SIG Twister C/L Kit, Fox 35 Eng.  
Retail \$42.90 OUR PRICE \$33.95

### TYCO

Golden West 1890's-Engine, Coach,  
track & P/Pack  
Retail \$64.00 OUR PRICE \$43.95  
Royal Blue w/Smoke-Steamer w/5ive  
cars, track & P/Pack  
Retail \$57.00 OUR PRICE \$37.95  
\*CHECK OUR PRICES ON INDIV. UNITS\*

PLANE S  
Four Lane Car Race w/Lights  
4 cars, 4 control. & 2 P/Packs  
Retail \$78.00 OUR PRICE \$54.95

SEND \$1.00 FOR PRICE LIST, REPUND-  
ABLE w/ORDER. SPECIFY PLANE,  
TRAIN, TOOLS, ETC.

TRAIN S  
BOATS  
\*Mass. Residents add 5% Tax  
\*Visa, Master Charge, Money Orders  
& Certified Checks Accepted  
\*Personal Checks will require  
two week clearance

TOOLS ROCKETS & ACC.

**ATTENTION Beginners in RC**  
The FOX 15RC was designed for you



- Schneurle Porting
- Replacable Crankshaft Stud
- Replacable Head Button
- Patented Crankcase

Super easy to start.  
Runs smooth, steady and surprisingly powerful.

Non critical on adjustments.  
Long life.  
Crack-up resistant.  
Xpert advise available by telephone (501-646-1656)  
Quick parts service.

Kits we have tested and recommend with 15RC Schneurle:  
Midwest - Tri-Squire, Little Stick  
Andrews - H-Ray, A-Ray  
Top Flite - Headmaster  
Sig - Klipper, Super Sport  
Fly a FOX 15RC - the fun engine.

**FOX MANUFACTURING COMPANY**  
5305 Towson Avenue  
Fort Smith, Arkansas 72901



### RC TROPHIES

Finally, a set of awards designed especially for RC competitions. A solid walnut plaque with a printed metal plate depicting soaring, pylon, scale and pattern. For catalogue sheet write to:

**VANTAGE DESIGNS**  
235 Blue Rock Road  
West Chester, Pa. 19380

square and sheet stock. After you have built the two sides, glue the 1/16" plywood fuselage doublers and 3/32" sheet pieces in aft end of the fuselage sides. The 3/32" pieces should be flush to the outside of each fuselage side. Be sure that you don't inadvertently build two left or right sides! Cut out all the fuselage formers. Drill the engine mount, fuel line and 1/16" landing gear mounting holes in F1. Install blind nuts on back side of F1 to accept the engine mount. Glue formers F1 and F2 in place, making sure that the sides and formers are square. Cut the 3/16" square fuselage cross pieces to size and glue them in place, using the fuselage top plan view (shaded portion) as a guide, to insure that the fuselage is symmetrical. Bevel the aft ends of the fuselage sides as shown, and draw them together and glue. Install formers FT1, FT2, FT3, FT4, FT5 and the 1/8" x 1/4" top cross piece (in front of stabilizer). The landing gear should now be bent to shape as indicated, using the designated music wire sizes. Wrap and solder the axle joints. Mount the landing gear onto the 1/4" plywood landing gear plate with heavy weight fishing line or wrapping wire, and epoxy. Fit the landing gear assembly into the fuselage as shown. It will be necessary to notch the fuselage sides for the main landing gear legs, in order for the plywood plate to fit flush with the fuselage sides on the bottom. Glue the landing gear in place. Wrap and epoxy the 1/16" music wire front braces to F1 as shown. Glue the 3/16" x 1/4" hardwood (bottom hatch and rear landing gear brace) supports in place. Drill the holes in these supports to accept the rear landing gear braces and epoxy the braces in place. The fuselage wing support strut unit is now assembled, using the detail view on the plan as a guide. The 1/4" plywood wing saddle plate should be vee channeled slightly to accommodate the dihedral angle of the wing. Place this plate on the bottom of the wing and drill two #7 holes through the plywood plate and into the hardwood blocks which were built into the wing. Be careful not to drill through the top of the wing! Tap the holes in the wing with a 1/4-20 tap. Drill out the holes in the plywood plate to accept the 1/4-20 nylon bolts. Drill the holes for the arrow shaft uprights in the 1/4" plywood plate and the fuselage hardwood blocks, at the proper angles. Strive for a good tight fit. It is preferable to waste a couple of pieces of block material in order to get the drill angle correct, rather than reaming the holes to large and filling the excess with epoxy. Glue the strut assembly into the fuselage, make certain that the strut assembly is aligned correctly so that the wing, when attached, is at 0 degrees incidence and square to the fuselage. A little extra time spent on this step is time well spent.

to page 150

## Now-- House of Balsa presents the rib jig UP-RIGHT



The 90 degree alignment jig that makes model building easy.  
Slotted for 1/16", 3/32", and 1/8" thick wing ribs.

For use on:

- Bulkheads
- Horizontal tail
- Vertical tail
- Fuselage sides

Also used as a thickness gauge.

**Price 98¢**



2814 E. 56th Way, Long Beach, CA 90805

## HALLCO *Temper-Lock*



SEE YOUR DEALER OR SEND A STAMPED ADDRESSED ENVELOPE FOR A DETAILED BROCHURE.



**9 SIZES-AVAILABLE!**

— OEM AND EXPORT INQUIRIES WELCOME —  
THE HALL CO., 429 E. WATER ST., P.O. BOX 38158, URBANA, OHIO 43078

# KIWI



For .35-.45 eng  
54" wingspan

**Hobby Barn \$25.99**

# SIG



**R/C Kits**

# COLT



For .09-.15 eng  
45" wingspan

**Hobby Barn Special \$13.99**

S.T. 60 SCHNURLE R/C

**NEW**  
SPECIAL  
**\$89.99**



**P-47 \$22.99 House of Balsa  
1/2A SCALE**



**P-51D MUSTANG \$19.99**



**FW 190 \$22.99**



**CHIPMUNK \$20.99**

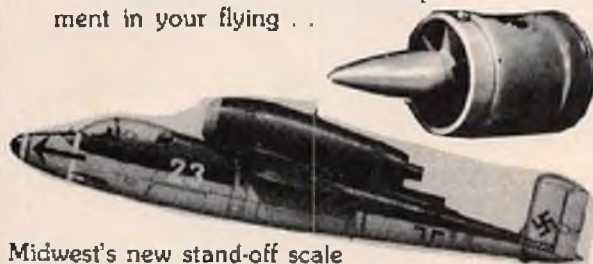
# NEW! BUD NOSEN'S 102" SPAN spectacular



**P-51 D Hobby Barn SPECIAL  
\$129.99**

Please add \$6.00 for postage on these kits

Midwest's He 162 and Axiflo will put new excitement in your flying . . .



Midwest's new stand-off scale  
**Heinkel 162. KIT \$55.99**



**RK-40 kit.  
\$34.99**



**H.B. \$63.99**

**For Ducted Fans**

## KRAFT KP-4A SPORT SERIES



**Hobby Barn Special 189.99**

## FUTABA INDUSTRIES



Channels: 4 Servos: 4 S17

**Hobby Barn SPECIAL 174.99**

## EK NIMBUS SPORT

**4 channel**



**Hobby Barn SPECIAL 185.99**

**MANY MORE GREAT BUYS - Send for our new catalog today, \$2.00**

POSTAGE AND HANDLING and insurance orders up to \$5.00, add .95; \$5.01 to \$10.00 add \$1.50; \$10.01 to \$20.00 add \$1.95; \$20.01 to \$30.00 add \$2.50; \$30.01 to \$40.00 add \$2.95; \$40.01 to \$50.00 add \$3.50; \$50.01 to \$80.00 add \$3.95; over \$80.01 add \$4.50. Send money order or certified check for fast service. APO's welcome. Export welcome. Prices subject to change, some quantities limited. Note: Some of the larger fiberglass kits are sent freight collect best way available.

## GENE THOMAS CLASSIC MODELS



HEATH SUPER PARASOL

Wingspan: 37 1/2 in. Channels: 1-4

15.99



HEATH "BABY BULLET" 1/2" SCALE

Wingspan: 27 in. Engine: .020

13.99



CHURCH "MID-WING" 1-1/2" SCALE

Wingspan: 39 3/4 in. Channels: 1-4

15.99

1/2 A SCALE

.020 to .049



ALEXANDER "BULLET"

Wingspan: 54" Engine: .049 in.

COMING SOON

## FIRST TIME ANYWHERE!

BRAND NEW!

L & L Electronics

## ON-BOARD IGNITION SYSTEM

H.B. Special 16.99

1/2 A TARNO-CARB



HOBBY BARN

\$9.99

NEW

## BOB SMITH R/C AIRCRAFT

T2-40

Wingspan: 57 in. Area: 540 sq. in.  
Engine: .40 Channels: 4  
Material: Epoxy-fiberglass fuselage, foam wing, 1/64" plywood covering

H.B. Special \$76.99

T2-40 offers fuel economy of a .40 with the performance of a .60 airplane. Kit features quality fiberglass fuselage with fin and canopy molded in.



World's Most Powerful  
60 R/C Engine  
2 Horse Power

Hobby Barn  
SPECIAL

\$125.99

Rossi 60 R/C, with pipe.

## Hobby Barn's "Almost Ready to Fly" Kits

Please add \$6.00 for postage.

### HOUSE OF BALS

P-51 (.40) \$139.99

### PLATT

FW 190 \$249.99

T-28B \$249.99

Trainer 40 \$79.99

Trainer 60 \$89.99

Falcon S6 MK11 \$79.99

Mini-Stik \$59.99

Stafford \$289.99

twin comanche

### Our Planes Are Ready to Fly In 4 to 5 Hours

These models are expertly built from the original manufacturer Kits are sent with the hardware and canopies supplied.

Ugly Stik \$89.99

M.E.N. 20 trainer \$74.99

M.E.N. 40 \$89.99

SIG Kadet \$79.99

Quickie 500 \$69.99

Quickest 500 \$74.99

Phoenix 7 \$139.99

(40 size)

### Custom Fiberglass Kits

Wings and stabilizers covered and sanded. These are made from original manufacturer kits. Top quality.

Curare \$109.99

Phoenix 7 \$119.99

U.F.O. \$115.99

Dirty Birdy \$109.99

T-6 Texan \$139.99

Trion \$115.99

Patricia \$115.99

Saturn \$109.99

## SIG KOUGAR



HOBBY BARN  
\$31.99

## AIRCRAFT EXTENSION DRILLS 12 Inch Length

High Speed Steel, Made In U.S.A.

For those hard to reach places.

3/32" - \$3.19 5/32" - \$3.99 3/16" - \$4.39

1/8" - \$3.59 1/4" - \$4.99

The Complete Set of 5: HOBBY BARN Special \$19.99

Call (602) 747-3633 for immediate COD shipments.

# FAST SERVICE

EXPORT

SPECIALISTS



# H O B B Y

P.O. BOX 17856 TUCSON,

ORDERS SHIPPED WITHIN 24 HOURS / COMPARE PRICES / WE SELL FOR LESS

### ACE R/C

Littlest Stick	3.95	2.99
Pacer	19.95	12.99
Super Pacer	32.95	20.99
Dick's Dream	11.95	9.99
Ace High Glider	19.95	12.99
Upstart II	17.95	11.99
All Star Bipe	24.95	16.99
Whizard	18.95	12.99
Mach None	19.95	12.99
Shrike	29.95	17.99
Guppy	8.95	5.99
GLH II Foam	16.95	10.99
GLH II Wood	18.95	12.99
Alpha	19.95	13.99

### AIRTRONICS

Square Soar	21.95	16.99
Q - Tee	19.95	14.99
Gere Sport	36.95	26.99
Aquila	64.95	49.99
Olympic II	49.95	38.99
New Era III	46.95	35.99
Acro-Star Bipe	89.95	65.99
Cessna Centur	49.95	38.99

### AIRBORNE ASSOCIATES

Phoenix 7 (.60)	124.50	89.99
Phoenix 7 (.40)	63.50	54.99

### ASTRO FLIGHT

Super Monterey	49.95	31.99
Super Mailbu	39.95	24.99
Fournier RF4	44.95	28.99
Bushmaster	44.95	28.99
Electra 225	99.99	69.99
ASW 15	54.95	36.99
Electra Fly	29.95	22.99

### R/C Electric Flight Systems

Astro 02	22.95	17.99
Astro 05	44.95	29.99
Astro 10	79.95	54.99
Astro 15	99.95	66.99
Astro 25	109.95	74.99
Astro 25 Twins	165.00	110.99
Rapid Charger	29.95	24.99
Analyzer	39.95	28.99
Fld. Box		
Charger	39.95	28.99

### BRIDI KITS

Trainer .10	27.95	20.99
Trainer .20	34.95	25.99
Trainer .40	54.95	38.99
Trainer .60	62.95	43.99
Basic Trainer	39.95	28.99
RCM Sportster	39.95	28.99
15-500	39.95	28.99
Tweedy Bird	39.95	28.99
Compass Cope	46.99	33.99
Sun Fil 4-20	29.95	22.99
Quickest 200	24.95	17.99
Quickest 500	42.95	31.99
Classic 40	54.95	38.99
Bridi Glider	19.95	13.99
Super Kaos .40	55.95	39.99
Super Kaos .60	69.96	48.99
Dirty Birdy .40	59.95	41.99
Balsa Birdy .60	84.95	58.99
Glass Birdy .60	124.95	89.99
U.F.O.	129.95	94.99
Shrike	184.95	129.99
P-51 Mustang	134.95	99.99
Sirus	134.95	99.99
Brown B-2	134.95	99.99
AT-6 Texan	134.95	99.99
Chipmunk	124.95	89.99
Super Fil	82.95	64.99
Tiger Cat	198.95	149.99
T-28	134.95	99.99
Cosmic Wind	139.95	104.99
Chubasco Boat	84.95	58.99

### CONCEPT MODELS

Travel Air	69.95	55.99
Super Fil	69.95	55.99
Barnstormer	69.95	55.99
Air Scout	39.95	32.99
Big Fleet		

### CASS ENGINEERING

Pulsar Bipe	95.00	79.99
P-39 Cobra	95.00	79.99

### CRAFT AIR

Windrifter	47.95	34.99
Sallaire	129.95	89.99
Windrifter		
SD 100	59.95	44.99
Bull-pup	34.99	26.99
J-Bird	59.95	44.99
Field Box	29.95	22.99

### DAVE PLATT MODELS

Waco Bipe	79.95	56.99
Spitfire	79.95	56.99
T-28B	79.95	56.99
FW 190	79.95	56.99

### D & B MODELS

P-51	154.95	119.99
P-40	144.95	109.99
Zero	144.95	109.99
Corsair	159.95	119.99
Stuka	169.95	129.99
T2-J	169.95	129.99
F-86	179.95	135.99
Yankee	109.99	76.99

### FLITE GLAS

Masking Film	4.95	4.20
Trion Basic	73.95	59.99
Trion Dix.	104.95	89.99
Saturn Basic	73.95	59.99
Saturn Dix.	104.95	89.99
P-51 Basic	89.95	72.99
P-51 Dix.	125.95	99.99
P-40 Basic	83.95	67.99
P-40 Dix.	120.95	95.99
El Bandito Dix.	88.95	71.99

### GOLDBERG MODELS

Ranger 42 A.R.F.	24.75	19.99
Falcon 56 MKII	39.95	29.99
Jr. Falcon	13.95	10.99
Skylark 56	44.95	34.99
Jr. Skylark	14.95	11.99
Skylane 42	15.95	12.99
Skylane 62	59.95	44.99
Sr. Falcon	59.95	44.99

### HOUSE OF BALSA

Nomad	13.95	10.99
Nomad II	19.95	14.99
Miss Dara	39.95	27.99
Pietenol	49.95	36.99
4 1/4 Wire Wheels	19.95	16.99
1/2 A Pete	22.95	16.99
P-51	29.95	22.99
ME 109	29.95	22.99
P-39	29.95	22.99
Chipmunk	29.95	22.99
P-47	29.95	22.99
Bonanza	29.95	22.99
FW-19A	29.95	22.99
P-51 (.40 size)	54.95	39.99

### JACK STAFFORD MODELS

8-24 Liberator	189.95	145.99
EAA Arco Bipe	64.95	49.99
Tom Kitty		
MK-15	36.95	28.99
Tom Kitty		
MK-40	49.95	32.99
P-39 Cobra	54.95	37.99
Sperry		
Messenger	49.95	32.99
Aircoupe	64.95	49.99
Weekender	54.95	37.99
Piper Comanche	64.95	49.99
Twin Comanche	39.95	29.99
Super Buccaneer	39.95	31.99

### JEMCO MODELS

PT-19	54.50	45.99
ME 109	54.50	45.99
Focke Wulf 190	58.50	49.99
Corsair F4U	58.50	49.99

### JENSEN KITS

DAS Ugly Stick	62.50	43.99
Wing Kit	26.00	19.99

### J. J. SCOZZI, INC.

Turb - Ax 1	59.95	49.99
Turb - Ax 11	39.95	29.99

### KAVAN HELICOPTERS

Jet Ranger	400.00	319.99
Allouette II	200.00	169.99

### LANIER MODELS

Jester II	73.50	49.99
Invader	84.50	59.99
Scamp	52.50	35.99
Comet 35	52.50	35.99
Comet II	58.50	39.99
Cessna	46.50	31.99
Pinto	46.50	31.99
Rebel Bipe	89.50	69.99
Slo-Comet	54.50	37.99
Transit	44.50	29.99

### M.E.N. MODELS

Trainer 20	31.95	21.99
Trainer 40	49.94	37.99

### MIDWEST KITS

Easy Flyer	89.95	62.99
Tri Squire	29.95	20.99
DAS Little Stick	32.95	23.99
Cessna Cardinal	29.95	20.99
Super Chipmunk	29.95	20.99
Sweet Stick	39.95	27.99
Mach 1	94.95	64.99
Cardinal Squire	84.95	54.99
Pitts Special Bipe	94.95	64.99
Strikemaster	69.95	47.99
Silent Squire	39.95	27.99
Attacker	39.95	27.99
Lil Tri Squire	22.95	16.99
Lil T Glider	26.95	19.99
Klampon Boat	44.95	32.99
Love Machine	46.95	34.99
RK .40 Duct Fan	46.95	34.99
HE-162 Kit	74.95	55.99

### BUD NOSEN MODELS

Aeronca Champ	99.95	68.99
Cessna 310	165.95	129.99
Citabria	99.95	69.99
Mr. Mulligan	139.95	99.99
Gere Sport	129.95	89.99
JN-4D Jenny	129.95	89.99
J-3 Cub	119.95	83.99
Nosen Trainer	79.95	55.99
P-51 Mustang	169.95	129.99

### PROCTOR KITS

Nieuport II	145.00	109.99
Antic Bipe	99.50	79.99
Antic	84.50	66.99
Parasol	86.50	68.99
Mini Antic	55.50	44.99

### PRATHER PRODUCTS

Panther	99.95	68.99
Polecat	22.95	17.99
Little Toni		
Deluxe	99.95	68.99
Little Toni Q.M.	69.95	49.99

### ROYAL PRODUCTS

Cessna		
Skymaster	99.95	86.99
P-38 Lightning	109.95	94.99
F8F Bearcat	94.95	82.99
Pitts S2 Bipe	89.95	77.99
B-25 Mitchell	99.95	86.99
Corsair	94.95	81.99
Cessna 182	89.95	77.99
Helin SR	94.95	82.99
C-47/DC-3	109.95	94.99
Zero SR	94.95	82.99
Staggerwing	89.95	77.99
FW 190	89.95	77.99
P-51 Mustang	94.95	82.99
Pitts Special	84.95	72.99
P-68 Victor	89.95	77.99

Aquarius	74.95	62.99
Piper Colt	94.95	82.99
K-143 Oscar	89.95	72.99
F4 Phantom	82.95	70.99
Cessna 206	94.95	82.99
Stuka Ju87	94.95	82.99
Spitfire	89.95	77.99
Cessna 310	99.95	86.99

### SIG KITS

Kadet	34.95	27.99
Kougar	44.95	35.99
Komander	39.95	30.99
Komet	47.25	36.99
Citabria	57.95	45.99
Klipper	20.95	16.99
Super Sport	19.95	15.99
P-51	57.95	45.99
Chipmunk	59.95	47.99
J-3 Cub	39.95	27.99
Clipped Wing		
Cub	39.95	29.99
Skybolt Bipe	62.50	49.99
Liberty Sport-		
Bipe	64.75	50.99
Cessna 150	69.95	55.99
Ryan STA	73.50	58.99
Zlin Akrobat	54.95	42.99
Smith Miniplane	49.95	37.99
YAK 18	73.50	58.99
Doublet II	24.95	19.99
Colt	20.95	16.99
Kiwi	37.95	28.99
Kavaliar	39.95	30.99

### SOUTHERN RC KITS

#### Balsa Kits

Alley Kat	48.50	35.99
Tigertail Dix.	124.95	88.99
Tigertail Std.	89.95	64.99
Sweetater Dix.	124.95	88.99
Sweetater Std.	89.95	64.99
Compensator		
Deluxe	124.95	88.99
Compensator		
Standard	89.95	64.99
Mustang X	64.95	44.99
Bobcat	59.95	41.99
Gator Flea	64.95	44.99
Southern Kite	74.95	54.99

#### Fiberglass Kits

Compensator		
Standard	109.95	78.99
Compensator		
Deluxe	134.95	93.99
Atlas Std.	109.95	78.99
Atlas Dix.	134.95	93.99
Bootegger	89.95	64.99
Tigertail III	89.95	64.99

### BOB SMITH R/C

#### AIRCRAFT

Patricia	109.95	89.99
T2-A	149.95	119.99
T2-A 40	89.95	72.99

#### SPICKLER MODELS

Quickie 500	43.95	29.99
Quickie 200	19.95	15.99

#### STERLING MODELS

Mini Fledgling	21.95	15.99
Puddle Jumper	16.95	11.99
P-51 Mustang	76.95	54.99
PT-17	89.95	64.99
Fokker D-7	87.95	69.99
S.E. 5A	47.95</	



FOR THE BEST RADIO DEAL ANYWHERE! SEND FOR OUR DISCOUNT CATALOG

### SOARCRAFT PRODUCTS

Glasflugel 604	99.50	74.99
Diamant	89.50	67.99
Libelle	79.50	59.99
Centurion II	59.50	44.99
Magnum 12	129.95	94.99
Sky Bolt	99.50	74.99
Launch System	39.50	32.99
Akromaster	64.50	64.99

### SURE FLITE MODELS

F7U Cutless	22.95	13.99
Spitfire ARF	34.95	22.99
J-3 Cub ARF	34.95	22.99
Cessna ARF	34.95	22.99
Bable Birdie	14.95	10.99
Eye Soar Glider	18.85	14.99
Foam Floats	11.95	8.99
Howard "Pete"	24.95	17.99

### TOP FLITE KITS

S.E. SA	59.95	44.99
Mustang P-51	59.95	44.99
Warhawk P-40	59.95	44.99
Aircobra P-39	59.95	44.99
Headmaster	25.50	18.99
P-47	79.95	59.99
Freshman	44.95	35.99

### -VK-

Nieuport 17	62.99	47.99
Fokker Triplane	62.95	47.99
Cherokee Babe	36.95	28.99
Cherokee	62.95	47.99

Corben Super-Aca	41.95	32.99
Sopwith Camel	62.95	47.99

### WORLD ENGINE KITS

Mr. Mulligan	47.95	36.99
J-3 Cub	39.95	29.99
Box Fly	34.95	27.99
Jr. Box Fly	24.95	19.99

Das Box Fly Bipe	39.95	29.99
Das Box Fly Hi-Wing	29.95	20.99

Miss World	49.95	38.99
------------	-------	-------

### R/C ENGINES

#### Fox

Fox .15 RC	55.95	39.99
Fox .19 RC	31.95	23.99
Fox .25 RC	31.95	23.99
Fox .29 RC	34.95	27.99
Fox .36 RC	34.95	27.99
Fox .40 RC BB	61.95	45.99
Fox .45 RC BB	64.95	48.99
Fox .78 RC	96.25	68.99

#### K & B

K&B .19 RC	50.00	34.99
K&B .21 RC	67.50	47.99
K&B .35 RC	39.95	25.99

K&B .40 RC w/ Perry Pump & Carb	95.00	63.99
---------------------------------	-------	-------

K&B .40 RC	67.50	44.95
K&B .61 RC	90.00	54.99

K&B .61 RC w/ Perry Pump & Carb	115.00	69.99
---------------------------------	--------	-------

K&B .40 SR III	92.50	59.99
K&B .40 (6.5) w/Perry Carb	110.00	64.99

#### Kraft

Kraft .61 RC	99.95	74.99
--------------	-------	-------

### O.S. with Mufflers

OS .10 RC FSR	30.95	23.99
OS .20 RC	37.95	28.99

OS .21 FSR	39.95	30.99
OS .25 RC	41.95	31.99
OS .25 RC FSR	57.95	43.99

OS .30 RC	47.95	36.99
OS .35 RC	49.95	38.99
OS .36	117.50	89.99

OS .40 RC	72.50	51.99
OS .40 RC FSR	87.95	63.99
OS .45 RC FSR	98.95	72.99

OS .45 FSR H	94.95	69.99
OS .60 4-cycle	199.95	139.99
OS 60 H RC	98.95	72.99

OS .60 RC FSR	119.95	86.99
OS .60 RC FSR w/Perry pump	149.95	115.99

OS Wankel	109.95	86.99
OS .90 RC	-	-
OS .120 RC	-	-

### Quality Line Kits

## sports scale kit!



For .40 to .60 Engine 59" wing span

## proven contest winner!

Hobby Barn Special

## \$44.99

## Quadra 2 cu. in Engines



Hobby Barn 110.99

(PROPS IN STOCK)

### HOUSE OF Balsa

.29 to .40 powered Sport, Stand-Off Scale



P-51D "MUSTANG"

H.B. Special \$38.99



The Dyna-Jet engine is not a toy; it is a highly engineered, precision manufactured true jet engine and is present holder of the accepted speed record for model airplanes—188 mph-plus.

2 1/2 in. long, 2 1/2 in. tapered diameter.

## HOBBY BARN SPECIAL

## \$79.99

### Super Tigre

X .15 F1	54.95	42.99
X .15 F1 RC	59.95	46.99
X .21 F1 RC	69.95	55.99
ST .23 RC	44.95	34.99
X .29 ABC	79.95	59.99
ST .35 RC	47.95	37.99
X .40 ABC	81.95	59.99
X .45 RC	83.00	59.99
ST .46 RC	59.95	46.99
ST .60 RC F1	69.95	54.99
STG .60 RC FP	90.95	69.99
STG .60 RC ABC	99.95	79.99
X .60 RC F1	125.95	98.99
STG .71 RC F1	94.95	74.99

### WEBRA & ENYA

Call for prices

### MARINE ENGINES

#### K & B

.40 RC Marine	75.00	57.99
.40 RS III	99.50	73.99
.21 RC Inboard	69.50	54.99
.21 Outboard	99.95	73.99

#### OPS

.40 Marine & Pipe	142.00	119.99
.60 Marine & Pipe	174.99	149.99
.21 Marine & Pipe	99.95	73.99

### RC SYSTEMS

#### Ace Radio Kits

3CH system	119.95	104.99
3CH micro kit	124.99	109.99
5CH Tx. Conv.	21.95	18.99
7CH Tx. Conv.	26.95	23.99

#### Micro Servo Kits

w/two servos		
100 MAH Ni-cd Bty Kit	59.95	52.99
w/four servos & Kits		
100 MAH Ni-cd Bty Kit	109.95	94.99

Micro Flite Pak Kits		
w/2 servos	94.95	84.99
w/4 servos	146.95	129.99

Flite Pak Kits		
w/2 Bantam Servos	79.95	72.99

w/4 Bantam servos	124.95	113.99
-------------------	--------	--------

Dual Rack Servos		
Add	1.00	each

Servo Kits		
Bantam Servo	23.95	20.99
Dual Rack Servo	24.95	21.99
Retract Servo	24.95	21.99
1-8 Receiver Kit	37.95	33.99

### SPECIFY FREQUENCY

### Kraft

KP-2A	129.95	89.99
KP-4A	299.95	199.99
KP-6A	339.95	229.99
KP-3C	219.99	169.99
KP-5C	375.43	285.99
KP-5CS	375.43	285.99
KP-7C	515.43	385.99
KP-7CS	515.43	385.99

Signature Series	749.95	680.99
------------------	--------	--------

Signature Single Stick	849.95	780.99
------------------------	--------	--------

### WORLD EXPERT SERIES

#### 1977 MK II Systems

5 ch. Expert	399.95	234.99
7 ch. Expert	432.95	255.99
7 ch. Expert	464.95	274.99

(with 5 servos)

For single stick add 15.00

### PROLINE FUTABA

#### MRC E/K

Prices too low to print!

### DUMAS PRODUCTS

#### Sailboats

Equation	148.50	115.99
Star Class 45"	99.95	78.99
Bingo	240.00	189.99
Etchells	215.00	169.99
Lightning	17.95	13.99

East Coast 12 meter	225.00	179.95
---------------------	--------	--------

#### Scale and Semi-Scale

Navy PT 109	38.00	28.99
U.S. Lifeboat	55.00	41.99
Tuna Clipper	45.00	33.99
Trojan Cruiser	60.00	45.99
Lil' Shelly Foss	41.00	30.99
Shelly Foss	75.00	56.99
Cabin Cruiser	16.00	11.99
Coast Guard		
40' Utility	44.00	33.99
Dauntless	58.00	44.99

#### Hydroplane

Atlas Van Line	11.00	8.99
Miss Thriftway	11.00	8.99
Atlas Van Line "40"		

Miss Unlimited	53.00	39.99
Thriftway Too	28.00	21.99
Drag'N Fly 40	16.00	12.99
Drag'N Fly 40	68.00	51.99
Drag'N Fly 40	55.00	41.99
Drag'N Fly 20	39.95	29.99
Hot Shot wood	30.00	22.99
Atlas U-76	50.00	37.99
Atlas U-1	47.95	34.99
Hot Shot glass	67.95	50.99

#### Deep Vee

DV .10 Mah	11.00	8.99
DV .20 Ply	30.00	22.99
DV .40 Ply	47.00	35.99
DV .60 Ply	65.00	48.99
DV .20 CF glass	78.00	58.99
DV .40 CF glass	82.00	68.99
DV .60 CF glass	100.00	74.99
DV .21 CF wood	42.95	32.99
Little Jon	6.50	4.99
Lil' Swamp Buggy	13.00	9.99
Swamp Buggy	30.00	22.99
Big S/Buggy	31.00	23.99

Dumas Sailboats and other hardware — call for prices

#### Octura

Wing Ding .40	70.00	59.99
Wing Ding .60	75.00	64.99
Wildcat .60	65.00	54.99
White Heat .60	67.50	56.99
Kool Klamps	5.25	4.50

Northwind .20	58.95	41.99
Northwind .40	61.95	44.99
Lil' Lightning	48.95	31.99
Bushwhacker	109.95	79.99
Lil' Dolphin	32.95	23.99
Mini Dolphin	26.95	18.99

### STEVE MUCK'S MODELS

Northwind .20	58.95	41.99
Northwind .40	61.95	44.99
Lil' Lightning	48.95	31.99
Bushwhacker	109.95	79.99
Lil' Dolphin	32.95	23.99
Mini Dolphin	26.95	18.99

Call (602) 747-3633 for immediate COD shipments.



# VALUES.....THE BEST AT RPS PROPORTIONAL RADIO CONTROL UNITS

## Futaba

SERVO	LIST	RPS
S7 H.O./water tight	39.95	29.95
S7L Reverse S7	39.95	29.95
S8 Retract	44.95	33.75
S10 Sail winch	79.95	59.95
S11 Linear action	39.95	29.95
S12 Standard	29.95	23.95
S14 High torque	79.95	59.95
S15M Ball bearing/H.O.	49.95	37.50
S15ML Reverse S15M	49.95	37.50
S15GM Ball bearing retract	54.95	41.50
S16 Mini	39.95	29.95
S16L Reverse S16	39.95	29.95
S17 Standard	29.95	23.95

FUTABA	LIST	RPS	SERVO	NICADS
FP2GA 2ch	99.95	70.95	2	EXCLUDED
FP2E 2ch	139.95	96.95	2	EXCLUDED
FP2F 2ch	139.95	96.95	2	EXCLUDED
FP3F 3ch	179.95	124.95	2	RX ONLY
FP3FN 3ch	199.95	138.95	2	INCLUDED
FP4FN4 4ch	299.95	197.95	4	INCLUDED
FP5FN 5ch	349.95	230.95	4	INCLUDED
FP6FN 6ch	359.95	237.95	4	INCLUDED
FP7G 7ch	579.95	401.95	4	INCLUDED

limited run editions				
FP4FN4 4ch	269.95	177.95	4	INCLUDED
FP6FN 6ch	319.95	210.95	4	INCLUDED
COX/SANWA				
8060 6ch	369.95	248.95	4	INCLUDED
MRC				
772 2ch	109.95	76.95	2	EXCLUDED
765 5ch	339.95	216.95	4	INCLUDED

## RPS HOBBIES

BOX 272 East Hampton, CT. 06424

Prices based on mfrs. present list prices, subject to change without notice. All units on 72 MHZ. To avoid delay list alternate frequencies. Conn. add 7% sales tax. Postage handling & insurance; U.S.-\$3.00, Canada-\$6.00, Foreign-\$20.00. Excess promptly refunded. Send payment in money order or check only (personal checks may be delayed to allow for clearance.) No COD's.

## SUPER PARASOL

from page 145/32

Install the 1/2" and 1/4" fuselage top sheeting. Glue the 3/16" sheet cockpit floor in place. Install the 1/32" plywood cockpit sheeting. Glue the 1/4" plywood hatch hold-down and strut strap block in place, in the rear of the radio compartment. Mount the aluminum wing strut straps. Glue the 1/8" sheet fuselage bottom sheeting in place cross grained. Make the access hatch from 1/8" hard sheet and fit it in place. Drill the hatch hold-down hole through the hatch and plywood plate. The hole in the plywood plate should be bored out to accept a 4-40 blind nut. Glue the 1/8" square fuselage stringers in place. Install your engine and engine mount on former F1. Be sure the engine's exhaust, carb, and fuel nipple are covered to keep dirt and dust out. Glue the cowl blocks in place around the engine. When dry, shape the cowl and fuselage to the proper contour and sand smooth. Install the elevator and rudder pushrods, and the throttle control rod or cable. Fine sand the fuselage in preparation for covering.

### Radio Installation:

Westport International's Variant radio equipment is shown on the plans and was used in my Super Parasol. However, the radio compartment is sufficient in size to accommodate almost all sizes of radio equipment including many of the older large size systems. The best radio installation advice to be given is to simply follow the manufacturer's instructions for your radio system. After all, who knows your radio system better?

### Finish:

The Super Parasol shown in this article, being built for sport flying, was finished with silkspun Coverite and K & B Super Poxxy with a final coat of K & B Super Poxxy satin finish being applied. If you are building your Parasol for sport flying, then the heat shrinkable films are a good finishing media to consider. If Stand-Off Scale or a model with more detail is your goal, then you will undoubtedly want to go the fabric and paint route. The Super Parasol is one Scale type that can "live" with the extra weight associated with a realistic painted finish, because of its generous wing area.

### Flying:

The Super Parasol, when balanced within the indicated C.G. limits, is an easy to fly, stable aircraft; very much like a trainer. With its large wing area, it will tend to "float" on landing, so allow for this with a longer or shallower landing approach. I sincerely hope that you will enjoy not only flying your Parasol, but building it as well. □

# K&S ACCESSORIES

### FUEL TUBING



Non-Hardening - Transparent - Flexible The Finest Fuel Tubing you can Buy.

	Per Roll
# 410 Small-50 Ft.	\$5.00 10c/FT.
# 411 Medium-25 Ft.	\$3.75 15c/FT.
# 412 Large-25 Ft.	\$5.00 20c/FT.

### SANDPAPER



Assortment of all popular grits.  
# 475 49c/Pack  
24 pkg/box \$9.36

### AEROSILK



Heavy duty 100% Pure Silk Made of the finest silk available.

# 600 White	# 603 Green
# 601 Orange	# 604 Yellow
# 602 Blue	# 605 Red
1 SQ. YD.	
White	.....\$5.95
Colors	.....\$6.95

### SILKSPAN

An excellent covering material for models.



HEAVY	MEDIUM	LIGHT
SGM	GM	DO
# 402	# 401	# 400
30c/Sheet	25c/Sheet	12c/Sheet
\$4.00/box		



ENGINEERING

6917 West 59th Street, Chicago, Illinois 60638

IF NOT AVAILABLE AT DEALER ORDER DIRECT  
SEND 25c FOR CATALOG

aces is much better for the spectators to be able to understand. Remember, these races are not only for your benefit, but for the benefit of the spectators as well. I cannot emphasize too strongly on how important spectators are.

Some of the largest, fastest growing clubs hold their races in parking lots located on large shopping malls. Some of these malls have advertising funds that they use to pay the clubs \$50 to \$150 a race. This money is then used to buy the race trophies. The club is then free to use the entry fees to buy a trailer to haul the boards or for whatever purpose they need. The shopping mall manager should be approached by someone in your club who can give the appearance of being a responsible person. Your club representative can bring along a nice clean car and maybe some photos of races, so the mall manager knows what you're talking about. In the beginning, it's best to just ask for permission to use part of the parking lot which is least used. They'll not be in a hurry to give you a parking lot that is used regularly. Don't ask for money right away. Run a few races first to see if you attract an audience. Then you can ask the mall manager if they would like to contribute to the trophy fund. Also, at your initial presentation to the mall manager, you can tell them that you will be getting site insurance to cover your racing activities. This is **very important** to the mall manager. You can get insurance for yourself, your club and site insurance from WAM Inc., Route A, Box 19, Lower Lake, California 95457. Write to them for details. Naturally, you'll want to clean up the area after the days racing, because this is also very important to the mall manager.

There is no limit to the amount of sponsorship your club can get for its racing activities if you approach it in an intelligent manner. In Europe, they have over 20 "purpose built" R/C car tracks. A "purpose built" R/C car track is a track that is built for the single purpose of running R/C cars. Such as Go-Kart tracks that you've seen, which were made solely for Go-Karts. These "purpose built" R/C car tracks are sponsored mainly by the same companies that sponsor 1/1 scale racing car activities. The tracks are run and used by the local R/C car club. They'll be paved with a track layout prescribed by the local club, with grass infields, wire fences around the outside, drivers stand, timing and P.A. equipment, etc. In this respect, Europe is more ahead of us here. Our tracks are all located on parking lots. I only know of two "purpose built" tracks in the U.S.A., and these are not club tracks, but commercial tracks. Thorp Raceway in Southern California and Rattey's Raceway near Boston. I

to page 154

# FLYING ACE!

That's what you are when you come over to S.C. Modeler. We know what it takes for you to conquer the skies, to soar high, to maneuver gracefully. We know because we've been there ourselves. That's the big difference . . . we don't just sell you and service you . . . we're radio control modelers ourselves.

We're not johnny-come-lately's either. Our expertise goes back to the pioneering days of radio control.

Look to us for all that you need to be the flying ace you want to be. Replacement parts, kits, radios, advice and help . . . from enthusiasts. . . . to enthusiasts.

Send \$1 for our new helicopter catalog and parts list.



**S.C. MODELER HOBBY SHOP**

Helis, Planes, Cars, Boats, Radios, Parts for RC Hobbyists  
1999 Larkin Avenue, Elgin, Illinois 60120  
Dept. 146 312-697-3737

It applies without sticky brushing or masking  
Its stronger than any typical R/C building material  
Its weighs only one gram per sq. foot of area  
Its only .0005" thick  
Its ready the instant you apply it

## ITS SUPERTAPE

The most outstanding application at this time is for applying balsa, greenskin or other skin to foam wings, but many other uses are being found daily for this truly fantastic new product. For complete literature on this and the many other fine model aviation products we offer, call write or use the Reader-Service Card today!

IN 1" AND 3/8" ROLLS  
1" ROLL = 2,160 Sq."

## SUPERWINGS

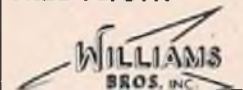
11015 GLENOAKS BLVD. PACOIMA, CA. 91331 213/ 899-4312



## REALISM! SCALE ACCESSORIES BY WILLIAMS BROTHERS

RADIO CONTROL  
CONTROL-LINE  
FREE-FLIGHT

SCALE PILOTS • SCALE WHEELS  
CYLINDERS • ENGINE KITS • MACHINE GUN KITS  
PLASTIC DISPLAY MODELS



SEND 50¢ FOR COMPLETE ILLUSTRATED CATALOG  
DEPT. RC  
181 PAWNEE STREET, SAN MARCOS, CA. • 92069



New binder designed to accommodate all old and new issues of RCM. Now you can keep all of your issues or anthology/library books together and in perfect condition for easy reference. Each binder has metal spines for holding twelve issues of RCM or your Anthology books. Copies can be easily inserted or removed. **BIGGER AND BETTER THAN EVER!**

\$7.00 each or 3 for \$17.50

# R/C MODELER MAGAZINE ANTHOLOGY LIBRARY BOOKS AND BINDERS



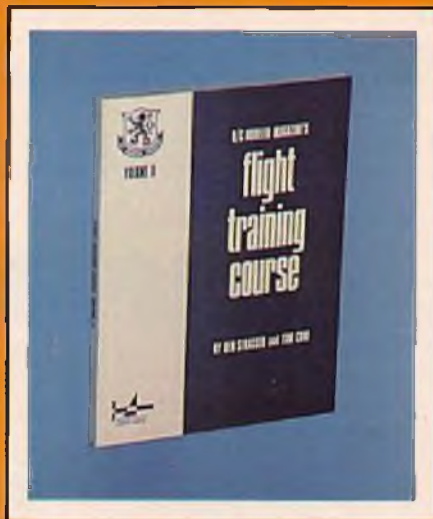
The author of this manual "S.O.P. FOR SUCCESSFUL CONTEST PUBLICITY" (Simple Operative Program), has outlined a proven and tested method for a successful publicity program for club, local, regional, or national contests.

\$3.00



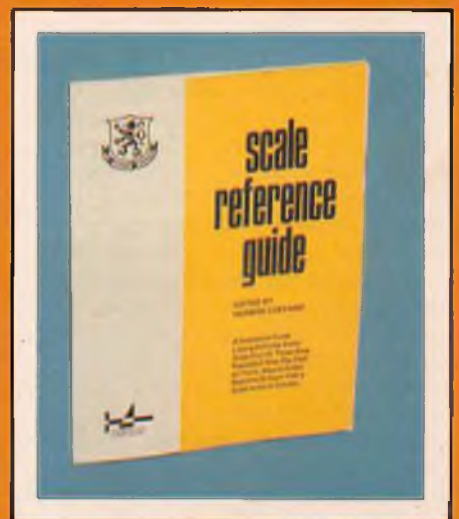
R/C Modeler Magazine's Flight Training Course is the most comprehensive library of material for the radio control beginner and sport flyer ever published. Over 300 photos and over 200 pages. Features the RCM Basic and Advanced Trainers. Everything you need to know.

\$10.00



Volume II of RCM's Flight Training Course teaches you how to trim your plane for competition maneuvers, then takes you step-by-step through each maneuver with diagrams and transmitter instructions.

\$10.00



"Scale Reference Guide" gives reference to virtually every scale plan or three-view drawing that has appeared over the past 40 years in the leading model publications. Also included are reprints from Dave Platt's popular Scale In Hand column.

\$4.50



"The R/C Engine", by Clarence Lee. Edited reprints of the best of Clarence Lee's popular Engine Clinic column by subject material. Also, full size drawings and specifications on the most popular RC engines. One of the best selling books ever printed for the R/C enthusiast.

\$3.95



Clarence Lee's articles reprinted by subject category and completely indexed for fast reference — plus a complete construction article by Henry J. Lopez, never before published, on scratch building a digital read-out tachometer. Also other selected features pertaining to the RC engine. No material in Vol. II has been reprinted from Vol. I.

\$6.95



A must for the serious Scale or Stand-Off Scale builder, and flyer. A compilation of Dave Platt's columns indexed by subject material. Learn the secrets of scale such as finishing, detailing, etc.

\$3.50



# WHAT'S SO GREAT ABOUT THE PERRY PUMP AND PERRY PUMP CARBURETOR?

## HERE'S WHAT:

"The Pump and Carb work extremely well and I am very pleased with it."

"I have a Perry Pump/Carb on a Veeco .61 which works fine - greatest thing since the glow plug!" - P.W., Alabama

"I have gotten great satisfaction from your carburetor."

"I always knew the S.T.G. 60ABC was a good engine but with the pump it will out perform any Speed Webra in D.C.R.C." - J.M., Maryland

"Thanks for a fine product... is very impressive." - H.M., Canada

"I really believe you have a fine product here. The increase in performance is incredible." - R.A., New York

"I recently installed your pump system on my Webra Speed .61 and was very pleased. The engine gained about 500 rpm." - C.S., Canada

"The engine performs beautifully and the Perry carburetor seems to be working flawlessly." - W.S., Illinois

"And I must tell you the pump and regulator have worked very good. The rpm increases 1000 rpm on my OS FSR." - E.T., Sweden

"Love that pump."

"... also my thanks for the pump won at the Omaha contest" - E.C., Kansas

"... and let me compliment you on a piece of equipment that does more than even your advertising claims" - P.H., New Mexico

"I was so pleased with its performance that I wish to order another set."

"I want to tell you that when I installed this pump and carb on my old Veeco '72, I had the sweetest running, highest revving engine in the area." - P.H., New Mexico

"I have been flying my O.S. Blackhead .60 for nine months with your pump and carburetor. It has increased the engine's performance a noticeable amount and I have become very dependent on it." - E.M., APO S.F.

"I think the pump is the best thing to come along since canned beer. Keep it up!" - P.W., Alabama

## PERRY AEROMOTIVE, INC.

581 N. TWIN OAKS VALLEY ROAD  
SAN MARCOS, CALIFORNIA 92069  
Phone 714-744-0841

## PIT STOP

from page 151/30

have heard of some clubs that are working on getting tracks built in park areas. I think this is also a good idea you can look into.

There is no limit to the racing facility your club could have. It just depends on how hard you try and it sure doesn't hurt anyone to ask. Good luck in your search. □

## SUNDAY FLIER

from page 27

wrong. I told him the nose wouldn't stay up. He told me to bring her around easy to an emergency approach. Nervous as I already was, I turned left directly into the sun. I said, "quick, give me my sunglasses, they're on the ground." He looked and looked quickly to no avail and by then the need for them had left. I was having to give more and more elevator to keep it flying. At this point I chickened out and quickly handed the transmitter to my instructor. With some fancy throttle control and other stick maneuvers too numerous to mention, he expertly landed the Blue Goose (as I affectionately call it) on the nose gear with a sudden thud. We immediately ran over to check the radio and servo actuation.

The elevator had plenty of down throw but hardly any up. We stood around theorizing for about ten minutes until I decided to get down on my hands and knees and eyeball the situation. Still on my all fours, I looked at my instructor and said, "George, look here but don't you dare laugh." He looked and yes he burst out laughing. It seems I had a slight cargo aboard my aircraft. The left arm of my sunglasses was hanging out of the wing saddle on the lower side of the wing. I removed the rubber bands and found my Foster Grants hopelessly bent like a pretzel entwined in the arms of my KPS 9 servos.

For this malfunction junction my club, the Central Georgia Radio Controlled League of Warner Robins, voted me the "Dunce of the Month."

Shamefully yours,  
Thomas Geary

Warner Robins, Georgia

No doubt about it, Tom - - - you're a contender. Now here's one that has me guessing.

Dear Ken;

Let's go back a few years, won't say how many.

My first R/C was a H. DeBolt "Sonic Cruiser", powered by an O.S. Max .35, rudder only, using an Orbit-4 (relay) superregen radio.

to page 156

### ATTENTION R/C MODELER SUBSCRIBERS

If you're moving, want to write us about your subscription, or have missed an issue, fill out this form, attach your old mailing label and mail to RCM.

ATTACH YOUR MAILING LABEL OR  
PRINT YOUR OLD ADDRESS HERE

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

PRINT YOUR NEW ADDRESS HERE

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

R/C MODELER MAGAZINE

P.O. Box 487, Sierra Madre, Calif. 91024

# Mac's *FANTASTIC* 5-CHANNEL RADIO

RECHARGEABLE  
NICADS  
THROUGHOUT



## \$259.95

U.S. MADE



**DEFINITELY NOT A FOREIGN IMPORT!**  
**EXCLUSIVE UNCONDITIONAL 180 DAY WARRANTY**

### EQUIPMENT FEATURES

#### TRANSMITTER Model 810

- Number of Channels: 5.
- Case Material: Hi-Impact ABS plastic.
- Type Gimbals: Dunham open-gimbals.
- Type Pots: CTS 5K ceramic.
- Power Supply: 9.6v nicad.
- Type Meter: RF and battery condition indicator.
- Modes Available: Two stick, Mode 1, Mode 2, and single stick — also special order stick arrangements.
- Frequencies Available: 27, 53, 72 MHz
- Weight: 19 oz. with antenna & nicads.
- Size: 1-23/32" x 4-27/32" x 5-11/32" (43.5 x 123 x 136mm).
- Unique Features: RF section provides nominal 750 mw output. One of the smallest transmitters on the market.

#### RECEIVER Model 520R (5) (4)

- Case Material: Nylon.
- Size: 23/32" x 1-19/32" x 1-27/32" (18 x 40.5 x 47 mm).
- Weight: 1.24 oz. (35.1 gr.) for 5-channel.
- Type Decoder: C-MOS 8-bit shift register.
- Type Front End: Double tuned, dual FETS. FET RF AMP. Feeding a FET Mixer.

#### SERVO Model CE-4

- Case Material: Nylon.
- Size: 3/4" x 1 1/2" x 1 1/2" (19 x 38 x 38 mm).
- Weight: 1.25 oz. (35.4 grams).
- Output: Rotary type.
- Output Controls: Arms.

- Type Amplifier I.C. amplifier, utilizing T.I. 28604 I.C. chip.
- Motor Size: 8 ohm, 16 mm.
- Servos: CE-4 (Dunham Mechanics)

#### SYSTEM

- Airborne Power: 500 mah (Nicads).
- Type Connector: Deans 3-pin.
- Type Charger: Dual nicad charger, 2 charge indicators.
- Servo Trays: Full set.
- Shipping Container: Plastic outer, foam plastic inner.
- Service Available: Warranty service thru Mac's P.O.B. 909, BELLFLOWER CA. 90706. Other service available from Service Centers throughout U.S.A. and Canada.

### AVAILABLE ONLY FROM THESE OUTSTANDING DEALERS

**LEE'S HOBBY**  
201 W. 6th AVE.  
CORONA, CA. 91720  
(714) 734-5515

**FRANK'S HOBBY SHOP**  
666 NO. TUSTIN AVE.  
ORANGE, CA. 92667  
(714) 532-3462

**EARLE'S HOBBY AND CRAFTS**  
16631 BELLFLOWER BLVD.  
BELLFLOWER, CA. 90706  
(213) 925-8314

**ORANGE COAST HOBBIES**  
14536 BROOKHURST  
WESTMINSTER, CA. 92683  
(714) 839-8844

DEALER INQUIRIES INVITED. SHIPPING PREPAID ON RETAIL ORDERS. SEND CHECK OR MONEY ORDER TO ONE OF THE ABOVE LISTED DEALERS. ALLOW TIME FOR PERSONAL CHECKS TO CLEAR.

CALIFORNIA RESIDENTS ADD SALES TAX

# MORE MODELERS INSIST UPON

## DJ<sub>1/2</sub> MULTI-STRIPE

- YELLOW • BLACK • BLUE
- WHITE • GOLD • RED
- \* ORANGE \* SILVER \* GREEN

P.O. Box 9382 Glendale, Ca. 91206

**NOW**  
**3 NEW COLORS**

**9 Colors in 4 widths**

WHY is DJ's the most insisted upon striping tape?

The main reason is the patented DJ's multi-stripe adhesive that cures in sunlight!

If you want the **BEST!;** Insist upon

**DJ<sub>1/2</sub> MULTI-STRIPE**



1/16" Wide,  
36 Feet Long - \$1.98

3/32" Wide,  
36 Feet Long - \$2.69

1/8" Wide,  
36 Feet Long - \$2.69

1/4" Wide,  
36 Feet Long - \$3.69

### SUNDAY FLIER

from page 154/27

*Side note - also had a lifting airfoil on the stab! It flew well (I think) and I had a lot of fun for the next two years, until I got myself a 10 channel unit and changed the stab and added elevators.*

*Back to the dumb part.*

*My friend Roy, went out and got himself a new "Wen Mac" single channel superhet type radio, a .19 powered rudder only airplane with a rubber band powered escapement.*

*Now, are you ready for this? My Orbit-4 superregen would not hit Roy's Wen Mac superhet and Roy's Wen Mac would only drive my Orbit reeds a little bit. You could only hear them a little bit, and it wasn't enough to bring up any relays.*

*So! Why not?*

*We flew together quite a few times with no trouble, until one day. Some other modelers came along and said that we couldn't do that.*

*Now I tell you, that's dumb.*

*Sometimes what you don't know won't hurt you as it is true, that a little bit of knowledge can be dangerous.*

*Jerry G Slater  
Martinez, California*

I haven't been able to figure out who was the Dum-Dum. Was it Jerry --- or the guys who said Jerry and Roy couldn't fly simultaneously --- even though they were doing it? And how come they could? My guess is that the superhet was just enough off the Orbit frequency that it didn't get hit, and the Orbit was strong enough with its signal to reject the interference from the Wen Mac. (Somebody's bound to set me straight if that's wrong.)

I'll have some more for you later, but right now, it's time to announce the winners for the oldest and youngest R/C fliers (whose names were turned in to me with certification).

Oldest was Elmer Harms, of the Madison Area Radio Control Society. Elmer was born in 1897; he's in his 81st year on this spaceship Earth, and four years ago decided to learn to fly radio controlled airplanes. He belongs to the AMA, and flies all year round --- even up there in Wisconsin. He takes off from a frozen lake in the Winter! Now that's an active flier.

Elmer's name was submitted by Roger and David Deicher. Roger is the treasurer of the MARCS. They forgot one thing --- Elmer's address. So how do we send him a subscription to RCM? Or will he come to the offices in Sierra Madre to pick it up? (Only kidding, Roger. When you read this, send

Elmer's address to RCM's Subscription Department; tell them Elmer won the contest, and they'll put him on the mailing list.)

The youngest R/C flier is, by now a celebrity. His picture has been in several magazines, he has given demonstrations at contests, and I have personally been present during some of the training sessions when his father was instructing him. His name is Gordon D. Hyde, but is better known as "Chip." Chip was born in October, 1971. He soloed five days before his fifth birthday, and has been flying ever since. I have personally seen him perform slow rolls, Split S's, spins and other maneuvers, and he would be a good competitor in Novice Class at any meet. For that matter, if he has improved as much since I last saw him as he did while I was watching his training, he probably would be a good entrant now in Sportsman Class. So Chip wins the subscription as the youngest R/C flier whose name was submitted.

★ ★ ★

Last month I covered the WRAMS R/C show --- a really great event, even though only ten years old. This month, I went to the Weak Signals Toledo Show, now in its twenty fourth year, with the Silver Anniversary show coming up in 1979. As the saying goes, it's the "biggie" and getting bigger, as they all

## 6th ANNUAL FORT WAYNE AIR RACES

Sponsored by

Fort Wayne Flying Circuits, Inc., and in conjunction with The City of Fort Waynes' Three Rivers Festival

**PRIZE MONEY EACH EVENT: 1st Place \$250 ★ 2nd Place \$150 ★ 3rd Place \$100**

**Q.M. SATURDAY JULY 8th ONLY**

7:30 a.m. Registration  
8:30 a.m. First Race

**F.1 SUNDAY JULY 9th ONLY**

7:00 a.m. Registration  
8:00 a.m. Handicapping  
8:30 a.m. First Race

AMA Sanction 685 — AMA Rules — Pipes allowed

**Flying Site:** Jefferson Township Community Park (grass). Located 5 miles east of New Haven, Indiana on State Hwy. 14. First three place winning engines will be inspected — Banquet Saturday Nite, Family Style

For further information, contact: **James Gager, Contest Director**, 3727 Shepherd Lane, Fort Wayne, Indiana 46815 (219) 485-3467

1/2 A FLYING AT ITS BEST THAT'S WHAT YOU GET WHEN YOU BUILD THE HORNET. PRECISION CUT QUALITY BALSA & PLY WITH COMPLETE HARDWARE RIGHT DOWN TO THE .049 ENGINE MOUNT MAKE THE HORNET ONE OF THE BEST VALUES FOR YOUR MODELING DOLLAR. CHECK FOR IT AT YOUR NEAREST DEALER OR ORDER DIRECT.

# HORNET



MILE HIGH MODELS

4805 BAJA CT. NE.  
ALBU. N.M. 87111  
(505) 296-2405

**\$20.95**

are. Since RCM had four other staff members at Toledo, I'll only make a few observations this time around.

Maybe the Weak Signals Club will have to take a look at Detroit as a site soon. The Toledo Sports Arena can barely accommodate the crowds. Take a look at the photo I took from the balcony. Nothing but a solid mass of people. With one exception, which brings me to the next observation.

Note the huge airplane in the right center of the picture. It's a one half scale version of the Aeronca Champion — 17 foot wingspan. Note I say "version" rather than model. It's too big to be a model. If it were stressed and powered to handle the load, it could well be occupied by a ninety pound pilot and flown as a full scale airplane. It actually was larger than an RPV that I flew back in 1973 which carried a 110 pound payload!

Big airplanes were very much in evidence at Toledo, and the trend continues to accelerate. I am not opposed to them — in fact, I fell in love with Concept Models' 1/4 scale Fleet. I logged about fifteen hours in one back in 1930, and it was one of my favorite planes.

However, big "model" airplanes are bound to raise a question. How big can they get, and still be "regulated" by the AMA as opposed to becoming a subject

for control by the FAA? After all, they are getting to the point where they could conceivably create a "blip" on a radar controller's screen. Think about it.

While at the Toledo show, I talked with two experts in their respective fields -- fuels in one instance, batteries the other.

I quote: "Heat is power. Anyone who claims his fuel delivers more power, while at the same time runs cooler, is misleading the public!" How do you equate that with some of the claims? I'm not saying I agree -- or disagree. Perhaps some one of you can comment; I'd be interested to hear.

A second quote: "Nicad batteries do not have a memory." In another part of the show, a display says "Cycle your batteries. Get rid of their memory and let them operate to full capacity." It sure is confusing to a Sunday flier.

This month I'd like to close out the column with a heartfelt "thank you so very much" to all of you who wrote me, or phoned me, or stopped me at the WRAMS and Toledo shows just to tell me how much you enjoyed reading the column about my father. For a long time I had been thinking about writing that story, but it seemed a bit personal. Your response proved that I was wrong, and I thank you for it.

Sometimes the life of a columnist can be very rewarding. This was one of those times for me.

## HERE'S HOW

from page 24

also demonstrates the buddy box method itself. Dale is firmly convinced that the buddy box is the quickest way in the learning process of flying RC. During his demonstration this method is pointed out as the best possible way.

Designing and building the RC Flight Simulator was a rewarding project for Dale. It has been shown to hundreds of people and there is no doubt most have walked away much more knowledgeable with respect to this fun hobby of ours. Letting them know what it's all about and, a chance to see and "feel" the controls are most likely the strongest factors in creating the interest required to sell the newcomers. The RC Flight Simulator is, without a doubt, that special kind of device designed to fill a particular need in our hobby. Although not for everyone, it will be particularly beneficial to manufacturers, hobby dealers and clubs for demonstration and training. If you are interested, write to Dale Heuberger, 318 N. Bowen Avenue, Bremen, Indiana 46506. He will be most happy to answer your questions on how you can own your very own RC Flight Simulator.

## BLUE ANGEL KIT #104



There's not another 1/2A sport scale kit that even comes close. Quick, responsive and stable, it has a flat, steady sink-rate on approach. With retracts and throttle it brings jet-like realism to schoolyard scale. When you see its distinctive silhouette against the sky, you'll know you made the right choice.

## F-4 PHANTOM

1/2A Sport Scale

**SPECIFICATIONS**  
Span: 30 in.  
Area: 241 sq. in.  
Weight: 19-22 oz.  
Engine: .049-10  
Radio: 2-5 channels

### SPECIAL FEATURES

1. Super detailed sport scale with preassembled fuselage.
2. Tough, light, sheet foam wing.
3. Highly detailed clear canopy.
4. Easily accepts 1/2A retracts.
5. Precision aluminum motor mount.
6. Simple, quick construction.
7. Conventional elevator or stabilator construction.
8. Detailed photo-instruction booklet.
9. Complete decals for each version.

**\$29.95**

## THUNDERBIRD KIT #105



**MODEL MERCHANT**

"See your nearest hobby shop first."

For our full line brochure, write:  
Model Merchant, P.O. Box 3792, Irving, TX 75061



**AND NOW, AN  
ELECTRONIC IGNITION  
FOR GLOW PLUG MODEL ENGINES!  
PUT YOUR POWER IN YOUR PLUG**

(not in a large dropping resistor)

ONLY  
**\$29.95**



- The Electroglow;
- Prevents flooding
  - Regulates all 1 1/2 & 2 Volt plugs
  - Input voltage range now 5-15 volts (7+ needed for racing plugs)
  - Average draw, 500 MA
  - Covered by US patent.
  - Money returned if not satisfied
  - One year warranty

Try this experiment:

Heat a plug outside the engine. Then blow on the heating element. You will see how easily it cools. The Electroglow won't let this happen. It automatically, on demand from the glow plug, adds the necessary power to keep it red hot. You'll be amazed at how easily your engine will start. Designed to work with a rechargeable battery 6.3 - 12 volts (not included).

To order, send \$29.95 + \$1.50 for postage & handling. Ohioans add 4% tax. DEALERS PLEASE WRITE

THE D.L. WRIGHT CO.

10191 Dupont St. Columbia Station, Ohio 44028 (216) 236-5607

Size: 4" x 2 7/8 x 1 9/16 (box only). Or mount without box. Panel size 2 5/8 x 3 3/4"

**HOVER**

from page 22



*D.C.'s Flybarless Heli-Boy with Heli-Baby canopy fitted.*

3' from the first to the second to the third. The second set of three gates will have a 4' total rotor clearance and will be spaced the same 3' between 1st, 2nd and 3rd gate. The third and final set of gates will have a total rotor clearance of 2' and, again, will be spaced 3' between gates. All the gates will be 3' tall balsa sticks and the object will be to fly through three sets of three gates below 3' altitude without cutting any of the balsa sticks. Once through one set you will then proceed to the tighter second set then on to the third to get as many points as possible. This will be a complete round for the Sportsman division.

The Masters will lift off, hover, climb out to a procedure, turn left or right then a Figure 8 any size, then on to what sounds simple enough: a 200' perfectly straight level flight at 8' or less of altitude and then 200' back the opposite direction after which you will try to fly three laps around the 200' pylons at a prescribed elapsed time per lap. You will have 10 laps to attempt to get three laps under the elapsed time limit. After the pylon deal will be the same gate set-up as in Sportsman, only the gates will be smaller. They will have a total rotor clearance on the first set of 2', the second at 1', and the third at 6". The remaining task in Masters will be graduated hoop pick-ups. There will be three hoops to pick-up, 10"-6" and 3". This, then, will be a complete round for Masters.

A new optional to the Masters flyers class has been labeled Hot Dog. This Hot Dog class got its name from Hot Dog Skiing or do your own thing type of flying. You will be able to choose 5 various types of maneuvers and you will have 3 minutes to do them in. The maneuvers were limited to 5 so as to have time to do quality not quantity flying to gain points. Like I said earlier, these are the tentative rules as of this writing and if you have any further questions call Dwyane.

★ ★ ★

You know, when it comes to setting up a helicopter, there aren't what you could really call any real trick procedures. If you could say that there are any real tricks, it could be put into one word --- accuracy. The more precise you can

**8th ANNUAL NATIONAL MULTIWING  
RC CHAMPIONSHIPS**

Hawk Field — Omaha, Nebraska  
Biplane Capitol of the World

July 8th and 9th, 1978

Registration: 8 a.m. July 8th

Flying: 9 a.m. each day

Events: Three Acrobatic events, Sport Scale, High Noon Barnstorming

Entry Fee: \$10.00 per contestant — allows entry in one acrobatic event, Sport Scale, and High Noon Barnstorming

**WINNING Model & Hobby Supplies**

Main Branch: 2 Austin Avenue, ►  
Kowloon, H.K.

Tel: K-684184, K-891028

Cable: 5625, Hong Kong

★ ★ ★ ★ ★

RC Planes, Copters, Gyrocopters, Motor Gliders, Soarers, Scale Planes, Pylon Racers, ARF & RTF Models.



◀ H.K. Branch: 34-36, Yik Yam St. B1.

Happy Valley, Hong Kong.

Tel: H-753483

★ ★ ★ ★ ★

RC Boats, Yachts, Cars, Buggies, Tanks, Rockets, Radios, Parts, Etc.

Mall Order Service. Price List — US \$1.00 (by Air).

10 AM- 7 PM Sun. & Holidays closed.

set-up a helicopter, the better it will fly. The problem is finding out the methods to achieve this desired precision. The main rotor system (now notice I said system) has many areas of set-up that can benefit from a more precise set-up. This month we can cover a very exacting method for checking pitch settings on fixed pitched machines; also checking collective pitch settings such as total collective travel; just how much pitch it takes to hover a particular machine at a certain throttle opening; whether one set of blades are more efficient than another; how much cyclic control you have; is the fore and aft cyclic balanced with the left and right, and can it go on and on. But the trick here is that the checking and results are done accurately without any guessing of "I think it's so many degrees" method. This method will tell you exactly and you may be surprised at some of the readings you get.

All checking is done at the tip of the blades because that's where most all of the work the blade does, is done at - - the last 4" to 6". After using this method and keeping notes on your readings, eventually you will be able to duplicate previous set-ups that seem to work well and, also, when conferring with fellow flyers, you can exchange information and, with the exactness that you have in set-ups, you can try someone else's suggested set-ups and get the same results and, also someone else can try your set-ups. What this all achieves is that it eliminates guesswork and you end up with facts to work with.

Some of the pictures in this column will show you what I use for checking pitch settings. My own name for these super gadgets is an Angleometer (I believe the technical name is inclinometer). But anyway by using the Angleometer and an X-Acto adjustable clamp #7004, you can accurately set or adjust pitch on any helicopter. There are two sizes of the Angleometer available, the small 3" diameter or the larger 4" diameter. I use both sizes. The bigger one is much easier to read and is marked in half degrees. Both can be purchased at Sears.

I usually use the small one to level the machine for checking and also on the flybar to keep it level while checking the pitch on the rotor blades with the big one. I have found this to be the best, most accurate way of checking pitch. By using the X-Acto clamp which is about 8" long, I have even been able to check out a full size Hughes 300 for collective and cyclic - - - just like the models. You'll find after you have used this method awhile, you can set-up the machine with much more accuracy than you ever thought possible and you can repeat your set-ups that you know work best with no guessing. The pictures should clear up any questions you might have on how to use these pieces.

## KRAFT MIDWEST

PERSONAL SERVICE BY PETE WATERS  
"I'LL FLY WHAT I FIX"

- Typical 72 Hour Turn-Around
- Modern Test Equipment
- Large Up-To-Date Inventory
- Reasonable Charges



AUTHORIZED  
WARANTY  
SERVICE

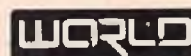


ALSO INTRODUCING:

### R/C SERVICE MIDWEST

EK·logictrol

AUTHORIZED  
SERVICING  
CENTER



31219 KENDALL, LIVONIA, MICH. 48154  
(313) 425-6414

THIS SPACE CONTRIBUTED BY THE PUBLISHER

Nobody likes a quitter...  
but we do!

American Cancer Society

THORP

**1/8 SCALE COMPETITION RACE CAR KIT**  
less engine & radio

**\$195.00**



**THE  
EASY  
ONE  
TO  
DRIVE**

**WINNER IN THE TOP THREE CLASSES IN 1977 SOUTHERN CALIFORNIA CHAMPIONSHIP SERIES**

Variable speed transmission & differential.

Available: READY TO RACE VERSION

**THORP MFG.**

**THORP R/C RACEWAY**

1655 E. Mission Blvd., Pomona, Calif. 91766

(714) 622-6518

## FOKKER FK-3

1/6 Stand-Off Scale now in full kit form and completely redesigned for one thing: Thermals

### KIT INCLUDES:

- Poly Glass fuselage.
- Canopy.
- Machine-cut wing and stab rib.
- All balsa and spruce.
- All necessary hardware.
- Easy to follow full size plans and instructions.

Wing Span ..... 128"  
 Wing Area ..... 750 sq. in.  
 Wing Loading ..... 8-10 oz.  
 Length ..... 48.5"  
 Weight ..... 42-48 oz.  
 Aspect Ratio ..... 21.85



**\$89.50**

### WINDSPIEL MODELS

Rt. 3, Box 457, Coeur D'Alene, Idaho 83814  
 (208) 664-6894

\*\*\*

One of the first problems I had when first trying to fly a helicopter, was try to keep the transmitter in one place where it felt comfortable. I always kept pulling it up into my chest until the stick would be stuck in my chest and I couldn't control the thing any more. What I did was to design a box or tray with a strap on it to go around my neck and angled it so it held the transmitter where it felt in a natural position to me. Now I have to admit that tray really helped me learn to fly because now I could concentrate better on flying.

There is no set design for these trays but if you would like to make one, here's how I would go about it. While you're actually flying, land the machine and immediately have someone take various measurements from your stomach to the transmitter stick — or sticks; from your chin to the stick and, if applicable, any angle the transmitter is to your front.



*A Hirobo kit Enstrom by Alan Hickman of Canton, Ohio.*

These are the basic measurements for your tray. The tray can be made from anything. At first I used wood paneling for the bottom and wood for the sides. I'm using plexiglass now, as shown in the photos, but it's more for looks than anything else.

I use foam rubber pipe insulation, available from a refrigeration supply. Hot Stuffed to the base to keep it from slipping on my stomach and, also, depending on the type of strap used, maybe the same thing slipped over the strap where it goes over my neck. If you decide to use plexiglass, the best glue to use to put it together with is a very thin viscosity plexiglass cement. They have various types of plexiglass cement but use the thin water-like type. Cadillac Plastics name for it is Cadco 94. But whatever brand, it's probably the same thing. This thin stuff you can use like Hot Stuff on the plexiglass and it's very strong and dries almost instantly.

\*\*\*

Well, as this is being written the Toledo show starts tomorrow and I can't wait to see what's new. Whatever news there is in helicopters I'll be sure to put in next month's column. Until then keep the stick forward. □

**NEW**  
 Scale Rotating Retracts

Another Robart Exclusive

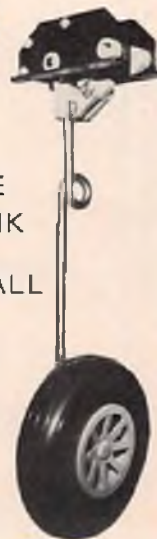
- 90 SCALE ROTATION FOR CORSAIR, P40, HELLCAT, AERO COMMANDER
  - SCALE DRAG LINK MECHANISM
  - AIR CYLINDER OR SERVO OPERATED .40/.60 SIZE
- \$49.95



**NEW**  
 Heavy Duty Scale Retracts

Another Robart Exclusive

- 3/16" GEAR WIRE
  - SCALE DRAG LINK MECHANISM
  - DESIGNED FOR ALL HEAVY DUTY APPLICATIONS (1/4 SCALE, ETC)
  - SERVO OR AIR CYLINDER OPERATED
- MAIN \$44.95  
 TRI \$54.95



**NEW**  
 .60 Scale Retracts

Another Robart Exclusive

- SCALE DRAG LINK MECHANISM
  - DESIGNED FOR ALL .60 SIZE APPLICATIONS
  - SERVO OR AIR CYLINDER OPERATED
- MAIN \$39.95  
 TRI \$54.95



**robart**  
 203 E ILLINOIS AVE ST CHARLES IL 60174

# THE BIG THREE — Chuck Cunningham's Original Line-up!

The quarter size planes that do it all on .61 power



*New*  
Sleek & sporty  
**Miss Texas**  
Introductory price \$89.50 Add \$5 postage, handling  
List price \$119  
• 84" span • For .61 engine • 1000 squares



Fun flyin' **LUCKY LADY**  
Introductory price \$59.50 Add \$4 postage, handling  
List price \$79.50  
• 72" span • .45-.61 power • Easy build



Magnificent  
**LAZY ACE**

Introductory price \$99.50 Add \$5 postage, handling  
List price \$125  
• For .61 engine • 76" span • Flies great

Complete kits: balsa, spruce and plywood construction, all parts machine cut and packaged, rolled plans.

**SKY MASTER INDUSTRIES**

**2440 COLONIAL PARKWAY**

**FORT WORTH, TX 76109**

Master Charge / Visa Texas residents add 5% sales tax. Send check or Money Order, no C.O.D. shipments.

## CAP'N DICK'S COCKPIT

from page 20

Top Flight P-40's and P-51's, two Royal O's, two scratch built Hurricanes, two SE-5's, and several original "fly for fun" trainers to teach "the other blokes" how to fly. All those "war birds" are contest quality Stand-Off Scale — really beautiful work.

Danny, now retired from Air Canada, was an RCAF fighter pilot — flew P-40's and P-51's. With similar backgrounds, plus our mutual modeling interests, we hit it right off. Dan dragged out a dusty portfolio of photographs from the past.

*Right: Dan Pethrick & his Royal 'O' showing what the average Canadian wears for a winter flying session at 22° below 0.*



*Dan has an excellent collection of old ignition mills.*

Displayed before me was a lifetime of modeling activity --- the 1947 Nats in Minneapolis; ignition airplanes of all descriptions; and early R/C ventures. Dan still has most of his early ignition mills — Browns, Orwicks, Atwoods, etc. I layed a little MECA propoganda on him — he'd be a fine member.

## NOW! NO NEED TO QUIT FLYING BECAUSE OF LOW BATTERIES.

### THE D&D AUTOMATIC FIELD CHARGER

Restores the energy used in a ten minute flight in 5 minutes maximum— regardless of size of pack! As seen in Nov. '77 RCM

- COMPLETELY SAFE - CANNOT OVERCHARGE!
- AUTOMATIC VOLTAGE AND TEMPERATURE CUT-OFF!
- LED indicates approximate state of charge while charging!
- Will charge ANY size 4 cell flight pack without adjustment, from any 12 volt D.C. source.

**\$19.95** KIT FORM - D&D 107

**\$24.95** ASSEMBLED - D&D 107 A

Add \$1.50 for shipping Ariz. Res. add 5% tax.



**D&D** electronics

ORDER BY PHONE - USE BANKAMERICARD OR MASTER CHARGE  
BOX 2102, LAKE HAVASU CITY, AZ. 86403 PHONE (602)855-3526



# MARK V

Super ELECTRIC FUEL PUMP



Introducing the most advanced design electric fuel pump ever available to you! . . . .

The combination of a new high performance motor and new molded pump unit will fill the largest of fuel tanks quickly and requires less than half the input current of other electric fuel pumps. Many new features including recessed fuel outlets, internal printed circuit board for solid control switch functions plus Nylon molded case.

Available in two models at your local dealers.

Model No. 250, 2 to 6 Volt operation.

Model No. 1250, 7½ to 12 Volt operation.

**\$13.95 each**

**SONIC-TRONICS INC.**

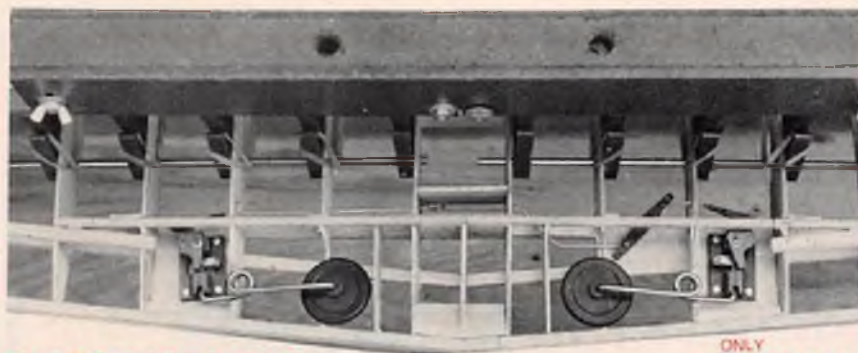
518 BYERS AVE. CHELTENHAM, PA. 19012



1/2A - .19

**NEW!**

# "A.J. RETRACTS"



Dealer Inquiries Invited

- ★ Lightweight Yet Durable (Approx. 3/4 Ounce)
- ★ Fully Adjustable Retract Height and Angle
- ★ Designed to Operate With Miniature 90° Servos
- ★ Positive Lock-down Feature
- ★ No Strain on Servo in Up or Down Position
- ★ Double Shock Coil in Strut
- ★ Easy to Install
- ★ Unconditionally Guaranteed

ONLY  
**\$11.95**

**A-justo-jig Co. Rt. 1, Box 673 Noblesville, Indiana 46060**

Bill and Dan are real old fashioned "dope and glue" craftsmen. I didn't see a power tool in the place. As they built and talked I soon realized that precision is their game.

"We hate foam — if it's not made out of sticks, we leave it alone," Bill said.

Things were still going strong when I had to leave (at 1 am). I had to catch some sleep before my early morning departure for Minneapolis, Chicago, Detroit, and Newark.

If I'm lucky enough to get more Friday night layovers in Winnipeg, bet you can guess where I'll be!

Readers, I've been blessed with some mobility in my profession. I might get into your town. If there is something of interest that you would like to share with the R/C gang, please drop me a line in care of the magazine. Perhaps we could meet on one of my layovers . . . From Cap'n Dick's Cockpit. □

## SUPER SCALE

from page 19/15

for a couple of reasons. The two servos share the load which is significant with as large a surface as the ailerons are, and plugging in a couple of servos to a 'Y' connector is a great deal easier than making, and adjusting, a mechanical linkage hook up every time you fly. They rarely get out of adjustment as a mechanical linkage will, and so are much more convenient.

The servos draw much more current than they would in a more conventional model when moving the larger surfaces, so you'll find your battery capacity to be about half of it's normal duration. This can be overcome by using a larger battery of about double what came with your radio (capacity, not voltage!) The added weight is of little consequence. I have been using the automatic field charger, detailed in a recent RCM article, which replaces the charge used in about 15 minutes after every flight. This item is self-limiting so it is impossible to damage your battery with it. All that is required is to assure the minimum charge time and you're home free. In theory, it would be possible to fly all day (or to the limit of TX capacity) charging every flight, and end the day with the RX battery still at full capacity. I have one of these little darlings and it sure solves the battery capacity problem. It won't charge the TX, but it does supply what the large model needs in a convenient package and will do it from your 12 volt battery without problems. (ED. Note: See May 1978 for TX charger. Reprints available for \$1.00, or back issue available for \$1.75.)

When I install separate servos for

each aileron, it is easier to mount the servo right in a wing rib in a convenient location to reach the aileron horn. This will require a long extension to get to the 'Y' connector. I make these runs inside the wing and place a piece of plastic tubing through the ribs to lead the extension cable to the wing root. In case of having to change a servo, I don't have to fish the lead through a bunch of mis-aligned small holes in the ribs. The tubing must be large enough to accommodate the plug on the extension cord, but in the sizes we're working with, that's not a problem.

I have not yet done so on ailerons, but on rudders and elevators, I have been using either wire cables or piano wire pushrods, working in both directions. These large control surfaces would be even more likely to cause pushrods to flex than would be the case with shorter runs and using rods working a surface in both directions prevents any flexing from reducing positive control. I set these up so the rods are quite snug (and there is still a little flexing) but there is a price to pay for this. The additional tension on the servo output arms can, and over a period of time will, cause extra wear in the direction of the tension applied. So, if you are using conventional servos, double check everything twice (that means four times total!) and keep an eye on things as you build up time on the model. We don't need any catastrophes this early in the big game. (Pun intended!) Some of the newer servos coming out utilizing a ball bearing around the output shaft begin to make a lot of sense.

An alternative to regular servos are the many, more powerful servos on the market, including retract servos, although these are a bit slow moving for control surface use. Jomac (formerly Jerobee) the people who make RC cars have a dandy servo. It puts out a reputed 5 pounds at the end of a 3" arm. It has an external amp so only the motor and gearing are in the servo case. They are a bit larger than what we are used to, but this is not a problem in the quarter scale field. They are all but as fast as the standard servos, and the power available is surprisingly good. One of our modelers in the local club has a 1/3 scale Andy Sheber Pitts S2-A with 3 of these installed and if you hold the rear of the elevator and apply full down, it will lift the tail off the ground. That's performance! Jomac's ads appear in RCM from time to

### FAMOUS BRITISH DIESELS

D/C P.A.W. M/E

☆☆ NEW ☆☆

CATALOG-DIESEL HANDBOOK

\$1.50 pp.

HOBBY HIDEAWAY DELAVAN, ILL. 61734

**Jerobee** **MRP**

#### RADIO CONTROLLED MODELS

1/12 Scale Race Cars both gas and electric. Winners of 90% of the trophies at the 1974, 1975, 1976 & 1977 Nationals.



#### JEROBEE 1/12 SCALE GAS CARS

Jerobee cars less radio are ideally suited for the person who already has a radio and would like to get a start in R/C car racing. All models have a radio mounting area 2" x 7.5". Models with the chassis pan have an additional 17 square inches of mounting area. All models include complete mounting and operating instructions. Jerobee ready to run cars come with a JoMac Mach 3 #404 2 channel R/C system with super fast servos. These cars and radios are used by 90% of all 1/12 scale gas contestants & winners at ROAR Nationals & other races.

#### Basic Features Of All Cars

1. High impact strength injection molded frame, wheels & gears.
2. Independent front coil suspension plus controlled chassis flex.
3. Ackerman steering.
4. Heavy-duty rear axle.
5. Recoil pull starter (except models with TD engine or motor).
6. Centrifugal clutch (except electric).
7. Realistic "Mag"-type wheels.
8. Steel drive gear and high strength molded main gear.
9. Additional accessories may be added to all models. All bodies interchange.

#### JEROBEE MK8B 1/12 SCALE BASIC GAS CAR

LOWEST COST ROAR LEGAL GAS RACE CAR SPEED 22 MPH



The MK8B shown above is the basic, lowest price model available. The MK8B comes with the #501 engine, cyclac body, and all the basic features and specifications listed above.

#141 MK8B COMPLETE READY TO RUN WITH ENGINE, #404 R/C SYSTEM, #201 MK8B COMPLETE WITH ENGINE LESS RADIO, #210 MK8B COMPLETE LESS RADIO & ENGINE

#### JEROBEE ALFA 1/12 SCALE CLASS B GAS RACE CAR

WINNER OF MANY ROAR NATIONALS SPEED 32 MPH



The Alfa Romeo Can Am car is an ultra high performance Class B (only) race car. The Alfa is not recommended for beginners as it comes with a Tee Dee .049 engine that requires experience and a starter to operate. This car has all basic features and specifications. Special features of the Alfa include: High strength, super impact resistant Lexan® chassis. Aluminum flywheel. Heat sink mount. Large tank. Molded pan. Molded bumper. Brake. Sponge front & rear race tires on chrome rims with bushed front wheels. Head sink. Painted light weight Lexan® body with a molded unpainted driver.

#147 ALFA COMPLETE READY TO RUN WITH ENGINE & #404 R/C SYSTEM

#207 ALFA COMPLETE WITH ENGINE LESS RADIO

#### JEROBEE VETTE 1/12 SCALE GAS CLASS A RACE CAR

WINNER OF 95% OF ALL 1974, 75, 76, 77 ROAR NATIONALS CLASS A ROAD & OVAL TROPHIES SPEED 26 MPH



The Vette is the best Class A race car available. The Vette comes complete with race engine and painted Lexan® body. Besides all the basic features and specifications as listed the Vette has all these added features that add performance: High compression head Lexan® chassis. Brake. Large remote tank. Bumper. Pan. Wide rear tires on nylon wheels.

#148 VETTE COMPLETE READY TO RUN WITH ENGINE & #404 R/C SYSTEM

#208 VETTE COMPLETE WITH ENGINE LESS RADIO

#280 VETTE COMPLETE LESS ENGINE & RADIO

Five gas and three electric to choose from with or without radio. Send 50¢ for complete catalog to

**JoMac**

12702 NE 124th Street  
Kirkland, Washington 98033  
(206) 827-8606

## THE FIRST COMPLETE ELECTRIC PROPULSION UNIT

- servo controlled
- 12 volts, 2 amps maximum draw
- forward, neutral, reverse
- full speed range
- all aluminum housing
- brass gears
- choice of 3 gear reductions  
1:1 (11900 rpm)  
1:1.5 (7932 rpm)  
1:2.3 (5173 rpm)
- weight: 20 ounces
- length: 4 1/4" width: 2 1/2" height: 2 1/4"



### M.A.C.K. Products

Model Marine Division

P.O. Box 33A

Rahway, New Jersey 07065

Send 25¢ for further information and full specification sheets

N.J. residents add 5% sales tax

### COMPET-TOTE



\$14.95

- Compact Size 18" x 7" x 14"
- Sturdy Model Support
- Gallon Fuel Can Compartment
- Rugged Interlocking Parts
- Fuel Resistant Foam Rubber Cushion
- Room For Starter, Batteries, Props, Tools
- Easy Balance Carry Handle
- Precut Parts For Fast Assembly

### The Amazing MITER SANDER



\$27.95

- Bevel or Square Parts For Precise Assembly
- Make Perfect Wing Butt Joints At Precise Dihedral Angles
- Sands Bevel Angles To 50° In Balsa, Styrofoam, Etc.
- Work Capacity 3" Thick x 14.5" Wide Wing Halves 36" Long
- Quick Build Kit, All Parts Pre-cut & Drilled
- Unique Fast Change 2 Grit Size Sanding Block
- Pre-assembled Slider Track Assembly

Add \$1.50 postage and handling  
We Accept Checks & C.O.D. Orders

### CUSTOM CRAFT PRODUCTS

19 FLORGATE RD., FARMINGDALE, N.Y. 11735

## THE KRAFT .61 CU. IN. ENGINE IT'S A WINNER!



IT'S A WINNER IN COMPETITIVE FLYING. THE PROVING GROUND FOR ENGINE PERFORMANCE.  
IT'S A WINNER WITH THE DAY-TO-DAY SPORT FLYER FOR ITS LONG LIFE AND READILY AVAILABLE PARTS AND SERVICE.  
QUALITY ASSURED. AMERICAN MADE.

**KRAFT**  
SYSTEMS, INC.

Write for free catalog, Dept. C  
450 WEST CALIFORNIA AVENUE  
P.O. BOX 1288-VISTA, CALIFORNIA 92083  
World's Largest Manufacturer of Proportional R/C Equipment

time and your local dealer should be able to order them direct from Jomac in Kirkland, Washington.

Jerobee tells me the servo produces 40 ounce inches at the end of an arm which is approximately 1 3/4" in length. Transit time is .3 seconds. Unfortunately, the servo is not as readily available as I had been led to believe (no fault of Jerobee's). They are currently available only on special orders of 50 or more. We can only hope that some enterprising distributor will choose to stock them for those of us who are interested in the larger models.

From experience, I know they do a great job on the larger control surfaces we are concerned with and, they are less costly than the ones which came with your radio. They plug right into your receiver (with the appropriate plug, of course) and will operate with any positive pulse system as is and with negative pulse systems and a pulse inverter. Reversing their rotation is so simple it's almost ridiculous, you unplug the leads between the servo and the amp, reverse them and plug them back in again. Couldn't be easier for those of us who goof occasionally!

Throttle is no problem for your regular servos as there is practically no load when the pushrods are properly installed. Some ingenuity may be required to get the movement to the right place in the right direction. (See Photo 4 for one solution on the Quadra).



We have found here that flaps on the larger models are very effective. While these large birds fly more slowly than the smaller ships, the use of flaps gets landing speeds down to very low levels. The Beaver mentioned earlier lands at an estimated 15 mph with flaps and excellent control can be maintained right down to this low speed. The Beaver suffers no appreciable pitch change when the flaps are dropped. Incidentally, there are no plans in existence for this nine foot Beaver, so please don't write and ask for them. The builder drew his own from an Aeromodeler plan from England and enlarged it right onto the wood he used to build with. Judging from the numbers of requests I've had for it, someone better do one soon!

I have finally managed to track down some large plans in Europe and have written for more details. I'll pass them along as details become available. Just

to page 166

# SERVOS, RECEIVERS, COMPLETE FLITE PAKS REGULAR OR MICRO, ASSEMBLED OR KITS

Litco flite paks or components can be purchased assembled or in kit form. Assembled units are pretuned and ready to use with transmitter specified below. All units use Deans connectors. Servos are supplied with extra female Deans connector to simplify installation.

Litco Systems has pioneered the concept of fully assembled flite paks custom matched to various transmitters. Our servos are electrically adapted to match the transmitter specified. There is no universal servo that operates properly with all transmitters since throws and pulse spacing vary with each make. Please order from table below.

PLEASE CIRCLE THE MAKE OF YOUR TRANSMITTER: **KRAFT EK ROYAL FUTABA WORLD MRC RS ORBIT HEATH ACE UNICOM CANNON**  
(PRO LINE COMPLETE FLITE PAK ONLY) **SANWA CIRRUS MICROAVIONICS KRAFT KP4A**

## REGULAR COMPONENTS



## MICRO COMPONENTS



### SERVO

- Double sided PC boards
- Solid tantalum capacitors
- Long life potentiometers
- High quality servo motors
- 4.0 lb. power, 0.5 sec transit
- 8 mA drain
- Fast, precise, high resolution
- Gold plated Deans connectors

REGULAR Size: 1.5x1.45x.73

Wt. 1.2 oz.

MICRO Size: 1.28x1.3x.6

Wt. 0.7 oz.

### RECEIVER

- Double sided PC boards
- Double tuned front end
- 1.5  $\mu$ V, AGC on 4 stages
- Gold plated Deans connectors
- High selectivity and rejection
- 5 channels, 8 available

FREQUENCY: 72.08, 72.16, 72.24, 72.32,

72.40, 72.96, 75.640

REGULAR Size: 1.9x1.7x.8 Wt. 1.5 oz.

MICRO Size: 1.75x1.14x1.0 Wt. 1.5 oz.

### BATTERY

#### REGULAR

- 500 mA, vibration resistant
- Nylon D&R case
- Gold plated Deans connectors

Size: 2.2x1.25x1.25 Wt. 4 oz.

#### MICRO

- 225 mA, vibration resistant
- Nylon D&R case
- Gold plated Deans connectors

Size: .85x1.45x1.45 Wt. 2 oz.

### SWITCH HARNESS

- Noble high quality switch
- Deans gold plated connectors
- Nylon protective cover
- Wt. 0.4 oz. (charging connector to be supplied by user)

WRITE: We answer inquiries immediately. We ship rapidly when paid by money order or cash.

GIFT CERTIFICATES \$25.00 EACH

## NEW 544 SERVOS!

## NEW LOW PRICES!

After one year of research we are introducing the best servos ever produced regardless of price — the 544 Servo Line. Also in addition to our regular kits a new microservo kit (S5443K) is now available.

These new servos and kits use a new highly advanced 544 AA IC offering internally regulated power supply, dynamic braking, linear ramp timing and the need for very few external components. This revolutionary new IC is complemented by the most sophisticated PC board in the industry — double sided, plated inside holes, reflowed in hot oil and manufactured of epoxy glass. This inherent reliability and vibration resistance is further enhanced by CTS metered deposition pots and the

best motors available. D&R mechanix production is now electronically controlled for increased precision. Finally a burn-in procedure further assures the highest reliability.

We have purchased a large volume of parts at low prices and we are passing the savings on to you. The prices will hold as long as this supply of parts lasts.

Our flite pak approach has been immensely popular and many modelers have purchased their 4th or 5th flite pak. If you have not yet tried our approach now is the best time to do it and save. Flite pak prices are the sum of component prices and all parts can be mixed.

NAME	ADDRESS	ZIP CODE		
QUANTITY	CAT. NO.	DESCRIPTION	PRICE	TOTAL
	S5441	Rotary D&R servo, assembled	544 IC 20.00	
	S5442	Rotary Dunham servo, assembled	544 IC 22.00	
	S5443	Rotary Dunham micro servo, assembled	544 IC 29.00	
	R2000	Receiver regular, assembled	Frequency _____ 36.00	
	R2001	Receiver micro, assembled	Frequency _____ 39.00	
	B1000	Battery regular, assembled	13.00	
	B1002	Battery micro, assembled	13.00	
	H1001	Switch harness, assembled	5.00	
	S5441K	Kit of S5441 servo	544 IC 17.00	
	S5442K	Kit of S5442 servo	544 IC 19.00	
	S5443K	Kit of S5443 servo	544 IC 25.00	
	R2000K	Kit of R2000 receiver	Frequency _____ 30.00	
	H2010	5 male & 5 female Deans 3 pin connectors & assortment of wire	8.00	
	S2000	Trays for all regular servos 5 pcs.	4.00	
	S2000A	Single snap on tray for all micro servos	1.25	
<input type="checkbox"/> COD, Shipping, handling & Insurance			2.50	
<input type="checkbox"/> Cash, money order, bank draft, certified check, shipping, handling & insurance			1.50	
On personal checks delay of up to 3 weeks. N.J. res. add 5% sales tax. Foreign orders add 10% of the total.			TOTAL	

**Litco Systems** BOX 90, EAST HANOVER, NEW JERSEY 07936



# Now! One Battery Can Do It ALL!

There's a DAE *Power Panel* that fits YOUR needs?

## Dual Range Power Panel

POWER for any starter, pump, & plug  
FAST CHARGE your radio at the field  
ALL from your 12-Volt battery

- Includes Hardware
- 3" x 5" Easy Mounting

ONLY  
\$24.95



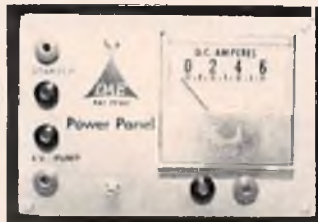
*In addition to featuring two voltage current ranges for any glow plug or glowhead, now you can charge your radio at the field in 15 minutes.*

## Power Panel

POWER for your starter-pump-plug  
AMMETER indication of plug condition  
ALL from your 12-Volt battery

- Battery Cord
- Mating Plugs
- 3" x 5" Easy Mounting

Only  
\$19.95



*This is the original DAE Power Panel and still is the most popular. It features ammeter indication of plug condition as well as power for your starter, pump and plug.*

## Mini Power Panel - A Space Saver

POWER for your starter-pump-plug  
LAMP Indication of Plug condition  
ALL from your 12-Volt battery

- Battery Cord
- Mating Plugs
- 3" x 3.5" Easy Mounting

Only  
\$15.95



*Works like the standard Power Panel, but is smaller and uses plug indicator lamp instead of meter*

SEE DEALER FIRST if unavailable, order direct including \$1.00 for handling. Indiana resident to add 4% sales tax

SEND FOR FREE CATALOG



**DA Enterprises**

BOX 326  
HAUBSTADT, INDIANA 47630  
Phone No. (812) 788-8228

## Just fuel it, flip it 'n go! Truly amazing!



Diesel Converters

Models for .020 and .049/.051  
Converts in seconds. No special tools . . . . . \$9.95  
Direct, add \$1.00 p&h.

"The first breakthrough in diesel design in 30 years," says Peter Chinn (M.A.N. April '77). Up to 50% more power and 50% more economy than glow with new fuel formula. Diesel Power fuel available in pints & quarts.

### Other Davis Diesel Products:

- D-Varnishing Brushes for .020-.60
- Fuel Bulbs 1 and 2 oz.
- 1/2A Fuel Line Asst.
- 1/4 and 1/2A Twin Exhaust Stax

Pint . . . . . \$3.50  
Quart . . . . . \$5.00  
Ask your dealer, or add \$1.00 p&h to order direct. (Conn. res. add sales tax) Send SASE for literature. Dealer inquiries invited.



Davis Diesel Development Inc.

BOX 141, MILFORD, CT 06460  
PHONE: (203) 877-1670

## SUPER SCALE

from page 164/15

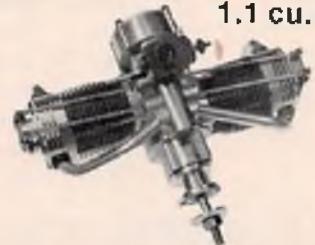
to whet your appetite, how about a Quarter Scale Me 109, or FW 190, or Bucker Jungman, or a Zlin, or a Citabria, or how about Richard Barron's P6-E or his Stinson Reliant or his up-coming Curtiss Gulfhawk 1 A? Things are starting to move and we'll soon have a small but good selection of subjects and I'm sure more will come along as more and more people get excited about the biggies. Judging from recent magazine features, there must be about a thousand Mr. Mulligans in the air now, with squadrons of P-51's on the way and Bud Nosen is rumored to have a couple of P-47's in the works; a razor back and a bubble top.

Concept Models has an 86" span Fleet Biplane out now and a Texas firm is on the way with another large Biplane. I hope these manufacturers have incorporated other woods than balsa in their kits, both for the sake of strength and cost reduction. The big jobs can be pretty high in cost if they are constructed with balsa only. In future columns I'll be going into some methods and materials designed to reduce costs and sacrifice nothing in strength and appearance.

Next column we'll have some tips on photographically enlarging plans and some more building tips for you. In the meantime, if there is a way we can help you, drop us a line and we'll try to help. If you have a picture of your latest BIG model, I'd like to have a shot of it for my own collection, and we'll use some of them in RCM as well.

Don Godfrey of Binghamton, New York has completed a plan for a stand-off scale Super Stearman modeled after Bud Fountain's air show special. Don has shortened the wings in order to get good performance from the model so it is not tight on scale at all. He has incorporated some features into the construction which look very good on

## DAMO 4 CYCLE TWIN 1.1 cu. in.



FOR MORE INFORMATION WRITE:

NP478-2



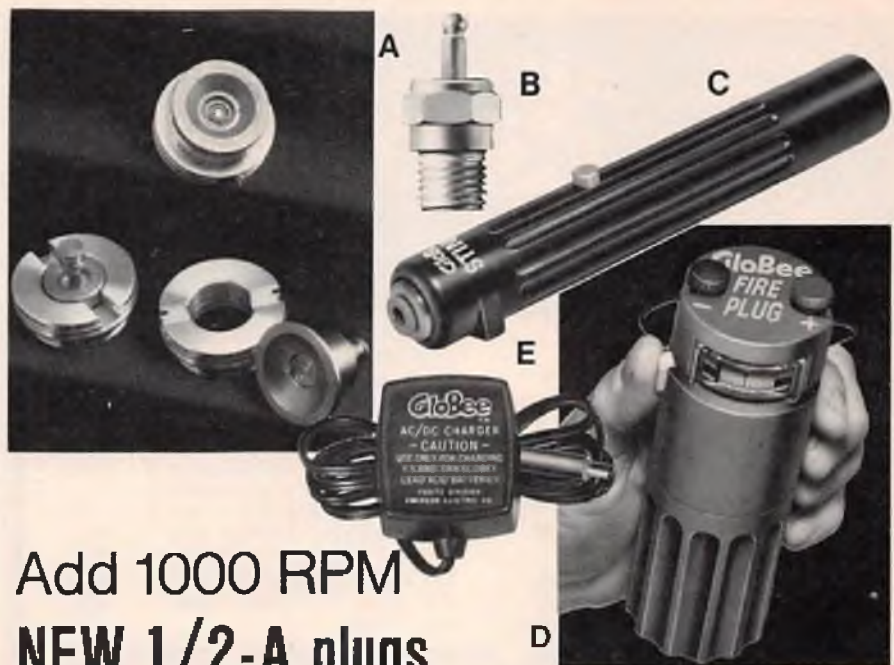
**NELSON MODEL PRODUCTS**

6929 WEST 59TH STREET  
CHICAGO, ILLINOIS 60638 - (312) 586-7101

paper (I haven't built mine yet) and I suspect it will fly very well indeed. Don will keep me in the picture, as their weather conditions at the time of this writing, precludes the initial flight testing of the model. If you are interested, Don will copy it for you at \$20.00 a set. Drop him a line at 254 Washington St., Binghamton, New York 13901. Sid Barron is making his quarter scale Gulfhawk (mentioned earlier) available at \$10.00, reduction from the regular \$30.00 price up until September 1st. After that time and after the publication date of October 1st, the price will be \$30.00 again. The picture I saw of it looks great and from past Barron plans I've seen, it'll be a great quarter scale project. Now if I can just wheedle out of Sid Morgan what he has up his sleeve for future release, I'll be happy!

Some really good looking scale projects have come to hand recently. If you are a WW I buff, these are for you. They come from Aerotec Model Engineering Co., Box 116, Lincolndale, New York 10540, and they include some 3" to the foot plans, semi-kits and kits. They have a number of 2" to the foot offerings in addition to the quarter scale items I'll list below.

The two I have details on are as follows: Spad XIII 3" = 1' plan only, \$19.95 (description is of 2" = 1' plan, presumably the 3" is the same). 106 scale ribs, all drawn and shown in scale placement, scale location of hardwood spars, scale color scheme, three view drawings, all specs and wood sizes shown, scale planking and strut locations. Enlarged details include; scale aileron detail, struts and rigging details, top wing attachment detail, scale control horn detail, scale shock cord gear, scale tail skid, lower wing attachment, gun control, seat and seat belt, head rest, gas tank feed, instrument panel, detail of engine mount and all specifications. The model is reputed to be tremendously strong, having survived a 200' dive into the deck, and that's got to be strong! They



## Add 1000 RPM NEW 1/2-A plugs

# Join the **GloBee** Team!

Now you can have GloBee leadership performance from a growing family of improved model products, featuring:

**A 1/2-A PLUGS:** Prototypes immediately set new records! Get at least 1000 more RPM, greater power and longer life by replacing the plug in your popular 1/2-A engine with a new GloBee—at competitive prices! Racing models have new high strength coil; both Racing and Sport plugs have patented spiral tip and blow-proof glass seal. Change heads with standard wrench.

**B GLOW PLUGS:** Standard line of GloBee glow plugs for larger models put more sting in your engine! Spiral glow element and leakproof seals are equal to the hottest engines you can buy. Racing, Racing<sup>2</sup>, RC and Sport models available in longs and shorts.

**C STINGER:** Cordless, self-contained 1/2-A starter delivers over 100 starts on a full charge. No external battery or dangling cords! Rechargeable lead acid cells (included) will start the crankiest engine from .010 to .051 cid. Shroud protects shaft and bearings. GloBee 4.5 VDC charger recommended.

**D FIRE PLUG:** Integrated glow plug starting system for optimum power. Rheostat control matches current to weather, fuel and plug choice. 0-10 amp ammeter indicates power output, also shows if plug is burned out or engine flooded. GloBee 2.5 VDC charger recommended.

**E CHARGERS:** Ask your model dealer about special combination offers on matching chargers—2.5 VDC for the Fire Plug and 4.5 VDC for the Stinger—at big savings.

**GloBee**...championship products for the world of modelers from...

# FUSITE

DIVISION OF EMERSON ELECTRIC CO.  
6000 Fernview Ave., Cincinnati, Ohio 45212

**(CLEVELAND)**  
**REAL SCALE MODELING**  
WORLD'S LARGEST MASTER MODELS ASS'N  
GIANTS OF ABOUT 5-10 FT. SPANS  
Catalog Subscriptions \$3 Bn (\$1.10 by Check)  
Same Price — Order A Plan Too!

See our model plans and models in what we call the numbers you ask for since we've become a volunteer design service organization, without dealer support.

Item	Name	Price
58	Douglas Sea Bee	\$45
59	Supermarine Sea Fury	\$20
62	Howard "fat" Race	\$23
70	Bayle's Weddell-Wynn	\$39
66	D H Comet Racer	\$18
82	How "Mr Mulligan"	\$23
74	"Pineapple Special"	\$29
81	Messerschmitt (Sea Bee)	\$21
55	Northrop Baby Buller	\$21
53	Howard "fat" Race	\$14
70	Bayle's Sea Bee	\$29
62	Curtiss Hawk P-6-E	\$19
66	Curt Thrake A-B	\$22
60	Douglas O-38 Obs	\$15
71	Martin B-10 Bomb	\$20
63	"Skyrocket" XP-5F	\$16
57	Curt Obs S-2C-1	\$15
98	Lock Hudson Bomb	\$49
77	Flying Fort B-17G	\$30
100	Flying Fort B-17G	\$49
65	M Messerschmitt B-26	\$39
89	Black Widow P-61	\$24
99	Black Widow P-61	\$10
48	Junkers Ju-87	\$10
58	H.P. 0400 Handb. PG	\$30
81	Fokker D-8 Fiv	\$20
70	Sopwith Pup Pr.	\$25
65	N.W. Bird-Sig	\$39
107	Martin MB-1 Bomb	\$30
66	Caudron G-III Obs	\$15
61	AEG G-IV Bomber	\$18
58	Salesman 2-A-2	\$15
82	Salesman Sub DIV	\$30
114	Coastal Bomber	\$49

**1100 PLANS CLEVELAND MODEL & SUPPLY CO.**  
AVAILABLE 10307RC (ext. 1111) Cleveland, Ohio 44102

## NEW FUEL "Blue Flame"

fuel that gives you the edge in performance

**BLUE FLAME** fuels are made from the highest quality ingredients to give your engine the **Best Performance** and the **Longest Life**.

- Made with a blend of synthetic and castor for the best possible lubrication.
- Detergent action to cut varnish even with a muffler.

	5 Gallon	Drum
5%	\$20.00	\$170.00
10%	\$22.00	\$180.00
15%	\$24.00	\$190.00
25%	\$28.00	\$240.00

- No C.O.D.
- F.O.B. Englewood
- Check or Money Order Only
- Send for our FREE Catalog

Shipping Cost to Postal Zone	For 5 gal.:
4	5.11
5	6.21
6	7.81
7	9.48
8	11.46

(Call your local Post Office for your zone)

**BK products**  
2672 WEST HAMPDEN / ENGLEWOOD, CO 80110  
PHONE (303) 789-9411

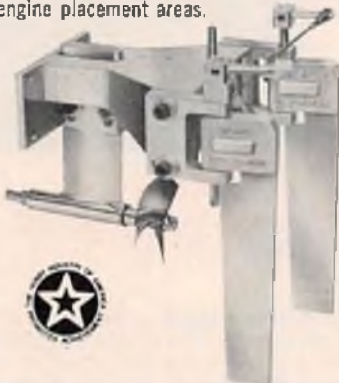
your best efforts surely deserve



**HARDWARE**  
for every boating need!

**MOTOR MOUNT SET**

Die cast aluminum, complete with 5" Master Mount, Screws and Washers, and Insert Adapter for .40 or .60 engine. Inserts can be rail mounted in boats with confined engine placement areas.



**RUDDER ASSEMBLY**

Aluminum die cast. Available for both .40 and .60 boats. Easy to assemble. Comes complete with Mounting Plate and Screws, Pivot Bracket, Rudder Blade, Pivot Pin — with Nylon Bushings, and Water Pick-up — threaded and adjustable. The .40 and .60 Rudder are identical, except the .60 Rudder Blade is 1/2" longer.



**DOUBLE RUDDER OUTDRIVE ASSEMBLY** For .40 or .60 boats. Aluminum die cast. Complete with Master Bracket (designed with twin ribs for individual modification), 2 Rudder Pivot Brackets, 2 Retainer Plates and all necessary Mounting Screws and Washers. Also includes Adjustable Strut — with installed Olite Bushings, Pivot Pins — with Nylon Bushings, 3 Control Arms — with set screws and 2 Rudder Blades (2 ARB for .40, 3 ARB for .60). The **SINGLE RUDDER OUTDRIVE ASSEMBLY** is the same as the above, except it only includes 1 Rudder Blade, Rudder Pivot Bracket, Pivot Pin and Control Arm.



say it flies like the prototype and, this certainly bears out our experience here with larger models. Their Siemens-Schuckert D-3 and D-4 consists of two sheets 156" and 96" in length and includes such goodies as authentic scale drawings of the Siemens-Halske eleven cylinder rotary engine, scale instrumentation and cockpit detail, scale spandau gun, scale functional gear (sprung) and bungee tail skid, scale planking (ply or balsa with the option incorporated into the formers). Field assembly time claimed is six minutes which has to be tops for a biplane. Wings include scale rib placement, scale spars (box) and their placement is also scale. The lozenge pattern is drawn on the wing plan for accurate finishing. Scale three views are included along with several scale color presentations. Span is 84 3/4", finished weight 13 1/2 to 14 1/2 pounds.

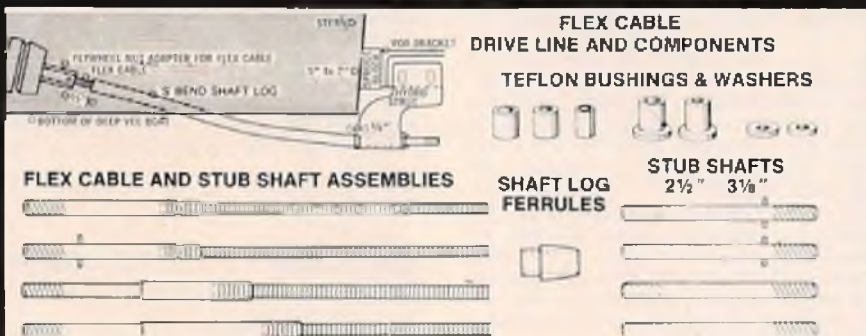
Other offerings are the classic Fokker DR-1 tripe, and a Nieuport 17. These will all be available as plans only, semi kits (plans, ribs, formers), or as complete kits. Additional items are scale vintage wheels in 6 3/4", 7" and 8", along with dynamically balanced, hard rock maple props which are handmade to order and engine cylinders in two halves.

2" to the foot items include the Spad XIII, Albatross DVa, Fokker DR-1, Fokker E III (Eindecker) and the Boeing Peashooter (P-26a). Write Aerotec Model for further details and prices. Lou Perretti (one of the Aerotec team) has had his 35 pound tripe, on the vintage wheels they make for over two years without any visible wear. These wheels are not spoked, they are solid (nylon) hubbed, with rubber tires. (Or, if you are a real purist, tyres.)

They also have a stand-off scale Fokker V-29 and the Howard 'Pete' racer in 2" scale, plus a couple of non-scale 'others', one a mono and one a biplane. Judging from the photos they sent, they (the scale jobs) are real beauties, no home should be without one . . . or two . . . or three!

Good news for the Super Scalers from E.W.H. Specialties in Arlington, Texas. They have been working for some time now to perfect a new servo, and the rather brief note I have just received announcing it's availability describes it's designers as geniuses. I gather, and this is subject to confirmation, the servo is about the size of the well known KPS-15

to page 170



Other Model Boating Hardware includes: Rudder Blades, Pivot Pins, Strut and Tee Bracket Assemblies, Struts, Stub Shafts, Olite Bushings, Solid Shafting, Flywheel Nut & Cable Adapter Assemblies, Tuned Pipe Couplers, Clamping Water Pick-ups, Skags, Control Arms, Drive Dogs, Folding Scissors, etc.

For complete details send \$1.00 for K&B Marine Specialties Model Boating Hardware Catalog



**K&B MANUFACTURING**  
DIVISION OF AURORA PRODUCTS CORP.  
12152 WOODRUFF AVE., DOWNEY, CA. 90241

**Proctor HARDWARE**

- WORKING TURNBUCKLES
- RIGGING & CONTROL CABLE
- CONTROL HORNS
- STRUT FITTINGS
- SHOCK CORD
- COCKPIT TRIM
- PULLEYS
- INSTRUMENT HOUSINGS

For information and catalogue, send \$1.00 to  
**Proctor ENT. CORP.**  
P.O. BOX 9641  
SAN DIEGO, CA. 92109

**ELECTRONIC SPEED CONTROL KIT**

MODEL MC-5

- Fully Proportional Forward & Reverse
- 5 adc Capability from 6-12 vdc
- Accepts Pos. or Neg. Control Pulse
- Size 2.5 x 1.5 x 1.2 in. Only \$37.50

FUTURE MODELS  
MC-20: 20 adc Model for Hi Power  
MC-10: 10 adc Model for Cars  
With Dynamic Braking

Write to  
**DAVIS ENGINEERING CO.**  
P.O. Box 1232  
Kokomo, Indiana 46901



## SUPER FUN FLY '78



SPONSORED BY  
Peoria R/C Modelers Club  
& Tower Hobbies

LOCATION  
Peoria, Illinois

DATES  
August 19 & 20, 1978

EVENTS  
Loops & Rolls, Touch & Goes, Carrier Landing,  
Name Your Poison Limbo, and (alternate event)  
Bomb Drop

### PRIZES

\$200.00 in merchandise plus trophies through 5th Place; three 6-channel Tower radios, kits, engines, and other R/C accessories. Prizes for 1st through 50th Places — AMA Membership and FCC License are required

REGISTRATION — Limited to 75 contestants  
\$10.00 if received by August 1, 1978  
\$15.00 on the days of the contest

For complete rules & information, contact:  
C.D. Bob Suhr, 1913 Echo Court,  
Bartonville, Ill. 61607 (309) 697-5396

### SUPER SCALE

from page 168/15

and it puts out 10 pounds at the end of a sizeable arm. That's right, Virginia, **Ten pounds!** Now if that won't move your control surfaces reliably, then they just ain't gonna move, no matter what. I don't have any further information yet as to current drain etc., but I am told you can order them through your dealer, or failing that, order direct from E.W.H. and if you specify your radio, they'll come equipped with the appropriate plug. Retail on these is \$29.95, and isn't that a pleasant surprise? I'll provide more detail as it becomes available from E.W.H. In the meantime, contact them at 607 East Abrams, Suite 10, Arlington, Texas 76010. □

### SOARING

from page 12

extent of the chord than with normal airfoils.

The NACA's work along these lines has produced the one-series through five-series airfoils known as low drag or

laminar airfoils. The NACA's six, seven and eight series airfoils represent continued work on low drag airfoils, however, the emphasis on these foils is directed toward achievement of a high critical Mach number rather than extensive laminar flow.

There now, I hope the explanation is somewhat clear, books are written just on the Rn subject so this has been very brief and I hope understandable without charts and graphs or diagrams. I tried to make it as non technical as possible. My research material was from three sources: "Airplane Aerodynamics" by Dommasch-Sherby and Connolly, "The Elements of Airfoil and Airscrew Theory", by H. Glauvert, "General Aeronautics", by H. Lusk.

\*\*\*

A new approach to winch drum and turn around construction has been introduced by Bill Amour, of Torrance California. The reel is fabricated from lightweight, red anodized aluminum. Greatly reduces tendencies to fly-wheel or overspin. The flanges are spun and then machined for trueness, with a locating diameter to locate the center section turned on the two end flanges. This way the center hub doesn't rely on the center bolts for centering. The turn

around base and swivel mechanism is of plated steel, spool of anodized aluminum with shielded ball bearings. Note the center hub is tapered toward the center for better line tracking. The spike swivels so that when a sailplane is directly over the turn around it will raise up without loosening hold down spike. For more information contact Bill Amour, 20326 Madison Street, Torrance, California 90503.

\*\*\*

At a recent soaring event, an acquaintance of mine (I have to refer to my son this way because he wins more contests than I do), was participating in a Duration Event. With Joe Bridi as a spotter and Dick Kidd as the timer, who could go wrong? By the way, he took home the Second Place trophy.

Tom (Craft-Air) Williams showed up at a recent contest with his new Viking. As explained in the May issue of RCM, the two wing concept is a real boom to the serious contest pilot who travels to various geographical locations and encounters many different tasks and flying conditions.

Time to sign off and get in more practice so I can better that acquaintance of mine.

Good Lift. □

WE'RE FIGHTING FOR YOUR LIFE

# Exercise Regularly

American Heart Association 

# GLO-POWER<sup>TM</sup>



Pertable enough to fit in your pocket for midfield starts, this 4 amp/hour cell has plenty of "oomph" to start flooded engines all day. Repeated drops from a two-story building show its durable packaging will withstand more than normal field use. Recharging your GLO-POWER<sup>TM</sup> for 16 hours gives you days of reliable starting

\$26.95 plus \$1.50 shipping plus Pa. sales tax for Pa. res. Price includes charger and Battery cord for your favorite starter clip. Send this ad and we pay shipping costs. 6 month limited warranty.

DEALER INQUIRIES INVITED 215-779-8717  
**GILBERT'S ELECTRONICS CORP.**  
 2230 Woodvale Ave., Mt. Penn. Pa. 19606



PATENT PENDING

## ENGINE CLINIC

from page 10

allow the use of the full length tuned pipe, you will have to go with the short 4" mini-pipe that comes with the engine. This must be used as the engine has a "pipe" timed sleeve and will not run properly without either the 4" mini-pipe or a full length pipe. This also may be part of your problem — trying to use the engine without a pipe.

Dear Mr. Lee,

How do I tell if an engine has Schneurle porting or not?

Tom Waller  
 Bronx, New York

You can tell a Schneurle design by looking in the exhaust with the piston at dead bottom. Schneurle ported engines will have a transfer port on either side of the exhaust port/ports and either one or two boost ports directly opposite the exhaust port/ports. There will be no baffle on the top of the piston. Conventional or cross flow engines will have only the transfer ports directly opposite the exhaust port/ports with a baffle to direct the incoming fuel charge

upward. An exception to this is some models of the Super Tigres have the transfer ports opposite the exhaust port but do not use a baffle on the piston. An extra thick sleeve with angled ports directs the fuel.

Dear Mr. Lee:

To set the stage for this skit — first let me say that our hobby is no better than the automotive industry and our government. Both, or rather all three, are sadly derelict in their duty to "us" — we still push a piston up and down to make a wheel (or prop) go around. How much longer must we wait. Even that old "Hero" engine or the forerunner of the Pelton Wheel was ahead of us in the fundamental concept — except for the Turbine and Turbojet engines. It's simply disgusting to feel that our economy has so restricted our technology.

So, I'm stuck with a two cycle miniature antique — recently redesigned, and I need to know how to select my own fuel mix to get optimum performance — — "my way". What I hope you can provide is a source of practical information for blending the alcohol (there goes my good vodka!), the castor oil — or suitable synthetic lubricant — and enough nitro methane to "build" a series of different fuels to find my choice for each of several engines.

So far, my methanol won't mix with any oils, and hopefully your aid will head me to the reason why. I want dependable idle that won't snuff out my glow plugs after getting a moderately rich max setting.

Every day I admire those old timers more and more for what they have given us so far — even if it is up and down to go around! Now I want to try my own brews. Can you steer me to a source of reference for fuel blending, etc. (I promise not to use Nitro Benzene.)

Best regards for all of you fellows at RCM who give us so much info. Even if you can't answer this one.

D.A. Hoffman, II  
 Springfield, Pennsylvania

Quite a few fellows have been writing in lately requesting information on mixing their own fuels. Many years ago when first starting this column, I did a complete article on fuels and this is reprinted in the Anthology series booklet "The R/C Engine" Vol. I. Although the original article was written many years ago, there have been no changes in fuel formulations other than improvement in synthetic oils. Klotz Special Formula, UCON MA 2270 and MA 731, and K & B's X2C.

As far as mixing methanol and castor oil — there is no problem whatsoever. If you are having mixing problems, then

to page 173

**THE MODEL FACTORY**

**EOS**

**1/2 A SPORT, STAND-UP SCALE**

WING SPAN	48.25 in.	Custom: Alclad ultralight Powerglide
WING AREA	327 sq. in.	Prop: long stroke, auto-reversing
WEIGHT	19-20 oz.	Custom: molded canopy
ENGINE	049-057	Standard: wood gear
FUNCTIONS	2-4 ch.	Standard: landing gear
PRICE	\$28.95	Kit built — no instructions
		Easy to fly, stable
		Perfect for glide competitions
		Kit of the model and standard parts
		ready to fly
		Power: Radio

See our first store at 1000 Airport Blvd., Alhambra, CA 91803, Tel. (818) 251-1234

**IME** 02121 876-0847

1807 S. MAIN ST. ALHAMBRA, CALIF 91801

**NEW!**

**"THE PEGGY"**

**\$21.95**

wing span	48.25 in.	balsa fuselage
wing area	326 sq. in.	constant chord wing
weight	20-28 oz.	flat-bottom airfoil
length	30.25 in.	foam wing and sheeting
functions	1-4 ch.	radio compartment
power	049 - 09	1 1/2 x 1 1/2 in.
glow or diesel		hardware
power or slope		no hassle construction

**COMING SOON! "THE INTRUDER"**

**A HIGH PERFORMANCE SLOPE SOAKER**

RECOMMENDED FOR BEGINNERS AND SUNDAY FLIERS

**DRILL AND TAP YOUR MOTOR MOUNTS**  
**Simple As: ONE - TWO - THREE**



Prather Drill Jigs make drilling and tapping motor mounts a real pleasure. Accurate and parallel motor mount holes are now easy with our drill jig. Available for most popular engines.

NEW Sizes: Rossi .15, Cox .15, D.S. 60 SR, Webra Speed .61, Kraft .61

**New!**



ONLY \$1.29

**AFTER-RUN Engine Oil**

- Prevents gumming
- Prevents rust
- Extends engine life
- Easier starts

Our engine oil is formulated to protect your engine while it is not being used. Oil comes in convenient squirt bottle.

**Super Silicone Fuel Line**



Available in Small - Medium and Large

- Resists kinks
- Stays tight on fittings
- Won't get hard or soft

Designed to meet the demands of the competition modeler.

Boaters: Our large size works great on water cooling lines.



**PRATHER PRODUCTS**

1860 RAVENNA AVENUE, WILMINGTON, CALIFORNIA 90744

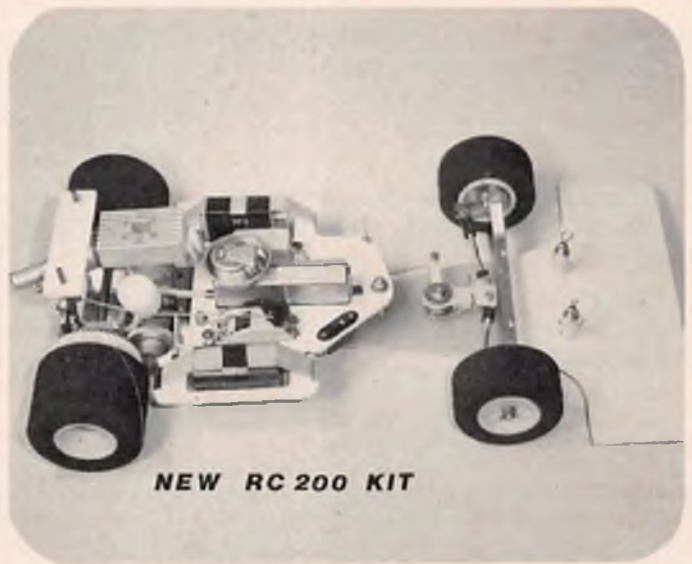
**WANT TO BE A FAMOUS RACE CAR DRIVER?**

TRY 1/8 SCALE R/C CARS  
 WORLD CHAMPIONS  
 JOIN THE WINNERS

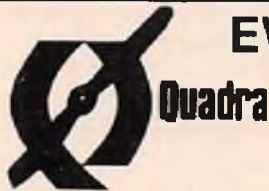
WE SHIP WORLDWIDE  
 Send for free Catalog

**ASSOCIATED**

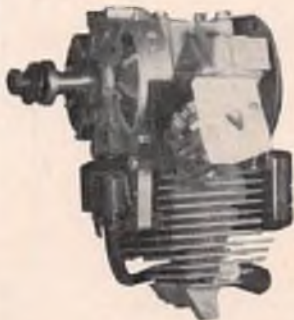
1928 EAST EDINGER  
 SANTA ANA, CA. 92705 USA



NEW RC 200 KIT



**Quadra**



The Quadra is a two cubic inch, two horsepower (@ 10,000 R.P.M.) two cycle engine. It uses regular gas and oil. It costs less to operate than a .15 size glow engine. Now you've got power to spare for those 1/2 size and 1/4 size models. Quadra burns fuel clean and the model stays clean (no need to fuel proof the model). Quadra comes complete with the accessories shown in the photo.

\$121.50

- Airflow Prop. .... \$6.95 (Specially for Quadra)
- EWH Prep Adaptor ..... \$14.95

Price subject to change without notice.

**E.W.H. is Your Miniature Aircraft Headquarters**

E.W.H. Introduces the new Super Servo. Our new 1/4 scale super Servo has mucho muscle 7-lbs. standing thrust / 10 lbs. running thrust. Each servo comes with its own amplifier and amplifier case. Super Servos high resolution circuitry and "zero" precisely every time. Now the sky is the limit in 1/4 scale or larger models. Call for price.

- Tank Kit with clunk (one qt.) \$3.75 ea.
- Extra RCJ-6 Spark Plug .... \$1.95 ea.
- Neoprene fuel line (1/8") .. \$ .65 ft.
- Throttle linkage adapter kit complete ..... \$6.95

Add \$2.00 handling to all orders.  
 Add \$4.00 to all C.O.D. orders.  
 Include Tax where applicable.



**E.W.H. Specialties Inc.**  
 607 E. ABRAMS ST.  
 ARLINGTON, TEXAS 76010  
 A.C. 817-461-1274



Stand-off-scale! Complete kits include fiberglass, foam, balsa, and accessories.

Deluxe Kit **\$129.95** Economy Kit **\$89.95**

Engine cleaner (safe for all parts), 2 3/8" needle nose spinners in black and white, side winder missiles 11" & 13", 1" & 2" brushes that leave no brush marks, Glossy paint and Flat camouflage (fuelproof, mar resistant, fast drying, excellent flow, excellent adhesion, covers most hobby sealers, safe for styrofoam and plastic, non-toxic) 31 colors, thinner, DECAL SHEETS ALSO!



Send for your free complete catalog.

**R&S HOBBY PRODUCTS, INC.**

P.O. Box 1161  
Oak Lawn, IL 60453

## ENGINE CLINIC

from page 171/10

you have other impurities in your methanol, it is of low grade, etc. There are over 30 grades of methanol and the grade you buy at some paint stores will not work as a model fuel. Methanol should always be purchased from a large chemical supply house specifying their driest grade or, better still, a speed shop that caters to the drag racers.

Methanol will have a tendency to settle out when mixed with castor oil. A few drops per quart of Amyl Acetate (banana oil) will hold the alcohol and castor oil in suspension. If you use any nitro methane in the fuel, it will take the place of the Amyl Acetate. Synthetic oils need no mixers at all. Nitro methane will not mix with castor oil in percentages

much over 50% without the use of Nitro Benzene which is a very dangerous toxic chemical. Synthetic oils will mix with any percentage of nitro methane and recommended when high percentages of nitro are used.

Dear Clarence:

First of all, I want to tell you that I enjoy your engine column very much. It is the first item I read each month.

Noise limitations are quite restrictive in my area and since I prefer medium size aerobatic type airplanes anyway, I am considering an O.S. Wankel. As fuel draw seems to be more of a problem with smaller engines, can the Robart Pumper be used somehow, or would muffler pressure be the only practical way?

Would a tuned exhaust pipe do anything for a Wankel engine?

Finally, I purchased a K & B .40 with a Perry Pump and upon removing the

pump from the engine, I noticed that there isn't a cover over the crankshaft counter-balance as there is on my non-pump K & B - Why? I realize that with the pump the crankcase suction may not be as critical, but what about by-passing when the crankcase is under pressure?

Your comments would be greatly appreciated.

Sincerely,  
Richard Shirey  
Sewickley, Pennsylvania

The O.S. Wankel does not have any crankcase compression, so a Robart Pump can not be used. Although technically, a 2 cycle engine the operation of the Wankel is more like a 4 cycle. Muffler pressure is the only way you can go as far as I know. If anyone out there has figured a way to use a Robart Pump with a Wankel, be sure and let us know.

I haven't tried a tuned pipe on a

# NEW!



## A Reusable Simulated EXPLODING BOMB

SEPARATES ON IMPACT TO DISCHARGE A  
PAYLOAD OF CHALK OR FLOUR

COMPATIBLE  
WITH OUR  
BOMB RELEASE  
MECHANISM

**\$9.98**  
2 PER  
PKG.  
\$5.98 EACH

SEE YOUR DEALER

SCALES TO 500 LB. SIZE  
FOR TOP FLIGHT STAND-OFF  
KITS OR 1000 LB. SIZE FOR  
HOUSE OF BALSA 40 POWERED P-51

## Bomb & Drop Tank RELEASE MECHANISM



### FEATURES

- POSITIVE LOCK
- LOADS INSTANTLY (LOAD CLIPS IN NO TOOLS OR TRANSMITTER NEEDED)
- EASILY ADAPTABLE TO SPORT, SPORT SCALE & A.M.A. SCALE MODELS
- PERFECT FOR FUN FLY BOMB DROPS
- ASSEMBLED, READY TO INSTALL

**\$4.98**

EXTRA CLIPS SOLD  
SEPARATELY  
**2 FOR 98¢**

**VORTAC MFG. CO.**

P.O. BOX 469 OAK LAWN, ILL. 60453



## 6th ANNUAL

# WESTERN CANADIAN OPEN SCALE CHAMPIONSHIPS

The 6th Annual Western Canadian Open Scale Championships are to be again held as a joint venture of the Radio Control Flying Club of B.C. and the Riverside Flyers R/C Club.

**August 19 and 20, 1978**

**Old Boundary Bay Airport — Flying sight of the R.C.F.C.B.C.**

<b>Registration:</b> 9:00 a.m. both days	<b>Static Judging:</b> 9:00 a.m. both days	<b>Flying:</b> 10:00 a.m. both days	<b>Entry Fee:</b> \$5.00 per aircraft entered
---	---	--	--

Prizes: 1st to 5th - Trophies 6th to 10th - Merchandise prizes  
M.A.A.C. sanctioned event and current radio licenses and M.A.A.C. or A.M.A. cards must be presented by all entrants.  
Mufflers required on all engines of .15 c.i. displacement or larger.

For Further Information, Contact:

Contest Director: Bert (Gabby) Hayes, 4619 Gothard St., Vancouver, B.C. Canada, V5R 3K8 Phone, (604) 433-2395

## Second Annual

# West Coast Dumas Deep Vee Classic

Roberts Lake, Monterey, California

July 22nd and 23rd, 1978



## NAMBA A, B, & C CLASSES

Trophies, Ribbons, Jacket Patches and Prizes • Award for Scale Judging

Sponsored by: Dumas Boats • Gold Coast Model Boat Club • Marine Modelers of Santa Clara Valley  
Hosted by: City of Seaside Department of Parks and Recreation

For information and entry blanks write or call:

## Hobbies Galore

3414 El Camino Real, Santa Clara, California 95051 408/244-6267

Wankel myself, but imagine one could be made to work. It would take some experimentation as to length, etc.

K & B has discontinued the cover over the counter-balance on the K & B .40. Your non-pump engine with the cover is just an earlier model than the pump engine. It was simply a matter of production — the cover being an unnecessary step that did not add anything to the performance of the engine. The latest non-pump engines do not have the cover either.

Dear Sir,

I am working on a .60 powered scale project that requires moving the engine back and driving the prop with a 5/4"

extension shaft. I would appreciate any information on prop shaft extensions and their related problems, i.e., bearings alignment, etc.

I would also like to know if the twins, such as Ross, would lend themselves better to such a proposal.

Thank you very much.

Yours truly,  
A.B. Comerford  
B.C. Canada

A properly designed extension shaft should not cause any problems. Vibration due to misalignment is usually the big problem. The shaft should be mounted independent of the engine. The shaft should be mounted on beam mounts supported at both ends by a ball

bearing. The shaft, in turn, driven by a boat type "U" joint. Any misalignment then between the engine and extension shaft would not be critical. Bearing alignment of the extension shaft itself being the critical factor. You would have to fabricate aluminum "pillow blocks" to hold the bearings which, in turn, bolt to the beam mounts. The bearings themselves should be of the sealed type which would not require lubrication for an extended interval.

I can't see where a Ross twin would be any better for this type of installation than a single cylinder engine. A single of the same displacement will develop more power which will in turn help compensate for the slight power loss



# MUTCHLER'S HOBBIES

4620 Crandall-Lanesville Road  
RR3, Corydon, Ind. 47112  
Phone - 812-366-3141

HOURS  
WEEKDAYS  
9-6

SEND FOR FREE LISTINGS  
WITH ALL KITS, RADIOS,  
ACCESSORIES & PRICES.

DEALERS  
WANTED

## -ACE R/C-

Alpha	11.95
Ace High	11.85
Upstart II	10.95
All Star	14.94
Mach Nine	11.95
Shrike	17.95
Guppy	5.95
GLH II (balsa wing)	11.95
GLH III (Foam wing)	10.95
Littlest Slick	2.95
Super Pacer	19.95
Pacer	11.95
Dick's Dream	6.95
Whizard	11.95
Foam Wings	3.07

## -AIRCRAFT-

Cere Sport	25.95
Questor	23.95
Super Questor	26.95
Cessna Centurian ARF	36.95
Cadet 62	33.95
New Era III	35.95
Acro Star	59.95
Square Soar	17.95
Q-tes	15.95
Olympic II	24.95
Aquila	47.95

## -A JUSTO JIG-

Full House (wing & fuse)	39.95
--------------------------	-------

## -ANDREWS-

Aeromaster	52.95
A-Ray	39.95
Sportsmaster	45.95

## -ASTRO FLIGHT-

ASW 15	35.95
ASW 17	54.95
Super Mentaray	30.95
Super Mailbu	23.95
Bushmaster	29.95
Fournier	23.95

## -BRIDI-

AT 6 Texan	95.95
Dirty Birdy (glass)	84.95
Dirty Birdy 60 (wood)	54.95
Dirty Birdy 40 (wood)	38.95
Basic Trainer	24.95
RCM Trainer 10	19.95
RCM Trainer 20	24.95
RCM Trainer 40	36.95
RCM Trainer 60	42.95
Quickiest 200	18.95
Quickiest 500	29.95
Super Kaos 40	36.95
Super Kaos 60	47.95
Kaot	43.95
Sooriter	24.95
Tweedy Bird	23.95
Compass Code	33.95
Sun Fil 4-20	21.95

## -ALSO-

BRIDI	
Super II	39.95
Classic 40	36.95
Soar Bridg	13.95
Waco	66.95
UFO	89.95

**COVERITE:**

Glizkate (Vnt)	1.99
Glassite Thinner (pt)	1.75

**FLITE LINE:**

Skooter II	31.95
Skooter II (racing)	21.95

**R/C KITS:**

F100	49.95
------	-------

**STRICK'S:**

Power mite dislander	21.95
Medillon .08 "MK II 24.95"	

**ARCO:**

1/8 no. 64	.59
------------	-----

**A JUSTO JIG:**

JA Retract	8.37
------------	------

**PERRY:**

Pump	16.77
Pump Carb.	11.88
Cox Flight Power qtl.	2.98
Cox Glow Power qtl.	2.40

15-500	26.95
P51 D (glass)	95.95
Lockheed Sirius (glass)	95.95
Chimpunk (glass)	82.95
Shrike (glass)	126.95

## -CASS ENG.-

Pulsar Bipe	77.95
-------------	-------

**-CONCEPT MODELS-**

Isarntormer	49.95
Travel Air	49.95
Kraft Super Fil	43.95
Air Scout	27.95

## -COVERITE-

Super Coverite	4.89
Silkspan Coverite	4.89
Permagloss Coverite	5.89
Day Glo Coverite	6.39
Camouflage coverite	6.39
Antique Coverite	4.89
Balarite	2.03
Trim It Knife	8.3
Also stock 15 ft. & 25 ft. rolls.	

## -CRAFT AIR-

Drifter	16.95
Windrifter	29.95
J-Bird	39.95
SD100	35.95
Sallaire	79.95

## -DREMEL-

260 Moto Tool	26.95
270 Moto Tool	29.95
280 Moto Tool	33.95
370 Moto Tool	36.95
380 Moto Tool	46.95
571 Moto Shop	46.95
572 Moto Shop Deluxe	59.95
210 Drill Press	14.95
223 Universal Stand	9.95
217 Foot Speed Control	15.95
220 H.S. 12pc. cutter set	18.95
240 H.S. 24pc. cutter set	36.95
Also carry all accessories	

## -DU-BRO-

Tri-Star Scorpion	165.95
Shark 60	265.95
Training Gear	25.45
Conversion Kit	64.95
Update Kit	27.95
Collective Pitch	28.95
Prop Drive unit	69.95
Also stock all accessories	

## -FUSITE-

Fire Plug	17.95
Fire Plug Charger	5.17
Stinger (1/4 starter)	22.95
Stinger Charger	5.17

**-GOLDBERG-**

Falcon 56 MK II	24.95
Sr. Falcon	32.95
Shoestring	28.95
Skylane 62	32.95
Ranger 42	15.95

## -HOT STUFF-

Blue Line 1/2 oz.	2.89
Clear 1/2 oz.	1.89

## -HOUSE OF BALSAM-

P40 (40 size)	36.95
---------------	-------

JA Pate	17.95
JA P51D Mustang	19.95
JA ME 109	19.95
JA P-39 Aircobra	19.95
JA P-47	21.95
JA P-51	19.95
JA Bonanza Wolfe	21.95
JA Chimpunk	19.95
Shoestring	26.95
Miss Dora	26.45
Pietenpol	36.95
Nomad	10.95
Nomad II	14.95

## -JENSEN-

Das Ugly Stick	39.95
----------------	-------

## -LANIER-

Robot	39.95
Scamp	34.95
Comet II	36.95
Comet 35	34.95
Jester II	44.95
Trim It Knife	57.95
Cayuse	47.95
Cessna	30.95
Transit	28.95
Pinto	30.95

## JEMCO

PT19	42.95
------	-------

## -MACO-

Jet Star	39.95
Simplex Trainer	28.95
Tiger Cat	36.95

## -MARKS MODELS-

Windfree	20.95
Wanderer	25.95
Bushwacker	12.95
Sunray	25.95

## -MASTER KIT-

Stinger II	41.95
Hiperbipe	41.95

## -MEN-

M.E.N. Trainer	19.95
M.E.N. Trainer 40	36.95
Buzzard Bombshell	34.95

## -MIDWEST-

Das Lil Stick	21.95
Tri Squire	19.95
Lil Y Squire	15.95
Stinger	18.95
Cessna Cardinal	19.95
Mach I	63.95
Sweet Slick	24.95
Cardinal Squire	57.95
Strikemaster	46.95
Pitts Special	54.95
Silent Squire	26.95
Attacker	24.95
Sirymate 16oz.	4.55

## -PEERLESS-

Cirrus 3000 Sailplane	59.95
Libelle 2700 Sailplane	59.95
Newspen Sailing Yacht	51.00
Dash 7 prop buggy	69.95
Peanut buggy .09	51.95
Spearfish cabin cruiser	48.95
Sydney sailing yacht	59.95

## RADIO'S

Futaba 4ch. S17	174.95
Futaba 4ch. S16	184.95
Futaba 6ch. S17	199.95
Futaba 6ch. S16	229.95
Futaba 7 channel	379.95
Cox 2ch. (Jdy)	69.95
Cox 3ch. 3servo, nicad	144.95
Cox 4ch. 4servo, nicad	179.95
Cox 6ch. 4servo, nicad	224.95
Ace 1ch. pulse (only)	59.95
Craft Air field boxes	20.95
Craft Air e.s. voltmeter	17.95

**MILLER:**

2115 non bleeder, 15gun	55.95
2124 3gun set	59.95
2129 2gun set (18 & 14)	56.95
2018 1gun set (11)	55.95
2017 2gun set (11 & 14)	55.95
2011 air brush set	48.95
2016 1gun set (16)	48.95

**12V motorcycle battery**

12V motorcycle battery	12.95
Charger for above batt.	6.95
K&B 100 gallons	6.95
K&B 500 gallons	7.79
K&B FAI gallons	5.95

**Fox Superfuel gallons**

Fox Superfuel gallons	7.95
Fox Duke's fuel gallons	7.95
Fox Missile fuel gallons	8.95

## -PLATT-

Spitfire	52.98
T28	52.98
FW190	52.98
Waco	52.98

## -PRATHER PROD.-

Little Toni Formula I	65.95
Little Toni 1/2 midget	49.95
Sport Panther	65.95
Pole Cat	16.95

## -ROYAL-

Pitts 52	65.95
Douglas C-47	92.95
Staggerwing beachcraft	75.95
B-25	75.95
Blerie	45.95
Focke Wolf 190	66.95
Hein Sr. (Tony)	70.95
Little Slinker (pitts)	63.95
P-38	92.95
Spitfire	66.95

## -SIG-

Doubler	17.95
Citabria	35.95
Liberty Sport	47.95
R-11 (Kwik built)	40.95
Cessna 150 (Kwik built)	48.95
Smith mini-plane	36.95
Piper J-3	27.95
Clipped wing cub	27.95
YAK 18	49.95
Zlin Akrobat	39.95
Aerobipe	14.95
Kadet	23.95
Skybolt	43.95
Wanderer	31.95
Klipper	13.95
Super Sport	12.95

## -SOLUTION-

Solo MK II	32.95
Saker	39.95

## -SONIC-TRONICS-

Solid state power panel	19.95
Electric Fuel Pump	8.49
8oz. big shot fuel bulb	1.99

## -SONIC SYSTEMS-

100-3gear sys & pump	38.95
101-gear sys	31.95
Retract main's (pair)	12.95
Retract nose gear	12.95
Super Charger II pump	8.95

## -SOUTHERN R/C-

Flight line & mini caddy	11.95
Tiger Tail (deluxe)	84.95
Sweatler (standard)	59.95
Sweatler (deluxe)	84.95
Compensator (standard)	59.95
Compensator (deluxe)	84.95
Bobcat	39.95
Mustang X	37.95
Cator Fies	30.95
Southern Kite	49.95
Fiberglass Kits:	72.95
Atlas (standard)	72.95
Compensator (standard)	72.95

## ENGINES

O.S. MAX.	
10 F SR R/C	20.45
15 R/C	25.45
20 R/C	26.95
25 F SR R/C	41.95
25 R/C	28.95
30 R/C	34.45
35 R/C	34.95
40 R/C	49.95
40 F SR R/C	59.95
60 Blackhead R/C	68.95
60 F SR R/C	84.45
60 F SR w/pump	101.45

**-K & B-**

6325 61 R/C	52.99
6335 61 R/C pump	67.99
8011 40 R/C	40.85
8360 40 R/C pump	67.95
8080 40 R/C marine	44.95
7861 35 R/C	20.95
6712 19 R/C	31.95
8380 3.5cc H plane	39.95
8381 3.5cc H plane	39.95
8384 3.5 inboard	41.95
7000 6.5cc R/C	54.95

**-FOX-**

15 R/C SR bushing	22.95
15 R/C SR 2BB	36.95
15 R/C SR 2BB	36.95
25 F SR R/C bushing	21.95
25 R/C bushing	23.95
25 R/C SR bushing	23.95
35 R/C SR bushing	28.95
40 R/C SR bushing	41.95
40 F SR R/C SR bushing	31.95
45 R/C SR RB	41.95
60 Eagle R/C	41.95
60 Hawk R/C	52.95
78 R/C	58.95

**-SUPER TIGER-**

Q20/23 R/C	32.95
Q21/35 R/C	35.95
S.T. 35 R/C P.P.	34.95

**-ENYA-**

29 IV TV	24.95
29 V III TV	24.95
40 TV	43.95
45 II TV	43.95
45 III TV	43.95
45 IV TV	43.95
45 V TV	43.95
45 VI TV	43.95
45 VII TV	43.95
45 VIII TV	43.95
45 IX TV	43.95
45 X TV	43.95
45 XI TV	43.95
45 XII TV	43.95
45 XIII TV	43.95
45 XIV TV	43.95
45 XV TV	43.95
45 XVI TV	43.95
45 XVII TV	43.95
45 XVIII TV	43.95
45 XIX TV	43.95
45 XX TV	43.95
45 XXI TV	43.95
45 XXII TV	43.95
45 XXIII TV	43.95
45 XXIV TV	43.95
45 XXV TV	43.95
45 XXVI TV	43.95
45 XXVII TV	43.95
45 XXVIII TV	43.95
45 XXIX TV	43.95
45 XXX TV	43.95

## -STAFFORD-

EAA Acro Sport	44.95
EAA Acro Sport (foam wing)	52.95
Chimpunk	41.95
B-24 Liberator	128.95
Super Buckeener	29.95
P-51 (retract gear)	44.95
Tom Kitty MK15	27.95
Tom Kitty MK40	37.95
Super Minnow	39.95



## CANNON SUPER-MINI

THE WORLD'S SMALLEST,  
LIGHTEST R/C SYSTEM

### FLITE-PAK WEIGHTS

1 Channel . . . 2.6 ozs.    3 Channel . . . 4.1 ozs.  
2 Channel . . . 3.2 ozs.    4 Channel . . . 5.0 ozs.

Full-house schoolyard flying, 1/2A Scale Models, indoor R/C, and R/C Free Flight become practical with the Cannon Super-Mini! Ultra-small servos and receiver are specifically designed for powerplants as small as .010 and CO<sub>2</sub>. While not intended for large aircraft, servos can (with proper installation) be used in Q/M racers and gliders to 100" span.

Available with receiver and separate servos, or Dual Block (with receiver) and extra servos. Choice of 100, 225 or 450 mah Rx nicads. Includes transmitter nicads and separate charger. Flite Paks compatible with most current transmitters.

Write for complete brochure, (please include Airmail postage)

SYSTEM	FLITE PAK
2-CH. . . . . \$204.95	\$139.95
3-CH. . . . . \$252.50	\$179.95
4-CH. . . . . \$309.95	\$224.95

Add \$15.00 for 53 MHz.

In Canada: H&W Enterprises  
Box 972, Regina, Sask. S4P3B2



13400-26 Satcoy St.  
North Hollywood, CA  
91605  
(213) 764-1488

NOW—100 DAY WARRANTY ON SYSTEMS AND FLITE PAKS!

SEE YOUR DEALER OR ORDER DIRECT. RETAIL ORDERS SHIPPED POST PAID. CALIFORNIA RESIDENTS ADD SALES TAX.



THE MOST COMPLETE  
STOCK OF AERO AND  
BOATS IN THE FAR EAST.

HANDLING EUROPEAN,  
U.S.A. AND JAPANESE  
RADIO CONTROL, KITS  
AND ACCESSORIES.

ENQUIRIES INVITED

## RADAR CO., LTD.

3, OBSERVATORY RD., KOWLOON, HONG KONG.  
TEL.: 3-680507

bypass/crankcase is not possible in this manner then a hole is usually drilled in the back plate itself and tapped for a fitting. This is called untimed pressure. On the upstroke of the piston negative pressure is created and on the down stroke positive pressure. Due to port timing the down stroke or positive pressure cycle is slightly longer than the negative pressure resulting in slight positive pressure when used to pressurize a fuel tank. Untimed pressure can also be taken off the front of the engine by removing one of the front plate screws that leads into the bypass (if the engine has a removable front plate). It would not matter whether the top or bottom holes were used if one or the other were drilled through into the crankcase. Usually the bottom holes are blind and do not go through. Taking untimed pressure off of the front of the case in this manner is bad practice as the pressure fitting can not be tightened as tightly as a screw and there is always the possibility of the front plate then coming loose.

When you were told that pressure could be taken off of the front of the engine, this was in reference to timed pressure which is considerably higher than untimed pressure. To use timed pressure, it is necessary to drill and tap a hole directly under the intake port in the bottom of the crankcase bearing journal area. Rotation of the crankshaft "times" the pressure impulses and, in effect, makes the engine a small air compressor. 6-8 pounds of pressure may be obtained this way versus 1/2-1 1/2 with untimed pressure.

That about wraps it up for another month, gang. Keep the letters and ideas coming in. See you next month. □

### CUNNINGHAM ON R/C

from page 7

warp in the other direction. Let your wife hold this twist in place, grab the trusty heat gun and re-shrink the covering over this twisted section. When she lets go, it should stay in place, with the warp removed. If you get warps back into the structure through improper storage or a handling problem, twist, shoot the heat and there you have it. While on this subject, when you have completed your new pride and joy, take the time to check it all over for warps before you go out to the flying field. They are easy to remove at home, but awfully hard to trim out at the field.

Back in the February 1978 issue, I talked about the Rowena 55cc engine that I had read about while visiting in England last fall. Here is a letter that I received the other day that I think you

will enjoy.

Dear Chuck:

The February issue of *RIC Modeler* finally arrived here this week and I was most interested to read of your trip to the U.K. I can answer some of your questions about the Rowena engine because the owner and designer of Rowena Engines, Tony Billing, happens to be my wife's uncle and a good friend.

Tony has promised to let me have photos and specifications for you, but in the meantime, I will give you some brief details.

Rowena Light Engines Limited is located at Llangaffo, Anglesey, North Wales (about 5 miles from the famous village of

Llanfairpwllgwyngyllgogerychwyrndrobwlllantysiliogogoch). (Did I spell it right?) Tony Billings used his long experience in tuning and racing 100cc go-karts to develop the engines for use in hovercraft, RPV's and now model aircraft.

The current 55cc 'A' type engine weighs 4 1/4 lbs., and puts out 4 hp, and 23 lbs. thrust on a straight methanolic/castor fuel. Normal model type glow-plug is used.

The slightly up-rated 'B' and 'C' types put out 4 1/2 hp/25 lbs. thrust and 5 hp/30 lbs. thrust, respectively. There are various other types of which the most interesting, to my mind, is the 110cc in-line twin.

As well as the models you mention, the engine also powers Jim Davies' huge scale Spitfire that flew the channel last year and there is a rumour of a northern modeler building a 1/2 size SE5A!

Your mention of climbing into the models has already been thought of. A Frenchman named Michel Colombar has built a full size aeroplane carrying two Rowenas mounted on outriggers on each side of the nose. This is claimed to be the world's smallest twin winged plane.

The engines are easy to start and run to any modeler used to 2 stroke engines and it is amazing to see them suck up fuel from a tank anywhere up to 3' below carburetor level.

Since the engines are handmade, Tony's biggest problem at the moment is keeping up with the demand. However, his imminent expansion into a new factory should help.

Current list price of the 'A' type works is about \$300.00, but if there is a demand in the U.S. for these we would be pleased to quote price and delivery.

I hope the above is of some interest and perhaps the next time you are in the U.K. we could give you a demonstration. Keep up the good work in your column which is always of interest.

to page 180

It's time you took stock. OURS!

# machinex<sup>5</sup>

lathe/drill/mill/grinder/polisher

NOW BEING SHIPPED . . . !

Here's the new standard in multi-purpose hobby workshop tool systems that does more than turn, drill, mill, grind and polish. It's making money. For all of our dealers!

Join them . . . send today for complete details on carrying the American-made MACHINEX 5" and its high-profit accessories . . . do it now!

American Edelstaal, Inc.  
Dept. HG-8  
1 Atwood Avenue  
Tenafly, N.J. 07670  
(201) 871-3800



## MERCURY MARINE CALIFORNIA OUTBOARD CLASSIC

Saturday, June 24, 1978 10:00 a.m. to 4:00 p.m.

Spreckles Lake (Fulton & 36th Ave.), Golden Gate Park, San Francisco

Events: Timed single boat lap • Concours d'Elegance • Six minute enduros • Heat racing — 5 or 6 boats negotiating a course of six laps

For further information and entry forms, contact:

Jay Selby, 682 Emerald Hill Rd., Redwood City, Calif., 94061 (415) 366-9831

## Our Ready-To-Fly Heath/Delta Skyhawk R/C Systems are some of the most complete flight packs available

\*Includes Heath 3-channel transmitter. Receiver with one plug in frequency module, receiver battery pack, and two miniature servos for elevator and rudder. Or select from any of 5 other Heath/Delta Skyhawk 3, 5, and 8-channel systems.



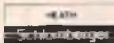
Heath/Delta Skyhawk Systems start as low as \$239<sup>90\*</sup>

Fly first class with any of the Heath high-performance R/C gear fully described in the big new Heathkit catalog! All have Heath's famous plug-in module capability that lets you change frequencies fast and easy and get maximum RF output with no alignment problems. Nearly 400 other exciting electronic products too!



# FREE! send for your copy!

Heath Company, Dept. 083-430  
Benton Harbor, Michigan 49022



Send me my FREE Heathkit Catalog. I am not on your mailing list.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Price is mail order, F.O.B. Benton Harbor, MI. Prices subject to change without notice. RC-133 Zip \_\_\_\_\_

MAIL THIS AD TODAY!

# \$ SAVE BROWN'S HOBBY CENTER SAVED \$

PRICES SUBJECT TO CHANGE. RESIDENTS OF NEW YORK STATE ADD 7% FOR SALES TAX. SALE PRICES FOR LIMITED TIME ONLY. NO C.O.D. POSTAGE INSURANCE EXTRA—ADD \$4.00 WE REFUND ALL EXCESS IN CASH WITH ORDER.

KP-7C



SEVEN CHANNEL

KPT-7CS

1976 Centennial 7 channel Kraft 2 Stick.

List Price \$515.43, and we are letting them go for only \$359.95. Brand spanking new, famous Kraft guarantee, and your choice of frequency, and servo. Choose the KPS-15 workhorse or smaller KPS-14.



VERY FEW SETS LEFT

**\$359.95**

KRAFT'S TWO STICK SYSTEM ON 72.75 MHZ OR 50 MHZ

LIST PRICE \$515.43 BHC PRICE ONLY

SAVE \$ • BHC SINCE 1952 • LOWEST PRICES ANYWHERE! PROVEN INTEGRITY!



**WORLD ENGINES LOW LOW, LOW PRICE**  
5 CHAN EXPERT ONLY  
**\$235.95**

**NEW MARK II**

	LIST	BHC
EXPERT 7 CHAN 2 STICK 4 SERVOS	440.00	259.95
EXPERT 7 CHAN 2 STICK 5 SERVOS	465.00	271.95
EXPERT 5 CHAN 2 STICK 4 SERVOS	400.00	235.95
S-10 OR S-11 SERVOS	45.00	36.95
550 MAH BATTERY PAK	19.00	15.95
MULLIGAN	47.95	38.40
SKYWAGON, SKYKNIGHT	59.95	48.00
SHELL FLY B	59.95	48.00
DAS BOX FLY BIPLANE	39.95	29.95
DAS BOX FLY SHOULDER WING	29.95	23.95
DAS BOX FLY LOW WING	34.95	27.95
PIPER CHEROKEE	42.95	34.40
NEW CUB, CHAMP	39.95	31.99
CARDINAL, OLYMPIA	42.95	34.40

WORLD ENGINES 5 CHAN, 1 STICK, ALL NICADS 3 SERVOS—ONLY \$169.95

OS ENGINES	LIST	BHC
OS 10 FSR std	22.95	18.40
OS 10 FSR R/C	28.95	23.20
OS 15 std	29.95	24.00
OS 15 R/C	35.95	28.80
OS 20 std	30.95	24.80
OS 20 R/C	37.95	30.40
OS 25 std	33.95	27.20
OS 25 R/C	39.95	32.00
OS 25 FSR R/C	56.95	45.60
OS 25 FSR std	49.95	40.00
OS 30 std	40.95	32.80
OS 30 R/C	45.95	36.80
OS 35 std	41.95	33.60
OS 35 R/C	47.95	38.40
OS 40 std	57.95	46.40
OS 40 R/C	69.95	56.00
OS 40 FSR R/C	64.95	68.00
OS 60 R/C	94.95	76.00
OS 60 FSR R/C	114.95	92.00
OS 60 FSR R/C	114.95	92.00
w/pump carb & muff	116.00	
OS WANKEL	104.95	87.00
OS 60 RSR	129.00/103.20	
OS 65 RSR	133.95/107.20	
OS 60 fourcycle R/C	199.95/139.95	
O.S. 80 RC	137.00	109.60

OS 10 FSR R/C MARINE	LIST	BHC
OS 10 FSR R/C MARINE	35.95	28.80
OS 20 R/C MARINE	47.95	38.40
OS 40 SR R/C MARINE	94.95	76.00
OS 45 RSR MARINE	104.95	84.00

SUPER TIGRE ENGINES	LIST	BHC
X 15 Fl sch. std	59.95	47.95
X 15 ABC R/C	62.00	48.00
G-15 R/C	38.00	31.00
ST 23 std	35.00	26.00
ST 23 R/C	48.95	35.50
X 20 RV ABC	74.00	58.00
ST 35 std	50.00	39.00
ST 35 R/C	56.00	44.80
ST-X 40	78.95	61.60
ST 46 R/C	56.00	44.00
ST G 2, 103 std	57.00	39.00
G60 FI PYP R/C	85.00	67.00
G60 ABC PYP R/C	93.00	74.00
G60 BH w/pump & carb	104.00	83.00
G71 FI R/C	99.00	78.00
ST 60 FI		
BB R/C	70.00	55.00



KRAFT	LIST	BHC
KP 2A	129.95	88.95
KP 3C	219.95	178.95
KP 3CS	219.95	178.95
KP 4A	299.95	194.95
KP 6A	329.95	224.98
KP 5C	375.43	280.00
KP 5CS	375.43	280.00
KP 7C	515.43	360.00
KP 7CS	515.43	360.00
KPS 14, 15 SERVOS		38.95

Brand New Fully Guaranteed By Kraft Systems Inc. KRAFT TRAYS, MOUNTS, TANKS WHEELS, NICAD PAKS, ENGINES



**SUPER SPECIAL!**



BRAND NEW 1978 KRAFT 5 CHANNEL, 2 STICK (KP5C) SYSTEMS ON ANY 72 THROUGH 75 MHZ CHOICE OF SERVOS—14's OR 15's

LIMITED OFFER!  
LIST \$375.43 BHC \$274.95

SEND MONEY ORDER FOR IMMEDIATE DELIVERY. ADD \$3.00 FOR SHIPPING. EXCESS REFUNDED



	LIST	BHC
#775	369.95	229.95

MRC SYSTEMS	LIST	BHC
772-2 CHAN	119.75	95.50
774-4 CHAN	279.95	197.95
785-5 CHAN	349.95	227.95
775-5 CHAN	379.95	237.95



PORSCHE CAR LIST 64.98 BHC 52.00  
TYRELL CAR LIST 67.98 BHC 53.95



LEOPARD TANK LIST 159.95 BHC 121.95  
R/C CARS & TANKS LIST BHC  
PORSCHE 64.98 51.88  
TYRELL 67.98 53.59  
SHERMAN TANK 134.98 107.98  
LEOPARD TANK 174.98 139.96

40% OFF! "HOT" SPECIALS!

	LIST	BHC
S.T. X40	77.00	46.20
S.T. X15	60.00	36.00
S.T. 35 RC	56.00	33.60
S.T. 35 COMBAT	37.00	22.20
COX 15 CONQUEST RC	60.00	36.00
COX 15 CONQUEST STD	56.00	33.60
ENYA 60 RC XF CHROME		
SCHNUERLE	180.00	108.00



**E.K. LOGICROL**  
"NIMBUS" 4 CHAN 2 ST. \$189.00  
CHAMPION 5 CHAN 2 ST. 245.00  
SUPER-PRO 7 CHAN 2 ST. 265.00  
RECHARGEABLE BATTERIES, CHARGER, TRAYS, ACCESSORIES, WARRANTY, ETC. ALL ABOVE COMPLETE—4 SERVOS.

MRC READY-TO-FLY PLANES

MRC	LIST	BHC
MRC Cherokee		
MRC Cessna		

MRC AIRPLANES	LIST	BHC
CHEROKEE	419.95	284.95
CESSNA	369.95	249.95

MRC HELICOPTERS	LIST	BHC
HELI-BABY	265.00	193.95
SUPER HELI-BABY	299.95	219.95



TURBO TROL LIST 59.95 BHC 47.95  
The water jet propulsion system that offers modelers maneuverability and control even in the most treacherous or stump filled waters.



REMOCALL LIST 24.95 BHC 19.95  
ONLY 1 1/2" LONG UNDER 10 OZ. WT.  
WATERPROOF INSTALLATION BOX 107.95  
Includes a pre-formed fiber-glass box complete with clear acrylic top, a set of waterproof seals and brass channel nutting. Holds wires and receiver, protects against water damage, submersion, dampness. Dimensions: Exterior: 8" long x 5" wide x 2" deep. Interior area: 5" long x 4" wide x 2" deep.  
LIST 19.95 BHC 15.99



SHERMAN R/C TANK KIT 107.95  
INCLUDE \$4.00 FOR SHIPPING—EXCESS REFUNDED IN CASH. SEND MONEY ORDERS FOR PROMPT SHIPMENTS—EXTRA FOR AIR & OVERSEAS, PRICE LIST 36¢—FREE WITH EACH ORDER

SAVE \$ ALL MAJOR R/C SYSTEMS, KITS, ARFS, AND READY TO OPERATE EQUIPMENT.  
NEW SUEVIA ENGINE LIST 295.95 BHC 199.99

## BROWN'S HOBBY CENTER

6031 BROADWAY, BRONX, NEW YORK 10471 ONE BLOCK NORTH OF 242nd STREET "EL" STATION  
OPPOSITE VAN CORTLANDT MANSION TELEPHONE (212) 796-5422 CLOSED ON WEDNESDAY AND SUNDAY

# SAVE BROWN'S SAVES

## HOBBY CENTER

**MEL \*SPECIAL!** PRICES SUBJECT TO CHANGE. RESIDENTS OF NEW YORK STATE ADD 7% FOR SALES TAX. SALE PRICES FOR LIMITED TIME ONLY. NO C.O.D. POSTAGE INSURANCE EXTRA—ADD \$4.00 WE REFUND ALL EXCESS IN CASH WITH ORDER.

**Variable Speed MOTO-TOOL Kit 381**  
Includes Model 380 Moto-Tool with ball bearing construction and .9 amp motor. 115V 60 Hz AC. Contains over 30 accessories in carry/storage case.  
LIST 69.95 BHC 43.95 \*special

**MOTO-SHOP** Model 572 Deluxe  
Includes a rubber backing pad, adapter, 6 sanding discs, 9 saw blades, 1 cloth wheel, 1 wire brush, 1 adapter, 1 polishing compound stick, 1 flexible shaft attachment and complete accessory kit.

MEL	LIST	BHC		LIST	BHC
PRESS	21.95	15.40	#290 ENGRAVER	14.95	10.47
CONTROL	23.95	16.77	#371 TOOL	59.95	41.97
CONTROL	21.95	15.40	#380 TOOL	54.95	38.47
STAND	14.95	10.50	#381 TOOL *special	69.95	49.00
ROUTER	10.95	7.70	#550 SAW	49.95	35.00
FLX TOOL	69.95	49.00	#571 TOOL	69.95	49.00
TOOL	39.95	28.00	#572 SHOP	89.95	63.00
TOOL	39.95	27.97	#700 LATHE	49.95	35.00
TOOL	48.95	34.97	#701 LATHE	59.95	41.97
TOOL	44.95	31.47	#702 AC SORY	19.95	14.00
TOOL	59.95	42.00			
TOOL	48.95	34.97			

### DREMEL EXTRAS



WE HAVE A COMPLETE LINE OF DREMEL TOOLS AND ACCESSORIES

**ASTRO FULL STARTER** LIST \$119.95 BHC \$79.95  
**DAE POWER PANEL** LIST \$14.95 BHC \$9.95  
**DELUXE** \$24.95

### K&B ENGINES

**BANTAM PLUG RC WITH IDLE BAR LIST—\$2.00 BHC—\$1.40**  
**STANDARD BHC—\$1.20 PRIME THRU PLUG**

#6526 61 RC W/MUFF LST \$90.00 BHC \$63.00  
#6533 61 RC W/PUMP/MUFF LST \$115.00 BHC \$80.50  
#6712 19RC CAR/BOAT/PLN LST \$50.00 BHC \$34.99  
#7860 35 UKIE LST \$29.95 BHC \$21.00  
#7861 35RC LST \$34.95 BHC \$24.45  
#8011 40RC 75" LST \$57.50 BHC \$47.25  
#8060 40RC MARINE LST \$75.00 BHC \$52.50  
#8360 40RC FRW/PP LST \$95.00 BHC \$66.50  
#8384 3.5ccSI FR W/P LST \$67.50 BHC \$47.25  
#8382 3.5ccSI OUTBOARD LST \$99.50 BHC \$69.95  
#8384 3.5ccSI MARINE LST \$69.50 BHC \$48.65  
#8450 3.5cc FIF or UIC LST \$57.00 BHC \$39.90  
#8450 4.9cc RACING FIF or UIC \$95.00 BHC \$66.50  
#8550 3.25cc FIF or UIC \$57.00 BHC \$39.90  
#8600 5.8cc FIF or UIC \$95.00 BHC \$66.50  
#9000 6.5cc FR/MUFF LST \$110.00 BHC \$77.00  
#9001 6.5 RACING LST \$89.50 BHC \$62.70  
#9020 6.5cc FF or UIC LST \$95.00 BHC \$66.50  
#9030 6.5cc RS III RR LST \$92.00 BHC \$64.40  
#9040 6.5cc RS3 MARINE LST \$99.50 BHC \$69.95

### PANAVISE



### 12 VOLTS 4.5 AMP SUPERGEL EXPRESSLY FOR MODEL USE

BHC ONLY 21.99  
CHARGER A GREAT TEAMMATE  
SUPERSTAR OF STARTERS  
DELUXE \$28.00 STANDARD \$25.90

### FULL LINE OF CONTROL LINE KITS, ENGINES, & ACCESSORIES, AT BIG DISCOUNTS

**DUBRO FUEL PUMP** LIST \$10.95 BHC \$7.98  
**STEVE MUCK'S LIL LIGHTNING** LIST \$48.95 BHC \$34.95

### SPECIAL!

NICADS-GOULD PAK OF 4—475 MA 4.8 VOLTS EASILY SEPARATED \$4.98 AS ABOVE—500 MA ONLY \$5.98  
SELECTOR HEAT IRON LIST \$22.40 BHC \$15.99

### #8382 K&B MARINE OUTBOARD



### DUBRO PROP DRIVE UNIT

FOR BIG AIRPLANES LIST 100.00 BHC 69.95

### COMPLETE CONTROL LINE KITS

Includes appropriate tank, handle, control lines, wheels, fuel line, line connectors, bell crank, elevator horn, spars glow plug, wrench, fuel filter, wheel collars, spinner nut, motor mount bolts, and landing gear clips.

### STEVE MUCK'S LIL LIGHTNING

LIST \$48.95 BHC \$34.95

### D&B KITS

LIST BHC  
ZERO 145.00 109.99  
T-2 BUCKEYE 170.00 129.99  
YANKEE 110.00 76.99  
SABRE JET 180.00 139.99  
P-51 159.95 119.98

### GEE BEE

MALLARD \$32.99  
ISLANDER \$34.95  
SEA HAWK \$34.95  
FLOATS 33" \$16.49  
FLOATS 28" \$14.95

### DUMA S BOATS

AND PLANES  
DUMAS HIGHEST QUALITY BOATS AND PLANES IN WOOD AND FIBERGLAS AT 20% OFF. FITTINGS AT 20% OFF. SEE OUR LIST, SAVE \$\$.  
DUBRO COPTERS LIST \$29.95 BHC \$21.95

### ARROW 60 RC IN LINE SINGLE CYLINDER BHC SPECIAL ONLY \$289.95

POWER PACER LIST \$59.95 BHC \$44.95  
TELECO CO. MOTOR & CHARGING GUN LIST \$19.95 BHC \$15.99  
"SHARK" ALSO

### BEST PRICES ANYWHERE ON

KITS, BOATS, ENGINES, BATTERIES, RESERVES ETC.

ASTRO FLIGHT	LIST	BHC
RAPID CHARGER	29.95	21.00
ANALYZER CHARGER	37.95	27.00
ELECTRA TWIN	99.95	70.00
1/2A ASTRO STARTER	16.95	11.95
ASTRO POWER PANEL	22.95	16.10
ELECTRONIC SPEED CONTROL	59.95	42.00
MECHANICAL SPEED REDUCER	23.00	
MONOCOQUE	34.95	24.50
AIRBORNE NUTCRACKER	73.50	49.00
TIGER TAIL	73.50	49.00
BRIDI KITS DIRTY BIRD 40 (wood)	58.95	45.50
DIRTY BIRD 60 (wood)	84.95	59.95
SHRIKE	185.00	135.00
RCM 15-500	40.00	30.00
T-20	45.00	32.00
KAOS 40	55.00	42.00
SUPER KACS	70.00	51.50
TRAINER 40	55.00	42.00
TRAINER 60	63.00	53.00
BASIC TRAINER	40.00	30.00
TRAINER 10	27.95	21.00
SPORTSTER	40.00	30.00
P-51	135.00	102.00
QUICK CHARGER	19.00	
TWEDDY BIRD	43.95	35.00
QUICKEST 500	43.00	32.00
SUN FUJ-4-20	29.95	23.00
COVERITE LIST BHC		
# PINT CAN BALSARITE	2.95	2.39
PERMAGLOSS	9.10	6.40
COVERITE	7.75	5.60
DAE LIST BHC		
POWER PANEL	19.95	14.95
DELUXE	34.95	24.95

### D&B KITS

ZERO 145.00 109.99  
T-2 BUCKEYE 170.00 129.99  
YANKEE 110.00 76.99  
SABRE JET 180.00 139.99  
P-51 159.95 119.98

**DUMAS** LIST BHC  
STAR CLASS 30 47.00 32.90  
STAR CLASS 45 110.00 77.00  
BINGO 250.00 175.00  
EQUATION 165.00 115.50  
ETCHELTS 22 235.00 164.50  
EAST COAST 12 METER 250.00 175.00  
45" GLASS STAR 180.00 126.00  
HUSON 36 155.00 108.50  
PROBAR 52.00 36.40  
DAUNTLESS 44.00 30.80  
DV-10 MAH 11.00 8.80  
DV-20 PLY 30.00 21.00  
DV-40 PLY 47.00 32.90  
DV-60 PLY 65.00 45.60  
DV-20 GLASS CF 78.00 54.50  
DV-40 GLASS CF 92.00 64.40  
DV-60 GLASS CF 100.00 70.00  
PT-109 38.00 26.60  
LIFEBOAT 44 55.00 38.50  
TUNA CLIPPER 45.00 31.50  
FOSS TUG 75.00 52.50  
U-76 50.00 35.00  
SWAMP BUGGY, LARGE 31.00 21.70  
HOT-SHOT 30.00 21.00  
PAY-N-PAK 38.00 26.60  
ALL DUMAS IN STOCK HARDWARE AT 20% OFF-KITS OVER \$20.00 LIST AT 30% OFF & 20% OFF IF LESS THAN \$20.00

**GOLDBERG** LIST BHC  
RANGER 42 24.95 19.99  
FALCON 56 39.95 31.99  
JR. FALCON 13.95 11.19  
SKYLARK 58 44.95 35.99  
JR. SKYLARK 14.95 11.99

### GOLDBERG

SKYLARK 62 59.95 47.99  
SKYLARK 42 15.95 12.79  
SR. FALCON 59.95 47.99  
ALL OTHER GOLDBERG KITS AND ACCESSORIES IN STOCK

**MIDWEST KITS** LIST BHC  
ATTACKER 39.95 28.00  
SILENT SQUIRE 39.95 28.00  
CARDINAL SQUIRE 85.00 59.50  
CESSNA CARDINAL 29.95 21.00  
SUPER CHIPMONK 29.95 21.00  
DAS LIL STIK 32.95 23.10  
SWEET STIK 39.95 28.00  
MACH 1 94.95 66.50  
PITTS SPECIAL 94.95 66.50  
STRIKEMASTER 69.95 49.00  
MINI STAR 90.00 59.95

**PROCTOR KITS** LIST BHC  
NIUPOURT 164.50 132.00  
ANTIC 89.95 72.50  
ANTIC BIPE 106.95 85.99

**SIG KITS** LIST BHC  
KADET 34.95 27.96  
KOUGAR 44.95 35.96  
KOMANDER 39.95 31.96  
KOMET 47.25 37.80  
CITABRIA 57.95 46.36  
KLIPPER 20.95 16.75  
SPORT SPORT 19.95 15.96  
P-51 57.95 46.36  
CHIPMONK 59.95 47.96  
J-3 CUB 39.95 31.96  
CLIPPED WING CUB 39.95 31.96  
SKYBOLT BIPE 62.50 50.00  
LIBERTY SPORT BIPE 64.75 51.80  
CESSNA 150 69.50 55.96  
RYAN STA 73.50 58.80  
ZLIN AKROBAT 54.95 43.96  
SMITH MINIPLANE 49.95 39.96  
OTHER SIG KITS ALSO IN STOCK

### TOP FLITE

AIRCORBA 59.95 47.95  
SESA 59.95 47.95  
P-51 57.95 45.95  
CONTENDER 45.95 35.95  
HEADMASTER 25.50 19.95  
P-47 T-BOLT 79.95 63.95  
FRESHMAN TRAINER 44.95 36.00  
TAURUS 53.95 43.20

**VK MODELS** LIST BHC  
CHEROKEE 67.95 54.40  
CHEROKEE BABE 36.95 29.95  
NAVAJO 62.95 50.40  
NIUPOURT 62.95 50.40  
CORBEN 41.95 33.95  
FOKKER TRI-PLANE 62.95 50.40  
SOPWITH CAMEL 62.95 50.40

**FOX ENGINES** LIST BHC  
FOX RC 18 31.95 22.40  
FOX 25 RC 31.95 22.40  
FOX 29 RC 34.95 24.50  
FOX 36 RC 34.95 24.50  
FOX 40 RC 45.95 32.20  
FOX 45 RC 51.95 36.40  
FOX 60 RC 84.95 69.50  
FOX 78 RC 86.95 67.90  
ALL FOX U-CONTROL ENGINES IN STOCK 30% OFF LIST PRICE

**GEL CELLS** BHC  
6 VOLT, 4 AMP 10.39  
6 VOLT, 7 AMP 12.95  
6 VOLT CHARGER 9.95  
12 VOLT, 4.5 AMP 19.99  
12 VOLT CHARGER 7.95

**ZAP** BHC  
X-30 36 FL. OZ 2.75  
ZAP 18 FL. OZ 1.60

### ROSSI

ROSSI 61 RC W/TUNED PIPE FI MUFFLER 167.00 129.98  
REAR EXHAUST RC FI WITH PIPE 175.00 139.98

**WORLD ENGINES** LIST BHC  
MISS WORLD 49.95 37.95  
SKYVAGON, SKYKNIGHT 59.95 48.00  
SHELL FLY 'B' 59.95 48.00  
BOX FLY LOW-WING 34.95 27.95  
BOX FLY HI-WING 29.95 23.95  
BOX FLY BIPE 39.95 29.95  
PIPER CUB 34.95 27.95  
PIPER CHEROKEE 42.95 34.40  
CARDINAL OLYMPIA 42.95 34.40

**WEBRA-MRC** BHC  
#1022 40 RC 69.98  
#1020 61 RC 89.98  
#1034 40 RC FI 79.98  
#1024 61 FI SR 104.95  
#1026 61 RI SR 109.95  
#1023 40 RC MARINE 79.98  
#1035 40 RC SR MARINE 89.98  
#1020 61 RC MARINE 99.98  
#1025 61 RC FI MARINE SR 114.98  
#1026 61 RC RI MARINE SR 124.98  
#1037 90 RC 119.98  
#1039 90 RC MARINE 139.98  
SUEVIA 2.5 H.P. ENGINE 199.98

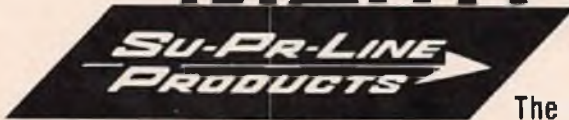
### ENYA ENGINES

ENYA 09 RC 36.98 25.90  
ENYA 15 RC 40.98 28.70  
ENYA 19 RC 45.50 31.85  
ENYA 35 RC 53.50 37.45  
ENYA 40 RC 89.98 63.00  
ENYA 45 RC 89.98 63.00  
ENYA 60 RC Schurrite 199.98 139.98  
ENYA 60 RC BBIII 117.98 82.60

# BROWN'S HOBBY CENTER

6031 BROADWAY, BRONX, NEW YORK 10471 ONE BLOCK NORTH OF 242nd STREET "EL" STATION  
OPPOSITE VAN CORTLANDT MANSION TELEPHONE (212) 796-5422 CLOSED ON WEDNESDAY AND SUNDAY

# PRO ROD NY ROD SU-PR-ROD MASTEROD MASTEROD-XF



The Leader in ADVANCED Push-Rod Systems

PLAINFIELD, ILLINOIS 60544

## CUNNINGHAM ON R/C

from page 1777

Perhaps the next time you come, you should bring Clarence Lee with you and we will show him what real silencers (mufflers) are. Currently in our club and many others, no model is allowed to fly if the noise exceeds 80 db at 7 metres range. We find that we can attain this and, contrary to Clarence's words of doom, do not burn up engines. We are amazed that in the ecology conscious U.S. it is apparently normal to run engines either unsilenced or with open front mufflers that do no good at all.

Sorry if this letter has gone on a bit, but it is nice to see some mention of European activities in R/C Modeler which is widely read over here. Let's hope we see more in the future.

Sincerely,  
Graham Foster  
Surrey, England

Thanks for your very interesting and informative letter. Graham, and I'd love to take you up on that demonstration - - how about letting me fly the bird that the engine is in. One quicky on the muffler statement, though. Normally, in the U.S., most modelers are flying their aircraft in temperatures that are much higher than in England. A muffler that will

be quite nice at 60 to 70 degrees will burn up an engine if it is running at 90 to 100 degrees in the areas of Texas, California, and the Midwest U.S. in the summer. I burned up one of the first Webra .61 engines because I used an Enya II muffler on it in the summertime, one flight was all she wrote! It was a quiet flight, but a disastrous one too. In traveling and living in many parts of the U.S., I know what a wide temperature difference we can have here, and I also know how nice and mild the climate is in England. Tuned pipes and extractors come the closest to producing the least noise, but are also somewhat bothersome for the sport flier. Thanks again, Graham, and watch out for a knock on your door.

I'd like to close out this month with another letter received about the Lazy Ace.

Dear Mr. Cunningham:

I thought you might be interested in keeping up with the Lazy Ace. After reading your article on the big biplane, I could hardly wait to begin construction, making none of the usual changes. Using only light contest balsa, I was happy to find she weighed 8½ lbs. After covering with MonoKote, the weight stayed down under 9 lbs. Complete . . . almost . . . I had a very tall heavy bird.

After correcting this, the obese bird tipped the scales at a super weight of 11½ lbs. You must have weighed yours without balancing to get the 9½ lbs.

Living in the high country of Colorado, I knew no .60 would fly the Lazy Ace, so I took one small liberty and installed an O.S. Max .80 and used a 14/5 prop. All our expectations were fulfilled. She took off in about 25-30 feet and flew just like the real thing, slow and easy (even at 7200 ft. altitude).

After flying her a bit, I found the power ratio still wasn't enough to suit me in the vertical maneuvers . . . so again we took a liberty and installed a Suevia engine 25cc rated at 3 horses, and all flying problems ceased. She now climbs straight up doing vertical rolls as far as I want to go. Hard to believe, she is not much faster than with the .80, but what power. I'm using an 18/6 prop and getting 11,000 rpms.

I have absolutely no stab problems and have had over 95 logged flights at this writing. The Lazy Ace is a fine bird and very enjoyable to fly. Thanks for thinking about the "Big Bird Builders".

Sincerely yours,  
Bill Tuttle

Colorado Springs, Colorado

Just a word on Bill's letter. Frankly, I don't know how his Lazy Ace turned out tail heavy, as mine came out on the

to page 183

## TATONE PRODUCTS CORPORATION



### PROVEN AND RELIABLE ACCESSORIES

- ENGINE MOUNTS
- TANK MOUNTS
- MUFFLERS
- TIMERS
- SCALE INSTRUMENTS
- NOSE GEAR
- TEST STANDS
- ULTRASONIC CLEANERS

- MANY OTHER ACCESSORIES
- SEE YOUR DEALER
- SEND FOR CATALOG
- CAR BUFFS—  
SEND FOR OUR  
THUNDER ROAD  
CATALOG.

TATONE PRODUCTS CORPORATION  
1209 GENEVA ST. SAN FRANCISCO, CA 94112

## ULTRASONIC CLEANER



- Three dimensional cleaning action
- Patented power pump circuit
- Removes metal chips, hard grease - even microscopic dirt

Clean it in 1/50th the time with sound waves. . . . AND DO IT 16 TIMES CLEANER THAN SCRUBBING, RUBBING OR BRUSHING!

A MUST FOR ALL ENGINE WORK, IDEAL FOR CLUB USE OR HOBBY SHOPS.

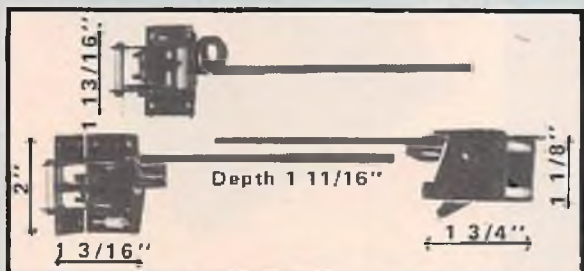
2.1 QT CAPACITY \$165.00 4.6 QT CAPACITY \$185.00

# Sure Relief for the Ups and Downs of Modeling



## ROYAL RETRACTABLE LANDING GEARS

Retractable Landing Gears are used commonly by today's modelers. What is uncommon is to find a gear that operates reliably, conveniently, and at an economical price. Royal offers *reliability* through positive up/down locking and through the strength provided by a reinforced aluminum shell and fiberglass-filled nylon internal parts. *Convenience* is offered through features like "dual-set" (non-slip) adjustable axles, compact design, dual take-off actuation and comprehensive written instructions. All this; and at *one of the lowest suggested retail prices on the market*: a tricycle set is only \$27.95, and the main gear set only \$16.95. Compare value and price, and we feel confident you'll choose Royal!



## Going up?.....Try These Royal Accessories

### WHAT MAKES A ROYAL R/C SCALE KIT SPECIAL.....

- Hand-crafted parts
- Crisp die cutting on all plywood parts
- Select quality balsa
- An unprecedented emphasis on scale accuracy and detailings
- Spun aluminum cowls used in many kits
- A special emphasis on flyability
- Detailed written assembly hints and instructions

### ROYAL HAS BIG PLANS

Scratch-build the plane you want from Royal's selection of big, full-size, printed plans. Two big sheets complete with step-by-step instructions. All formers and ribs are shown full-size and detail scale information is provided.

F4U-1D Corsair	F8F Bearcat
B-25 Mitchell	A6M5 Zero
P-38 Lightning	Cessna 182
Cessna 310Q	
P-51D Mustang	
Beechcraft Staggerwing	
C-47 Skytrain	
JU87D-5 Stuka	

**\$8.95**  
PER SET

#### GLOW PLUG SNAP SOCKET



This accessory is unique among starting clips. Its socket style design provides a positive locking, clamp-like grip and its six contact points transfer current from the starting battery to your engine's glowplug with maximum efficiency.

Price ..... \$2.79

#### CLOTHESPIN TYPE BATTERY CLIP



\$1.49

Complete with wire, this positive gripping clip is ideal for starting your model engine. Just hook the wires to a starting battery, hook the clip to your engine and you're ready to go.



**ROYAL**  
Products  
Corp.

790 West Tennessee  
Denver, Colorado 80223

## THERMALON IS COMING

"THE IDEAL MODEL COVERING"

It combines the strength of fabric with the convenience and working ease of the plastic iron-ons. Watch for more detail next month.



# If you missed...

## any of these issues



You missed more how-to material for the tropical fish enthusiast than was published in all other aquarium magazines combined during the same period of time. Already acclaimed by both fresh water and marine aquarists as the nations leading aquarium publication, Freshwater And Marine Aquarium Magazine is dedicated to bringing you, each month, the finest articles available, written by hobbyists, for hobbyists. You can add a whole new dimension to the hobby of tropical fish keeping with FAMA --- the only magazine that covers every facet of fresh and salt water aquariology --- with an emphasis on making the hobby more enjoyable for you! Enter your money-saving subscription today to the magazine that dared to break the traditional mold of 'mediocrity at any price'.

### DON'T MISS A SINGLE ISSUE! SUBSCRIBE NOW!

#### FRESHWATER AND MARINE AQUARIUM

120 W. Sierra Madre Blvd.  
P.O. Box 487  
Sierra Madre, CA 91024



- 1 year - \$13.75       2 years - \$26.50  
 1st Class - \$27.20       1st Class - \$53.40

For orders outside U.S.A.,  
add \$2.50 per year for 2nd Class postage  
(except APO's and FPO's)

- Full Payment Enclosed  
 Bill Me  
 BankAmericard/Master Charge



M.C. or B of A # \_\_\_\_\_  
 Bank Name \_\_\_\_\_  
 Expiration Date \_\_\_\_\_  
 Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

**PLEASE ENTER THE FOLLOWING GIFT SUBSCRIPTION FOR:**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

This is a gift order. Please send a gift card signed:

Please allow 6 weeks for a new subscription to begin.

I would like to submit articles to FAMA. Please send your Author's Guide sheet.

from page 182/7

button, and have heard no word of this trouble from any of the many other builders around the country. At normal altitudes you don't need more than a good .61 to fly her, but at 7200 feet I can see why Bill stuck the Suevia in the nose. Here at 600 feet, I wouldn't think of putting my Suevia in the nose of the Ace. If you're building and flying a Lazy Ace, be sure to not use an 11/anything prop. Use a 12/6 or a 13/5. The smaller props will make a lot of noise, but will not pull the aircraft any place. The same is true of Miss Texas; use a 12/6 or a 13/5. I've completed test flights on the Sporty Ace, which is a scaled down Lazy Ace with 700" of wing area for .40 engines, and she is flying great. The wing is semi-symmetrical, and the stab is a slightly lifting section, and she handles just like her big sister. Take-off runs are straight and true because the lifting tail gets the tail wheel up off of the ground in about 2'. Landing can be fast or slow, no snap rolling on a slow landing, just hold back on the stick and she settles down. We will be bringing the Sporty Ace to you in the next few months, if I can just get myself down to the typewriter to do the construction article. □

FROM THE SHOP

from page 2

"That is very true, Socrates. I am reminded of my uncle, Prevaricus the Elder, who has a great passion for fishing. Every weekend and holy day he plies the blue waters of the Mediterranean --- and every night he bores us with his fish stories. No one doubts that he enjoys his sport --- yet no one asks whether he bends his own hooks, or braids his own line."

"Very good, Phlydo. And do you not see the parallel between your uncle's sport and your own? For if your uncle is no less a fisherman for using hooks from K-Mart, why do you feel that you are an inferior flier for using a ready-built airplane? Does not an ARF model perform all the functions you desire, just as well as a hand-built model might?"

"Hmmm --- you argue most convincingly, Socrates. And yet I am loath to set my plane beside yours, for fear of the comparison."

"Ah, now you are comparing form rather than function, friend Phlydo. And the comparison is most unjust. For my



**ELECTRONICS**

P.O. BOX 13434, ALBUQUERQUE, NEW MEXICO 87112

**FIRST TIME ANYWHERE!  
ON-BOARD IGNITION SYSTEM™**

- ★ Completely Solid State
- ★ Up To 12 Amps For 1.5V Plugs
- ★ Weighs Less Than 8 Oz.
- ★ Ideal For Scale Aircraft
- ★ Improves Idle And Performance
- ★ Perfect For R/C Boats
- ★ Rechargeable From Most 4.8 And 9.6 Volt Chargers
- ★ Automatically Adjusts Current
- ★ Up To 40 Amps For 2V Plugs
- ★ Mounts Permanently On Board
- ★ A Must For Twin Engine Planes
- ★ Reduces Stall-Outs
- ★ This Is NOT A Ni-Cad System

**ONLY  
\$19.95**

DEALER AND DISTRIBUTORSHIPS NOW BEING ACCEPTED.

**M-n-M  
Radiomodel's**

THE COMPLETE R/C SHOP, 2 LOCATIONS

Complete Catalogue & Monthly Specials \$1.00

5544 W. 147th Street  
Oak Forest, Il. 60452

914 Plainfield Road  
Joliet, Il. 60435

**Totally Complete Kit (except glue): Simple fast assembly. Wing, tail & fuselage are fuel proof foam requiring no painting, no covering. Nose section is pre-cut aircraft grade plywood. Step-by-step photo instructions.**



Terry Miller's

**SWEET  
SIXTEEN**

Order Direct — Kans. add 3%  
**ORDER DIRECT FROM:  
SHARON ENTERPRISES  
Crestline, Kansas 66728  
Phone: (316) 389-2299**

**FLY THE BIGGEST**

**FOR ONLY  
\$97.50**

Wing Load.,  
11 1/3 oz. per sq. ft.

Flies rudder, elev.,  
& throttle

Chord, 18"

16 ft span  
Flying Wt., 17 lbs  
For .60 engines or larger

**ALREADY THE PROVEN SUPER TRAINER**

At last, the book  
R/C modelers have been  
waiting for



# basics of RADIO CONTROL MODELING

Now there is a book that challenges both beginning and veteran R/C modelers; a book that combines detailed explanation with clear, colorful graphics; a book that presents the total R/C hobby — from airplanes, boats, and cars to missile-launching submarines. **BASICS OF RADIO CONTROL MODELING** is the all-purpose, up-to-date guide to R/C. In 84 pages it covers tools, materials, cars, engines, radio equipment, boats, and aircraft, with a special section on learning to fly your model. Included are more than 220 photos and 53 drawings and diagrams. **BASICS OF RADIO CONTROL MODELING** is the R/C book you've been waiting for. Buy it at your local hobby shop, or order direct with the coupon below. \$4.50

Dept. 3888-1, KALMBACH PUBLISHING CO.  
1027 N. SEVENTH ST., MILWAUKEE, WI 53233

Enclosed is \$\_\_\_\_\_ for \_\_\_\_\_ copies of **BASICS OF RADIO CONTROL MODELING** at \$4.50. Include 50 cents for postage and handling. Wisconsin residents add 4 per cent sales tax.

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**MICROX**

P. O. Box 1063-D  
Lorain, Ohio 44055

## Perfection in R/C THE EXETER

Wt. 3 to 4 lbs.

Power  
.23 to .35

Span 45"

Performance  
better than most  
.40 powered aircraft!

All Contest  
Quality Balsa

At your dealer or direct ... \$43.95

aircraft was built by one who enjoyed the building for its own sake, one who found pleasure and fulfillment in creating out of raw materials a unique piece of flying sculpture --- in short, a craftsman, a hobbyist, a modeler.

"The modeler is concerned primarily with form. He wishes his creation to measure up to some ideal: perhaps some real aircraft, or a standard model design, or even some vague and fleeting image from his own daydreams. And he values patience, building skill, problem solving, originality --- the traits of the craftsman.

"The sportsman, on the other hand, is more likely to be concerned with the model's function: is it easy or difficult to fly? Does it survive hard landings well? Will it perform outside maneuvers? Can it carry the extra weight of retracts? And he is more likely to value flying skill, quick reflexes, steady nerves, good sportsmanship --- the traits of the athlete."

"Then it is just as I feared, Socrates -- we are in two separate camps. You are a modeler; I am a sportsman. You should read *R/C Modeler*, and I should read ..."

"Hush! For the love of Zeus, friend Phlydo! Do you want the Emperor (no relation) to hang us both by the neck -- or worse? And haven't you ever been in a Socratic dialogue before? You're just the straight man. Your job is to say 'yes indeed, Socrates' and 'that is very true, Socrates.' I'm supposed to do all the brainwork and jumping to conclusions. Is that not so, Phlydo?"

"Yes indeed, Socrates. That is very true, Socrates."

"I am glad you agree, Phlydo. Now we may proceed with our enquiry."

"Is it not true, Phlydo, that all things in nature are found to be a mixture of opposites --- that some evil is found in even the best of men, no cold is ever totally without heat, and even the farrahest of blonds often have dark roots?"

"That is very true, Socrates. Only death and pregnancy are absolutes; for the Oracle at Delphi says, 'It is not possible to be just a little bit ...'"

"... dead. Yes, yes, Phlydo. I am sure we are all familiar with the quotations from Delphi. But surely my point is clear: It is impossible for a modeler to have no sporting blood in him, just as it is impossible for a flyer to have no modelling instincts."

"That is very true, Socrates. Building and flying are merely extreme ends of the same spectrum. For you yourself are a modeler of the old school, yet you come every weekend to the field to fly your creations."

"I do indeed. And you, Phlydo, who claim to have no love of building. Have you not painted this ARF distinctively? And surely those are not stock wingtips?"

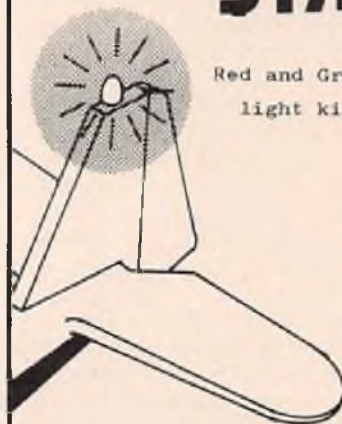
## STROBEACON



the new solid state controlled lighting system which produces brilliant light flashes visible over one-half mile. Enables dusk to dawn flying and adds realism to your aircraft. A 9V alkaline battery lasts all season. Wt 1oz.

**\$17.76**

Red and Green wing  
light kit - \$8.55



Postpaid. Batteries not supplied.  
Complete information sheet \$2.25

**DESTEK**  
INDUSTRIES

P.O. BOX 24163  
Los Angeles, CA 90024

a study in perfection

A collection of the world's finest scale kits for rubber, CO2, and glow power, free flight and radio control.

See your hobby dealer. Send 25c for catalog.

**FLYLINE MODELS, INC.**

### IN NEW HAMPSHIRE ---

Your complete R/C Center is Fitts Photo and Hobby Shop Kings Hwy Plaza, Route 108, Stratham, NH (603) 778-8802. Open weekdays 10-9. Sundays 1-6. Kraft MRC EK Enya OS Max Fox. Kits and accessories.

We fly ourselves.

### CUSTOM TUNED ENGINES COMPETITION ACCESSORIES

(Cox .049/.051 Specialists)  
For catalog, send 13c stamp to:  
Kustom Kraftsmanship (Catalog)  
Box 2699, Laguna Hills, CA 92653  
(714) 830-5162

**FINECRAFT  
FIREFLY**



44 1/2" Wing Span for 19-25 cu. ins. Engines and 3 Function Radio.

Kit includes moulded fibreglass fuselage, covered foam wing (light weight), tank kit, 2 part clear moulded cockpit, part machined balsa tips, ply and wood parts, building instructions.

**\$59.95    \$79.95**

Distributed exclusively in the U.S. by:

dealer enquiries invited  
A. MORAN & CO.  
P.O. Box 66169  
Baton Rouge, La 70896  
C.O.D. orders accepted

order direct no postage required

**CANADIANS**



FOR

Fast, Efficient, Economical MAIL ORDER service of all your AEROMODELING Supplies.

WRITE

**CALGARY HOBBY SUPPLY LIMITED**  
Box 3173, Stn. 8., Calgary, Alberta

DEALER INQUIRIES invited for Du-Bro, Sullivan, Swanson, Franklin, K & B, Webra, Perfect Point, Superstrong Covering, RDM Balsa, Kraft, Soarcraft.  
Store Address: 3920 Edmonton Trail N.E., Calgary, Alberta. Phone: 277-4664

**\$\$\$\$\$ SAVE \$\$\$\$\$**

**DISCOUNT PRICES - R/C GEAR**

R/C plane, helicopter, and glider kits — engines and control systems — We have them ALL!!

Send S.A.S.E. for DISCOUNT price sheets and save your \$\$\$\$\$\$\$\$\$\$!

M.C. & B.A. cards accepted.

**THE R/C HANGAR**

1302 Arleen, Sunnyvale, Calif.  
(408) 736-2023    94087

**THE BIG ROOPER 1.40 cu. in.**

IDEAL ENGINE FOR 1/4 + 1/3 SCALE AIRPLANE & BOATS  
Comes completely set up for gas plus oil, spark plug, mag. ing., recoil starter. When stripped for glow plug use, weight is 32 oz. (Cox) design.



**WHILE THEY  
LAST  
\$59.95**

**QUADRA \$110.00**

Glow Plug Adapter \$10.00  
Prop adpt kit \$19.00 - Front rad. mt. for glow \$14.50  
Spinner adpt. kit \$22.50 Rear Props available  
**SPECIAL INTRODUCTORY OFFER**  
1.9 cu. in. engine \$69.95  
Reg. price \$95.00, Prop hub \$18.00, Mount \$14.50  
Complete including mount and hub — \$98.00

Will ship UPS COD. Ill. customers add 5% sales tax  
Send 13¢ for catalog. Call me and I'll help you get power for your big "job" — Gene Horner.

HORNER'S SALES Beecher, Ill., 60401 (312) 946-2615

"Very true, Socrates. Every design, I feel, would benefit from tip plates such as those. If Icarus had used them, he'd never have stalled out and spun into the Aegean . . ."

"Stalled? But Phlydo, what of the report that he flew too near the sun and melted the wax . . ."

"Horsefeathers! Every shepherd's kid who ever climbed a mountain knows better than that — you've been reading the tabloids again. Why do you think all that snow stays on Mount Olympus? Because it gets cold up there near the sun, that's why. Freeze the Adidas off a brass monkey, up in those jet lanes where Icarus stalled out . . ."

"Very well, Phlydo . . ."

" . . . hang a set of wings on damn near anybody these days . . ."

"Very well, Phlydo! Let us conclude our dialogue. We are agreed, are we not, friend Phlydo, that our hobby consists of a broad spectrum of people, and those who are primarily modelers reside nearest the end of the spectrum where designs are created, while those who are predominantly sportsmen fall towards the end where designs are field-tested and flown."

"That is true, Socrates."

"And every R/C enthusiast seems to contain a mixture of these two extremes."

"That he does, Socrates."

"And occasionally there are those R/C'ers who contain fanatical amounts of both extremes . . ."

" . . . and win every bloody scale contest in sight, Socrates, provided they escape the men with the straight jacket."

"Indeed, Phlydo. Such people do often structure their life around R/C, becoming jobbers, manufacturers, publishers or dealers, and thus ruining both their hobby and their income simultaneously. But once again we have digressed from our dialogue, Phlydo. We do agree, do we not, that both extremes, the modeler and the sportsman, are necessary to the hobby?"

"Yes, we are agreed, Socrates."

"And there is room on our flying field, is there not, for people from every part of the spectrum?"

"There is indeed, Socrates — and a good thing it is, for here comes a crowd of them just now."

"Indeed, indeed, Phlydo. Through yonder gate comes Bilbo of Athens and a full round dozen of his fellow fliers; and those that be not upon my frequency must in sooth be upon yours. Let us retire until next Sunday, then. May the gods be with you."

"And with you, friend Socrates. Perhaps next week we may fly together — if only my engine will start faster than your mouth!"

See you next month. Good Flying. □

**The Hobbyist**

(704) 523-5441

P.O. Box 15928  
Pressley Park • Charlotte, N.C. 28210  
Mail Orders add \$1.50 for Handling  
In Cont. USA for Check or M.O.  
For C.O.D. add additional \$1.00  
(Not Applicable to Drum Fuel)  
N.C. Sales — Add 4% Sales Tax

**SINCE 1969**

**FUEL - FUEL - FUEL**  
OVER 1/2 MILLION GALLONS SOLD  
**RED-MAX**

Top Quality FUEL Clean Burning  
Proven Reliability

% Nitro	One Gal.	Five Gal.	55 Gal. Drum
5%	\$ 6.20	\$28.00	\$158.00 FOB
10%	\$ 7.70	\$32.00	\$188.00 FOB
15%	\$ 8.70	\$36.50	\$216.00 FOB
25%	\$11.20	\$45.00	\$274.00 FOB

Used By National Champions  
DAVE PEARCE  
55 gal. Drum FOB Charlotte, NC

**OUR MOST POPULAR**

10% 30 GAL. FOB  
RED-MAX DRUM \$110.00  
We specialize in supplying clubs.

Modelers please note: We use the finest brands of synthetic oil available for your model engine in standard Red Max Fuel. It has been tested and proven for 10 years. With our fuel it is not even necessary to continue the time honored practice of lubricating your engine with "3 in 1" Oil after the day's flying. With our synthetic oils the lubrication coating remains. Standard Castor Oil Fuel is available for those who prefer; however, since castor oil has recently taken a jump in price it will be necessary that you add 5% to the above prices for castor fuels.

— OR —

We can brew to your specifications — just call and let us know exactly what you like.

**"SUMMER FUEL SPECIAL"**



100 GALLONS in  
one gallon bottles  
\$480.00 delivered in USA  
RED MAX 10%

For the  
ultimate  
finish



Glaskote is a clear liquid that goes over your favorite paint & produces a high gloss finish that is remarkably fuel resistant. One coat. No mixing. No short pot life. Also fantastic on Coverite.

**COVERITE**

2779 PHILMONT AVE., HUNTINGDON VALLEY, PA.

# RCM PRODUCTS

## RCM WING JIG II — PRICE: \$34.50



The original RCM Wing Jig, first published in the August 1967 issue of this magazine made it possible for many modelers to build their airplane wings warp-free and in far less time than it had previously taken. The RCM Wing Jig II offers many design improvements on the original version that greatly extends both its versatility and the accuracy of the wings produced. It is now used exclusively in the RCM shop for all building projects.

Since the accuracy of the jig depends almost completely on precise fabrication and fit of the parts, RCM has made arrangements to have a limited quantity of these Wing Jigs manufactured which are now available through the RCM Product Division.

The RCM Wing Jig II consists of two sections hinged in the middle. Each section consists of a front and back "L" shaped base piece. A jig rod support is located at either end of each wing jig section to mount the rods that support the wing ribs.

The switch to a double length jig that's hinged in the middle makes it possible to build an entire wing, complete with the dihedral called for in the plans, in one operation. Or, the Wing Jig II can be set up flat to use both sections to build up a wing panel for one of those big powered or glider jobs. Or, with the dihedral set, a polyhedral wing can be accurately built. It can even be used to join foam wing halves to get the dihedral as it should be.

A uniquely designed rod and support makes it possible to true the wing jig rods to order. A simple protractor device makes it possible to set the dihedral even when it is given in degrees. The addition of adjustable end legs make it possible to set the dihedral accurately for each wing panel. New "L" shaped base pieces assure a warp free jig to start with. A yardstick attached to the front of the base pieces helps in spacing the ribs when the wing is set up on the jig. A bubble leveling arrangement assures both wing panels will be true to each other. A new design rod support makes it possible to move the two wing jig rods from as close as you'd want them to 6 1/2" apart. And, a new technique makes it possible to build those small cord wings with ribs too narrow for two wing jig rod holes.

To use the Wing Jig, holes are drilled in the wing ribs, the proper dihedral is set on the jig, and the ribs are slid onto the wing jig rods. The rods are aligned and clamped down, the ribs are properly spaced, and the spars, leading and trailing edge and top sheathing is glued in place. The wing is removed from the jig and the bottom sheathing is glued in place. Finally, glass cloth and resin is applied to the center section, and the wing tips are installed.

That's it, the RCM Wing Jig II — the most versatile, easy to use and convenient wing jig ever designed. Assembly time is approximately one hour and you'll be ready to build your next wing faster and with more accuracy than you ever dreamed possible. This is the only Wing Jig endorsed and manufactured by RCM.

## RC NIGHT FLYING!



Now, with Cyalume® Lightsticks you can fly your R/C aircraft at night for up to eight hours. Used extensively by RC'ers on the West Coast for night flying of R/C sailplanes, one Cyalume® Lightstick is mounted on the bottom of each wing, near the tip, and another on the Hi-Start just below the chute. Originally designed by the American Cyanamid Company for use by the U.S. Navy, Cyalume® chemical lights are far higher in visibility than conventional electric light sources. Completely non-toxic or hazardous, simply bend the external plastic case which breaks the internal glass tube. Shake vigorously, and the fluorescent green liquid material glows brightly and can be seen further than any normal light source or emergency marker. The light source lasts up to 20 hours with maximum brilliance for R/C usage diminishing after 6 hours. Simple capacitor clips can be used to mount them to your aircraft. A cellophane, or plastic, sleeve or a different color can be slipped over one, if so desired, in order to differentiate aircraft direction. Cyalume® Lightsticks are also excellent to carry in the car or camper as emergency light sources. Price is \$4.75 per box of three Cyalume® Lightsticks and includes postage and handling.

## FOAM CUTTING WIRE



Now available from RCM Products is the finest quality Nichrome wire for foam wing cutters. Available in packaged 5 foot lengths for \$2.00, this is the finest material of its kind available. It is designed for extremely precise and smooth cutting of foam wing cores, and can be used with any commercial or home-built foam wing cutter.

## WANT AN RCM DECAL?

Send a self addressed stamped envelope to:  
RCM Decals,  
P.O. Box 487  
Sierra Madre,  
Calif. 91024.



Lay the decal face down with enamel side on a table top. Peel the backing paper away. The plate will have the sticky side up & will adhere to your finger. Holding it flat, apply in position. After application, wipe hard with a soft cloth, then with squeegee, tie down all the edges. After 48 hour set up at room temperature, decal will adhere permanently.



## RCM CIRCLE SCALE

- It's a compass for accurate circles to 6" in 1/8" increments.
  - It's a metric scale from 0 to 150 millimeters.
  - It's a 6" scale with 1/8" division.
  - It's an equivalents scale showing fraction, decimal and millimeter equivalents.
  - It's a tap and drill chart showing drill decimals, tap drills, threads, and tap sizes.
  - It's a lettering guide.
  - It's a square and protractor.
  - It's a Fahrenheit and centigrade equivalent.
- One of the most valuable tools you can have in your shop.

R/C MODELER MAGAZINE  
P.O. Box 487  
Sierra Madre, Calif. 91024



Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

### Please send the following RCM Products

\_\_\_\_\_ RCM Wing Jig II @ \$34.50 ea. \$ \_\_\_\_\_  
\_\_\_\_\_ Box(s) Cyalume® Lightsticks @ \$4.75 per box \$ \_\_\_\_\_  
\_\_\_\_\_ Package(s) Foam Cutting Wire @ \$2.00 ea. \$ \_\_\_\_\_  
\_\_\_\_\_ Circle Scale(s) @ \$1.50 ea. \$ \_\_\_\_\_  
\_\_\_\_\_ Calif. residents add 6% tax. \$ \_\_\_\_\_  
\_\_\_\_\_ Total Payment Enclosed \$ \_\_\_\_\_

2 RCM Decals — Free with self-addressed stamped envelope

M.C. or B of A # \_\_\_\_\_  
Bank Name \_\_\_\_\_  
Expiration Date \_\_\_\_\_  
Signature \_\_\_\_\_

# RCM PLANS SERVICE

## WD-II (WHING DING) By Paul Denson

A Stand-Off Scale model of the home built ultra-light biplane. Our little one is powered by a Tee Dee .049. The original full size had a span of 17 feet against our model's span of 42 inches. One plan sheet: 30" x 43".

#731

\$3.75

## MISS GRANDIN By Ed Happich

A large flying boat (81½" span) designed for .60 power mounted on a pylon. Plans include full size drawings of a jig to build the hull. It's very spectacular both on the water and in the air. Four plan sheets: 40" x 64½", 36" x 52", 34½" x 56" and 17" x 20½" three view.

#732

\$18.75

## SUPER PARASOL By Bob Wallace

A .19 powered Stand-Off Scale model of the 1928 original by the Heath Aircraft Corp. Easy to construct with a stick and stringer fuselage. Easy to fly 3 channel that has real eye appeal.

#733

\$4.50

\* A REPRINT OF THE ORIGINAL CONSTRUCTION ARTICLE IS INCLUDED WITH EACH PLAN ORDERED \*

### INSTRUCTIONS FOR ORDERING PLANS

Plans for each construction article featured in R/C Modeler Magazine are just as close as your mailbox. Your order is given individual attention and processed by our own Plans Department. Each plan is a full-size, individual blue-line print of the highest quality. Reproduced from the master Cronaflex which was made from the original drawing. All plans sent 3rd or 4th Class mail. For Airmail or First Class service add 25% of your total order. Airmail Overseas orders add 50% additional to your order and remit by International Money Order. Postage paid for APO and FPO orders. Make all checks payable to R/C Modeler Magazine. California residents add 6% sales tax. If you would like your plans mailed 1st Class, rolled in a mailing tube, add \$3.00 for 1-4 plans, \$3.50 for 5-10 plans. Limit 10 plans per tube. Mail tube offer good only in U.S.A. If amount enclosed for Airmail or First Class postage is not sufficient, plans will be sent 3rd Class or printed matter.

### RCM WINDANCER ADHESIVE BACKED TEMPLATES

Now you can avoid cutting up your RCM plans and having to spray the cut-out ribs, bulkheads, etc. with contact or rubber cement. RCM's Windancer Adhesive backed templates are printed on 8½" x 11" sheets with peel-off backing so that you can arrange the parts on your wood stock with the least amount of waste material. Once positioned, simply peel off the backing material and press in place on the wood. They can be removed from the balsa or plywood and re-positioned as necessary, but remain firmly in place for cutting the material. No adhesive residue remains on the wood. Packed in a clear polyethylene plastic envelope, RCM's Windancer Adhesive backed templates are available for any plan indicated by the plan number followed by the letter "T".

### RCM WINDANCER ADHESIVE BACKED TEMPLATES AVAILABLE FOR:

- #820T Beechcraft Staggerwing \$4.75—#579T Berliner Joyce \$5.50
- #554T Super Kaco Jr. \$3.25—#354T RCM Trainer \$2.95—#591T Sun-Ray \$3.95
- #630T F-86 Sabre \$4.50—#482T Wayfarer \$4.25—#587T Centurion II \$2.75
- #572T DeHavilland D.H. 2 \$4.95—#602T Dirty Birdy \$2.95
- #842T Focke-Wulf Ta 154 \$5.25—#649T PBY-2 Catalina \$4.95
- #671T Republic Seabee \$4.50—#682T Miss Kat Brat \$4.50
- #688T UFO \$2.95—#703T Culver Dart \$3.95
- #725T TMTT \$3.50

R/C MODELER MAGAZINE  
P.O. BOX 487  
SIERRA MADRE, CA. 91024  
ATTN: PLANS SERVICE

M.C. or B of A # \_\_\_\_\_

Bank Name \_\_\_\_\_

Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_



Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

\$ \_\_\_\_\_ RCM Plan Catalog (50c)

\$ \_\_\_\_\_ Amount for the following plans: # \_\_\_\_\_ # \_\_\_\_\_ # \_\_\_\_\_ # \_\_\_\_\_

\$ \_\_\_\_\_ Amount for the following templates: # \_\_\_\_\_ # \_\_\_\_\_ # \_\_\_\_\_ # \_\_\_\_\_

\$ \_\_\_\_\_ Amount for 1st Class Mail Tube (\$3.00 for 1-4 plans, \$3.50 for 5-10)

(This includes postage — Offer good only in U.S.A.)

\$ \_\_\_\_\_ Amount for Airmail or 1st Class postage (25% of order)

\$ \_\_\_\_\_ Amount for Overseas postage (50% of order)

\$ \_\_\_\_\_ California residents add 6% sales tax

\$ \_\_\_\_\_ TOTAL AMOUNT ENCLOSED

3rd or 4th Class Mail (no postage necessary).

Allow 2-4 weeks delivery. No C.O.D.'s.

Foreign orders will not be processed until Money Order is received in our office.

## SUBSCRIBE TO RCM

Mall To:  
R/C MODELER MAGAZINE  
P.O. BOX 487  
SIERRA MADRE, CALIFORNIA 91024

- 1 year - \$16.50
- 2 year - \$32.00
- 1st Class - \$35.00
- 1st Class - \$69.00

- New Subscription
- Extend my present subscription

OUTSIDE U.S.A.  
Add \$2.50 per year for 2nd Class postage  
(except APO's and FPO's)  
For Airmail Postage — Please Write

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_



M.C. or B of A # \_\_\_\_\_

Bank Name \_\_\_\_\_

Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_

# READERS EXCHANGE

**TOM'S HOBBY KORNER**, 113 Graniteville Rd., Chelmsford, Mass. 01824. Radios — Futaba 2 Ch. \$75.00, 3 Ch. \$145.00, 4 Ch. \$195.00, 6 Ch. \$215.00; MRC 765 \$235.00; Kraft KP5C \$285.00. Prices subject to change. Please call for current prices. Engines — Super Tigre .23 \$31.50, .35 \$33.95, .46 \$39.95, .60 \$48.00; Enya 40XTV \$56.00, 60XFV \$94.00; O.S. Max 10 Schnurle \$22.50, .25 Schnurle \$39.00, 60 Schnurle \$79.00, 60 Schnurle w/pump \$89.00. All engines are throttled engines. Kits — Andrews H-Ray \$27.00, Sig Kader \$27.95. (Excellent trainers.) Complete stock of most popular kits to choose from. Competitively priced. Accessories — Complete stock of all major brands. 20% discount. We pride ourselves on being one of the most complete RC shops in the country. Fuel — Power Blast Contest 1000 (1 1/2 Nitro) \$200.00 per 55 gal. drum. Power Blast Sport 750 (7 1/2 Nitro) \$185.00 per 55 gal. drum. Freight FOB Malden, Mass. Give us a call or stop in for a visit with Tom, Mike or Roger. Hours — Monday through Friday 5:30 to 9:00 PM, Saturdays 10:00 AM to 5:00 PM. Phone (617) 251-4576 for fast COD service or send certified check or Money Order. Add \$1.00 for handling.

**K & B/VECO** .61 CUSTOM ENGINES selectively hand fit and assembled by designer Clarence Lee. Complete with muffler and new Perry pump/regulator and PDP Mod \$123.50. Without pump/regulator \$98.50. K & B 6.5 (40) Schnurle Customs for Formula 1 \$99.50. Vega 19 Customs \$52.00 — with Perry carburetor \$60.00. Custom versions of all engines in K & B line including Marine available. Write for prices. Trade in allowance for old time ignition engines or will buy outright. Dealer inquiry invited. C.F. Lee Mfg. Co., 7215 Fairhill Blvd., Tujunga, California 91042.

**BACK ISSUE** magazines, we buy trade and sell RCM, Model Airplane News, Air Trails, Flying Aces — 1920-1978. Send stamped envelope. Free list. Everybody's Bookshop, Dept. RC, 317 West Sixth St., Los Angeles, California 90014.

**"SAIPLANE DESIGNER'S HANDBOOK"** — Clear instructions, 175 NACA and Eppler airfoils. How to size and locate components. Performance, stability and scale effects. \$5.50. Eric Lister, 410 Regina Dr., Clarksburg, MD 20734.

**RADIO AND ENGINES** repaired: Nationwide service on Heathkits, World Engines, Pro-Line, Kraft, Royal, O.S., Super Tigre, Webro, Enya. 90 day guarantee. \$35.00 maximum charge on radios. \$12.50 on engines. Parts extra at reduced prices. Please enclose phone number and charge batteries. Write or call for our low prices on Kraft, KGL, KSE, W.E., Pro-Line, Royal radios; O.S., K & B, Webro, Enya engines, and other RC equipment. Aero Tech Products, P.O. Box 182, Lake Hiawatha, New Jersey 07034. (201) 887-7672.

**GENERAL ELECTRIC** nickel cadmium batteries with tabs. AA Pencil \$1.98; 1/2 Sub C, \$2.65; R/C car batteries \$2.65; Fast charge batteries, packs and more. RQVA Dist., W242 N4251 Hwy. F, Pewaukee, WI. 53072. Shipping Extra.

**NICAD CONVERSION** for 2 ch. transmitters (suitable replacement for any transmitter), furnished assembled with charging plug, instructions, ready for quick installation. Satisfaction assured, \$21.50 ppd. Charger card \$1.50. Dick Stanton, 2755 South Wallace, Montgomery, Ala. 36116.

**DEMBROS HOBBY SHOP**, 58 Lake St., Nashua, NH 03060. Featuring a full selection of R/C supplies for the beginner or pro. Radios, engines, kits & accessories. Hours: Mon., Tues., Wed., 12-6. Thurs., Fri., 12-9. Sat., 9-5:30. VISA, MasterCard. No sales tax. 603-882-6422.

**FOR SALE** — OK ignition engine, large size, appears complete \$50.00. Call P.F. Heck, Ohio (614) 446-1822 late evenings.

**GUARANTEED TWIST DRILLS**. #50 through #80. \$1.50 brings 2 drills, any size, plus particulars. Arvid Anderson, Frederick, Wisconsin 54837.

**KAVAN JET RANGER** Kit, new Webro .61, and Heathkit 8 channel radio for sale. Roland Blauer, Box 359, Golden, Colorado 80401. (303) 759-4103.

**WANTED** - Graupner Dandy Glider Kit or two. Lee Mellinger, 4002 W. 184th St., Torrance, California 90504.

**HAVE HELICOPTER** will sell Schluter Heli-Baby, collective pitch mod, K & B 40, extra parts, make offer. Douglas Reeb, 56778 Joshua Dr., Yucca Valley, California 92284.

**RADIAL ENGINE** Norton M-5 excellent condition. Coil included. Best offer est. \$500.00. Allen D. Robinson, 7647 Cooper Rd., Kenosha, Wis. 53142.

**PATTERN FLYERS**: the Utopia is now for sale. 100% pre-built pattern aircraft, guaranteed straight. This is not a hand built aircraft. It is manufactured with machines, molds, and jigs. Each one is identical to the other. It has barn door ailerons, flying tabs, retractable landing gear with doors and much more. The design has been proven and refined over a period of seven years. The manufacturing process has taken 15 months of full time work. The result is unbelievable perfection. For free brochure, contact Utopia Enterprises Co., 1014 Bellevue Ct., Jefferson City, Missouri 65101. (314) 635-4638 or 741-9916.

**HUGHES RACER (M-1)** plans 3/4" scale; four sheets. Full size plans show rib and bulkhead patterns. Short and long wings. Thompson's Vintage Race Planes, 219 White City Blvd., Springfield, Illinois 62703.

**SELLING OUT** many radios, kits, engines, retracts systems, SASE for complete list. George G. Ware, 4000 Walton, Fort Worth, Texas 76133.

**FOR SALE** Training Gear for Revolution Helicopter with 3 1/2" diameter wheels. SASE with inquiry. David Wyatt, Rt. 1, Box 74, Hinton, West Virginia 25951.

**CASH FOR ENGINES** worn, obsolete R/C, glow 80% complete \$5 each. Ignition, others describe for offer. Especially desire S.T. and racing engines. Arthur DeKalb, 10189 Crane Rd., Lindley, N.Y. 14858.

**MODEL PLANS** new catalog updated. Scale plans R/C, U/C, F/F. Send 25¢ for postage and handling to new address. Hobby Helpers, P.O. Box 217, Glenville Sta., Greenwich Conn. 06830.

**60 REVOLUTION II** with 60 F.S.R.O.S. and Pro-Line radio installed ready to go, complete \$650.00. Russ Legare, West River Rd., Waterville, Maine 04901 (207) 873-4603.

**BOOKS WANTED** Volume 7 & 8 Aircraft In Profile, send me your price. Charles H. Brown, 11742 Miami, Detroit, Michigan 48217.

**IN MASSACHUSETTS** Eastcoast Hobby Supply, Charlton Rd. East Brookfield, Tel. (617) 867-3975. Kits - engines - radios 20% to 30% off. Thousands of hardware items discontinued 20% plus. Devcon 45% off. Send 50¢ for list, (credited on order). 2% extra discount for phone orders. Free glue with all kits.

**AIRCRAFT PLYWOOD** — Wing Skins 4mm x 50" x 50" \$16.50, .8mm x 50" x 50" \$14.50. All the following are 12" x 48" size (all in stock). 1/32" \$4.30; 1/16" \$4.30; 3/32" \$5.05; 1/8" \$5.40; 3/16" \$5.75; 1/4" \$5.75. Poplar light ply 1/8" 3.20. Min. order \$20.00. Add \$2.00 for U.P.S. For complete list, dealers, scratch builders write to: John S. Chuckran, 22 Loring Street, Brockton, MA 02402.

**WANTED: OLD SPARK** Ignition model airplane motors. Russell Stokes Rt. 1, Box 73J, Keller, Texas 76248.

**R/C COUNTRY** gliders - scale - old-timers. M. Van Svec, 610 East Alford, Glendora, California 91740.


**LOWER PRICES** at Fisher RC, check us out. Kraft KP4a \$205.00, KP5C \$288.00, KP6a \$230.00, Futaba 4 \$200.00, Futaba 6 \$240.00, Max 60 Schnurle @ \$84.00. Fisher RC, 17 Salmi Road, Framingham, Massachusetts 01701.

**CASH FOR** old model airplane engines — O & R, Bunch, Brawnie, others. State condition, price, first letter. Dave Wehry, 4218 Darby Drive, Ft. Wayne, Indiana 46815. (219) 485-5762.

**WARBIRDS** - will build R/C Stand-Off Scale WW II planes. Send SASE for price listing. Bob Atkinson, 3252 Strawberry Lane, Decatur, Georgia 30034.

**DELAWARE** - JIM'S HOBBIES. Good discounts on all major brands. Include SASE with inquiry. P.O. Box 7316, Newark, Delaware 19711.

**KAVAN JET RANGER** kit, gyro, head modification. All brand new, unassembled \$260.00. SASE inquiries welcome. Wm. Orr, 345P-B Stone Mtn. St., Lawrenceville, Georgia 30245.



**NATIONAL SOARING SOCIETY**

Request Application From  
Dave Cook  
Star Route  
Granby, Colorado 80446

**Perform a death-defying act.**

**Have your blood pressure checked.**

Give Heart Fund  
American Heart Association

**WHEN WRITING TO AN ADVERTISER, BE SURE TO LET THEM KNOW YOU SAW THEIR AD IN RCM!**

## CLASSIFIED ADVERTISING ORDER FORM

**NON-COMMERCIAL** fan ads only. Commercial ads of any kind not acceptable at this special reduced rate. **RATE:** 15 words or less \$3.50 in advance. Name and address free. Additional words 20 cents each. **CLOSING DATE:** 20th of third preceding month, (i.e., May 20th for August RCM, June 20th for September RCM, etc.) We do not furnish box numbers. **COMMERCIAL CLASSIFIED:** The rate for anybody who has something to sell on a "commercial" basis, such as retailers, manufacturers, etc., is 40 cents per word. Payment must accompany copy. Count all initials, numbers, name, address, city, state. **CLOSING DATE:** Same as above.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35

Words @ Non-Commercial Rate \$ \_\_\_\_\_

Words @ Commercial Rate \$ \_\_\_\_\_

Total Enclosed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Signature \_\_\_\_\_

# ADVERTISERS INDEX

1	Ace Radio Control	124-125
2	Aeromobis Design	120
3	A-Justo-Jig	162
4	Allied Hobbies	107
5	AMA Membership Application	115
6	American Edelstahl, Inc.	177
7	American R/C Helicopters	143
8	America's Hobby Center, Inc.	169
9	A. Moran & Co.	185
10	Aquarium Magazine	182
11	Associated	172
12	Balsa U.S.A.	121
13	Bavarian Precision Products Co.	31
14	BD Hobby Warehouse	136
15	BK Products	167
16	Brown Hobby Center	178-179
17	Bud Nosen Models	104-105
18	Calgary Hobby Supply Ltd.	185
19	Cannon Electronics	176
20	Carl Goldberg Models	14
21	Carrera USA	114
22	Central Avionics	108
23	Cleveland Model	167
24	Coverite	185
25	Co's Avionics	113
26	Craft-Air	127
27	Custom Craft Products	164
28	DaCa Model Products	31
29	DA Enterprises	166
30	Dallas R/C Stand-Off Scale	134
31	Dave's Custom Models	123
32	Davis Diesel	166
33	Davis Engineering Co.	168
34	D.C. Engineering	141
35	D & D Electronic Specialists	161
36	Des Tek Industries	184
37	DJ'S Multi-Stripe	156
38	D.L. Wright Co.	158
39	Du-Bro Products	23
40	Dunham's R & R	128
41	Earl's Hobbies	155
42	Edson Enterprises	126
43	EK Products	11
44	Empire Models	118-119
45	E.W.H. Specialties	172
46	Fitts Photo & Hobby Shop	184
47	Flyline Models	184
48	Ft. Wayne Flying Circuits	156
49	Fox Manufacturing	134-145
50	Fusite	167
51	Futaba	2nd Cover
52	GBS Enterprises	132

53	Gibbert's Electronics	171
54	Gold Coast RC	108
55	Hallo	145
56	Heath Company	177
57	Hobby Barn	146-147-148-149
58	Hobby Helpers	110
59	Hobby Hideaway	163
60	Hobbyist	185
61	Hobby Lobby Int'l.	3-4-5
62	Hobby Market	28-29
63	Hobby Shack	6-8-9-80-81-137
64	Hobby World	110
65	Horner's Sales	185
66	House of Balsa	122-144-145
67	Idea Development Inc.	130
68	Indy RC	190-191-192-3rd Cover
69	Jock Stafford Models	112
70	J.A. Enterprises	114
71	JoMac Products	163
72	Kalmbach Press	184
73	K & B Aurora	116-168
74	Kraft Midwest	159
75	Kraft Orange County	120
76	Kraft Southwestern	116
77	Kraft Systems	101-132-164
78	K & S Engineering	150
79	Kustom Kraftsmanship	184
80	Lanier Industries	13
81	Lita Systems	165
82	L & L Electronics	183
83	M.A.C.K. Products	164
84	Mark's Models	21
85	Mercury Marine Calif. Classic	177
86	Michigan Hobby Hangar	144
87	Micro-X Products	184
88	Midwest Products	106
89	Mile High Models	157
90	Minia Radionovels	183
91	Model factory	171
92	Model Merchant	157
93	Model Rectifier Corp.	4th Cover
94	Morgan's Hobby Enterprises	120
95	MS Read-A-Thon	135
96	Mutcher's Hobbies	175
97	National Multiwing RC Champs	158
98	Nelson Model Products	166
99	NEMOH	144
100	NRCHA Nationals	142
101	NSS	184
102	Ohio Superstar Model Prod.	106
103	Pactra Industries	130
104	Perry Aeromotive	154

105	PICA	109-111
106	Prather Products	172
107	Precision Products	129
108	Proctor Enterprises	168
109	Radar Co. Ltd.	176
110	R.A.M.	122
111	The R/C Hangar	185
112	RCM Anthology Library	103-152-153
113	RCM Back Issue Sale	115
114	RCM Binders	152
115	RCM Plans Service	187
116	RCM Products	186
117	RCM Subscription Service	187
118	Robert Mfg. Co.	160
119	Rocket City RC Specialists	144
120	Royal	18-181
121	RPS Hobbies	150
122	R & S Hobby Products	173
123	San Antonio Hobby Shop	126
124	Satellite City	112
125	S.C. Modeler	151
126	Sharon Enterprises	163
127	Sig Manufacturing Co.	16-17
128	Skycraft Associates	161
129	Solution Aeromodel	130
130	Sevic-Clean	128
131	Sevic-Tronics	162
132	Standard Hobby	138-139
133	Sterling Models	140
134	Stewart Aircraft	102
135	Sullivan Products	141
136	Super Fun Fly	170
137	Superwings	151
138	Su-Pr-Line	180
139	Tatone Products	180
140	Thorp Manufacturing	159
141	Top Flite Models Inc.	26
142	Tower Hobbies	87-88-89-90-91-92-93
143	Vantage Designs	145
144	Vantec	136
145	Vortex Mfg. Co.	173
146	Vortex Model Engineering	133
147	Warehouse Hobbies	117
148	West Canadian Open Scale Champs	174
149	West Coast Dumas DeepVee Classic	174
150	Williams Bros	151
151	Windspiel Models	160
152	Wing Mfg.	126
153	Winning Model & Hobby	158
154	World Engines	95-97

## READERS SERVICE

The following advertisers have additional free information. Simply circle the number corresponding to the advertiser from whom you want the information.

- |     |                              |      |                          |      |                      |
|-----|------------------------------|------|--------------------------|------|----------------------|
| 8.  | America's Hobby Center, Inc. | 59.  | Heath Company            | 121. | Perry Aeromotive     |
| 16. | Bud Nosen                    | 61.  | Hobby Hideaway           | 123. | Prather Products     |
| 20. | Cannon Electronics           | 63.  | Hobby Market             | 128. | The R/C Hangar       |
| 22. | Carl Goldberg Models         | 69.  | Hobby Shack              | 136. | Robert Mfg. Co.      |
| 27. | Coverite                     | 71.  | Hobby World              | 140. | Royal                |
| 31. | DA Enterprises               | 77.  | Indy R/C                 | 145. | RPS Hobbies          |
| 32. | D&D Electronics              | 81.  | J.A. Enterprises         | 146. | R & S Hobby Products |
| 39. | DaCa Model Products          | 90.  | K & B Aurora Hobbycrafts | 162. | Superwings           |
| 41. | Edson Enterprises            | 94.  | Kraft Systems            | 165. | Sterling Models      |
| 43. | EK Products                  | 96.  | Lanier Industries        | 166. | Su-Pr-Line           |
| 47. | Fitts Photo & Hobby          | 98.  | L & L Electronics        | 168. | Techni Models (DJ's) |
| 48. | Fusite                       | 100. | Mark's Models            | 172. | Vantage Designs      |
| 49. | Fox Manufacturing            | 106. | Mile High Models         | 173. | Vantec               |
| 51. | Futaba Electronics           | 112. | MRC                      | 176. | Tower Hobbies        |
| 57. | Hallo                        | 117. | Pactra Industries        |      |                      |

PLEASE PRINT

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Mail this coupon to: RCM Readers Service Dept., P.O. Box 487, Sierra Madre, California 91024

VOID AFTER JULY 31, 1978



# INDY

CALL TOLL FREE  
1-800-428-4682  
Indiana Res. - 317-846-0768

# INDY



SEE  
INDY ADV.  
3RD COVER

## INDY ENGINES

CIPALLO			
09	18.95	14.93	
09 throttle	03.50	02.98	
MILLS			
0.75 Diesel	19.95	15.95	
1.3 Diesel	28.95	19.95	



### COMO

COMO  
40 R/C w/muffler  
& S.T. Carb. . . . . 69.95 43.50

### COMO

#### SUPERTIGRE ENGINES

X-15 RC . . . . . 59.95 48.00  
X-21 RC Sch. 69.95 54.00  
X-21 FI RC Car. 74.95 57.  
23 STD . . . . . 36.95 28.00  
\*35 STD . . . . . 39.95 30.50  
\*35 RC . . . . . 47.95 37.00  
G21/35 STD. 53.50 41.30  
G21/35 RC . 59.95 46.00  
X-40 ABC Sch. W/Rear  
Valve . . . . . 81.95 63.00  
G60 FI PP . . . . . 90.95 70.00  
G60 ABC RC 95.95 77.00  
X-45 FI RC W/Rear  
Exhaust . . . . . 83.00 64.00  
G60 BH W/Pump &  
Carb . . . . . 112.95 87.00  
G60 ABC W/Pump &  
Carb . . . . . 121.95 94.00  
X-60 FI SP. 125.00 99.95

#### OS MARINE ENGINES

OS 10 Sch. . . . . 37.95 29.00  
OS 20 . . . . . 49.95 38.50  
OS 60 RSR . 139.95 108.  
OS 65 RSR . 142.95 110.  
OS 45 RSR 109.95 84.50

#### NEW OS ENGINES LESS MUFFLERS

60 RSR . . . . . 136.50 105.00  
65 RSR . . . . . 142.95 110.00  
40 SR RV . . . . . 82.95 64.00  
10 FSR S . . . . . 23.95 18.00  
10 FSR RC . 30.95 23.50  
15 STD . . . . . 31.95 24.50  
15 RC . . . . . 37.95 29.00  
20 STD . . . . . 32.95 25.00  
20 RC . . . . . 39.95 30.50  
25 STD . . . . . 34.95 26.99  
25 RC . . . . . 41.95 32.00  
25 FSR STD. 51.95 40.00  
25 FSR RC . 57.95 44.50  
30 STD . . . . . 42.95 33.00  
30 RC . . . . . 47.95 37.00  
35 STD . . . . . 43.95 33.50  
35 RC . . . . . 49.95 38.50  
40 STD . . . . . 59.95 46.00  
40 RC . . . . . 72.50 55.97  
45 H . . . . . 94.95 73.00  
45 FSR RC . 99.95 77.00  
40 FSR RC . 87.95 67.50  
60 BH RC . . . . . 99.95 77.00  
60 FSR RC 119.95 92.00  
60 FSR RC W/Perry Pump  
& Carb . . . . . 149.95 115.00  
WANDEL . 109.95 84.50  
60 FS . . . . . 199.95 139.95  
OS 36 . . . . . 117.50 90.00

\* Denotes Combat with PP

#### SUPER TIGRE ENGINES WITH MUFFLERS

G71 RC . . . . . 105.95 81.00  
60 FI BB RC 74.95 57.00  
23 RC . . . . . 53.95 41.50  
46 RC . . . . . 68.95 53.00

#### K&B (VECO) ENGINES List Indy

Veco 19 std . . . . . 40. 29.00  
Veco 19 R/C . . . . . 47. 33.00  
K&B 35 pta. br. 30. 21.00  
K&B 40 R/C . . . . . 62. 44.00  
K&B 3.5 R/C w/muffler  
. . . . . 67. 47.00  
K&B 3.5 inboard marine  
. . . . . 69. 49.00  
K&B 4.9 FR std 95. 66.00  
K&B 5.8 FR std 95. 66.00  
K&B 6.5 RSII . . . . . 92. 64.00  
K&B 3.5 Outboard 99. 69.00  
K&B 61 R/C . . . . . 85. 59.00

## KITS Indy's Special Low Prices

MK

Spirit St. Louis	98.50	73.50
Zero	54.95	42.95
Mattias 40	54.95	42.95
Mattias 20	43.99	34.99
Curare 40	79.95	63.00
Curare 60	98.50	79.00
Blue Angel Jr.	54.95	42.95
Happy 20 S	29.95	23.95
Astro 20	45.00	35.50

## MIDWEST

#### MIDWEST MODELS

Lil T. Glider	26.95	21.00
Tri Squire	29.95	23.50
Lil T. Squire	22.95	17.90
Pitts Spec.	94.95	74.00
Cardinal Squire	84.95	66.00
Strikemaster	69.95	54.50
Cessna Cardinal	29.95	23.50
Mach I	94.95	74.00
Das Lil Stick	32.95	25.70
Sweet Stik	39.95	29.00
Chipmunk	29.95	23.50
Attacker	39.95	29.00
New Hawk		
Glider	139.95	104.00
Silent Squire	39.95	29.00



#### BUD NOSEN MODELS

1/4 Aerona Champ	99.95	84.00
Cessna 310	169.95	135.96
Citabria	99.95	84.00
Geer Sport	129.95	110.00
Jenny	129.95	110.00
Mr. Mulligan	139.95	112.00
J-3 Cub	119.95	95.99
Trainer	79.95	65.00



#### SIG

Super Sport	19.95	15.95
Klipper	20.95	16.75
S. Chipmunk	58.95	48.00
Sig P-51	57.95	45.00
Kadet	34.95	27.95
Kommander	39.95	31.00
Kongar	44.95	35.75
Smith Mini plane	49.95	39.95
Zinn Akrobat	54.95	43.99
Yak 18	73.50	59.00
Crabria	57.95	45.00
Liberty Sport	64.95	51.50
Ryan STA	73.50	59.00
Clip Wing Cub	39.95	31.00
Skybolt	62.50	49.95
Piper J-3	39.95	31.00
Daughter II	24.95	19.95
Cessna 150	69.95	55.00
Minnow	27.95	22.25

## RADIO CONTROL SYSTEMS



#### WORLD EXPERT MARK II List Indy

7 Ch DS (5 Servos)	464.95	279.00
7 Ch SS (5 Servos)	484.95	290.00
7 Ch DS (4 Servos)	439.95	263.00
7 Ch SS (4 Servos)	459.95	276.00
5 Ch DS (4 Servos)	399.95	235.00
6 Ch SS (4 Servos)	419.95	261.00

FLIGHT PACKS

7 Ch. 5 servos	\$264.95	\$188.95
7 Ch. 4 servos	\$259.95	\$162.95
5 Ch. 4 servos	\$249.95	\$157.96

SERVOES

5-10 & 5-11	\$45.00	\$36.00
Retract	\$52.00	\$42.00

## RADIO CONTROL SYSTEMS

#### NEW FROM WORLD

4 channel, 3 servos, Transmitter takes dry batteries. Nicads and charger in airborne system.  
L. \$229.95 . . . . . 15139.00



#### A-JUSTO-JIG CO. 1/4 Retracts - mains 11.95 9.95



#### MICHIGAN HOBBY HANGAR SMALL WONDER

Michigan Hobby Hangar	28.95	20.25
Outiekin Biplane	35.95	25.17
Miss Vintage	54.95	38.47
Small Wonder	33.95	23.75

## WORLD ENGINES KITS



CUB



GLASS HAWK



MULLIGAN

#### WORLD ENGINES DAS BOX FLY SERIES

20-L (low wing)	34.95	26.00
20-W (biplane)	39.95	29.00
10 mg-(motor glider)	24.95	18.95
20-S (shoulder wing)	29.95	21.95
15-H (high wing)	22.95	18.00
Box Fly-19-25	34.95	27.00
Box Fly Jr.	24.95	18.95
Miss World	49.95	36.00
Mr. Mulligan	47.95	36.95
WE Cub	39.95	29.00
WE Champ	39.95	29.00
Lil John (low wing)	59.95	47.00

PRICES  
GOOD THRU  
8-25-78  
SUPPLIES MAY  
BE LIMITED

**Indy**  
32% OFF  
1/2 A HORNET  
L. \$20.95  
I. \$14.25

**Indy**  
33% OFF  
M. H. H.  
QUICKIE  
L. \$78.95  
I. \$19.40

**Indy**  
30% OFF  
DAE  
FAST CHARGER  
L. \$17.95  
I. \$12.57

**Indy**  
35% OFF  
STEVE MUCK'S  
LIL LIGHTNING  
L. \$48.95  
I. \$31.33

**Indy**  
34% OFF  
SURE FLITE  
BALSA J-3  
L. \$24.95  
I. \$16.47

**Indy**  
35% OFF  
CRAFT AIR  
FIELD BOX  
L. \$29.65  
I. \$19.47



#### COX SANWA

2 Ch., 2 servos, all dry	\$69.95	\$73.00
4 ch. 4 servos, nicads	\$259.95	\$189.95
6 ch. 4 servos, nicads	\$369.95	\$239.95

KRAFT

KP-3C dual stick	\$219.00	\$175.95
KP-5C dual stick	\$375.43	\$295.00
KP-5CS single stick	\$375.43	\$295.00
KP-7C dual stick	\$515.43	\$399.00
KP-7CS single stick	\$515.43	\$399.00

#### NEW FROM KRAFT

KP-4A dual stick, 4 channel, 4 servos, all nicads	\$289.95	\$209.00
KP-6A dual stick, 6 channel, 4 servos, all nicads	\$329.95	\$229.95
KP-2A 2 channel, single stick, dry batteries	\$129.95	95.00

SERVOES

KPS 11, 12, 14 & 15	\$44.95	\$38.00
KPS 15H & 16	\$49.94	\$41.00



Pump - 2 oz. per revolution so you can partially fill tank if you desire. Extra heavy duty gear train for rugged service. Fast pumping not necessary as with most hand pumps. These manual hand pumps are always ready to go - no batteries to worry about. List - \$12.50, Indy - \$8.95.

# INDY

CALL TOLL FREE  
**1-800-428-4682**  
 Indiana Res - 317-948-0766

**Indy % SALES**

SEE  
**INDY ADV.  
 3RD COVER**

# INDY

PRICES  
 GOOD THRU  
 8-25-78  
 SUPPLIES MAY  
 BE LIMITED

## KITS Indy's Special Low Prices

### AIRTRONICS

	List	Indy
Electric Sport	39.95	30.50
Electric Soar	24.95	19.00
Electric Jet	36.95	28.00
Electric Star	34.95	26.50
Electric Spirit	129.95	95.00
Electric Questor	39.95	30.50
Electricquila	89.95	54.00
Electricmpic 11	49.95	35.95



TRAINMASTER

### ANDREWS

Ray	34.95	27.95
Ray	44.95	35.95
Ray	39.95	31.95
Ortmaster	69.95	55.95
Ortmaster	44.95	35.95
Ortmaster	52.95	42.95
Ortmaster Top	74.95	59.95

### ASTRO FLIGHT

Electric Fly	24.95	17.95
Ortmaster	44.95	37.75
Ortmaster RF/4	44.95	37.75
Ortmaster	29.95	22.50
Ortmaster	39.95	29.95



BRIDI

	List	Indy
Shrike	184.95	129.99
Brown Racer	134.95	102.00
Chipmunk	124.95	93.00
Dirty Birdy (balsa)	84.95	63.95
Dirty Birdy 40	59.95	45.99
Tweedy Birdy	43.95	34.50
Sportster	39.95	31.00
Trainer 10	27.95	21.50
Trainer 20	34.95	27.00
Trainer 40	54.95	42.00
Trainer 60	62.95	49.00
Basic Trainer	39.95	31.00
15-500	39.95	31.00
Sun Fly 4-20	29.95	23.00
Quickest 200	24.95	19.00
Quickest 500	42.95	33.00
Super Kaos 40	55.95	43.00
Sugar Kaos 60	69.95	54.00
Kaos	65.95	52.00
Sirus Lockheed	134.95	102.00

## KITS Indy's Special Low Prices

### CASS ENGINEERING

	List	Indy
Pulsar Biplane	95.00	79.95



SR' FALCON

### GOLDBERG MODELS

Ranger ARF	23.95	19.00
Sr. Falcon	59.95	47.95
Falcon 56 MKII	39.95	26.50
Skylark 62	59.95	47.95
Jr. Falcon R/C	13.95	11.00
1/2 A Skylark	15.95	12.95
Jr. Skylark	14.95	11.95



PETE AIR CAMPER

### HOUSE OF BALS

Miss Dora	39.95	27.99
Pietenpol	48.95	39.95
1/2 A Pietenpol	29.95	23.99
P-51	27.95	21.95
ME-109	27.95	21.95
P-39	27.95	21.95
Chipmunk	27.95	21.95
P-47	29.95	23.99
FW 190A	29.95	23.99

### LANIER MODELS

Jester II	73.50	51.50
Invader	84.50	59.00
Scamp	52.50	36.75
Comet II	58.50	40.95
Cosmo	46.50	32.75
Pinto	46.50	32.75

### MARKS MODELS

Sunny (Bipe)	32.95	24.75
Windward	32.95	24.75
Windfree	44.95	35.00
Wanderer	19.95	15.95
Buschwacker	44.95	35.00

### MILE HIGH MODELS

Joy Stick	18.95	14.99
Super Joy Stick	36.95	25.95

## GLUE & FILM

### ADHESIVES

	List	Indy
Wilhold R/C 56	1.50	1.25
GMP Styro Stik	2.30	2.00
Hobby Poxy II	4.00	2.99
Hobby Poxy IV	2.00	1.75
Wilhold Aliphatic	1.80	1.50
GMP 6 min. Epoxy	5.95	4.75
GTAP 1/2 fast	5.50	3.75
Devcon 5 min. lg.	2.50	1.85
Devcon 5 min. sm.	1.35	1.00
Devcon 5 min. Gaz.	5.80	3.99
Devcon slow cure	5.80	3.99
Hot stuff	3.50	2.40
Blue Line H.S.	4.95	3.50
Giant Zap	3.50	2.40
X-30 Adhesive	3.25	2.40
Ambroid 4 oz.	1.15	1.00
Ambroid 1/2 oz.	.60	.50
Super Cement	.85	.65
Blue Gon	2.95	2.59
Glaskote 1/2 pt.	2.95	2.75
Glaskote Thinner	2.55	2.25

### COVERING MATERIAL INDY SILK

1 yd. pkg.	3.25	2.75
2 yd. pkg.	6.50	5.00

### COVERITE

Super 38 x 47	7.75	6.20
Silkspun	7.75	6.20
Permagloss	9.10	7.25
Day-glo permagloss orange, yellow, olive drab & aluminum	9.95	7.95
Camouflage 1 1/2" and 2" scale	9.95	7.25
Balsarite 1/2 pt.	2.95	2.75

### MONOKOTE

Opaque	9.00	5.50
Transparent	9.00	5.50
Metallic	10.50	7.00
plain trim sheets	1.19	1.10
Checkerboard trim	1.59	1.50

### SOLARFILM

Opaque	7.80	5.00
Transparent	9.00	6.50
Metallic	10.00	7.00

### MIDWEST

MicroLon	1.95	1.75
----------	------	------

### BUTY - FLEX DOPE

22 Colors

Quartz - colors	5.95
Quartz - clear	4.95
Gallons - clear	10.95
Gallons - thinner	6.75

### GLIDER ACCESSORIES

#### AIRTRONICS

Std. launch pad	34.95	27.99
HD launch pad	36.95	29.00

#### CRAFT AIR

Del. Hi Start	39.95	31.00
Std. Hi Start	34.95	25.00
Super HD Hi	59.95	42.00
Para Pod	09.95	07.00

### ASTRO-FLITE

HD Hi-Start	41.95	31.95
(real heavy duty)		
Astro-start	39.95	31.00

## BOATS & CARS



### JEROBEE CARS

#### CARS WITH RADIOS

MK-88	177.50	142.00
Challenger	187.50	150.00
Alfa	226.95	181.00
Vette	215.95	172.00

#### CARS LESS RADIO

MK-88	55.00	44.00
Challenger	65.00	52.00
Alfa	97.50	78.00
Vette	87.50	67.00

#### CARS LESS RADIO AND ENGINE

MK-88	27.00	21.50
Challenger	32.00	25.50
Vette	50.00	40.00

### JEROBEE - BODIES

MK-88 Body	7.95	6.50
Porsche	4.95	4.00
VW Bug Body	12.95	10.50
Vette Body	12.95	10.50

### ACCESSORIES

Tank heat sink	2.50
wing with decals	2.95
brake kit	1.95
remote tank kit	2.95
Aluminum flywheel	2.95
mount for Tee Dee	6.95
Bumper	2.49
Classis Frame	3.95
Lexan Chassis frame	7.95
Starter Rebuild kit	1.60
Eng. rebuild kit	7.55
Rear Axle kit	1.49
Clutch shoes	.98
drive shaft w/ret	.89

### HUGHEY

	List	Indy
20 Rigger	100.00	85.00
40 Rigger	110.00	93.50
19 Hydro	77.00	62.00



### SAIL BOATS

Blue Sonic 900	129.95
Indy special	599.95

## PUMPS STARTERS



### STARTERS

Std. Sullivan	36.95	26.99
Del. Sullivan	39.95	28.99
Sonic Tronic	38.50	27.00
Kavan	45.00	32.00
Astro 1/2 A	16.95	13.50

### FUEL PUMPS

Sonic Tronic MK II	
Electric	14.95 11.75

### HAND PUMPS

Du-Bou	10.95 8.50
Six Shooter	10.95 8.50

### HELICOPTERS

	List	Indy
Shark 60	325.00	275.00
Tri-Star	229.95	189.00

### ACCESSORIES

Conversion kit	75.00
Update Kit	34.95
Blade Set	15.00
Tri-Star Blades	12.00
Alum. paddles	10.00
Flybar	6.00

### KAVAN

Bell Jet	400.00	320.00
Alouette II	200.00	175.00

### ACCESSORIES

Instrument panel	12.00
T.R. blades	3.00
Reg. main blades	18.00
Expert main blades	19.95
Nylon tail cone	5.95
Comp. window set	20.00
window channel	2.95

### RETRACTS

#### ROM - AIR

2 gear mains	85.00	57.75
3 gr. firewall	114.00	79.95
3 gr. belly	114.00	79.95
pressure gauge	13.50	
Feen	2.75	
1 1/2 oz. Oil	1.65	
line coupler	1.90	
quick disconnect	2.00	

### GOLDBERG

2 Gear	14.95	10.50
3 gear	24.95	17.50

### POWER PANELS

#### DAE

Dual range	24.95	18.00
Mini panel	15.95	11.00
Series V	34.95	24.95
Std. panel	18.95	14.95

### STEVE MUCKS

LW Lightning	48.95	38.95
Buschwacker	109.95	74.95

prices subject to change  
 without notice

**Indy**

K & B  
 6.5 SR II  
 Racing Eng.

L. \$68.00  
 I. \$48.80

**Indy**

40% OFF

CAL STRIPE  
 TAPE  
 1/16" Wide

L. \$1.98  
 I. \$1.19

**Indy**

40% OFF

CAL STRIPE  
 TAPE  
 3/32" & 1/8"  
 Wide

L. \$2.69  
 I. \$1.62

**Indy**

45% OFF

12 VOLT  
 WET-CELL

L. \$24.95  
 I. \$13.73

**Indy**

35% OFF

SULLIVAN  
 STD. STARTER

L. \$36.95  
 I. \$23.98

**Indy**

40% OFF

K & B  
 4.9 F.R.  
 With Pipe

L. \$95.00  
 I. \$57



### FRANCHISE DEALERS

If you want to get a Indy franchise, you can sign up for advertising on this page with us providing that you meet the requirements of being a good hobby retail shop.

We have some dealers who drop out of the program to someone has the Indy franchise exclusively in your county, keep your eye on this ad the county may open up.

The prices of exclusive Indy R/C items are often slightly higher at the franchise dealers than advertised in the magazine due to freight charges and etc.

# INDY R/C

CALL TOLL FREE 1-800-428-4682

INDIANA RESIDENTS call 317-846-0765

10620 N. COLLEGE AVE., INDIANAPOLIS, IN. 46280

## INDY FRANCHISE HOBBY DEALERS

### JIM GOAD SEZ

This month we want to comment that we have some more Mass and Batria online gliders. With the exception of painting and trim and R/C installation there are ready to fly. It has a 93" span and with T-tail linkage complete. Details. This model readily disassembles for bicycle or small car transport. List: \$199.95 . . . . . Indy: \$199.95

We also have some new SG competition race car with ball bearing wheels, 51 X 21 Schuurke engine and clutch assembly with Ferrari style body. List: \$199.95 . . . . . Indy: \$199.95



# INDY R/C

# INDY R/C

**ARIZONA**  
Hobby Den, Inc.  
3347 W. Gateway Road  
Phoenix, Az. 85023  
ph. 503-993-6630

**Hobby Haven**  
2751 N. Campbell  
Tucson, Az. 85710  
ph. 602-325-0112

**ARKANSAS**  
Family Hobby & Toy Center  
Route 5, Box 84 B  
Conway, Ar. 72032

**Ron's Hobbies**  
300 N. Wright Street  
Silsam Springs, Ar. 72781

**Cash Auto Supply, Inc.**  
P.O. Box 155  
Cash, Ar. 72421

**CALIFORNIA**  
Bay Hobby  
1498 Davy Avenue  
San Mateo, Ca. 94401

**Dave's Custom Models**  
1894 W. Glenoaks Blvd.  
Glendale, Ca. 91207  
ph. 213-240-6810

**Ron's Hobby**  
6038 Telegraph Avenue  
Oakland, Ca. 94609

**Active Hobby**  
717 E. Main Street  
Santa Mesa, Ca. 93454

**The Hobby Shop**  
8295 12th Avenue  
Hanford, Ca. 93220  
ph. 882-5671

**Musick Drug & Hobbies**  
305 E. Fontanero St.  
Colorado Springs, Co. 80907  
ph. 300-632-2635

**Jensen Cycle & Auto Parts**  
Box 182  
Granada, Co. 81041  
ph. 303-734-5332

**FLORIDA**  
A & J Models, Inc.  
Coralwood Mall  
Cape Coral, Fl. 33904  
ph. 813-642-8858

**Action Hobbies**  
4301 A. North Dixie Hwy.  
 Ft. Lauderdale, Fl. 33324  
ph. 305-661-6611

**The Hobby House, Inc.**  
360 U.S. Hwy. 17-82  
Maitland, Fl. 32751  
ph. 305-647-3442

**Ocean Hobby**  
323 N. Federal Hwy.  
Boynton Beach, Fl. 33435  
ph. 572-4490

**GEORGIA**  
Atlanta Hobby Center  
6125 Roswell Road, N.E.  
Atlanta, Ga. 30328  
ph. 404-255-0033

**Country Cloth Shop**  
Rt 4, Traxton Road  
Griffin, Ga. 30223  
ph. 404-822-6016

**ILLINOIS**  
Babi's Hobby Hut  
88 Main Street  
Owego, Il. 60543  
ph. 554-9243

**The County Hobbies**  
N. Sheridan Road  
Morgan, Il. 60089  
662-4544

**INDIANA**  
ABC Hobby Craft  
2155 E. Morgan Avenue  
Evansville, In. 47711  
ph. 812-477-9561

**Craft & Hobby House**  
324 Main Street  
Vincennes, In. 47591

**Frank's Hobby Shack**  
4954 E. Robin Court  
Rolling Prairie, In. 46371  
ph. 219-778-4670

**Hobby Manor**  
509 S. Memorial Street  
Hartford City, In. 47348  
ph. 317-348-1931

**Hobby World**  
154-13A W. Healey Avenue  
Elkhart, In. 46514  
ph. 219-293-3715

**Hobbyland**  
343 Lincolnway West  
South Bend, In. 46601  
ph. 219-287-0180

**Kirk's Hobby Shop**  
117 E. Main  
Muncie, In. 47305  
ph. 317-282-4121

**Wings N'ails, Inc.**  
1824 E. Main Street  
Plainfield, In. 46168  
ph. 317-839-6383

**INDIA**  
Family Craft & Hobby  
2834 S. Saint Aubin  
Sioux City, Ia. 51106  
ph. 712-276-7885

**A-Z Hobby, Ltd.**  
1314 Army Post Road  
Des Moines, Ia. 50315

**KANSAS**  
Deli's Body Shop  
607 N. Penn  
Oberlin, Ka. 67248  
ph. 913-475-2624

**The Modeler Hobby Shop**  
1726 South Hillside  
Wichita, Ka. 67211  
ph. 316-681-2941

**LOUISIANA**  
Ron's Hobbies  
713 E. McNeese  
Lake Charles, La. 70605  
ph. 318-478-8651

**MAINE**  
Hobby Casher  
70 Main Street  
Houlton, Me. 04730  
ph. 207-532-8289

**Pets & Pastimes**  
5 Central Street  
Bangor, Me. 04401  
ph. 207-942-9346

**MASSACHUSETTS**  
Bill's Hobby Supplies  
600 N. Main Street  
E. Longmeadow, Ma. ph. 413-736-7211

**MICHIGAN**  
Avo Model Supplies  
1885 Dyson Street  
Muskegon, Mi. 49442  
ph. 616-926-3490

**Berry's Hobby House**  
2536 18th Avenue  
Port Huron, Mi. 48060  
ph. 313-982-1237

**MICHIGAN** Cont'd  
John's Radio & TV Ctr.  
US 31 Hwy  
Bayshore, Mi. 49711

**Tex Hobby Shop**  
2307 N. 5th St.  
Niles, Mi. 49120

**M.P. Model Air**  
326 W. Genesee St.  
Iron River, Mi. 49935

**MINNESOTA**  
Mac's Models, Inc.  
1322 N. Rice Street  
St. Paul, Mn. 55117  
ph. 812-488-5060

**Wicklund's Hobby House**  
Route 1  
Lake Lillian, Mn. 56253

**MISSISSIPPI**  
Creative Sources  
1002 Jackson Avenue  
Oxford, Ms. 38655  
ph. 601-234-2475

**H & B Models**  
319 W. Main  
Tupelo, Ms. 38801  
ph. 601-844-7846

**Sacky's Model & Hobby Shop**  
3919 Cordoba Drive  
Gastonia, Ms. 39653

**MISSOURI**  
Sho-Ma Hobby Center  
1239 E. Republic Road  
Springfield, Ms. 65807  
ph. 417-887-2327

**MONTANA**  
Viking Hobbies, Inc.  
1745 E. Main  
Billings, Mt. 59101

**NEW HAMPSHIRE**  
Hobby Hill  
1 Cannon Drive  
Nashua, Nh. 03060  
ph. 888-5576

**NEW JERSEY**  
Frank's Hobbies  
28 Fairfield Rd.  
Fairfield, N.J. 07005  
ph. 201-227-1918

**NEW YORK**  
Custom Hobbies  
785 Broadway  
Kingston, Ny 12401

**Hobbies Galore**  
99 Central Avenue  
Lancaster, Ny 14086  
ph. 716-681-8587

**Jim's R/C Hangar**  
Rt 4, Box 4-Canton Road  
Ogdensburg, Ny 13669  
ph. 315-393-2580

**King Arthur Ceramics & Hobbies, Co.**  
Bridge Rd.  
Hudson Falls, Ny 12839  
ph. 518-742-8818

**Thompson Outboard S & S**  
Upper East Street  
Orangetown, Ny 13820  
ph. 807-432-5368

**Ray's Hobby Supplies**  
458 Jerusalem Avenue  
Uniondale, Ny 11553  
ph. 518-486-4047

**NORTH CAROLINA**  
B & J Hobby Enterprise  
4975 Western Blvd.  
Raleigh, Nc 27606  
ph. 919-851-4492

**Thornton's Hobbies**  
100 N. Main Street  
Four Oaks, Nc 27524

**Edras Hobbies**  
1316 Lakewood Drive  
Wilson, Nc

**NORTH DAKOTA**  
Crafts Etc.  
Northport Shopping Ctr.  
Fargo, Nd 58102  
ph. 701-293-7121

**McGillivray, Inc.**  
1228 9th Ave. South  
Grand Forks, Nd 58201  
ph. 701-772-5311

**Hobby World**  
421 W. Willard  
Dickinson, Nd 58501  
ph. 701-226-3703

**OHIO**  
American Modeler  
2 Berea Commons  
Berea, Oh. 44017  
ph. 216-826-3086

**Dad's Toy Shop**  
129 E. Augusta Street  
Wapakoneta, Oh. 45895

**Hobby Hut, Inc.**  
8753 Ravenna Road  
Twinsburg, Oh. 44097  
ph. 426-7353

**Hobby Road Hobby Shop**  
2483 E. Dublin Grandville  
Columbus, Oh. 43228

**Lalayer's Escadrille Hobby**  
1414 S. Avenue  
Toledo, Ohio 43608  
ph. 419-385-8739

**Lighthouse Hobby Supply**  
507 E. North Street  
Prospect, Oh. 43342  
ph. 614-499-2110

**Lima Radio Control Spls.**  
307 N. Cole Street  
Lima, Oh. 45805  
ph. 419-228-5117

**Paul's Hobbies**  
Route 4, Box 125  
Lucasville, Oh. 45648  
ph. 514-259-5298

**S & M Print Shop**  
7154 Calvary Road SE  
Amsterdam, Oh. 43903  
ph. 514-543-4024

**The Model Hanger**  
321 N. Market  
Galton, Oh. 44833  
ph. 419-488-7694

**White Birch Tree Hobbies**  
114 Park Ave. West  
Mansfield, Oh. 44902  
ph. 419-626-4093

**F. L. Yocum Hobbies**  
7261 State Street #18  
Celina, Oh. 45822

**Xenia Hobby & Craft Ctr.**  
159 Ballbrook Avenue  
Xenia, Oh. 45385  
ph. 513-376-9928

**OREGON**  
Creative Store  
37828 Crabtree Drive  
Clatskanie, Or. 97135

**Charm's Enterprises**  
2435 Commercial NE  
Salem, Or. 97303  
ph. 503-581-5276

**Strictly R/C**  
7868 SW Capital Hwy.  
Portland, Or. 97219  
ph. 503-244-3356

**PENNSYLVANIA**  
Hobbies Galore of Pa.  
Great Sition Shopping Ctr.  
Bridgeville, Pa. 15017  
ph. 412-221-2600

**H & S Sales & Service**  
Rd. No. 1, Box 440-A  
Indiana, Pa. 15701  
ph. 412-463-0191

**Laurel Shop**  
176 Main Street  
Brookville, Pa. 15825

**The Silver Mine**  
301 Oak Spring Road  
Washington, Pa. 15301  
ph. 412-228-3470

**Sharon R.C. & Hobby**  
45 Taylor Blvd.  
Sharon, Pa. 16146  
ph. 347-4581

**SOUTH CAROLINA**  
Andy's Hobby Shop  
Harrison Building  
Airport Heights  
Walterboro, SC 29488  
ph. 803-549-7825

**Creative Pastime Shop**  
1011 Third Avenue  
Conway, SC 29526

**TENNESSEE**  
Myers Auto & Farm Parts  
105 Elmrose Road  
Crownsville, Tn. 38555  
ph. 614-484-8168

**TEXAS**  
B.T. Enterprises  
Queen Rt. FBC Bldg.  
Marineview, Tx. 78072  
ph. 806-889-3541

**The Hobby Habit**  
2280 Baileys Road  
San Antonio, Tx. 78228  
ph. 438-9226

**Hobby Towne**  
1421 W. Houston  
Sherman, Tx. 75090  
ph. 214-892-1821

**Hobbies World**  
3031 Woodland Hills Drive  
Kingwood, Tx. 77339  
ph. 713-368-2284

**Mercantile Park Hobbies**  
3727 Dalida, Suite 138  
Dallas, Tx. 75228

**Sight & Sound**  
715 Parties  
Denton, Tx. 76209  
ph. 806-936-7422

**Tea Pee Hobby Shop**  
420 N. Main  
Bozger, Tx. 79007  
ph. 273-7037

**VERMONT**  
The Hobby Mart  
Smith Road  
Wilmington, Vt. 05363  
ph. 802-464-5059

**VIRGINIA**  
Kilowatt Kage, Inc.  
Watchdog Plaza  
Lynchburg, Va. 24502

**WASHINGTON**  
Bill's Hobby Town  
11112 Pacific Avenue  
Tacoma, Wa. 98404  
ph. 206-531-8111

**Kinsap Hobby Supply**  
Poulsbo Jet & Hwy. J  
Poulsbo, Wa. 98370  
ph. 206-779-7676

**Stewart Enterprises**  
47 McCoy's TV & Radio  
429 S. Chelan Street  
Venatche, Wa. 98801  
ph. 509-663-3232

**WEST VIRGINIA**  
McCoy's Inc.  
Box 52  
Smithville, WV 26178

**Mountaineer Shop**  
117 Court Street  
Ripley, Wv 25271  
ph. 304-372-8544

**WISCONSIN**  
Happy House Gift Shop  
216 S. Knowles Avenue  
New Richmond, Wv. ph. 715-246-1284

**Lake Geneva Model Center**  
726 1/2 Ann  
Lake Geneva, Wi. 53147

**R.C. Hobbies, Inc.**  
18305 W. Lisbon Rd.  
Brookfield, Wi. 53005

**CANADA**  
A.B.C. Model Craft  
34 Meakin Street  
St. Catharines, Ontario, Canada

**B & H Hobby Supply**  
30 Georgian Drive  
Bazee, Ontario, Canada

**Calgary Hobby Supply Ltd.**  
3920 Edmonton Trail  
Calgary, Alberta, Canada

**Elgin Cycle & Hobby Centre**  
441 Talbot Street  
St. Thomas, Ontario, Canada

**Royal Oak Hobbies**  
4454 W. Saanich Road  
Victoria, British Columbia, Canada

**Skyer's Associates**  
130 York Road  
Oundas, Ontario, Canada

**Grant's Hobby Supplies**  
183 King Street West  
Rockville, Ontario, Canada

**T J Sitt & Hobbies**  
3011 Pandosy Street  
Kelowna, British Columbia, Canada

**PUERTO RICO**  
Hobbies Unlimited  
Ave. Jesus T. Ponce No. 1176  
Puerto Rivero,  
Puerto Rico

**SOUTH AMERICA**  
P & L Hobbies  
Medellin - Colombia  
S. America

\$1.00 Handling on all orders. Prepaid domestic order post paid, foreign order allow \$10.00  
Orders—check, M.O. or C.O.D.—also BankAmericard or Master Charge (Bank Number) 4% IND. RES. TAX

# INDY R/C

CALL TOLL FREE 1-800-428-4682

INDIANA RESIDENTS call 317-846-0765

# INDY

INDY R/C 10620 N. COLLEGE AVE  
INDIANAPOLIS, INDIANA 46280

1. **COMO 40** - Twin ball-bearing aluminum piston, chrome carburetor and muffler. \$69.95 L: \$43.00. U/C version is muffler. L: \$55.95 I: \$33.95

2. **IZUMI RACE CAR** - One inch scale Porsche. Engine: 15/19. Engine not included. One of our most popular race cars. L: \$129.95 I: \$89.95

3. **MILLS .075** - Sentimental diesel favorite. Excellent for small R/C. L: \$19.95 I: \$15.95

4. **CAPILLO .09 R/C** - Italian glow engine. L: \$18.95 I: \$14.95

5. **MILLS 1.3** - The classic Mills 1.3 cu in diesel, now manufactured in India. Reach back into 1954 and power your old timer with a real old timer. L: \$29.95 I: \$19.95

6. **INDY FILM (MK II)** - New colors like K & B epoxy. Solids: wh., yel., grn., org., bl., navy blue. L: \$7.50 / roll. Intro: \$3.99 or 3 rolls for \$9.99.

7. **US - 1 SERVO** - Similar to Indy US - 2 servo. Dunham mechanics with dual racks. L: \$28.95 I: \$20.95. World Connector: \$1.00 - Kraft Connectors: \$2.00.

8. **US - 2 SERVO** - OS mechanics, Signetic IC 544. For use with systems like Futaba, Kraft, Standard, and World. Positive pulse systems. Mitsumi connector. L: \$23.95 I: \$16.95

9. **CURARE** - MK's all balsa kit of Hanno Prettnner's famous Curare. MK's quality really shows on this kit. 60 size L: \$98.50 I: \$79.00. 40 size L: \$79.50 I: \$63.00

10. **HAPPY 20** - This is an all balsa trainer for the beginner who is looking for a quick and easy 3 Ch. building project. It would make a nice airplane for an experienced flyer to take along on a vacation or trip. L: \$29.95 I: \$23.95

11. **6 AMP BATTERY** - Indy 12 volt 6 amp. hr. gel cell. Charger is the 24 hr. type only. L: \$19.95 I: \$15.95. Battery: L: \$29.95 I: \$21.95

12. **2 VOLT GEL CELL** - Starting battery. Charger or battery. L: \$10.95 I: \$7.95

13. **POWER PANEL** - Mount the Indy Power Panel in your tool box. Operates from 12 v. and services your engine starter, and fast field charger and glow plug. L: \$34.95 I: \$23.50

14. **TRAYS - ARMS - PEN CELLS** Snap - in servo tray for US - 2 servo. L: \$9.99 I: \$6.99. Round output arms for US - 2 servo. L: \$5.50 I: \$3.95. Panasonic pen cell nicads with tabs. New (4) ea. \$1.80 - \$7.20; (8) ea. \$1.65 - \$13.20; (12) ea. \$1.55 - \$18.66.

Notes - the bore in the Como 40 U/C Central venturi will be about .275. We also offer a 12v. Gel Cell with 6v. and 2v. taps. Gives you power for your electric starter and your glow plug. L: \$25.95 I: \$18.50



## BEST FROM INDY

INDY R/C 1-800-428-4682 CALL TOLL FREE

### ORDER INSTRUCTIONS

\$1.00 handling on all orders. Prepaid domestic orders postpaid. Foreign orders allow \$10.00. We will take your check or money order to ship your order C.O.D. Also, we honor BankAmericard (VISA) or Master Charge (Bank Number). INDIANA RESIDENTS INCLUDE 4% SALES TAX.

INDIANA RESIDENTS  
(317) 846-0766



INDY R/C 1-800-428-4682 CALL TOLL FREE



# When you buy a two channel

**Don't miss the boat, compromise control of the glider or the car**



## Get an MRC system with open gimbal sticks

Don't for one instant put all two channels in the same category. They may all be priced within a few dollars of each other . . . but there aren't any within even a few features of our 772. Let's start with the sticks. MRC's 772 has open gimbals. They allow the control potentiometer to connect directly to the stick arm without linkages. This means maximum response, virtually free of play at neutral. It's a must on more expensive, professional multi-channel sets . . . a rarity on most other two channels.

We also make a full-size transmitter for solid feel and sure grip, not a toyish size designed to save us a few dollars. You'll also find Darsonval meter (not just lights) to monitor transmitter battery. And ITT Cannon "Centi-Loc"® gold plated connectors, as well as an external servo potentiometer adjustment for centering. You won't find those on other two channel radios. Nor are you likely to see a combination of receiver features which include lead out wires for easy installation, double tuned RF front end and IC circuit decoder. In short, we didn't skimp on the 772, it's better all the way 'round. So whether you sail, fly, glide or take a spin, don't trust your pride to just any two channel. Buy the better one so you don't compromise control. Ask your dealer to show you the 772 with open gimbals.



772 comes complete with 2 servos, receiver, battery holder, switch harness. (At a small additional charge, select the servos best suited to your application).



MODEL RECTIFIER CORPORATION/2500 WOODBRIDGE AVE., EDISON, N.J. 08817

In Canada: Borgfeldt Toys LTD., 3440 Pharmacy, Scarborough, Ontario M1W2P8

\*A Registered Trademark of International Telephone and Telegraph Company