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Send for our big colorful catalog . . . only 25¢
Monty Groves' photo of his 40-powered replica of the first Lockheed airplane. At the time of the original's design, the company was known as Loughead Aircraft. It is an unusual biplane and an excellent flyer. See pages 40 through 47 for the story.

Cover Photo

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Volume 75, Number 4 — October 1972
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**Modeler Mail**

**Wants variation in design**

I am a tenderfoot in Radio Control and am also quite adept in Control Line and Free Flight. I often read the "Air Action Is" section in your magazine; after finishing with the Pylon Racing column, I am left with the impression that this aspect of modeling must be rather dull with respect to design. It seems that almost all the planes have different names, but generally look alike. I am of the opinion that if the experts are as good as they are presented in your magazine, they should be able to come up with a totally new design that would perform just as well, if not better than, the other conventional planes and still be legal to fly in competition. I realize that there may not be many subjects that will perform satisfactorily, but planes that almost all look alike really turn me off. They have different finishes, but they still are the same basic design. I feel this probably holds true for Pattern ships also. I am presently a Scale fan, but build other types as well.

John Pribble, Burnsville, Minn.

**Plea from Ft. Leavenworth**

Modelers have been described as everything from purists to nonconformists. But the dedicated hobbyist still holds a distinct place in our society. What I will do is attempt to show the vastness of this syndrome—the small engine jockey. There exists within the confines of the U.S. Military Discipline Barracks at Fort Leavenworth, Kansas, what we consider to be the most dedicated, most resolute, and probably the most frustrated fraternity of modelers in hobbydom. We number about eight now; our interests are varied, however, each is tremendously dependent upon his fellow modeler.

Examples of comraderie should exist everywhere as it does here. The men accumulate the necessary parts and equipment in ways that would bring tears to the average builder. Kits are predominately purchased by interested parents, but remain scarce. One of the methods is our system of converting the applicable plans from AAM into aircraft. We first make a complete set of full-scale drawings in order that they may be reused. Then we assemble the components needed and usually combine old kits (leftover balsa and hardwood), eventually fabricating our own materials. Fuel tanks are made of sheet metal from one-gallon modelers’ fuel cans. Brass tubing comes from expended ballpoint pen cartridges.

We are currently finishing a strange melange of aircraft. In process is a scale Spitfire, two Voodoos, and a P-4U, contender and just recently a Vertigo by lan Barrett (September 1972 AAM).

There exists an impressive array of aircraft—a P-51 Mustang, a Shoestring, a Spitfire, two Voodoos, an F-4U, a Cond-tender, a Sr. Falcon, a scale Cessna, a 36” hydroplane, two Jr. Combat ships, a Jr. Falcon and an RC racing Dodge Charger.

All of these models were acquired over a great length of time and at the expense of relatives and friends. These people cared and we love them for it. Probably the most outstanding record we can claim is our aircraft attrition rate. Only one aircraft damaged in the last year. This while taxing. You see, we aren’t allowed to fly them!

We at this institution have formulated a desire and achieved a degree of professionalism in this challenging endeavor. Now it remains a question as to our ability to carry on. The problems are slowly being resolved through teamwork and keen interest. But there remains the ever-present lack of equipment and accessories (glue is gold here!). In order to continue, we solicit the aid of understanding individuals in the hope that we may make a place for ourselves, we can continue to foster hope from the outside.

Your magazine is a constant source of enjoyment (when we can get it), and we profoundly congratulate the work you are doing.

Lt. Richard Jacobs USA, Drawer ‘A’, Fort Leavenworth, Kansas 66027

**In Appreciation**

I would like to thank American Aircraft Modeler for donating the trophy which I won for first place in the Speed Task, at the ’72 Soaring Nats in Chicago. It’s a good feeling to know that RC Soaring has the support of the finest modelers’ magazine available.

Thank you for saying thank you.

—Publisher.

**Hobby Lobby NYLON COVERING MATERIAL**

For the most DURABLE covering of all, nothing beats NYLON. 39″ x 65″—about 2 square yards, this nylon is a much closer weave than has been available before. It fills with ONE COAT OF DOPE and imparts extraordinary strength and rigidity to the balsa framework.

Hobby Lobby NYLON is for medium and large size models. At 40 grams/square meter it is a bit heavier than silk (usually 25 gms./sq, meter). Applications are similar to those with nylon but a few differences that are pointed out in the accompanying instructions.

**Hobby Lobby 1972 ILLUSTRATED CATALOG $2.00**

**Port City DROPPING RESISTOR $1.00**

**NEW Hobby Lobby’s BRAND 23/4” WHEEL**

2” pair $1.00
2¼” pair $1.15
2½” pair $1.30
2¼” pair $1.45
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**Get ready—this’ll be hard for you to swallow. We’re offering these very well-known wheels at a very attractive price. YOU’VE BEEN PAYING FOR THEM. Not only that, but these may very well be the best wheels you can buy for a model airplane. They are lightweight, they use a neutral-bounce neoprene rubber, and have a tread design that makes ‘em look better than most others. I know that our offering them at these prices may have you thinking that they’re some kind of junk, but all I can say is it’ll only cost you $1.00 to $1.55 to find out if all this is true.**

**Hobby Lobby CARBURETORS**

**Perry CARBURETORS**

<table>
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<td>Veco 50</td>
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**Specify what engine when ordering.**

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**Hobby Lobby WEBRA 61**

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**Utopia CARBURETORS**

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<td>STG 45</td>
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<td>STG 50</td>
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**Hobby Lobby 1972 CATALOG ORDER FORM**

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2. ADDRESS:
3. CITY, STATE, ZIP:
4. ITEMS ORDERED:
5. TOTALS:
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Please order quickly because even though this offer is being made during what is a somewhat slack time for radio sales, it is quite possible that demand could outrun supply at this extremely low price.

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NEW! 3 UNUSUAL “Change of Pace” KITS FROM GERMANY.......

These kits, while well known in Europe, have been unavailable in this country for the simple reason that their prices are too high to permit dealer and distributor markups. Hobby Lobby is importing these directly for retail sales which is the only way a low retail price can be put on these kits. For example, the Senior Telemaster would ordinarily have sold for nearly $100, but by being sold directly to you we can sell it for half that price. Anyway - read on, because these are very unusual kits in many different respects.

1 NEW! SENIOR TELEMASTER
$49.95

With nearly an 8 FOOT SPAN this airplane is the largest RC model kit we know of, 95” wing span. This plane is so gentle that it’ll fly rudder-only. Of course, it is intended for 4 channels and has ailerons. It uses a 40-60 size engine which is plenty of power for a plane that has such a huge lifting capability. This RC plane has been used in Germany to string cables over valleys for aerial photography, and RC glider towing. Construction is conventional and uncomplicated. Sufficient nylon covering material is included to make the SENIOR TELEMASTER as indescribable as an RC model can be made.

2 NEW! TELEMASTER
$34.95

If the Senior Telemaster is just a bit too big for you, the identical, but smaller 71” span TELEMASTER may be your cup of tea. For .30 to .60 engines this 4 channel plane is nearly as much of a delight as its big brother.

3 NEW! RED EAGLE’ (3-in-1 Kit)
$49.95

The German for this 3 in 1 kit is ‘ROTER ADLER.’ You can build it as a ‘Doppeldecker,” “Hochdecker,” or “Tiefdecker.” The large top wing is 60” and the smaller lower wing is 51” - pretty large for a biplane, but this kit can be built whichever way you want, and can be converted to one of the other types later. Construction is kept very simple. Engine size: 40 to 60. Vintage German decals and aileron and tail surface design give RED EAGLE that World War I look.

TRY US OUT: Ben P. did:

"With ocean and land between us, you people put through a good sized order which arrived within three days. Really, this just about puts me at your front door."

Ben P.
Honolulu, Hawaii

RC Modeler Magazine FLIGHT TRAINING COURSE $10.00
Over 200 pages, 300 photos, covering every phase of radio control for the beginner and sport flyer. It begins with the basic fundamentals of radio control and takes the individual through construction, radio installation, theory of flight, all the way up to the actual flying of his first RC aircraft.

NEW! ROM BASIC TRAINER
50” span, 2, 3, or 4 channels
McCoy 19 cc Engine
Total List price $30.90
Special $27.99

1/4 MIDGET RACING KITS
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NEW! Dee Bee MIRAGE 42 A-R-F
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SPECIAL $29.97 of the 1949 Midget Racer.
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SPECIAL $19.97 Conventional balsa construction semi-scale kit of famous racers.

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List Price $29.95
SPECIAL $19.97

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Last month we discussed some of the more significant parameters which determine radio performance. We will now list a few of these, the units of measure and the relative "goodness" of high or low values, then we will discuss some of the other considerations in buying a radio.

I recently received a letter from a reader who asked, "What radio would you buy?" As I explained to him, my desires or requirements for RC as well as my ability to acquire a radio may differ greatly from his. When you contemplate spending up to a thousand dollars on RC, you should choose your equipment as carefully as you choose a car or a house—or maybe even a wife. There is much that should go into your determination of the most suitable radio for you.

In our first article we discussed the consideration of complexity, i.e., how many functions do you need, or think you'll need? Other questions to be answered are: How dedicated are you to the hobby? How much do you want to invest? Are you right- or left-handed? Do you have a physical disability which restricts finger, hand, or arm movement? Unfortunately the RC fraternity has no pro shops that can custom fit you to an RC outfit, but clubs and hobby shops can help. My whole point is that you shouldn't blindly accept the word of the first guy you meet—including me.

The following are a few of the parameters we discussed last month and an idea of how to compare system values of various radios:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Best Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Resolution</td>
<td>degrees or percent</td>
<td>smaller</td>
</tr>
<tr>
<td>Transmitter Output</td>
<td>watts</td>
<td>larger</td>
</tr>
<tr>
<td>Receiver Sensitivity</td>
<td>millivolts/microvolts</td>
<td>smaller</td>
</tr>
<tr>
<td>Image Rejection</td>
<td>decibels</td>
<td>larger</td>
</tr>
<tr>
<td>Harmonic Rejection</td>
<td>decibels</td>
<td>larger</td>
</tr>
<tr>
<td>Servo Transit Time</td>
<td>sec.</td>
<td>lower</td>
</tr>
<tr>
<td>Servo Thrust (Torque)</td>
<td>lbs. in.</td>
<td>higher</td>
</tr>
<tr>
<td>Airborne System Power Consumption</td>
<td>watts</td>
<td>lower</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>amps/hour</td>
<td>lower</td>
</tr>
</tbody>
</table>

There are no industry standards for these values, but the information is, or should be, available from most manufacturers. Other criteria which will influence your decision to buy a specific radio are cost, size, weight and intended use. There is no way for these considerations to be predeterined for you. It is not necessarily true that all expensive radios are good and all cheap ones bad.

Another problem is that the parameters listed are engineering specifications verified on specific test units. Unless the manufacturer runs stringent production tests for each unit, you have no assurance that your radio will perform to those specifications. The average RCer has no facilities available to verify system performance. This is where the manufacturer's reputation comes in: if he is known for his system reliability or for conservatively rating his equipment, chances are you have nothing to worry about. Also, the reviews of radios conducted by various publications are generally performed by objective people on production units which are picked at random. The performance data in these reports can generally be considered representative.

This is all well and good, but the fact remains that even General Motors produces an occasional lemon. Radio manufacturers are subject to the same problems as any mass production company experiences. System design changes, changes in personnel, production techniques or location of a hangover assembler, can wreak havoc with the final product. A company which has maintained an unsullied reputation for years can lose its following overnight through one bad run of radios. The RC community is very fickle. Popularity of a given system, initially at least, is based as much on who flies it as on how well it performs. Granted, the expert is more aware of the shortcomings of the radio than the novice or sport flier, but the expert is also more capable of compensating for these shortcomings. So, if you can read a lot on the subject of radio choice, you can, and should, seek the advice of other people, but the choice is ultimately your own. We can only provide a few pointers to reduce your chances of making an expensive error.

While on the subject of industry standards, there are none for sequence of control functions, component connectors, master/trainer systems, voltages or charging rates, output pulse width or directions. The only generally agreed...
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TWIN GEAR Retracts — $9.95
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SNAKES AND MINISNAKES

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TRI-GEAR Retracts — RG3 — $19.95

SNAP LINK, Mini-Snap, Snap-Link, Regular, with rod — 20¢ each
Snap-Link or Mini-Snap, less rod — 2 for 40¢

Snap-Link and Mini-Snap

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

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KLETT SMALL HINGES — The KLETT's Designed and manufactured by Roy Klett, Originator of the World-Famous RK Hinge
An exclusive with Carl Goldberg, these are extremely strong, smaller hinges constructed with exceptional care and attention to detail. So thin that all you need is a knife slit. Top quality, yet only cost $1.05 for 15 and $1.10 for 7.

Snap Link or Mini-Snap, regular, with rod — 20¢ each
Snap-Link or Mini-Snap, less rod — 2 for 40¢

For $1.95, you can buy a truly safe link—the Snap-Link! Not these features:
- Tiny 30° shoulder snaps through arm, prevents accidental opening. So unique it's Patent Pending!
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When you want a SAFE link—ask for SNAP-LINK!

SNAP-LINK, Snap-Link, Regular, with rod — 20¢ each
Snap-Link or Mini-Snap, less rod — 2 for 40¢

KLETT SAFETY DRIVER

SOCKETS SLIP INTO SCREW HEAD—CAN'T SLIP OFF AND DAMAGE YOUR WING

Takes Round Head Screws and Binder Head

For 1/4" or 1/16" screw—$1.00 each

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

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Hardened steel collar and screw—75¢.

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BELLCRANKS

Made of nylon, this new set provides smooth 1/2" control line operation. Easy on dacron lines, too—$2.50.

Aileron Bellcrank — $2.50
3/8" Bellcrank and 3/16" Made of nylon, this new set provides smooth 1/4" control line operation. Easy on dacron lines, too—$1.50.

SHEET METAL SCREWS

Like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers—#2 x 1/2—30¢ for 10; 1/4 x 3/4—50¢ for 8.

For best service, see your dealer for items you want. If not available, write direct; add 35¢ per item. (75¢ outside U.S.) Minimum order $1.

MANUFACTURERS—All our accessories are available at excellent O.E.M. bulk prices.
Gee Bee/Mk IV floats. Ready-to-paint floats are 33" long, lightweight blow-molded plastic, operate from water, snow and sand equally well. Can be attached to aircraft in three minutes using spreader bars and nuts supplied with kit. Provisions for attaching sub-rudder. Additional sizes forthcoming. $19.95. The Gee Bee Line, 143 E. Main St., Chicopee, Mass. 01020

Dumas/Hi-Pro Soarer. Lightweight molded fiberglass fuselage in two pieces, built-up balsa wing has 101" span, high aspect ratio for spectacular soaring. For thermal flying on two channels, Hi-Pro has flying weight of 38 to 42 oz., wing area of 590 sq. in. $39.95. Dumas Products Inc., 1905 Park Ave., Tucson, Ariz. 85719

Octura Models/ Marine Engine mounts. Third in a series of extruded aluminum mounts. Designed for 40 through 65 engines. Integral fins provide extra engine cooling, acting as heat sink. 5' wide, 7.5 oz. Mounting hardware included. $6.45. Octura Models, Box 536, Park Ridge, Ill. 60068

MRC/Encyclopedia-Catalog. The thing in catalogs today is to make them big, beautiful and informative, as well as a display of manufacturers' wares—and MRC has come through with a beauty. Their Tommy line of precision plastic kits are displayed in quality multi-colored printing, beautiful black-and-white photos, lots of supporting detail in text. Autos, armor, cycles, aircraft all featured in this outstanding scale line of equipment. 50 cents. Model Rectifier Corp., 2580 Woodbridge Ave., Edison, N.J. 08817

Hobby Lobby/’72 catalog. One of the price leaders in the industry displays its ’72 line in 77 pages of text and illustrations of RC equipment, engines, kits. Text consists not merely of manufacturer's verbatim ad copy but the real word from Jim Martin of Hobby Lobby who tells the hobbyist what he needs to know. Lots of additional good advice, insights. $2. Hobby Lobby International, Rt. 3, Franklin Pike Circle, Brentwood, Tenn. 37027


Jerobee/Cox RC conversion kit. Add RC to your Cox Baja Bug or Dune Buggy in 15 minutes. Template shows location of Jerobee brick-type receiver. Linkage is pre-cut to facilitate installation. Available in two forms, linkage only for people with own RC gear, and linkage plus Jerobee transmitter and receiver. $84.50 with radio. $1.49 without. Jerobee Industries Inc., 17702A N.E. 124th St., Kirkland, Wash. 98033

Badger/Airbrush techniques. A valuable book for the scale modeler. Covers techniques, special effects as well as general information on airbrushing with the Badger Airbrush. 50 cents at Badger outlets or order directly from Badger Airbrush Co., AM Div., 9201 Gage Ave., Franklin Park, Ill. 60131
Reynolds/12-meter sailboat. Now available with Black-design deck; in fiberglass, ready for sail, rudder, ballast. Available in any stage of completion from $41.65 and up 58/4" length. For complete details send stamped return envelope to Reynolds Mfg. Co., 3010 Chris La., Orlando, Fla. 32806

World Engines/Pre-fab trainer, Box-Fly by Pilot is an unusual kit for a beginner or anyone else who wants a high-quality easy-to-build airplane. Plastic-covered foam wings, slab-sided fuselage, all-wooden parts pop out cleanly and neatly with no need for further handwork. High 52" wing, for one to three channels, 19 to 25 power recommended. Flying weight 1 to 3½ lbs. Detailed instructions, beautiful packaging. $29.95. Also: Nasha, Box Fly. New high-performance low-wing plane uses foam fuselage which is reinforced with plywood at firewall and underside for light weight plus strength and reliability. Foam wing is reinforced with wooden spars and wood-encased bottom. Result is exceptionally rugged but easily built aircraft. 52" span, 480 sq. in., 33" length, weighs just over four lb. with four-channel gear and 19 to 40 power. With decals and hardware, $24.95. World Engines Inc., 4960 Roshah Ave., Cincinnati, Ohio 45236

Sterling/Great Lakes Trainer. For CL flying with an extra measure of interest and visual appeal, this classic 1930s-era biplane trainer fills the bill. Kit contains covering material, plastic cowl, engine mounts, hardware pack, shaped wood notched balsa and plywood parts. Scale, 1¼":1', 36" span, 26½" length, recommended for 19 to 35 power. $14.95. Sterling Models, 6500 S. Wister Ave., and 6401 W. Frankford Ave., Philadelphia, Penn. 19144

The Squadron Shops/More for the scale modeler. In addition to detailed publications in the aviation field, Squadron Shops now provide technical data on almost anything else which the scale modeler may wish to build. Detailed book covers single example of German armored infantry carrier, provides extensive text and many action photographs. $3.95. Write Squadron Shops, 23500 John R, Hazel Park, Mich. 48030

Rom-Air/Prop face. A unique tool which eliminates a large potential source of vibration in your engine, add smooth rpm's to the top end of power range. Prop hub face must be at exactly 90° to exist note for true running. Trim-Prop rectifies hub face with precision sandpaper-faced collars. Built to precision tolerances, pointed ends of shaft allow use as a prop balancer as well as hub face. $5.95. Rom-Air International, Inc., 924-65 8th St., Brooklyn, N.Y. 11219

Hot Line Models/Sierra Trainer. Large low-wing Beachcraft cabin ship flies on three to six channel RC with 40 to 60 power. Unusual slab-sided lower fuselage combines with plastic cowling and fuselage top. Pre-cut and finished ribs, span 67", area 670 sq. in., weight 5½ to 6 lbs. With hardware, $44.95. Hot Line Models Inc., 208 N. Taylor St., Amarillo, Texas 79109

Sig/Stinson L-5. 1" scale Stinson observation plane is designed as a large (34" span) rubber-powered near-scale kit with excellent flying qualities. Can be easily converted to O2O power for free flight. Simple, strong construction, $4.95. Sig Mfg. Co., 401 S. Front St., Montezuma, Iowa 50171

K&B/Vecho muffler. For the 19R/C series 71 engines, muffler is billed as providing maximum quieting while maintaining high performance inherent in Vecho design. $6.95. K&B Manufacturing, 12135 Woodruff Ave., Downey, Calif. 90241
Texaco Old Timer Meet

ROBERT ANGEL

The only man-made object on the horizon for several miles broke the monotony of the desert.

With activity as the friendliest, relaxed contest I have ever beheld.

The Texaco event, as it is flown today, has remained virtually unchanged since 1938. All designs used must have been designed and flown prior to January 1939. Engines must be gasoline-powered to a maximum engine size of 99 cubic inches. The engine run is limited only by the amount of fuel, at 1/4 oz., up to 1 oz. per pound. The total weight, up to 1 1/2 lb., maximum, of each model is released from the ground until it is out of sight. First place winner R.B. Bob Chandler's ship after one hour and one minute was followed by two ships at the same time. In the contest.

This AMA sanctioned and SAM-SCIFS (Society of Antique Modelers) sponsored contest was held late in 1971 near Taft, California. The season opener for 1972 occurred in April—same site and same day.

16 October 1972

(1) Big old Bucaneer, suitably lauded, was built by Joe Van Winkle, and entered by Bob Chandler to inject measured amount of fuel. (2) Cliff Side was won by Cliff Side, a two-place powered by Bunch Midjet; it placed fourth. (3) Phil Black, Wally Sallie, and Sal Taibi, next to Leo, placed second. Leo Holland, far right, won the 1937 Detroit Texaco event. Almost half the airplanes; if not half the contestants, managed to get lined up.

Photos: Joe Kleinert
HEYYYY...

Aw...come on! You don't really look like that, do you? Just because you're a beginner at age 40 doesn't mean you're a retarded adult. You may be suffering from a slight middle age spread, but that's maturity. Who said you can't be a beginner at your age. Not us!

You can read JUNIOR AMERICAN MODELER without feeling like a kid with a beard problem. JUNIOR AMERICAN MODELER is for you too! It covers planes, cars, boats, rockets, and plastics every issue. The emphasis is on instruction and FUN! Subscribe today so that you won't be sorry tomorrow. Don't delay and don't miss a thing!

YOU THERE!

Of course JUNIOR AMERICAN MODELER is written especially for boys and girls who are just getting started in modeling. You don't have to have a beard problem, maybe nothing more drastic than homework. Modeling is a very good outlet for all those emotions.

JUNIOR AMERICAN MODELER is on sale at the newsstands in Philadelphia, San Diego, and Washington, D.C. More will be added later. It is also on sale in selected hobby shops. But the best way to make sure that you have JUNIOR AMERICAN MODELER is to subscribe. Where else could you get so much (full-size plans in the magazine) for so little?

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

$19.95

Takes Single To 4 Channel Proportional Radio. Molded Fuselage...One Piece Molded Wing, Stabilizer and Vertical Fin. Also Free Flight. Span 42". Weight 26 oz. For .049-.10 Engines.

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1-Piece Full-Length Sides

Now with 1-Piece Full-Length Sides. Takes 2 to 4 Channel Proportional. Span 56". For .15-.19-.35 Engines.

FEATURES:
- Semi-symmetrical wing section
- Colk-sprung main gear...
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The Goodyear Racer With Enough Area and Stability So You Can Fly It! For 4 Channel Proportional. Span 54". Area 540 sq. in.; Weight 412-5 Lbs. For .35-.45 Engines.

FEATURES:
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For Single or 2 Channel, Pulse or Digital. Span 42". Weight 22 oz. For .049 To .10 Engines.

All Carl Goldberg Models Come With All Major Fittings Such As Nylon Snap-Links, Control Horns, Snap 'R Keepers, Full Size Plans, Illustrated Step By Step, And Folder on How to Set Up and Operate R/C Models.
Congratulations Don!

When you ask Don Botteron if you can brush HobbyPox, his answer is a nice collection of scale "wins," including Fourth in Scale at the 1972 Nats! Don gets those points because his HobbyPox-brushed Zlin beats the boys both on the ground (racking up lots of scale finish points) and in the air. HobbyPox brushes as smoothly as any other finish you can find, and better than most. It's no secret we designed it that way. And Don's secrets are all spelled out in the June 1972 issue of American Aircraft Modeler. Go back and read it!

for brushing your way to 4th place in scale at the Nats

HobbyPox... the epoxy finish you can brush or spray!

HOBBYPOXY PRODUCTS
A Division of Pettit Paint Co., Inc.
507 Main Street / Belleville, N. J. 07109

Builder: Don Botteron; Fort Collins, Colorado. No, he didn't really use that big brush on the model, but he gets big results. It's the paint that counts, not the brush!

Plane: Zlin "Akrobat"
Finish: Brushed HOBBYPOXY

Paint Co., Inc.
1100 N. J. 07109
CONTEST WINNING HLG
FOR BROAD RANGE OF WEATHER CONDITIONS.
CAN DO 60 SECONDS IN EVENING AIR
FROM AN ATHLETIC LAUNCH

DON CHANCEY with DICK MATHIS

Contest flying with hand-launched gliders is highly personalized. Competition, effort, skill, and rivalry among the top fliers is unparalleled in other free-flight events. Perhaps the reason is that hand-launch gliders call into play all the requirements of other events—trimming, design, craftsmanship, and tactics, plus athletic ability. There are many people who take the event quite seriously, which is ample proof that hand-launch glider flying is highly demanding and rewarding.

The Bo Weevil is a contest glider designed for a broad range of weather conditions. Its impressive record for the last two years includes: first place in Open and second place in Senior at the 1970 Nationals in Chicago; first and third in Senior, fourth in Junior, and seventh in Open at the 1971 Nationals; first in Open at the 1971 Rebel Rally in Florida; and second in Open in the 1971 King Orange Internationals. In addition, there have been numerous high placings at local meets. Frank Perkins, Bud
Right: Fine gliders require appropriate care to preserve adjustment and condition. This carrying case holds two gliders safely on airliners or in cars for contest trips.

Below: At altitude, the Bo Weevil keeps nose up in thermals.

Tenny and I won the 1971 World Team HLG Championship with Don Chancey and his Bo Weevil. I also flew a Bo Weevil for part of my flights, until it was lost OOS, at the 1971 U.S. Free Flight Championships in California where I placed third.

With a good launch and fine trim, the Bo Weevil exceeds 60 seconds in evening air. Some still-air performance has been sacrificed for a high altitude climb and a bouncy, thermal-hanging glide. Anyone can have satisfactory results with this glider for sport or contest flying.

Construction

Select medium light balsa for wing and tail (preferably "C" stock—little visible grain, mottled appearance). If a four-in. wide piece for the wing can be found, use it. Lacking this, a one-in. wide front piece with a three-in. wide back piece spliced together on a flat surface with the back piece of the lightest balsa will suffice. Superlight wood should be avoided. A glider that is too light (in the case of the Bo Weevil, less than one oz.) is worse than one that is too heavy—can't be thrown high. About 1.25 oz. is best for most flyers.

Transfer the outline from the plans to the wing by sticking a pin through the plans to make marks on the balsa underneath which can be connected with a pencil. Mark the dihedral lines, too. Treat the marked side of the wing as the bottom so the dihedral break lines can be seen for accurate cutting after the wing airfoil is sanded. Rough carve the airfoil; sand the true airfoil with 180 grit paper and then finish with 400. Follow the same procedure for the tail surfaces.

The dihedral joints of the wing should be cut precisely, beveled for a perfect fit, then glued with epoxy. You may cover the wing with tissue or leave it clear. Don's are covered with black tissue on the bottom and mostly white on the top, which seems to give good visibility. When covering with tissue, regular butyrate dope should be used (Aero Gloss). After covering, the same procedure described below for the fuselage is followed.

The fuselage wood is spruce. Pick the stiffest and straightest piece you can find, round off the edges and sand smooth with 400 paper. Apply several coats of lacquer sealer, sanding with 400 between coats. Apply a final coat of brushing lacquer and rub out with rubbing compound until a mirror-like finish is achieved.

Only one coat of sealer is needed for the tail, followed by a gloss coat of brushing lacquer. Take extra care to fit the finger rest and fuselage grip to your hand. They should allow a very tight grip that is still comfortable. For contest work, a dethermalizer of the type shown is essential. (M & P Enterprises manufactures one.) Add lead or clay on the nose to finish balancing at the point shown. Before flying, permanently bend the back of the left-hand main wing panel down about 1/16 in. at the dihedral joint—this will help the model resist spiral diving in thermals. Bend in slight (1/64 to 1/32 in.) left rudder tab for left glide circle.

Flying

Test glides should show a flat, slight turn. Toss the model purposely into a stall to check the recovery. Correct poor recovery with up elevator, or continued stalling with down elevator (molten trailing edge and breath on it while bending). Hard launches should reveal a quarter-turn climb to the right with no snap rolls, spirals, loops, etc. It should just go almost straight up and bank hard to the right as it slows into the glide going downwind.

To obtain a good pattern you may also use stab tilt (to tighten glide without affecting the climb—turns toward high side) or differential deflection of the right or left elevator to create a rolling effect in the climb. Contest flying requires practice so you will not have to think about how to throw or whether the glider is trimmed. You must be free to concentrate on finding thermals. If it is necessary to run downwind to put the glider under another competitor's which is in a thermal, do so. Watch other models, thermal detectors, flying insects, and anything else that insures launching in a thermal.
ANNUAL DCRC RECORD TRIALS HAVE NETTED THE USA MANY WORLD RECORDS.
IN SPEED THE NEW GOAL IS TO EXCEED 214 MPH.
CAN IT BE DONE?

CHARLES and MIKE FITZPATRICK

On Labor Day weekend, 1971, a small but dedicated group of RC modelers ventured into beautiful Virginia with one idea in mind: to pulverize the European-held FAI records. However, they failed to achieve this goal. We will nonetheless relate some of the exciting details and events of those three memorable days and let the reader decide whether or not this failure can long endure.

It's true, we Fitzpatricks have made our name in CL Speed—not RC; in fact, until 1971 we didn't even know what a servo was. Speed and speed engines have always been our passion. Well did we know of the DCRC Annual Record Trials scheduled for September 4, 5 and 6. We decided to travel from New York to attend—to watch those lovely wire¬less speed birds track through the open blue skies. The meet was held at the most fabulous RC flying site we have ever seen—the U.S. Naval Weapons Laboratory in Dahlgren. Endless blacktop runway stretched seemingly into infinity, flanked everywhere by the green grass of colorful Virginia.

Cliff Telford and Bob Violett brought two bright orange RC speed models and invited us to inspect their efforts. One plane was powered by an ST 60 ABC; the other had no engine. Both jobs were identical in design except that the one without an engine was obviously made for a rear exhaust tuned pipe engine.

Having designed a successful, .29 displacement speed engine ourselves, we were interested in seeing their TWA. We had long ago seen the TWA 15 out in the CL Speed contest circuit, but we were quite curious as to how the new TWA 61 engine looked.

Cliff, the engine man of the team, had an RC carb of his own design made for this massive and impressive engine, which, together with the tuned pipe, will set you back $200 and is available to anyone with that kind of money to spend. Using this Roger Theobold and Bill Wisniewski-designed engine without the full tuned pipe will get you nothing but a lot of noise. Insert the pipe and it turns into a lion. At least a 35 to 40 power rise can be recorded when the engine "comes in." (Bill left K&B, where he was machine shop foreman and designer of all the Dykes Ring Torps, to produce these custom-made precision speed instruments. Knowing quite well that Cliff and Bob had never used a full tuned pipe system, we advised them to concentrate on the ST ABC.

The TWA 61, because of the one in bore, short stroke, and lack of a flat mid-section on the pipe, is a very critical system.

GRASPING The INFINITE
Note expression on holder's face as the engine comes to life. Maynard looks satisfied, George Pickerel reaches the glow plug clip to disconnect.

The TV plane is like an enlarged CL Speed ship. Note access hatch behind wing to get to the servos and internal equipment.

A lot of gear, plumbing, tankage and electronics are crammed into a Speed plane—here's Hill's model.

Something quit—another Speed job is wiped out. Several were lost at Record Trials.

While Bob keeps the plane on course in sight at over 170 mph, Cliff reaches to set the remotely adjustable needle valve.

John Spalding heaves Maynard Hill's machine into the blue. These planes are actually powerful and light, they leap from the launcher's hand into the air.

Cliff Telford has tossed the Violet Speed plane into flight. It is a graceful looking ship. Workmanship is outstanding, design is entirely original.

Photos by Charles and Mike Fitzpatrick
A Clary/Wisniewski 61 with tuned pipe removed. Has the well-proven Schnuerle porting, rear exhaust and rear intake.

The Roselle and Frye engine is a very likely speed record setter. Has chrome-plated bronze liner and piston 20-24 aluminum. This one is only a prototype and some Rossi parts.

A year ago we met Maynard Hill in White Plains, New York. At that time we discussed engine design—the OPS in particular. We thought he would have a difficult time breaking the RC speed record with this engine. He strongly differed with us. We wondered whether he was using the OPS for these record attempts. He wasn’t. (We saw a number of them collecting dirt at Dahlgren.) Both Maynard’s RC speed planes had ST 60 ABCs up front.

Maynard was at Dahlgren with his hard-working team of about six whom we saw launching one of his two RC speed machines into still air. It looked a lot easier than we’re sure it really was. They had already taken numerous flights that morning, and this was just one more run. Intense concentration marked the face of Maynard as he calmly put the plane into a 45º climb and proceeded to make it no more than a large speck to his left. A dramatic turn was followed by a dive you had to see to believe. We were sure he wasn’t going to pull out of a dive like that. He had the engine, an ST 60 ABC, at full bore;

(Continued on page 80)
The OV-10A Bronco was designed by North American Rockwell to replace the aging, unarmed Cessna Bird Dogs used by the Forward Air Controllers in Southeast Asia. Former President Johnson called this aircraft “the airborne equivalent of the jeep.” The powerful Bronco has certainly lived up to its nickname.

In 1966 Air Progress ran a cover story on the OV-10A and included some drawings. I normally look for unusual airplanes; here was one. Not being sure what kind of model it would make, I built up an all-sheet 049 version. Surprisingly, it flew well. A number of these 049 Broncos were tried out with built-up wings, booms and the like. Satisfied I had a good model, I proposed the little bird as an article for AAM, however, it was suggested that I try a bigger built-up version for Carrier or Scale. After much head scratching and midnight oil burning, the prototype appeared at the flying field. While the design was being worked out, Frank Ehling, the technical director for AMA, gave permission to fly the Bronco in Carrier with or without the tailhook. Now we had a model to stop the show in Carrier. And stop the show it does.

Just because the OV-10A has two engines, don’t panic and run away. Though there haven’t been any twin engines in Carrier since the early ’60s, that doesn’t mean twins won’t work. Properly set up a twin can be a real asset. How many times have you seen a single-engine Carrier model shut down and crash like a rock? That second engine will prevent an embarrassing dunking. If you read the fine print in Section 20.10 in the AMA rule book under Navy Carrier, you will find an extra five points just waiting to be given to the owner of a Bronco. Some Carrier models over and lose points or damage airframes. Being a tricycle-gearved airplane, the OV has never nosed over, and I save on props. The extra engine is not a problem if you know your engines. I have normally been airborne in 30 seconds.

Before you start building, decide whether you want to fly Carrier or Scale. If you have no intentions of flying Scale with the “Bronco,” there are a number of things that can improve performance. First get the hottest engines available and install slide valve exhaust and fuel throttling pressure. Replace the clunk type tank with homemade brass tanks and replace the scale wheels with thin speed wheels. Extra details such as machine guns, wings walks, pitot tubes, rivet details and the scale finish can be sacrificed to cut weight. You may want to cut out the centers of the formers but I feel you will cut the life of the model. I am sure there are more ideas, but these are a start.

If you want full scale points for Carrier landings, do the following while
the model is being built. Install a set of Rocket City wheel brakes to the main gear wheels, and actuate the brakes by running a nylon line up to the throttle transfer crank. Since the brakes must stay clean to work, mount the tank overflow tube away from the brakes. A set of Tatone-type manifolds will keep gunk off the wheels.

If you only want to fly Scale with the OV-10A, here are some modifications. Add spinners to the engines, route engine exhaust to scale exhaust ports, make up shock-absorbing landing gears, and make the flaps retracted. By mounting the Nyrod in one of the booms and replacing the sheeted canopy with a .030” plexiglass canopy, the scale effect increases. Add a detailed interior and droppable stores, and the Bronco will take on any scale airplane. More information on the OV-10A Bronco can be obtained from North American Rockwell in Columbus, Ohio, and Garrett AiResearch in Phoenix, Arizona. I have found both companies most helpful.

Construction
The model should be built in five sections and then assembled into one. Since weight can hurt performance (especially in Class I), keep everything as light as possible. The model is big compared to most carriers. Follow the plans carefully. Some new ideas are incorporated in the design.

Cut out all eight pieces of the tail section from a 5” Sig contest balsa. Glue dorsal fin to main fin and fin to stabilizer. Leave rudders off until final assembly. Hinge the elevator with polypropylene hinges—three will do. Mount a fairly long control horn on the elevator to minimize movement. Check alignment carefully, and set aside to dry.

Next cut out the formers for the booms and the 1/8” balsa boom sides, tops, and bottoms. Then bend the main landing gear to shape. The 1/8” m.w. is tough to bend; use a torch, a vise, and a lot of oomph. Be careful. Use the correct size Sig aluminum mounts and drill for your engines (Series 71 Veco 19s were used on the original). Then drill the firewall and bolt the engine mounts to it with blind nuts. If you are going to interchange engines, make both sets of mounts and set up the firewall so they are interchangeable. Bolt main gear to its former with J-bolts and epoxy the whole assembly. These take the landing load so do a good job. Make sure you mount the gear properly: one left, right. Glue formers and sides together, and let dry. Use a long drill to make the holes for the fuel tubing; modify the two oz. Veco clunk tanks as shown on the plans. Mount these on the centerline of your engine. Add 1/8” top and bottom sheeting. The rest of the sheeting is added later.

To build the main fuselage, cut out the formers, make up and bolt the nose-wheel to its mount, and glue the 1/8” balsa sides, formers, and nose-wheel mount together with epoxy. If this is a Carrier Bronco, sheet the cockpit from F-8 to F-10 with 1/8” balsa strips. Section F-10 to wing is left until final assembly. Sheet bottom corners with 1/8” balsa. Add hollowed out windshield, nose and tail blocks. Sand and set aside for final assembly.

The wing is where new ideas are used. Because of the large wingspan and chord, I thought something stronger than balsa sheeting was needed. I tried 1/64” ply sheeting from Sig. No seams are needed since the sheets are large enough. First cut out the ribs and glue the L.E, T.E, and ribs together. Watch for warps. Mount the Roberts bellcrank and the 90° transfer bellcrank to the mount. Attach leadouts, and glue mount in place. Glue transfer bellcrank mounts into framework. Mount bellcranks as shown. Make up transfer rods from
1/16” Oxy-Acetylene welding rod. Check system for smooth operation. Wires from transfer bellcranks to throttles are added during final assembly. Glue flap crank mount in place; mount bellcrank. Make up flap wire and install. Glue on bottom ply sheeting. Cut out openings for throttle wires in bottom sheeting. Make up and hinge flaps at trailing edge. Add brass tubing and droopwire to right flap. Set wing aside to cure. Top sheeting and other wing parts are added later.

Now for the fun part! Collect a number of dope cans, rubber bands, pins and a lot of glue. Epoxy main fuselage in place on wing, using a triangle to check alignment. Epoxy booms in place on wing and make sure it is aligned. Any misalignment can mean disaster with twin engines. Balance whole assembly on the dope cans and allow to dry.

Temporarily mount engines and make up wires between transfer cranks and the throttles, then remove engines. Add corner sheeting to tops of booms—1/8" wide strips work well. Add strip sheeting from F-3 to F-1 on bottom of booms and from F-3 back on the bottom of the booms. Sand and fill any cracks or nicks.

Epoxy tail assembly to top of booms and make sure it is on true. Glue rudders in place with ¼ to ½” offset.

Attach one end of the Nyrod to the Roberts bellcrank, and epoxy one end of the outer tubing to the trailing edge. Notch the TE so the tubing sets flush. Cut Nyrod to length, and attach to elevator horn. Epoxy outer tubing to stabilize spacing it as necessary for smooth operation. Epoxy two or three oz. of lead in the outboard wing tip; don’t forget it. Glue inboard tip on, and put brass tubing bearings for leadouts in place.

Add strip sheeting from F-1 to wing on top and from F-10 to wing on top. Fillet all joints with Hobbypoxy Stuff and sand. Add the four landing gear doors to the booms and the two doors on the main fuselage. Sand the whole model before starting the finishing.

There has been some talk that the Bronco is not usable for Carrier. In addition to the fact that AMA allows landing without a hook, some new information makes the OV even more usable. The Bronco normally uses the reversible turbo-props to achieve slowdown. I have found from USN sources that the OV is fitted with small (Continued on page 78)
PLY BELLCRANK MOUNTS.

TRAILING EDGE 1/4" x 1/2".

CUT OUT TO CLEAR ENGINE.

F-1, 2, 3 3/16" PLY

F-1, 2, 3 3/16" PLY

F-4, 5, 6 1/8" Balsa

ROUND OFF AND BLEND IN 1/8" Balsa:

MAIN GEAR DOOR 1/8" Balsa - 4 Req'd.

2 OZ. VESCO CLUNK TANK

1/8" BALSA STRIP SHEETING

MAIN LANDING GEAR

F-1, 2, 3 3/16" PLY

F-4, 5, 6 1/8" Balsa

SIDE VIEW SHEET CO

1/4" BALSA

Rudder Angle - See Text. Hollowed Balsa Block

2 PROJECTIONS - BIND AND SOLDER

F-1, 2, 3 3/16" PLY

SAME PIECE OF WIRE

FORWARD

1/8" BALSA SHEET

1/16" BALSA SHEET COV

OV-1A BRONCO

DESIGNED BY J.W. LABARGE
INKED BY FRANK ELMIGER

30 October 1972
CUT SHEET COVERING TO CONFORM TO FUSELAGE CONTOUR

PUSHRODS - 1/16" OXY-ACETYLENE WELDING ROD

Balsa Tips
EPOXY LEAD
WEIGHT HERE-
SEE TEXT

Carve to blend with wing contour

W-3
SOLID BALSA

NOTCH T.E. FOR FLUSH MOUNTING OF NYROD

W-1 AND W-2
W-2 1/8" PLY

W-1 1/8" BALSA

W-3 1/4" BALSA

W-4 1/8" BALSA

W-5

TOP VIEW

NOSE GEAR
1/8" M.W.

SIDE VIEW

REAR VIEW

FORWARD

Rudder Post

1/4" BALSA

Rudder Post

1/4" BALSA

Balsa Filler Block

3/32" Dia. Tube

Hollowed Balsa Block

Hollowed Balsa Block

Nose Gear Door
1/8" Balsa - 2 Req'd.

Nose Gear Filler Block

Full-size Plans Available—See Page 84
You're a daring British ace of World War I when you take off in your Sopwith Camel just as the sun rises over France. And you're hoping you'll tangle with one of Von Richthofen's Flying Circus—maybe the dreaded Red Baron himself—flying a fast, maneuverable Fokker DVII.

Now, in these faithful Cox replicas of the Sopwith and Fokker, you can actually dogfight in the skies just as the great air aces did more than fifty years ago.

Whichever side you choose, your plane is powered by a dependable Cox .049 gas engine and is designed for the quick handling and thrilling maneuvers you'll make when you engage your worthy opponent. Both the Cox Fokker and Sopwith models have the authentic type features and markings of the original planes.

Capture the excitement and interest of mock aerial combat, vintage 1918, with these two great Cox flying models. Both have 13" wingspan. High impact plastic to help survive crashes. Priced at approximately $11 each.

Send 25¢ for a full-color brochure of Cox gas-powered planes, cars, rockets and accessories. Address Dept. AA-10
FOLLOWING LAST MONTH'S TECHNICAL ANALYSIS OF UNLIMITED RUBBER MODEL PERFORMANCE, HERE'S THE FANTASTIC 15-MINUTE FLYER. PLANE CAN BE BUILT DIRECTLY FROM PLANS ON THE NEXT PAGES.

JOHN GARD

No one significant design feature built into this airplane pinpoints its outstanding performance. However, the model does incorporate many design features which improve performance, and they have made a significant contribution toward the goal of attaining the "ultimate performance."

Construction

The airplane is not difficult to build. The only power tool necessary is a portable drill. A 4-40 tap and die may be the only items you need to purchase.

The first step in building the wing is to select balsa with the correct density for each component. I do this by weighing each 3 x 36" sheet before stripping to the correct size. (Note the correct wood density specified.)

Make a template to cut out all ribs from 1/32" sheet. Next cut out the center span spar from 1/32" sheet. Notch the spar to one half its depth on the top side, and notch the ribs one half their depth from the bottom side.

Assemble the wing on a soft white pine board. Pin a 3/16" square piece of scrap balsa equal in length to the span of the center section to the board. Pin the spar on top and at the rear edge of this piece. Locate a 1/16 x 1/8" piece of scrap balsa so it supports the aft end of each rib. These two blocking strips will give proper airfoil contour during assembly. Cement all ribs to the spar. Shape the TE from 3/32" sheet, notch and cement in place. Cut the LE from 1/8" sheet, notch and cement into position. Allow to dry and remove center section from the jig. Enclose the top and bottom sides of the torque box with 1/32" sheet. Sand the section to obtain the proper airfoil shape.
Assemble both intermediate and tip panels following the above construction procedure. Build the right tip panel with a wash-in of 3/16". Make sure end ribs at each dihedral joint are 3/16" from their ends.

Bevel the ends of each panel slightly on your bench saw to obtain the correct dihedral angle. Make these butt joints, and cement the tip panel to its adjoining panel. Reinforce both panels to the center panel section. Reinforce all dihedral joints with a light mesh of fiberglass. Shape wing tips from four to six lb. density 3/16" sheet after cementing to each tip rib.

Make a rib template for the stabilizer and cut out all ribs. Assemble and sand in the conventional manner. Shape tips from four to six lb. density 1/8" wood after cementing each to its tip rib. Add 1/32" sheet to center LE bay.

The fuselage motor tube is 56" long. My fuselage is 1-5/8" square, but I suggest a cross section 1¾" square. First build up the two fuselage sides making sure the diagonals cross when one side is laid on top of the other.

Pin to the pine building board two straight strips of wood equal in length to the fuselage and spaced 1¾" apart. Set the two fuselage sides upright between these edges and pin in place. Continue construction by cementing all diagonals, cross members and sheeting in place. Turn the assembly over and complete the top side. Cut the fuselage into two pieces with a razor blade at the separation plane. Add two 1/16" plywood reinforcement pieces and four corner gussets to the forward section. Then attach four 1/16" balsa keys to the tail section. Sand all four sides of the fuselage and reinforce the sheeted nose section with silk.

Make the rear motor fitting from 3/16" mag plate. Cut and shape with hack saw, then file and smooth with emery cloth. Drill a No. 43 hole in the forward end of this fitting, center the one-in. length of 3/32" m.w., and epoxy in place. Drill two 3/32" dia. holes in the rear of the fitting—one to be used for winding and the other to receive a two-in. length of 3/32" m.w. for the rear motor anchor.

Fin and wing mount offer no problems and are built as indicated by the drawing. The fin is cemented to the fuselage after all parts have been covered with Jap tissue, water shrunk, and three thinned coats of nitrate dope (50%-50%) applied.

Make the prop shaft from 1/8" m.w. Cut to length and heat both ends to a cherry red with an L.P. torch and air cool. Chuck in a portable electric drill and file each end down to .11" dia. Cut 4-40 threads on each end. Shape the prop hub from a piece of 3/16" mag plate. Drill the hole for the prop shaft in the hub with a No. 43 drill and tap with 4-40 threads. Open up this hole to 1/8" dia. and a depth of 1/16" on the back side of the hub. Thread the prop shaft to the hub and lock tight with a 4-40 nut. Key the hub and shaft with a .05" dia. wire driven through a 3/64" hole.
Left: Skeleton reveals strong warp resistant structure. Diagonal ribbed fuselage firmly resists motor torque.

Below: Motor is wound from the tail. Rubber bands hold stabilizer unit in place on tight-fitting plywood tongues.

Left: Interior view of rear rubber motor attachment. The "T" mount offers minimum rubber fatigue and an easy grip for the winder without handling the rubber itself.

Right: The hub assembly uses carefully shaped magnesium and aluminum parts. Spinner helps glide slightly.

**METHOD TO CARVE PROP BLADE**

CUT METAL TEMPLATES TO L.E. AND T.E. CONTOURS. NAIL TO SIDE OF HARDWOOD BLOCK 2½X7½. USE THESE METAL EDGES AS GUIDES TO CARVE FACE OF BLADE.

More plans on page 36
The second USFFC is now modeling history. It was bigger and better than last year and promises to be more so in 1973. Symbolically, the USFFC represents FF at its zenith. FFers around the country should start planning now for the 1973 meet—they won't be disappointed. In years to come we will sit around and reminisce about the experiences of the first two years at Taft the same way fliers now reminisce about the first AMA Nationals in the ’40s. In an age gone soft and flabby, this contest is lean and hungry.

Contestants from as far as Canada, New Jersey, Michigan, Illinois, Indiana, Oklahoma, Texas and Mexico chose to spend their Memorial Day weekend at Taft to give the contest’s name validity. The bulk of contestants are contest-wise Californians which makes the competition extremely tough. A trophy from the USFFC’s deserves a place right beside one from the AMA Nationals. It is impossible to accurately convey the full details of the three days of competition. For example, there were many interesting aspects of the contest besides the winners. Maybe some of these impressions will help capture the essence of the affair.

The Field: The desert, with very sparse, tired looking 18 to 30 in. bushes, sandy washes and mountains looming all around, is not level, but it goes for miles with no fences, houses, or man-made structures anywhere. Tom Peadon, the week before leaving Texas for Taft, first had a dream that the site would be miles of mown Bermuda grass, and then a nightmare that it would be one giant sand dune. It’s somewhere between the two.
After a string of five easy maxes on a new Unlimited Rubber job, Bud Romak lost the plane and when being returned the wing folded accidently, then while winding, the fuselage splintered. By flying his old Wakefield for the last flight, he won the meet.

Robert Provar, engineer for Northrop Aviation, A/1 towline glider, 13.3 aspect ratio—named Counterfeit.

Marilyn Taylor launches husband Carl's canard Nordic A/2 towline glider. Carl flies canards in all Gas and Glider events.

Bob White, with brand new Wakefield, using a Bill Bogart airfoil from the 1971 NFFS Symposium report with turbulators. Motor tube is two layers of fiberglassed 1/16 balsa.

Ernst Johnson, Old-Timer Rubber event winner. Model is Bruce Lucket's 1936 Mulvihill Trophy winner—span 32", wing 120 sq. in., six strands of 3/16 Sig contest rubber.

“Tommy-T” Peadon fires up Rambunctious by Coleman light for Night Flying, a popular event at Western meets. He won second place with a K&B 40.

Marvin Taylor launches husband Carl's canard Nordic A/2 towline glider. Carl flies canards in all Gas and Glider events.

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“Tommy-T” Peadon fires up Rambunctious by Coleman light for Night Flying, a popular event at Western meets. He won second place with a K&B 40.
George Xenakis had four Wakefields with torque-actuated stabilizer trim. Used homemade air temperature recorder as thermal-detecting aid. After losing the hang of detecting California thermals, he maxed on three of his five Wakefield flights.

Jeff Cunningham, age nine, son of Vic Cunningham, Jr. Model is 1/4 A Mini-Pearl, Bill Chausant design, M&P kit. This was his first flight with a gas model in a contest—he maxed.

The Weather: Contrary to the popular non-California FFCer's notion, it isn't always dead calm with buoyant air where maxes land at your feet. The wind blows from all directions during the day and sometimes is gusty. Even the night flying event found a fresh breeze blowing the best-lighted ships to the limits of visibility in five minutes. The afternoon thermals are strong, especially for 1/4 A's and HLG's, making for close chases even after dehazing. The downdrafts are there too, even early in the morning. One can't automatically count on good air unless he picks it.

The heat on Sunday was something else. It was like a furnace—with some reports of the temperature reaching 120 degrees. Fliers were forgetting about flying events they had prepared for just to get out of the sun. Sal Taibi remarked that it was the hottest contest he could remember in his career, which must date back to 1812. The heat didn't keep Sal from being his usual competitive self, though—he got fourth place in Payload with one of his Eagle sport FF kits.

(Continued on page 72)
One can become addicted to early aviation research. After researching and building a model of Wiley Post’s beautiful Winnie Mae (August 1970 AAM), we became interested in the aircraft immediately preceding the Lockheed Vega. Precursor to the Vega was the Loughead Sport-Biplane, and research into this little-known one-of-a-kind aircraft has been an engrossing and fascinating project.

Though built and flown 52 years ago, with the exception of Allan and Malcolm Lockheed, most of the original participants are still with us. And without their cooperation, the S-1 project would never have gotten off the ground.

During the Vega research we came across six photos of the slender little biplane. With these and five or so others located in the Lockheed-Burbank files, we began the project. After two years of constant correspondence and probing into various personal and public archives, some 55 construction and flying photos have been amassed. The original 1920 Loughead sales brochure, as modified, provided all the dimensions. Interviews and correspondence with Jack Northrop, the principal engineer, Tony Stadiman, the shop superintendent who built it, Gil Budwig, the original test pilot, and several others provided an almost complete story.

One of the more exciting side effects of historical aviation research came the day my wife and I drove home with the original, one-and-only, two-cylinder engine, its propeller and spinner ring. The S-1 engine, which had dropped out of sight for over 30 years, is slated to go to the Smithsonian as soon as it’s overhauled and test run, providing I can locate a Manley Governor.

Since no original drawings have been found, the drawings with this article were generated over a long period of time, and are based on the photos, published dimensions and review by the men who created and flew the S-1. Data and photos are still being located, so the search will continue.

The Loughead S-1 had several unique design features—an elliptical molded, monocoque fuselage, and for lateral control the entire lower wing pivoted at the root. After landing and during the landing roll, the pilot could disengage the lower wing and pivot the entire lower wing 90° to assist it in braking to a stop. The wings folded up so that the plane could be towed down the highway and stored at home.

The configuration of the model of the Loughead S-1 is scale, and based on the 1:1's appearance at the 1920 San Francisco Aero Show. Like the original, the model is complete with folding wings. Since most of the flying of the real aircraft was done without the cheek cowls, these will be eliminated and you'll still be "scale." While the model has folding wings, they can be eliminated too, if you're concerned about the structural integrity of what appears to be (but isn't) a Mickey Mouse arrangement. The folding wings were built into the model to confirm the functional operation that the original designers intended and to further confirm that the dimensions and proportions were correct.

Except for the lateral control surfaces, which may seem strange but really are practical, the aircraft is conventional in configuration.

Construction

Wings: Wing construction is conventional with the exception of the trailing edges. To obtain the scalloped effect, use 1/32” wire, much the same technique as on the original. Small brass tabs are spaced two in. apart and soldered to the wire edge prior to attaching it to the ribs. This, coupled with the use of one-piece Super Coverite covering for each panel, provides the proper amount of shrinkage for the scale, scalloped effect.

The lower wing is built up using a spruce box spar molded fuselage the required loads when it's used for lateral control. The number of ribs and their spacing is scale with respect to the original. However, the airfoil still isn't exactly known, so the model airfoil is approximated from the photos we've collected.

The "V" struts, the cabane strut construction, and their installation are shown on the plans, and are easy to follow. The small fittings on top of the cabanes for wing and wire attachment are made from tubing and soldered to the cabane wire mounts before the wood fairings are attached.

The plans depict a different leading edge than that shown in the construction photos. The more solid leading edge shown on the plans will tend to keep the wings from warping.

To cover the wings, cut one piece of Super Coverite to cover both top and bottom of the wing. Start at the leading edge and cover the bottom to the trailing edge; follow Coverite's instructions. With the bottom section now covered, continue up and over the top so that you end up back at the leading edge. Super Coverite provides additional strength to the wing, and the shrinkage can be controlled without getting out of hand.

Fuselage and Empennage: As with the Lockheed Vega model, we chunked out in making a scale concrete mold for the molded fuselage halves. The model is planked over a preformed skeleton frame.

Unlike the Vega, which was made up of two identical symmetrical shells, the Loughead S-1 required two asymmetrical shells. (On the S-1, there's greater depth below the centerline.)

Construct a crutch, and attach the top and the bottom forms and stringers. This helps reduce the likelihood that you'll run into a fuselage warping problem, which is, as we all know, a giant pain in the neck. All forms, except for F-1, the firewall, F-3, and the...
end former F-10, were made from 1/8" ply. F-4 and F-5 are to be doubled later, as shown, and provide suitable landing gear and cabane mounting.

Form the front and rear landing gear struts from 5/32" wire from the flat pattern as shown. After confirming alignment, solder the struts to the mild steel fittings shown in the isometric. After the landing gear assembly is completed, install it and epoxy it well in between F-4 and F-5. (Double up F-4 and F-5 as shown.) Be sure of your alignment because it's difficult to get to afterwards.

The S-1 had an axle, which, when used properly, helped prevent ground handling problems. Pin the wheels to the axle so that they'll turn together as a unit, not independently.

42 October 1972

The conventional, early Loughead tail skid is made from 5/32" wire with a soldered brass shoe. Attach this to the lower stringer, blocked, as shown. Remember to keep the entire structure lightweight toward the rear.

The end former, F-10, is made from 1/4" balsa and is left solid until after planking is complete. When you've finished planking, cut out as required to give enough clearance for the empennage controls.

The cabane struts are installed between the doubled F-4 and F-5, and epoxied well into place.

Because of cramped working space, solder up a fuel tank that mounts permanently behind the firewall, then snake the venting fuel feed lines through the firewall. The filler tube is installed
FULL-SIZE PLANS AVAILABLE—SEE PAGE 84

LOUGHEAD SPORT -1 BIPLANE 1920
COMPILED FROM ORIGINAL PHOTOS AND PUBLISHED DATA

M.B. GROVES JUN 1970
up through the top of the fuselage, and is threaded to match a 4-40 screw which was modified with a butterfly head. (On the real S-1, this screw cap covered the water tank to the water-cooled engine.) Be sure to completely check your homemade tank for leaks before installation.

Because of limited space I selected a rear rotor, Supertigre 40, with a Perry carb to improve idling. Mount this to a wooden rail mount of your own design. Attach the rail mount to the firewall with No. 6 blind nuts with Allen head screws.

The ST 40 is mounted flat with the cylinder out the right side for cooling. This places the exhaust downward. A friend of mine, who has access to such things, provided some flexible beryllium copper wave guide material for the exhaust stack. This was attached to the engine exhaust, folded under the engine, and directed out to the left side (opposite the cylinder). Thus, the now somewhat muffed ST 40 is a deep-throated powerhouse. (If you don't have access to wave guide, silver solder something similar.)

The lateral control provided a unique challenge to implement, and while it eventually worked like a charm, it gave us all sorts of headaches until Jim Sunday, famous local "test pilot" and bosom chum, came up with the clever concept shown on the plans.

The wing pivot block, which provides the lower wing support and pivot drive, is a ply structure with the pivoting assembly supported in a Teflon block. There's no way that this can bind. The pivot block is installed and blocked in as shown just aft of F-5. Check for alignment and centering. The total movement of the lower wing is only 8°. It must be positive with little or no slop.

The lower wing is attached to this pivot point by scrounging some eyeglass hinges from your local optometrist. The lower wing is held on with the screw that holds the hinges together. Carefully solder each side of the hinge—one side to the plate which you've epoxied and screwed to the wing, the other side to the pivot shaft in the block.

Provide two additional balsa formers up front around the engine compartment: in front of the firewall, F-3, and one behind the front ring, F-1. Force them into place between the crutch and glue to the top stringer, but do not glue to the crutch or F-1 or F-3. You're almost ready to plank, but first install your servo trays, and check out your servo action on the lower ring pivot and throttle. I used standard servo mounting trays mounted to hardwood rails between the formers.

Now, plank! For ease of assembly, the 3/16" planking strips should be cut to 3/8" widths. After planking and preliminary shaping and sanding, finish the fairing around the lower ring pivot block with soft balsa blocks. Now's also the time to fair in the landing gear and cabane struts. (Check for fuselage warping as you glue, pin and plank.)

Attach and glue the Super Covered horizontal stab to the fuselage. This should be done with the elevator attached to ensure proper operations. Now glue the vertical fin directly to the fuselage after squaring it with the stabilizer. Cut out F-10 and connect the rudder and elevator controls.

Lay out and cut the planking for the cockpit. This requires cutting through the top stringer and the doubled F-5. Use your razor saw to cut F-5 vertically. After some additional sanding and filling, cover the entire fuselage with Super Coverite, using longitudinal strips overlapped. This adds unbelievable strength and cuts finishing time by more than half.

Up front, cut out the cowling using a razor saw to cut vertically between the formers F-1 and F-3 and the extra unglued balsa formers. Now cut horizontally along the top of the crutch between F-1 and F-3. And out pops a cowling!

Cut out the cylinder and exhaust areas, and install the engine and exhaust.

Fittings, etc.: The S-1 had a non-standard Albatros, Halberstadt, rounded-type, Snyder-type spinner. To achieve this miserable shape, heat 1/8" ABS sheet plastic, and pull over a turned form. The ABS plastic spinner is mounted to the aluminum spinner plate with 0-80 screws. Cut out notches on either side of the plastic spinner for the 11" wooden prop.

Cheek cowls, if used, can be made in a similar manner to that of the spinner. Just remember, you've got a double compound curve over which it must fit.

The removable instrument panel is made from ply. Using double sticky foam tape, mount your battery pack to the back of the panel. Sprinkle the
airspeed, throttle (right side), oil pressure, water temperature, altimeter and compass. Other than the type of instruments used and the location of the throttle, the exact panel layout is not known at this time.

The bottom of the pilot's seat is made from balsa and the back is made from shaped cardboard. The whole thing is covered with an old, thin piece of scrap leather.

The tail cone is a piece of bond paper that's been rolled and glued with a balsa plug. Attach the tail cone to the fuselage with pins.

The windshield frame is brass. A single piece of butyrate plastic windscreen is set in the frame and attached to the fuselage.

A soft, old, bought-in-Hong Kong leather wallet was used for the padding around the cockpit. Contact cement will attach it around the cockpit. Then stitch it through the planking and Coverite to hold it securely and, at the same time, give it an authentic appearance.

The original S-1 had wire wheels with fabric wheel covers. Use four circular disc pieces of old sticky Coverite. (Cut a 1/4" axle hole.) Very carefully remove the tire, place the Coverite over the wheel, and press the Coverite discs up and over the edge of the flange, one for each side. Carefully replace the rubber tire. This will hold the cloth discs in place while they're being painted. The wire spokes tend to press through the cloth covering which provides that little extra touch of realism.

Using the pattern provided, make the plans, solder up the underslung radiator from a piece of sheet brass. Attach it to the fuselage with 0-80 screws. Incidentally, use the inside of the radiator to stow your antenna when you're not flying.

Rigging: Proctor turnbuckles used in the rigging, one on each wire. When rigging, be sure there's zero incidence in the wing with respect to the stab. Allow no twists in the wing, and by all means, use the safety wire those turnbuckles. (I test ran the engine once without safety wires, and thirty minutes later I was still looking for pieces and parts.)

Paint and Color Scheme: The S-1 had wire wheels with with fabric wheel covers. Use four circular disc pieces of old sticky Coverite. (Cut a 1/4" axle hole.) Very carefully remove the tire, place the Coverite over the wheel, and press the Coverite discs up and over the edge of the flange, one for each side. Carefully replace the rubber tire. This will hold the cloth discs in place while they're being painted. The wire spokes tend to press through the cloth covering which provides that little extra touch of realism.

Center of Gravity: With respect to CG, after much debate we decided to ignore the small lower wing and place the CG as shown.

When I'm building, I have a tendency to get a little tail heavy (as well as on the model), so I had to add a removable lead horseshoe around the engine. If you have to add such a mass, be sure that it's well secured.

Flying

With an 11" power prop and the ST-40, we took it to the field and fired it up. Cameras at the ready; fingers, etc., crossed, watched Jim Sunday start his take-off roll. Man, straight as a die. Up and out.

Jim was a little concerned about using the lower wings for lateral control, so he didn't plan to try them until he'd gotten up a little higher. But just after it broke ground, it started a very slight roll to the left. Jim hesitantly and cautiously applied the correction. It worked!

Then, up and around the pattern. For the benefit of all the highly-skilled photographers, he made several circuits. High-speed passes. Low-speed passes. Around and around and around until my suggestion to "bring it in, Jim" were borderline violent.

"Ya know," he laughed as he made one more circuit, "a guy could get addicted to this little wing-pivoting toad."

Then lining up for the approach, he throttled back and the engine quit cold. (This, due to a minor pre-flight adjustment.) On in she came, then touched down just like it was supposed to. Those pinned-together wheels are the only way to go.

After congratulations all around, it was discovered that the only problem was none of the ground cameras were working. So, confident with our S-1, Jim did it all again, and when I became certain he was determined to run out of gas, I had to threaten him to bring her down.

Epilog

Shortly after the second flight, we discovered a leak in the fuel system and my receiver was soggy. I got my radio out of there in a hurry, and hung up the S-1 in a place of honor in Jim Sunday's hobby shop.

One evening, a few weeks later and just before Christmas, Jim was open late. Along with the fact that it hadn't been exactly a banner-type day, Jim was alone in the shop and hadn't had his dinner. He was feeling less than jaunty-jolly when a young guy strolled into the shop and started normal I-just-came-in-here-to-kill-time casual gazing around looking at all the "toy" airplanes hanging from the ceiling.

Jim folded his arms, leaned up against the wall and watched the guy through heavy-lidded eyes. The young man looked at the S-1, and then after making a few rather cool remarks about it, he said, "Is that thing supposed to be scale?"

"The eyelids crank up, "You bet it's scale. That airplane is exact. And anyway, who're you?"

"Oh, I'm sorry. I didn't introduce myself. I'm Allan Lockhead, Jr.

Not only do poor beleaguered hobby shop owners have to put up with so-called scale experts all the time, occasionally they have to endure practical-joking friends, ex-friends, and, ooh, it was beauty-full.
Before the end of World War I, the Loughead Aircraft Manufacturing Co. of Santa Barbara, California—like other aircraft companies the world over—began planning for the expected post-war boom in aviation. Long before space age spacings of the Loughead family name in thought of, Allan and Malcolm Loughead (Allan legalized the phonetic spelling of the Loughead family name in 1934). Jack Northrop and Tony Stadilman got all their marbles together and thrashed out future options.

Since the autumn of 1916, when it began in a corner of Bill Rust's garage, the Loughead Co. had expanded all through his shops at 101 State St. America was at war; investors and townspeople enthusiastically supported their local aircraft company and the men employed there.

When Allan and Tony entered into the wildly expanding aeronautics industry in Chicago in 1910, the industry, as such, was a mere fledgling. It was a game, but a serious one. And, often, for keepers.

Then, when Malcolm Loughead and Jack Northrop entered the field a few years later, they—like Allan and Tony—brought prior practical experience in automotive and mechanical engineering with them. By 1918, all four had witnessed aviation's phenomenal growth in the nearly 15 years since Kitty Hawk.

In September 1918, when destiny finally brought them together in Santa Barbara, the chemistry of their individual growth experiences, abilities and personalities catalyzed into a team. Over the months that followed, they quickly developed their own system of balancing out individual pluses and minuses—a creative bloodletting that would lead to the Sport 1 Biplane.

Within the context and course of daily work, the postwar possibilities were discussed, debated and decided on. A new aircraft, designed to fulfill the desires yet fit the abilities of the mass of wartime pilots then being turned out by the military, was eventually proposed.

With this as the basic criteria, what was wanted was an honest airplane—easy to fly, and priced so anyone could afford it. It had to be strong and durable, easy to maintain, and inexpensive to operate. To compensate for the lack of airfields and hangar space, this new aircraft would be storable in any ordinary garage, and easily towed behind a car. And so that it could be flown out of the fields that were available, it would have short takeoff and landing characteristics.

With the requirements established, the group grappled with design possibilities and construction methods. Of the then current fabricating techniques, the monocoque type of construction received a vote of confidence—if only it weren't such a flippin' pain in the neck. Then, with Malcolm supplying the initial impetus, the team worked out a new process. Eventually patented, the Loughead/Northrop/Stadilman development was the first practical attempt to apply plastic methods to aircraft construction.

Prior to this development, manufacture of wood-laminated fuselages was an expensive and time-consuming operation because individual thin strips of wood, butted together, had to be laminated by hand over a series of elliptical forms. Since the adhesive on the first layer generally set up before succeeding layers could be applied, it was impossible to subject the whole structure to a uniform pressure to achieve the desired weld. Sometimes the whole affair wound up pinging and twanging asunder before the total operation was complete. And about the only "production" then was more and better ways of swearing.

Not only was it a frustrating operation in itself, but all too often separation occurred either between the buttetogether strips and/or the layered sections—frequently at the most inopportune moments, such as during mid-flight.

The method the Loughead group developed was a process in which individual thin strips of wood are fitted to the surface of a male mold so that the strips, as a unit, can be temporarily fastened to a removable form. Then, secure in this removable form, the completed layer is removed as a unit, ready for use at any time.

When a fuselage is wanted, the desired number of prefabricated diagonal and longitudinal layers, or units, is selected. The already prefabricated first layer is nested into a concrete female mold and thoroughly slopped with an adhesive. Next a layer of binding cloth is placed on top and painted with the adhesive.

A second prefab unit, put in place and coated, is followed by more binding cloth. After this layer of cloth is coated, the final wood layer is added. The completed ply is then subjected to intense and uniform pressure until the glue is set, after which it can be removed as a unit to be dried. This method produces a uniformly thick shell in which all control cables and horns can be totally enclosed within a fuselage.

After months of jawboning and experimentation, Allan, Malcolm, Tony and Jack created the product: a neat little biplane and a whole new construction process. When the dimensions were finally established, Jack got down to
serious drafting and Tony began work on the concrete molds. Since the S-1 was asymmetrical in shape, two molds were built.

When engines were needed, both European and American makes were researched. A small, economical power plane was desired—a simple, uncomplicated engine made from easy to maintain and service standard parts. Overall, every aspect was considered in order to make maintenance and operation of the proposed S-1 a one-man job. It would be the ideal airplane, an all-Loughead airplane. However, to ensure the success of the total venture, the group considered purchasing an established four-cylinder inline to be used in the prototype aircraft until a Loughead engine could be fully developed and tested.

By May 1919, a nation-wide Return to Normalcy campaign was in full swing. Even though aviation flourished—records broken, "firsts" being made—the aeronautics industry slipped into financial doldrums. Industry-wide, there were layoffs, cut-backs and major changes in direction. Investors cooled. But even though set adrift in these economic horse-latitudes, the boys at Loughead tightened their belts and staked their remaining financial resources, and future, on the Sport Bi-plane.

In the months that followed, final engineering and construction began on the forms, the molds, tools and jigs, on all the things that would be needed to go into aircraft production. For the moment, work on the prototype engine was put on the back burner.

Shortly after New Year's 1920, news of an air show planned for that April reached the Santa Barbara shop. Loughead quickly reserved space for the S-1 to debut at the San Francisco Aeronautical Exposition. And now, with a definite target date to shoot for, the company went all out. The decision was made for an all-Loughead airplane. Let's not wait. And immediately, Allan and Bill Rust began pulling an engine together.

As the S-1 neared completion, the company looked for an experienced experimental test pilot. They found Gilbert G. Budwig practicing his chancey trade in Venice, California. But before making his decision to accept the job, Bud drove up to Santa Barbara to check over the new airplane. He'd already heard a lot about "unusual innovations" and, before risking his neck, he wanted to see what he was up against. Bud had a long-standing habit of examining the engineering and construction on any new airplane. A calculated risk is one thing, being a damn fool is something else.

The design of the S-1's lower wings performed two unconventional functions: Instead of ailerons, each lower wing pivoted where it connected into the fuselage providing lateral control. Secondly, a special control lever allowed the entire lower ring to rotate 90° (after landing) and function as a very efficient air brake.

(Continued on page 95)
Quasimodo

JOHN BURDICK

The basic design for the Quasimodo series was developed during a rainy vacation. I started sketching what I wanted. A 40-sized sport ship that would incorporate the following features: medium size, light weight, construction ease and good aerobatic performance. After a lot of doodling, an airplane began to take shape. A simple box fuselage just big enough to hold the radio gear, shoulder wing, high thrust line and zero-zero-force arrangement. Sheet balsa tail group, straight-edge flat wing with my favorite modified Ritz airfoil, tip plates, and construction heavily influenced by "Das Ugly Stick." Long, wing-mounted landing gear and, finally, a bubble-shaped cover for the tank and aileron servo to avoid carving and (ugh!) sanding a turtle deck aft. I thought I would call this cover a canopy. Canopies are required for aircraft, right?

Functionally, if not aesthetically, this seemed satisfying, so Quasimodo I was built. Its performance was up to expectations, but its appearance evoked such comments from fellow members of the Poughkeepsie IBM Radio Control and Model Club as: "Look at the wing war!", "What's that thing behind the engine?"

Keeping these friendly suggestions in mind, but not eliminating the canopy, since by now I'd grown used to it, I built a cleaned-up version—Quasimodo II. The second ship had conventional tips rather than tip plates. The long landing gear had proven too flexible, so LG location was changed to the fuse bottom. This was a fine performer, but on its tenth flight it executed a rolling figure seven and left me with nothing to fly.

To get back into the air quickly I decided to shrink the design to 35 size and simplify it as much as possible. I like to fly with a power loading of about ten lb. per cubic in. displacement and a wing loading of 18 oz. per sq. ft. This dictated a three sq. ft. wing which was laid out first, and the rest of the design scaled proportionately.

(Continued on page 96)
NEW CONCEPT IN PULSE RUDDER-ONLY COMMANDER '72 SYSTEMS

For 1972 the improved Commander has a Drain Brain switching arrangement in the receiver to reduce total battery drain and increase flying time from 50.8% per battery charge. Plugs are wired into the airbone unit which allows you to switch receiver from plane to plane with a minimum of effort. COMPLETE Flite Pak weights, including nicads, run from 2.5 to 4.8 oz. Transmitter has increased output to overcome interference.

Fully Proportional—Rudder follows directly movement of your stick.

Versatile—The same receiver and transmitter can be used with airplanes from 18-72" span.

Interchangeable—Plug-in wiring of receiver from plane to plane.

Lightest—Weights 2.6 to 4.8 oz. Include nicad batteries and are TOTAL weights.

Simple—Easy installation, actuator has only one moving part. Minimum maintenance.

Inexpensive—Initial cost of system, airplane and engine is low. Nickel cadmium airborne pak and charger are included; transmitter and receiver can be used for many different airplanes.

COMMANDER '72 R-O SYSTEMS

Completely wired and tested, with transmitter, receiver, actuator, nicad battery airborne pack and charger, switch and connectors. Transmitter battery not furnished.

10G15—Baby 225 ma Batt. $11.95
10G15ST—Baby Twin 225 ma Batt. $15.95
10G16—Standard 500 ma Batt. $13.95
10G17—Stomper 500 ma Batt. $16.95

FLITE PAK WEIGHTS & RECOMMENDATIONS

Complete weight of each unit and suggested application:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Weight</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby</td>
<td>2.6 oz</td>
<td>Pee Wee .020</td>
</tr>
<tr>
<td>Baby Twin</td>
<td>2.7 oz</td>
<td>Pee Dee .020</td>
</tr>
<tr>
<td>Standard</td>
<td>4.4 oz</td>
<td>0.49 to 1.0</td>
</tr>
<tr>
<td>Stomper</td>
<td>4.8 oz</td>
<td>.049 to .10</td>
</tr>
</tbody>
</table>

ACE MINI FOAM WINGS

These jobs are being used by and more modelers to come up with their own designs. See recent issue of AAM for P38 and RCM for Mr. Mulligan, Ideal for 1/2A Racing, and other plans of semi-scale or fun types.

Constant chord measures 35" span, 5/8" wide, area 192.5. Weighs 3 oz. More information on QUANTITY Pulse Rudder-Only available anywher.

DIJK'S DREAM KIT

Highly Recommended for Beginners
- 34" Foam Wing—Moulded sections
- Top grade die-cut wood parts
- For .020 engines
- Commander Baby or Baby Twin
- Owen Kampen design

No. 13L100—Dick's Dream Kit $6.95

ACE HIGH GLIDER KIT

170" Foam Wing—Moulded sections
- Precision Machine cut and sanded wood
- For .049—Power Pod parts supplied
- Recommended for Rudder-Only
- Standard = Stomper Commander
- Owen Kampen design

No. 13L104—Ace High Glider Kit $14.95

For Your R/C Flying Fun!

SKAMPY KIT

If you have mastered Rudder-Only pulse proportional flying, and are looking for new ventures, the Skampy is for you. Resembles a stand-off Goodyear Scale Racer. Owen Kampen touches in both the design and kit assures the experienced modeler of a satisfactory R.O. pulse experience. IT IS NOT recommended for beginners.

Has 30" span, wing cut from Ace mini foam tapers. Construction of the fuselage is bit harder than a box type, but still simple for modelers with experience. Fuselage is 23/4" recommended power is 10 oz. Recommended radio installation is Commander Baby Twin. This makes total weight of 12 to 13 oz.

Kits contains taper foam wing set, precision band sawed and sanded top grade balsas and hardwood parts. Balsa landing gear, wire for torque rod and plastic bearing, and hinges material is also supplied. Wheels and props mounting hardware not included.

Full step by step instructions make this a simple job for the experienced R.O. flyer.

No. 13L103—Skampy Foam Wing $6.95

UPSTART 1/2A RACER KIT

By Ron Jacobsen

Uses two sections of the Ace Mini Foam Taper Wings, and one Constant Chord section for a total span of 50 inches. 262 sq. in. Coupled with an .049, the 2T was designed primarily for the two channel Brick type digitalis that are on the market. One or two servos of any digital system is recommended. Also, when constructed correctly, it performs exceptionally well on Rudder-Only using the Commander Standard or Stomper. Motor control can be added to a later date by using the KR7 motor control.

Kit contains three wing panels, all balsa wood completely band sawed and precision sanded, bent landing gear, and miscellaneous parts. Kit, would be of the same general high caliber as previous Ace kits, Hardware for hinges and linkage and wheels left to the buyer.

No. 13L106—2T Foam Wing Airplane Kit $14.75

No. 13L106—Three Foam Wing Sections $5.00 For 2T

R-O PULSE HANDBOOK

UPSTART 1/2A RACER KIT

Name

ACE RADIO CONTROL, INC. * 301 * HIGGSVILLE, MO. 64037

R-O PULSE HANDBOOK

With Only $1.00

Handbook has expanded data on How Pulse Works, Interference, How to Fly, and much more. It will complete information on Pulse Rudder-Only available anywhere.

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

Price is $1.00 for THIRD CLASS BULK MAIL. If you wish letter rating, add 50c for return postage FIRST CLASS.

Add $1.00 shipping-handling for direct mail orders except catalog

2T KIT

By Ron Jacobsen

Uses two sections of the Ace Mini Foam Taper Wings, and one Constant Chord section for a total span of 50 inches. 262 sq. in. Coupled with an .049, the 2T was designed primarily for the two channel Brick type digitalis that are on the market, or two servos of any digital system.

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No. 13L106—2T Foam Wing Airplane Kit $14.75

No. 13L106—Three Foam Wing Sections $5.00 For 2T

ACE HIGH GLIDER KIT

170" Foam Wing—Moulded sections
- Precision Machine cut and sanded wood
- For .049—Power Pod parts supplied
- Recommended for Rudder-Only
- Standard = Stomper Commander
- Owen Kampen design

No. 13L104—Ace High Glider Kit $14.95

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No. 13L106—2T Foam Wing Airplane Kit $14.75

No. 13L106—Three Foam Wing Sections $5.00 For 2T

UPSTART 1/2A RACER KIT

Midrute Racing Just For Fun!
- 34" span, 61" chord, 200 sq. in. foam wing
- Top grade balsa and sandwich wood
- .049 to .051 Tee Dee Engine
- Two channel operation
- Owen Kampen design

No. 13L102—Upstart Custom Kit $10.95
digital commander

- Two channel system using IC's and latest state of the art; may be expanded to 4 channel.
- Receiver-Decoder will work with ANY modern 4-6-8 channel digital transmitter on same frequency! Reads aileron and elevator signals ignores the rest.
- Receiver-Decoder works any modern digital servos.
- Receiver-Decoder offer inexpensive way to go with your present system for glider, plane, boat or car: with extra servos you already have. Or combo flute pak: receiver-decoder, two servos, etc.
- Available on the following frequencies: 27.855, 27.865, 27.895, 27.145, 27.195, 53.100, 53.200, 53.300, 53.400, 53.500

digital commander

RECEIVER-DECODER KIT

IC's simplify wiring and set up of 2 channel decoder. Receiver is conventional double tuned front end using discrete components. Complete with detailed step by step instructions.

No. 12G20—Digital Commander Receiver Decoder Kit $27.95

(Servos, switches, connectors, please specify frequency)

digital commander

SERVO KIT

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

No. 14G20—Digital Commander Servo Kit 26.95

No. 14G20L—As above, except with DS3P Linear Mechanics (less connectors) $26.95

digital commander

FLITE PAK KIT COMBO

If you intend to use Commander Digital with your multi digital transmitter, all you need are the receiver decoder and 2 servo kits. Combo Pak offers savings over kits purchased individually. Includes 3 connectors, switch, hookup wire for cabling. Everything you need to make complete 2 channel 2 servo pack for your sailplane, boat or car, except batteries.

No. 12G30—Flight Pak Combo $69.95

No. 12G30L—As above, but with D & R DS2P Linear Mechanics 71.95

Please Specify Frequency

For complete listing of Transmitter and Combo Pak, Batteries, Packs, Connectors, IC components and RC boards—see our Handbook-Catalog. Price is $1.00 via BULK Third Class. $1.50 via First Class.

digital commander

TRANSMITTER KIT

IC's make the encoder a cinch, and easy conversion later to 8 channel. Built to a standard of excellence, not to meet a price. Complete kit with step by step instructions.

No. 11G20—Digital Commander 2 Channel Kit $48.95

(please specify frequency)

COMPLETE KIT COMBO

Consists of Transmitter Kit, and all parts of the D & R Combo Pak, saves still more. Available initially on 27 MHz spots.

No. 10G2—Digital Commander Kit Combo $117.95

(please specify frequency)

BATTERY & CHARGER OPTIONS

While alkaline accumulators may be used for Flite Pak, Nicads are recommended—4.8 volts.

<table>
<thead>
<tr>
<th>Battery Type</th>
<th>Capacity</th>
<th>Voltage</th>
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<tbody>
<tr>
<td>38K33—Nicoa 225 ma Cylindrical cells</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>38K50—MRB Flat Pack for above (4)</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>38K33—Nicoa 450 ma Cylindrical cells</td>
<td>2.50</td>
<td></td>
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<tr>
<td>38K8—D &amp; R Square Pack for above</td>
<td>1.95</td>
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</tr>
<tr>
<td>38L10—XL-ent 4.8v 500 ma battery pack</td>
<td>8.99</td>
<td></td>
</tr>
<tr>
<td>39K7—XL-ent 225 ma charger kit</td>
<td>1.95</td>
<td></td>
</tr>
<tr>
<td>39K7—XL-ent 500 ma charger kit</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>39K22—Varicharger kit</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>39K21—Varicharger, assembled</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>(Varicharger will charge both 225 and 500 ma and other packs)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No. 39K54—Mallory 1603, 9 volt Transmitter Battery 2.25

Dear Friend:

Does that model above look familiar? To many a reader it will, it is the Nomad. This is a design which quite a few people back, and thousands of modelers built it, and many of them learned to fly on it.

It has been resurrected by House of Balsa at Long Beach, California. Will be available by the time this ad appears. A considerably improved kit form, with top grade Balsa all the way through, and with installation instructions for single channel. (Pulse Commander recommended.)

48" span, with a Baby or Baby Twin, and a 21 oz. .620, and you've literally got a bundle of fun on your hands.

This is our catalog No. 13L50-House of Balsa Nomad, $11.95.

House of Balsa also has a Snostring model called the Glider Queen, $19.95, in 48" span, with a .620 engine. This is a Quarter Aileron stand-off scale. Uses .5 R/C engine with a weight of 13 oz. and 36 inches. Glass spar wings, No. 13L89-Snostring Quarter Midget Kit, $32.95.

The photo shows the new effort by Lee Renard of Airtronics. Called the Questor 42, it's a 62" span, has 409 squares and weights 16 to 20 ounces. For 2 channel operation.

No. 13K85-Airtronics Questor, $26.95

Airtronics Carryall, $36.95.

Apollon Model Specialties introduces the Airtronics Pylon Racer, $32.95. Designed for 15 engine, 5 channel, with a 12" span is 13.91 at $1.98, while the Miles M. 18, 13" span, is 13.92 at $1.98. Complete with nylon thrust bearing, plastic prop, wheels, motor, and two pairs of plans.

The next trade show coming up is the one in Oklahoma. This is sponsored by The Oklahoma Science and Arts Foundation, and the dates are October 28 and 29. We'll be there—come by and see us.

Avenue in San Diego, California, 92103. Russ could have never been there were it not for the help of his family. He was a great friend and will be missed by all who had a hand in making it the best ever.

Sincerely,
Paul F. Runge
What is mylar? Glad you asked! Mylar is the best thing since the phone call from that farmer in Fresno saying: “I found your model and the cows only ate one wing tip.”

Mylar is a clear, paintable, space age polyester film, manufactured by DuPont. Several different grades are produced, all of which will heat shrink at various temperatures according to the use designated. We have chosen a grade in the 275° heat shrink range, so that after heat shrinking with a “Selector” iron, it is least affected by weather and temperature changes. After shrinking, it will withstand direct heat to 150° with no change. Thickness of the mylar governs weight, so we’ve stayed within one quarter thousandth to one thousandth (¼ mil, ½ mil, and 1 mil) using the thickness determined by our research for the particular type model we wished to cover.

How light is it? How strong? Is it fuelproof? Easy to use? Can my models look as good or better using mylar, than they do already? All of these questions have been asked and I’ll try to provide the answers.

Weight of ¼ mil mylar is .8 gram per sq. ft. (clear); ½ mil is 1.6 grams per sq. ft. (clear); 1 mil is 3.2 grams per sq. ft. (clear). As a comparison of weight: Japan tissue less dope weighs 1.5 grams per sq. ft. (28.35 grams = one ounce.) The tensile strength of ¼ mil is 6250 lb./sq. in.; ½ mil is 12,500 lb./sq. in.; 1 mil is 25,000 lb./sq. in. Such strength results in extremely high puncture resistance with great resilience.

Mylar is definitely fuelproof. Clear mylar may be left to set in sure nitro methane. When cleaned off and dried, it can be used as described with no effect showing.

The ease in using mylar is demonstrated by the fact that a ‘C’ Special Satellite 100 sq. in. wing, prepared as later described, can be ready to fly with an hour from covering, start to finish.

The reflective brilliance of a mylar-covered surface is most easily compared to that of glass. Since all paint work is done on the side that will be placed against the surface to be covered, even the smallest model looks like it has fifty coats of hand-rubbed dope, yet weighs less than a doped model of the same structure. An added advantage to mylar is the very low surface drag which becomes important as the model’s speed increases under power.

We combine the use of mylar-covered flying surfaces with a fabulous new epoxy paint process, developed by K&B Manufacturing Co., called Super Poxy which we use on all balsa fuselage and fin surfaces. The Super Poxy process virtually eliminates the dust-epoxy problem, since it sets up dust-free in twelve minutes at 70° and is fuelproof flyable in twenty-four hours.

Light weight again is the name of the game since using Super Poxy involves only: sanding balsa smooth; coating with K&B resin/catalyst combination; covering with K&B’s new one and two-tenths thousandth superlight fiberglass cloth (¼ the thickness of a human hair) and blotting the excess resin up with tissue. The resin/catalyst sets up in from five minutes to one hour depending on amount of catalyst used and does not get brittle or become waxy. When set, spray on a coat of K&B primer with primer catalyst and K&B thinner. After primer is dry, sand lightly with 220 grit 3M tricut silicone paper and spray one coat of your favorite K&B Super Poxy color. (Mixing color charts are available at your hobby shop.) No further sanding or rubbing is necessary and the reflective brilliance rating is 98% that of glass.

Trim colors with Super Poxy may be sprayed after 24 hours. We use vinyl plastic tape—it is extremely thin, bends perfectly around curves and corners and leaves a super-thin paint edge which requires no sealing for bleed under.

Note of caution: K&B’s research and development of the Super Poxy process has been extensive, with best results for the modeler’s use as the prime target. They have succeeded so don’t try to substitute other products into the process.

As a finished example of the total mylar Super Poxy process, see the photo of the Satellite “500” A-Special. The engine, pan mount, timer and accessories weigh 11 oz. and the model weighs nine oz. with ¼ mil mylar covering.

We have found mylar to be an ideal covering material for all sizes and classes of models, from indoor penny planes covered with ¼ mil (don’t shrink it), through U-Control Combat to the largest 1300 sq. in. Satellite class C-D jobs at 1 mil.

Now we can build strength into structure as never before, so tissue, silk and dope are things of the past. Semigeodetic construction is used on all
free surfaces result utilizing mylar to its best advantage. Our 300 sq. in. YAs come out at six oz. ready to fly and the 1000 ‘C Specials barely make 34 oz.

The records set and held by the Series 70 Satellites, covered with mylar, are extensive, i.e., all of the 1971 Category I, II, and C Free Flight Junior records, the 1971 Category I Open C record at 24:04, the 1972 Category I Open C record at 26:41. In addition, the Satellite 1300 holds the Western States special Class D record at 25:00.

I realize that mylar is an entirely new medium for most modellers, and for those who have developed their skill with tissue, silkspan, silk, and dope, the change could be mind-bending. I've been a member of the glue-chewing fraternity for over seventeen years and changes in method don't come easily to me either, but "try it, you'll like it!"

The procedure for painting and covering flying surfaces is as follows: Cover must be added to the clear mylar unless you want to drive the timer crazy! First, paint the mylar on a clean workbench, lay out a rectangular section, twice the chord plus a couple of inches for overlap (all around) of the surface you intend to cover. Tape the section to the bench where necessary to stretch out any wrinkles or creases. Do a solid translucent color with no lettering or design, shake a spray can of your favorite color of "Kandy Apple" brand lacquer, and lightly spray the mylar. Let it set about three minutes and spray again. You'll start to see the color you desire by now. Don't try to make it too deep, as it is translucent. When you are satisfied with the color, let it set to dry. Usually check on the very edge with my finger tips.

An adhesive is applied to the framework of the wing or stab. We use 3M "77" clear spray contact cement. We've found 3M 77 to be the best available, after experimenting with many different types. The container holds 23.5 fluid ounces and it's enough to spray contact several huge "C-D" free flights. Dry weight is 1/10 fluid weight.

Hold the framework to be spray contacted up away from any other material and lightly spray the entire framework, particularly the outline, and bottom. As an example of how much spray contact should be applied, passing the spray over one entire side of a Class 'C' stabilizer should take no more than six seconds. Hang it up to dry a few minutes when the spray has dried for ten minutes or so, it will still feel a bit tacky, especially if you've sprayed your fingers! Always cover the bottom of any surface first, so let's suppose you have sprayed the contact of a flat bottom such as the Satellite. The mylar you have painted is still taped to the bench. Set the wing right down on the painted mylar, locating it so that you'll have enough to cover full length in one piece, and also so that plenty is left chordwise to cover the top, with overlap. Look down on the wing outline and with a sharp blade cut the mylar all around the edge outline. Leave some overlap to allow for error. When the mylar has been cut all around, tip the wing spanwise, first to one side and then the other, to pick up the mylar with the slight tackiness remaining from the contact spray. Turn the wing over and set the center section something so it will stay where you put it.

Now something very important becomes apparent. All the paint is on the inside! Completely fuelproof! If the mylar has moved or slipped readjust it and a bit of finger pressure will hold it in place due to the slight tackiness of the contact.

At this point we plug in the Sealerator sealant iron, and set it at 50% of maximum heat for 1 mil, 45% for 2 mil, or 40% for 4 mil. When hot, touch the center of the bottom center rib on the mylar with the tip of the iron. With just the touch, it seals immediately at that point. Now touch the iron at the leading and trailing edge (center rib) the same way. Do the same at the dihedral breaks and at the center of the tips. Since the wing has polydihedral, we slice the overlap with a blade out away from the dihedral joints at the leading and trailing edge.

This is a good time to do away with a lot of the overlap, so turn the wing back over on the bench. Place a straightedge on the mylar up to within 1/16" of the straight portions of the LE and TE and cut. You'll have to do the curved tip sections freehand but just use the edge for a guide with your thumb resting on it.

Flip the wing over again; you can hold it in your hand rather than on the bench if it's comfortable. With the
Above: Thin cutout paper used to mask the wing ribs for spraying adhesive.

Right: With heat iron, attach mylar to dihedral break ribs and around edges of structure—just like MonoKote, and stretch while heating. Compound cinch.

Below: Pull and stretch while heating. Compound curves are a cinch.

Complete wing and stencil layout of stab covering with spraying of K&B engine in progress.
WITH A TWIST OF YOUR WRIST, THIS SINGLE-BLADED, .010 POWERED THING SWISHES ALOFT. GREAT FUN AND EASY TO MAKE.

H.D.M. SHERRELD, JR.

In Greek mythology, Charybdis was an extremely powerful whirlpool off the Sicilian coast. This helicopter is not particularly powerful, but like its namesake, everything revolves at a rather high rate of speed, and to that degree at least the name was appropriately chosen by the inventor, Charles W. McCutchen of Princeton, New Jersey.

Charybdis was developed 18 years ago, while McCutchen was living in Cambridge, England, and caused something of a sensation when he took it to the British Nationals of 1954. Since that time, variations on the "McCutchen Machine," as the design is more generally called, have occasionally appeared in European magazines, but a prophet is usually without honor in his own country, and the Charybdis seems to have been completely ignored in the U.S.—a pity, since it is no tougher to build than a good hand-launched glider, and more fun than tying firecrackers to your old flying scales.

Construction

Construction is quite simple, with the emphasis on strength. The blade and stabilizer are of sheet rather than built-up, the motor and balance arms are of spruce, and the hub is reinforced with 1/16th plywood. The motor arm is inlaid into the lower surface of the blade, the reinforcing plate double-glued over the joint, and the whole bound with silk or other light cloth. This area is then virtually unbreakable, and also a good flat surface for the balance arm to bear against. You can, of course, glue or even bolt the balance arm in place, but Charybdis is much easier to carry around if the arm is detachable.

The blade is simply a 2' x 2" lath of Min. medium sheet balsa, shaped to a constant Clark Y section, No wash-in, no wash-out, no dihedral breaks; the squarest, easiest wing you ever made. Use a template to maintain section accuracy. Don't try something with undercamber instead. McCutchen tried both undercambered and curved-sheet airfoils, and found the resulting Charybdis to be unimproved, at best, or just plain unstable, at worst.

The stabilizer struts are 1/8th hard sheet sanded to a streamline section. Use plenty of glue and perhaps even some silk reinforcing at the strut-to-stabilizer joint, the only vulnerable area of Charybdis. The stabilizer itself is also 1/8th hard sheet, but is given a lifting section. Be careful to set it at an angle of at least -5° or -6° relative to the blade, as this is most important.

The motor pod is so designed mainly because it looks good. The streamlining probably helps a bit, but is really unnecessary. On the other hand, it does provide a solid mass behind the firewall...
(if you can call it that) and a little more weight. (The Cox O10 is awfully light.) The 1/8-in. plywood firewall is inlaid into the motor arm, and the pod itself built up from the same 1/8-in. stock used for the blade, or anything else in the scrap box, then carved and sanded to shape. With the motor inverted, as shown in the photos, the mounting screws bear through into the spruce arm instead of the soft balsa. Add a wire guard loop if you think it necessary, but the prop generally seems to be enough protection for the glow plug even when landing on bare spots.

Thinned, clear, hot, fuelproof dope is used on everything except the motor pod and adjacent portion of the motor arm, where straight dope is used for extra protection. Colored dope could be used, of course, and should produce a pretty jazzy effect with Charybdis revolving at the speed it does.

The inverted position of the Cox O10 has been found the best after much painful trial and error. The tank outlet is slightly high, but the fuel line itself is at the extreme outside of the swept circle, and fuel does not have to fight centrifugal force on its way to the needle valve. The other arrangements that seem so obvious either don't work for one reason or another, or offer no particular advantage.

Because of variations in engines, fuels, weather, altitude, etc., finding the proper needle valve setting is something you must do yourself; there is nothing else for it. But there is one peculiarity of the system worth mentioning that makes all the difference in running time: an odd combination of forces and pressures is at work that requires block-

(Continued on page 68)
CHARYBDIS
Invented by: C.W. McCutchen
Designed by: H.D. Sherrerd
Scale as noted 7/1/64

Blade: ¼” medium sheet

Stabilizer: ⅛” hard sheet

Balance Arm: ⅜” X ⅛” spruce

Center of gravity & Center of rotation
(Aproximately)

Motor Arm: ⅜” X ⅛” spruce

Motor Arm: plywood

Cox .010
Motor Pod: laminated ¼” soft sheet

½” plywood reinforcing plate

1” plywood firewall

Blade area: 48 sq.in. Weight: 3.1 oz.
SUPERCOAT SPRAY

* LONG SHELF LIFE
* GOOD COVERAGE
* FINE SPRAY

A completely new formula that sprays a dense, fine mist. Supercoat Spray Dope covers well and adheres to the surface with less tendency to run or sag. Long shelf life. ANOTHER FINE SIG PRODUCT!

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CUT YELLOW
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CARNIVAL YELLOW
CHINESE RED
FOREST GREEN
METALLIC BLUE
METALLIC ORANGE
GLASS WHITE
GLASS BLUE
FLORID BLACK
FLORID WHITE
METAL PRESS

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A Plastic Paint For Foam

HIGH GLOSS
FUEL PROOF
SAFE ON FOAM
GOOD COVERAGE

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7 BRILLIANT COLORS
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BLUE ORANGE YELLOW GREEN

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Use Alone or With SIG Superior or Color Dope.

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A white, contact type adhesive for bonding balsa, plastic, plywood or paper to foam wing cores. Slow drying (one hour) but well worth the wait. Foam will tear out before the Core-Bond gives up.

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* Won't Attract Foam
* Does Not Adhere to It

**PICT - $1.95**

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A New Adhesive For Bonding BALSA TO STYROFOAM

**Pint - $1.35**

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**WOOD FOR USE WHERE MAXIMUM STRENGTH IS DESIRED BUT HALF THE WEIGHT OF OUR REGULAR AIRCRAFT PLYWOOD.**

**FLAT BIRCH PLYWOOD**

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**SIG TOP QUALITY GLASS CLOTH**

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**SIG FIBERGLASS KIT**

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<tr>
<td>Mixing Cups</td>
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Control Line

BILL BOSS
SPORT AND SCALE

Old-Timers: When we talk of Old-Timer activities in aeromodeling, most modellers immediately think of the free-flight category known as the Specials, support and publicity given by the free flyers. However, in recent years there has been an attempt to bring Old-Timer activity into control line. There has been evidence over the past two to three years with ships such as the T-Bird, Smoothie, Chief, and Noblers, using the old AMA Stunt rules. There has been an attempt to bring Old-Timer increasing numbers of clubs running Old-Time completed as shown in the kit.

A recent comment from Quinn Flinta suggests that perhaps the Old-Timer theme could also be related to Scale. Quinn makes his point by illustrating his recently completed B-26 from an old Cleveland kit. You can hardly get more old-timer than that. The plane's construction is beefed up in the nacelle and landing gear areas to withstand engine vibration and the rigors of CL flying. All other construction was completed as shown in the kit.

Unique B-26 by Quinn Flinta made from a 1944 Cleveland SF-Master Kit uses 15s for power. Excellent cockpit detail and complete aluminum skinning with all rivet detail.

Why not more of this type of construction? While kits are not available from Chicago Models, there are many plans for old-timers. Why not an event where only old-timers such as the B-26 that Quinn has shown us are entered? The event doesn't necessarily have to be part of AMA A's team funds. A club auction may be the answer. Jerry Farr of the Key City Prop Twisters in Abilene, Texas, reports that 111 items were sold at their most recent auction with 25 percent of the proceeds going to the club treasury for club-sponsored activities. Sounds like a good idea as an adjunct to a regular club meeting and a means of disposing of the old-modelling gear you no longer use.

Clunk Tank Improvement: To the fuel tank in your clunk tank from folding over and restricting fuel flow, replace some of the flexible tubing inside the tank with copper tubing. Use flexible tubing only to connect the copper tubing to the outlet tube and to the clunk.

JOHNN SMITH
SPEED AND RACING

Soap Box Gleanings: An interesting letter from Donny Henry in Tulsa, Oklahoma says he would like to see limits put on some events as far as equipment, modifications, and cost are concerned. He points out that Rat (here we again) has gotten out of hand for the beginner flier with custom engines, super fuel, and restricted use of older fliers. As a result, he has received numerous letters from experienced fliers who think there is too much knuckle, teeth grinding and grumpiness, at supposedly fun type sports events. These letters are received, many interesting points can be used in this column, but remember there are many differing opinions. I have received a number of letters taking me or others to task for tree ideas and suggestions expressed in this column. I rate them all, but some are held in higher regard than others—otherwise it's File 13. Let's give everyone a chance to be heard.

Which Way Strength: Let's face it! It's critical! Where do we stop, securely? Wires, line clips, external construction joints, we can see. But what about the internal joints? For the most part, we don't. Carrier models experience rough treatment during a contest, and at a recent focal activity, a Class II Carrier model disintegrated from the wing forward at about the fourth lap. Fortunately no damage was done to anything but the airplane.

Now, how do we inspect the aircraft internally? For the most part, we don't. Carrier models experience rough treatment during a contest, and at a recent focal activity, a Class II Carrier model disintegrated from the wing forward at about the fourth lap. Fortunately no damage was done to anything but the airplane.

Proto Speed is a good example where rules have been bent, stretched and otherwise abused until their intent has long been lost by the wayside. When started in 1955 it was primarily an extension of Team Racing type air-planes, according to the rules, looked like air-planes. I can remember one model which was disqualified at the '57 NATS because it had a swept wing and the event director decreed it didn't meet the look-like-airplane part of the rules. The resulting furor included a sit-down striker by the contestants, the resignation of the event director, and many impromptu meetings to straighten things out. After all the hassle, the airplane was allowed to compete. Today 65 to 75 percent of the proto ships flown wouldn't pass the processing of those days. What is the answer?

Let's hear from you.

JOHN BLUM
CARRIER AND STUNT

This is strong—a Martin HO-1 with .100 sheet aluminum wing. S.T. 65 drives it and Bill Johnson-type throttle system controls it.
Profile Hook Assembly: Sketch shows a typical setup for a profile carrier model landing flap and hook arrangement. Hook release is accomplished by "snapping" extreme down-control.

Flap installation is typical, except the horn is on the inboard side. Elevator and control pushrod assembly is somewhat typical. Plywood doublers, 3/32", are added to set into the fuselage sides at location which centers with the tailhook pivot. After the hook is installed, a shim-stock horn is soldered to the end as shown and connected to the flap linkage.

The arresting hook release consists of a piece of brass or aluminum tubing epoxied to the side of the fuselage through which a 1/32" m.w. release rod passes. One end of the release rod is soldered to the elevator pushrod and the other end protrudes through the tubing. A hook of 1/32" m.w. to solder to the arresting hook is made with a loop in the upper end through which the release rod passes. The down-activating force is then created by a rubber band connected by small hooks to the fuselage and the arrest hook. The arrest hook is slotted with a piece of brass tubing at the pivot. A simple, quick method, but adequate.

Unfortunately, the model is uncompetitive since the class in which it must compete is determined by totaling the engine displacements. Thus, with two .19s, competition would be in Class I. Anything larger would fall into Class II. The maximum is .65 cu. in. total.

Stunt Model Landings: Some novice stunt fliers consider landing one of the simplest maneuvers. However, it is difficult to do (at least total 49 points), and takes practice to perfect. How many have made a near perfect landing only to have the model roll into the wind and lift off again? The lift-off may be only momentary, but it is disastrous to your score. There are some approaches to remedy this situation. One is to build and fly models with a tricycle landing gear. The presence of the nose wheel permits the application of extreme down control just after the model touches down. Another approach is the long-tail wheel landing gear to place the model at zero or near zero angle of attack after touchdown. It's not the final answer to the perfect landing, but it helps.

Free Flight

FOB MEUSER
SPORT

Windy-Weather Nordics: Chicago Aeronaut Charlie Sotich's Draw Dip Nordic is featured here in its drawings and construction notes. The Draw Dip model is described as a good beginner model with many features, including ease of construction and a unique design. The model is built with a single-wire joiner, which provides an advantage for adjusting wash-in, and is powered by a .30 cu. in. engine.

The model's drawings show the layout and construction details, including the use of rubber bands and a single-wire joiner. The model is designed for easy adjustment and is powered by a .30 cu. in. engine.

Note the wing joiner wire on the three-view. A single wire 5/32" dia. is used in place of the usual two or three wires of smaller diameter. The peculiar T-shape results in great flexibility, as the fore-and-aft legs act as torsion bars. The wings can deflect to a tremendous dihedral angle when the model is towed without fear of the wires taking a permanent set. The flexing of the wire occurs outside the wing, rather than within the wing tubes as it does with the conventional straight joiners, which takes some of the strain off the joints. With a single-wire joiner, the wing panels can be shimmied independently to provide easy adjustment of the wash-in of the panel on the inside of the turn. We don't know whether Charlie takes advantage of that feature, but Toronto's Tam Thompson uses a single-wire joiner for that purpose. The joiner is not built into the fuselage; instead, the wing is strapped to the fuselage with rubber bands after the wing panels are slipped over the joiner. Everything has its drawbacks. Bending 5/32" music wire is, let's say, character building.

When tiny electronic buzzers first hit the market, I was one of the first kids on the block to try them out in my box-tops for one. However, it produced such a pathetic little peep that I abandoned it. My mistake was not trying it outdoors in a model. Fliers like Charlie report that the buzzers can be a big help when finding a model buried knee deep in weeds. The buzzer weights only eight grams, and can be obtained for $4.50 from Projects Unlimited, 1926 East Sliebenthaler.
The wing and tail outlines are laid out according to what has been called the "parabolic development" shown in the sketch, similar to the surfaces on many of the best designs. You could just draw around a handy French curve, or the size of your shoe, but consider what the parabolic development has gone for it: it is easy to plot, and is reproducible. That makes scaling a model to a larger size a cinch. It is easy to figure the wing area by just taking 5/6 of the area of the enclosing rectangle = parabolagram. The best covering squares or weighting sheets of card board cut to the wing outline. Compared to the ellipse, it has a wider chord near the tips—narrow chord equals low Reynolds number equals bad omens. And lastly, it pleases the eye.

The fuselage is just a glob of balsa propped atop the fiber glass boom. The lead ballast weight slides into the front of the boom, is positioned to the proper balance point, and is pinned in place. Wonder whether Charlie shaped the front end to look like a dolphin on the model?

The wing construction looks monstrously complicated—37 ribs, count 'em, and all different. But actually, there are no ribs to cut, or at least not now. In the ordinary sense, which should be bad news to shareholders of Band-Aid Stock. The ribs are simply plain strips, the airfoil is sanded in after the assembly with a specially shaped sanding block. We'll save the construction details for next month. At this point a few words about the airfoil section are in order.

The top-surface profile is a ten percent Annenberg Simplex airfoil. The Simplex airfoils, often used on indoor models, appeared in the 1920s in the Annenberg catalog and subsequently in the Internationalist, Nos. 11 and 12. Mathematically it is a logarithmic or equi-angle spiral, and it has a unique property: any piece of the curve starting with the leading-edge point is a scale model of any other piece of the curve which includes the leading-edge point. In other words, you can use the same template to cut an airfoil of any chord and any percentage-thick, it will all be right on. The bottom surface is simply a circular arc. Since the radius of the arc is constant, the undersurface decreases, percentage-wise, from the root to the tip. But, because the planform is rather full toward the tips, the undersurface change is only about one percent from the root to within 10% of the tip. For the geometric structure, a shaped sanding block takes the place of a rib template.

Stay tuned to this column for further developments in the saga of Life with Draw Dip.

WALT MOONEY

SCALE

Contest Season: The scale contest season seems to be underway, at least in Southern California. Bob Peck, the producer of a new line of scale models called Peck's Polyimers, sponsored a contest for models built from his Miles M-15 kit. About a dozen contestants showed up for some competitive flying. Walt Mooney, who didn't compete, was drafted to judge entries for Scale. It wasn't easy, but the end result had Bill Hannan top in Scale and Bob Bradley top in flying for the Open Class. The Owlkerners held their monthly Scale contest and it looked like the Peanuts were flying over. There weren't many Gas entries, so for fun Walt Mooney entered his Phart-Foxxer as a Foxxer E-1. This model, designed as a beginners' Sport Gas model, has a tall thin profile, and it was entered for maximum dihedral points. Some minor complaints were made about the pilot but the fun factor was clear. Let's go—now we'll describe the rules mention scale pilot requirements. The model proceeded to get top flight points for the day.

The author doesn't really advocate the entry of semi-scale models in Scale contests, but he is a real advocate of fun in modeling. The piece de resistance of Scale contests was the annual Scale Seaplane contest put on by the Vagabonders at Lake Elsinore. They must have a special pact with the gods of the thermals because the weather was quite calm, it was warm and sunny on the contest day.

The quality of flying has improved significantly from the average of previous contests and most everyone managed to take off once. But the quest for light weight has resulted in less-than-waterproof dope jobs on the smaller models. They have more difficulty taking off, and graphically illustrate by their flying that they get increasingly tail heavy. Granby Williams entered a very nice RC Deperdussin Schneider cup racer and demonstrated the grammar that even an RC model can sometimes save a tail heavy model if it is skillfully piloted. He also flew a three-engined Blom und Voss seaplane for the Open Class, but it would only fly with full up elevator which made it difficult to turn while maintaining altitude. One impressive performance was an RC Shore string model designed for easy restarting. Gas engines can still be made to start after a few seconds, but rubber-powered models keep running which can result in an accident at being a submarine.

At least six of the Las Vegas contingent enthusiastically took part in the contest. Seaplane flying is really fun, and the spectators seem to enjoy it as much as the contestants. Maybe it's the tendency to return to our primordial ancestors in the sea.

Peck Polymer's second kit is a model of the Ford-engined Pickering Air camper. Bob Peck's original model has won several of the local Peanut scale events and many come over two minutes outdoors several occasions.

Bamboo Splitting: A recent letter asked about the techniques for splitting bamboo in some of the old-timer models. The writer has trouble every time he tries to split off a one-sixteenth inch thickness because, though it is a matter of getting the split off straight, the writer always gets a taper. The real old-timers know that to get parallel-sided clean edges, the split must be made down the center of the original piece until you finally achieve two pieces of the correct thickness. For instance, a quarter-inch piece can be split into two one-eighth inch widths and each of these can be split into two one-sixteenth inch widths. Trying to cut a single one-sixteenth inch piece off the quarter inch piece will almost always taper thinner towards the end of the split.

Even more modern models occasionally use bamboo. It makes strong, resilient rear motor pegs, very thin wingtip bows which are more slender than sheet balsa, and can be used wherever a thin yet strong and supple member is required.

HATSCHEK

GADGETS AND EQUIPMENT

The "Littlehook": Back in the 19th Century when this gadgeteer's paternal ancestors migrated from Moravia or Bohemia to the Austro-Hungarian Empire, they changed the spelling of the family name from the Czech Hacek to a more Germanized Hatschek. All of which is quite immaterial except for one thing: The Czech word hacek means little hook, and what we call a towhook, Czech glider fliers call a hacek. Which brings us to Hatschek's havek.

Basic hook components are aluminum, steel wire and brass.

This towhook mechanism is a major departure from the swinging style of hooks presented last month. It works as well, providing some distinct advantages: easy starting, straight tow, circle tow, zoom launch and glide circle. It has proven itself useful on five Nordics during the past year. No claim is made that it works any better than previously described mechanisms. Its major advantage, and the basic reason for its development, is that it can be installed in a glider fuselage consisting of a sheet aluminum pylon epoxied into a slot in a fiberglass rod. It is lighter and more compact than the other mechanisms and also provides a mounting arrangement with sliding adjustment. Though it is not simple to construct (remember gadgets), clever glider fliers can probably figure out ways to build it.

The individual parts of the mechanism are...
shown before assembly in their completed state except the .010" wire latchspring (center) and the .031" wire lever (near bottom), both of which are cut off after assembly for convenience. No dimension is especially critical, but the general positioning of all pivot points, stops, latch and adjusting screws was finally determined by a detailed analysis of why a previous version didn't function as well as it might have.

Advantage of this hook design is compactness. Body is 5/8" fiberglass fishing rod, pylon is 3/32" aluminum alloy.

Two-position autostop works in conjunction with unusual towhook to give four rudder positions.

The hook itself is made from 3/16" flat aluminum, the pivot mount from 1/16" flat aluminum, all wire parts except the latch spring are .031" diameter, and the two bushings are brass (ID of the pivot bushing is tapped 2-56). The upper portion of the hook is milled down to about .080" thickness from the right side. This could be done with a file, but it would be rather tedious. Other machined details on the hook, such as the shallow pocket into which the latch retracts, could be produced with a Dremel tool.

How does the hook function? The second photo shows the hook in latched position. It's rather evident that a tow ring ahead of the latch would pull down on the wire lever, pulling on the line that goes back to the rudder horn to center the rudder for straight tow. Easing off on towline tension allows the lever to rise, and the rudder swings over into a turn. If a two-position rudder stop is used, the rudder actually swings past the glide turn position for circle tow.

Articulated towhook in latched position. Towring omitted for clarity.

A hard pull on the towline, 3 to 7 lb., unlatches the hook and allows rudder to move toward glide position.

Tension of the main operating spring is adjusted by an inch-long screw (not shown) that is accessible through the nose of the glider. The only reason for the separate wire ring going toward and from the top of the hook to the operating spring is to clear the aluminum pylon inside the body. The spring is also inserted through the nose, and you have to fish around a bit to hook it up. A bright light shining through the fiberglass body helps immeasurably. Depending on glider trim, wind velocity and such considerations, the tension at which the latch releases should be set at from 3 to 7 lb. (using a fishing scale for calibration and always holding the glider body by the rear wing rod).

Installation of this rudder is shown in the fourth photo. The pivot mount goes on one side of the pylon, the hook on the other. The tapped bushing, which is firmly screwed to the hook, is long enough so that it doesn't bind in the pylon slot. The screw at the rear of the pivot mount simply clamps the works in the desired position.

Autorudder detail is shown in the next photo. The line at the bottom of the photo, connected to the rudder horn, is the one that comes from the towhook. The line at the top of the photo is hooked to the horn of a two-position rudder stop. The other end of this line is released by a pin attached to the towline which also starts the dehaverimer timer in a fashion similar to normal autorudded actuation. Four 0-80 screws are used for various adjustments.

Bob Stalick

Glider, Rubber and Power

Silver Anniversary—Thank you, Navy: When you read this, the 25-year-old tradition of USN-AMA-operated Nationals will be history. The times they are a changin', but the relationship has always been a friendly cooperative one. Too bad it has to end, but it is fitting that it lasted this long and that it marks a full quarter century. Some are the fine officials, timers helping hands. Now, the AMA is on its own to do those things we have come to expect. Help is needed from all members: ideas, suggestions, your free time and labor. Drop your AMA representative a letter or give him a phone call. The Nats probably will change; whether they change in a way you approve or not depends, in part, on you. Let your ideas be known. If you can't be part of the solution, then you might just be part of the problem. The National Free Flight Society and other subsidiary organizations will be called upon for their ideas to run special events at future Nats. They will be seeking help and ideas. If you are a member (and you should be), let them know too. The idea is to communicate.

Navy photo of Jim McNeil, at the Nats '71, releasing his B Gas ship for an official. Note it as a pusher design!

While you are at it, drop a thank you note c/o The U.S. Navy, Glenview NAS, Ill. Twenty-five years of cooperation deserves no less.

American Aircraft Modeler 63
New newsletters: Now and then a newsletter which is timely, informative, and humorous comes on the scene. "Free Flight" and "Free Flight News" (England) are a couple that come to mind. Now add "Conn-Tact", newsletter of the Southern Connecticut Aero Modelers Association (SCAMA). It is edited by Ron Evans, 83 Blake St., New Haven, Conn. 06511 and costs $1.50 a year.

The general arrangement of single wire systems. The most popular version is Fig. 1. Since the angled post and thrust bearing allow the wing to be removed without disturbing the motor stick bracing, adjusting the wire tension of this bracing gives both left and down-thrust simultaneously as the motor stick bends under the pull of the motor. Fig. 2's single wire setup requires that the fuselage brace wire be removable at one end and the wing be removed. The most common arrangement is for the wire to have a loop which hooks the thrust bearing as shown. Since wire tension pushes down on the wing posts, the wing posts must be pushed all the way into the sockets and the bottom of the sockets must be reinforced with a balsa plug. This arrangement has two advantages. First, downthrust and sidethrust can be controlled separately. Second, the only necessary weight on one bracing stick is the wire and the tiny blocks on the side of the wing posts to hold the wire. Move these blocks up and down to control the tension.

Important Note: All motor stick bracing should use tungsten wire at least 0.011 in. in diameter. This wire is available from hobby suppliers only. Other bracing systems will be discussed next month.

Radio Control

DON LOWE

SPORT AND PATTERN

Five Ways to Get Shot Down: Spotted in the "Valley Forge Signal Seekers News Letter" some experiences worth repeating — it might save you an airplane sometime. Bill Patterson writes about conflicting transmitters. "Of all the ways to put a good ship into the turf, this one really hurts since about 99 percent of the reasons for accidentally turning on a transmitter are easily preventable. It is usually done by an uninformed or absent-minded individual. Fortunately, there are not many nuts around that would do this just for kicks. Here are several situations which actually happened at our field or at other club fields:

1. Some time ago, several young lovely visitors found their way out to the flying site and became intrigued with our model aircraft. They asked one of our fliers what makes them go and with this, he obligingly turned on his transmitter to show them. He forgot about not having the colored clothespin snapped to his antenna.

2. "A couple of uninformed beginners had just purchased a Tornado Skyhawk but no one, not even the hobby department salesman, had told them about frequencies and interferences. Unknown to us, they selected a spot to fly about 300 yards from our pit area. It wasn't long before their transmitter caused another plane to crack up.

3. "When you have more than one transmitter, frequencies can be easily mixed up.

4. "One flier has two identical transmitters on different frequencies — both with detachable antennas, each with a different color frequency flag. You can imagine what happens when you attach the brown-coded antenna to the red-coded transmitter and then turn one on!

5. "Again the two transmitter man with his antennas properly attached, but this time snapped the red pin to his brown antenna and forgot to look up his frequency flag to see if the colors were the same.

6. "One flier removed the frequency clothespin from another transmitter which was apparently sitting idle, without first locating its owner. When the owner of the idle transmitter returned, he immediately turned on his transmitter without noticing that the frequency pin had been removed. If you have ever removed a frequency pin in this manner, I guarantee you will never do it again."

Does any of the above sound familiar? I'm sure it does if you fly very long. The problems range all the way from lack of proper instruction to the beginner to just lack of coordination.
plain carelessness on the part of the experienced flyer. Believe me, it's worth a little extra care and caution to save this wonderful RC hobby. One of his money-saving ideas is to build a new transponder for those hard-to-get together. He simply solders a standard flap and lengthen the flap into a piece of brass tubing. The check-end of the tubing is filled with solder and then the whole thing is inserted into the cavity. He says that this drill can reach as much as 14 inches with a substantial savings in cost. Using this basic idea, he extends an Allen wrench by soldering a straight section of wrench into a tube with a bent wire for a handle. He marks the end of the wrench and uses all facets of RC modeling. He would appreciate correspondence from those of like interests. Write to him at 89 Crawford St., Woonsocket, R.I.

Manuel de la Concha of Club Colombiano de Aeromodelismo in Bogota, Columbia demonstrates a modified Simco with Kraft/Enya 60. Down there, they fly at an elevation of 8600 ft. above sea level.

Continuing the Safety Theme: Word from Charles Scaggs of West Germany suggests a safety check list to be used at home or at the flying field as appropriate. His suggestions include:

- Other Channels: Check with other fliers at the airport about frequencies. Position your work area close to the other fliers. Use a frequency flat on your antenna. As extra insurance display your radio frequency number on your flight jacket and flight box.

- Fuel: Know total burn time of tank in normal flying conditions. Top off tank before flight after continued ground checks. Check output meter if so equipped. Mark the output meter with plastic tape so any small change will be evident. Reinstall antenna tightly and in the fully extended position.

- Traffic: Who is flying? What kind of flying are they doing? Perhaps it would be better to wait for a clear field with a new airplane.

- Trim: Set for takeoff. Observe that the servos continue to move at the same rate. Servo response should be linear throughout the full travel, if not, the system may not be free of binding. This last item can cause a random failure of the servo. Recharge for 24 hours prior to flight.

- Controls: With full batteries operate all servos to simulate flight conditions for the span time of your expected flights. Observe that the servos continue to move at the same rate. Servo response should be linear throughout the full travel, if not, the system may not be free of binding. This last item can cause a random failure of the servo. Recharge for 24 hours prior to flight.

- Antenna: Remove antenna and perform range checks. Check output meter if so equipped. Mark the output meter with plastic tape so any small change will be evident. Reinstall antenna tightly and in the fully extended position.

- Pattern: What direction is the established pattern? Are there alternate landing points around the field?

- Wind, Velocity and Direction: High velocity winds require high speed approaches to offset the head wind reduction at tow speeds. Maintain power on the approach at a set trim for power glide, and do not attempt to stretch the glide or hold up elevator pressure. Keep sure to take off into the wind. With strong winds, gain some altitude before starting turn.

- Pattern: What direction is the established pattern? Are there alternate landing points around the field? Full Throttle Check: Open throttle for a 20-second period, see mixture slightly rich for takeoff. The mixture strength will lean out during maneuvers.

- Mixture Strengths: If you're wondering why there were so many crashes, I think the increased speed has a lot to do with it. Four planes failed to finish the last turns. The pattern was the first to go through the barrier, with a 1:29.8 at Bakersfield on June 4. Then Larry Lash of the West Coast Flying Club with a 1:29.4. Smith is not one to stand by while his records get broken. He borrowed a prop from Johnny Brodbeck with which Johnny had turned 1:34 while flying a course that could not be described as light. With it, Smith turned a 1:27.9. His course could in- deed be described as tight—like right on top of every other bug.

- High nitro makes quite a difference in the new K&B Schnuerles. Clarence Neufeld, who turned second and 1:42.0 at Bakersfield, was mostly turning around 1:30 until he put 75 percent nitro in—then he turned a 1:30.2. I thought his gold and offf White Stain unloads the price airplane at that spectacular event. He had a perfect score, but couldn't get his engine started for the fly-off with Bob Smith.

The Bakersfield event broke all kinds of records. It was the largest RC pylon event in history with 95 entered and flying (there were 100 pre-entries). 119 airplanes for handicap judging which they accomplished in 45 minutes, thanks to the dire-8 eyes of Jack Fabbi, Morse, and Jerry Christensen—and there are some always there, with 140 flights and 95 per cent of the events outside California. There were 27 fliers who turned 1:40 and more than 70 flights under 1:50. Four entries were actually flying, National champions were entered and racing, and all but one of the previous NMPA champions and winners were entered and racing. Perhaps the youngest FMA flier in the country, Steve Sica, 11 years old, was flying. It was an introduction, and Jo Von Ander, who also flew, is the oldest in the country.

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BOB STOCKWELL
planes and engines. The big props will take 10 to 15 seconds off anybody's time and cold fuel will take another five to ten off. Big props will make the takeoffs easier and safer and improve the acceleration, but slow them down in the straightaway. Maybe we ought to try it. Cliff Weirick's been pushing the idea for four years.

The really serious question about speed has very little to do with safety. The question is: If the experts continue to go so fast and get faster, how do we get new blood into the sport? The real question is too specialized, if very many guys take that testing and rewarding event in RC, I think that would be tragic.

K&B tried with their 100 Schnauzies to show that the rule allowing an engine to be legal if a minimum of 100 are produced is bad precisely because it contains the germ of self-destruction for RC pylon racing. They want the rule changed to a minimum of 1000. This would make a great engine available to more modelers, but it would also eliminate small manufacture, which is intended. Adequate compensation in the form of points has to be awarded to those who modelers marketing these ideas are invited to submit for publication in this column.

Fred Collins submits his innovation of a sun visor for use in any kind of the bottom of the transmitter antenna. When looking towards the sun, this viewing plate provides reduced glare and an improved view of the control stick. Sun visors are a green transparent plastic which measures about six inches square. The Sun visor, called "Pilots Eye" is priced at $1.49 each plus 25 cents postage from Fred Collins, 39 Stewart Ave., Pittsburgh, Penn. 15227.

CLAUDE McCULLOUGH

SCALE

Sport Scale Takes Off: When the Scale Contest Board added Sport Scale to the 1972 AMA Rule Book as a provisional event, it was expected to be popular. What was unexpected was the interest which it has pushed regular AMA Scale off the contest calendar. Dozens of annual meets which regularly used to feature RC Scale have replaced it this year with the new class. The Stand-off judging is much easier than before, yet the building and judging details are still important. High scores are gained only if the model is made top models literally of museum quality, requires steady and consistent time and attention from the constructor. Since the introduction of the new class, it is perhaps understandable that the newcomer has taken hold instantly. But it will be a bit of a disappointment to the earlier announced class with its high standards, reduced to in Nationals-only affair. There is room and interest enough for both classes, and it is to be hoped that groups planning contests for 1973 will take a long look at the matter and find accommodations on their schedules for AMA and Scale Sport.
in the meantime, meetings were held with interested members of WRCRA. We worked out a system to accommodate many cars and drivers as possible over the day show, in addition, signs were made, track markers and other equipment got gathered, and excuses were worked out for breaking up the Memorial Day weekend. Somehow everything came together and we were ready to go.

The first Saturday set the pattern for the show. The group arrived early to get in ahead of the crowds and get the track laid out. With a combination of police barricades (from New Orleans for some reason) and the Club's own flags, an area was blocked off and a small, tight track made of asphalt. The track was small so the top speed of the cars would be kept to a minimum and allow spectators to be close without trouble.

Each day while the track was set up, one member of the RC car group got together with John Worth to plane and coordinate the day's activities. AMA's flight schedule was different each day and their flight schedule came from track location. This required careful planning. Cars could operate until 15 minutes before RC flight time, and we arranged it so that all radio car transmitters were shut down until after the AMA had completed their show. The system worked well; not once during TRANSPO did the car operation affect the AMA flight operations.

Once everything was set, a car would be fired up and start running the track. This would attract a crowd, and we would then schedule an "air show," usually adding variable vials to get a good crowd. We tried to run a 10-lap heat every 10 to 15 minutes and keep one car on the track. At times, there were three to four deep in the air showing when we had cars running in the tight turns. In between races we passed out leaflets on RC cars and answered thousands of questions. While the track was shut down for the AMA flight show we would either repair a car or set up for the next day's TRANSPO.

On the initial weekend we had to manage to get some additional exposure. Mark Donahue's winning Indy McLaren was in the Goodyear display. The plane and car were 19 feet long and had a beautiful scratch-built model of last year's McLaren. The Goodyear people let us display their model of our own design. We had the full scale car and all the leaflets to hand out. We had more spectators for the last two days.

The official TRANSPO attendance figures are about 2500 for our RC cars, and approximately 8000 were interested enough to take one of the leaflets (we didn't just give them to everyone).

There is no doubt that the TRANSPO effort was a success. Groups already have made sales which will be traced directly to the demonstrations at TRANSPO. In fact, the most frequent comment we got from spectators was that they had always wanted to do something like this but didn't know how. We have received letters from a lot of people who would like to join us. What has been done in the past to publicize RC cars hasn't been effective. The manufacturers like dealers who have been moaning about the RC car market not developing as they expected are now realizing the RC car market potential.

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Criteria of a Good Design: The design should be well integrated—everything should go together. The landing gear, source of greatest loads, should be strong and well-maintained. The engine and main rotor, the two greatest concentrated masses, should be well isolated. The servos should be easy to access. Everything should be easily accessible by removing a cover plate or two. Structure should be crash resistant but not overly strong where it is unnecessary. Safety! Omaha! How easy to gear or pulleys where heavy loads are applied. Support fittings should be as few in number and as easy to make as possible. Design for at least 100 hours life and maximum reliability. Protect servos and radio from water and electrical current. Provide adequate engine cooling and easy starting by electric starter. Shroud around the cooling fan makes it more efficient and protects the aircraft handling qualities in forward flight, especially if the fan is horizontal and is out of the way.

An improved fuselage and drive system for tube, designed to satisfy the above criteria, will be used. The first tube will be test flown and will be on exhibit at all the major air shows. The system worked well; not once during TRANSPO did the car operation affect the AMA flight operations.

Model Helicopter Progress: Gene Rock's model, much improved and redesigned, with shaft driven tail rotor is really giving good performance and is coming along well. The tail rotor is definitely the key to the model's success. The tail rotor should be designed with the airfoil shape of the tail rotor and the control surfaces. The control surfaces should be designed to provide lift and control. The tail rotor should be designed to provide lift and control.

Designing RC Helicopters: Since I wrote the article by that name in 1969 (published in March 1971 AAM), ideas have changed. The design procedure outlined in that article still holds—write specifications, estimate size and maximum thrust from the chart, lay out airframe to 1% or 1 scale, estimate preliminary weight and balance, full scale layout and detail design. Recommended revisions to the article, based on more recent experience, would be the following: 1) Increase the size of the rotor diameter to 8 to 10 inches, 2) Increase the size of the fuselage to accommodate the larger rotor, and 3) Increase the size of the tail rotor to accommodate the larger rotor. Recommended changes to the article, based on more recent experience, would be the following: 1) Increase the size of the rotor diameter to 8 to 10 inches, 2) Increase the size of the fuselage to accommodate the larger rotor, and 3) Increase the size of the tail rotor to accommodate the larger rotor.

Readers: "Where the Action Is" is your part of AAM each month. The correspondents are experts in their fields, but they need to hear from you. Please keep them well supplied with reports and news. If you have any questions about RC activities, club news, and newsletters, we pay $5 for modelers' ideas if used in a column; clubs are given credit. 0057 AAM, Potomac Aviation Publications, 733 15th St. N.W., Washington, D.C. 20005.

John Burkam's float-equipped model (great on snow, too) and dressed-up version of Gene Rock's heli.
Charybdis (continued from page 56)

...ing off one of the filler nipples for maximum engine duration. With both nipples open, engine run will be 15 to 20 seconds. With one blocked off, the run will be well over a minute. This can be done with a short length of pinched-off tubing, or a longer piece running to the pressure-tap nipple. With this latter system you don’t lose the short piece in the grass while fuelling, as it is attached to the pressure-tap. You can, of course, use a control-line tank and find the optimum setup yourself. However, the simplest fuel line is always the best, and use of the integral tank has the advantages of simplicity, strength, and aerodynamic cleanliness.

Flying

Launching may seem a bit hairy at first, but is really no problem if the CG is located approximately as shown. To avoid losing fuel from the inverted tank, turn the Charybdis upside-down and start as usual. Now grasp the hub area with your fingertips on the blade leading edge and thumb on trailing. Raise the whole affair over your head while simultaneously turning it upright; snap your wrist to start rotation, and push upwards. Then duck, and run into the wind, since you probably haven’t got the carburation right to begin with. Try again, until the engine continues to run and Charybdis climbs away like a startled mallard.

An alternate launch method is to gusset the general area of the CG, drill a small hole at the approximate center of rotation, and impale the Charybdis on a headless nail driven into the end of a stick. In this case Charybdis will simply fly itself once it picks up sufficient speed. McCutchen remarks that this is a good idea while getting the carburation and balance unscrambled, since it prevents powered crashes while in an unstable condition.

Once properly trimmed, Charybdis is remarkably stable. The rate of climb can be varied by adding or removing clay, and by sliding the balance arm in and out. But this will not make as much difference as you might think, and unless carried to extremes, will not seriously disturb autorotation characteristics following engine shut-down. If the Charybdis is really out of balance, of course it won’t take off to begin with. Changing the stabilizer angle, on the other hand, will make a great difference in rate of climb. An adjustable stabilizer, or at least a movable tab on the fixed one, would permit complete freedom of experimentation.

The other factor that most strongly affects performance is power. With the 3 x 1.25 standard .010 prop, time from launch to touchdown averages around a minute and 30 to 45 seconds. Charybdis climbs steadily for several hundred feet, depending on engine run, then descends in autorotation for anything from 30 seconds to a minute. On one memorable flight of this sort, the Charybdis got hung up in a thermal at 100 feet or so and just sat there, silently autorotating...
over one spot for something close to two minutes. Total time was 3:15 for a rather different max fly.

But to really have a ball with Charybdis, turn the prop around to reduce thrust, or use a 4% x 2 prop, more clay on the balance arm, maybe try it on the elevator—anything to hold it down, it will take a while to work out, but you can get the Charybdis to hover waist-high. It will first sink to a near-cutting level, then find an equilibrium altitude in ground effect at two or three feet, and just sit there, drifting with the breeze, following the contour of the ground. McCutchen rigged one to do this so well it would go down the gentle terrain stream, cross the creek, climb the opposite bank, and continue wandering off across the fields. He says it was quite upsetting to casual observers along the flight path.

While hovering like this, Charybdis will produce the weirdest sound you have ever heard outside a science-fiction movie. You'll think the Martians are coming—it is a kind of whoop-whoop-whoop-whoop gradually increasing in pitch and frequency, with an underlying humming note, and the scream of the engine. All this may be only a peculiarity of this Charybdis and may not be true for others—even working from the same plans, everyone builds slightly differently. But for the Charybdis in the photos it's real. And strange.

Supreme 
(continued from page 34)

Caution—drill this hole through the hub, but locate it at the edge of the shaft where the threads begin. Make sure the shaft is 90° to the hub.

Construct the nose block of six lb. density balsa and face both sides with 1/32" balsa and 1/32" plywood. This keys the nose block to the fuselage. Put a 3/8" hole through the center of these pieces for the aluminum tube bearing retainers. Cut this tube 5" long and drill it a 5/16" hole in each end to a depth of 20". Install the tube in the nose block. Cut a 3/4" square hole in the front piece of plywood and replace with a 1/32" thick square piece of aluminum with a 5/16" hole in its center. Add this hole with the 5/16" hole in the aluminum tube, install the two 1/8" aircraft bearings. The aft bearing can be held by crimping the tube. (I purchased the thrust bearing SFR2-53 and the radial bearing SFR2-53 from New Hampshire Ball Bearings, Inc.)

Make the prop fitting which anchors the rubber from 3/16" mag plate. Cut out with a hack saw, file and smooth with emery cloth. Drill two holes with a No. 43 drill: one for the prop shaft to a depth of 5/16" and the other for the set screw. Tap the hole for the prop shaft with 4-40 threads. Thread the fitting on the shaft and drill lightly into the shaft through the set screw hole. Tap this hole with 4-40 threads for the set
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The Taft Bash
(continued from page 35)

Motorcycles: Everyone chases on trail bikes since the terrain downwind is too rough for cars. It's also rough on the bikes, if the number of breakdowns and bent parts are indicative. It's a great way to retrieve, but it takes some getting used to. I'll swear I motored through a razor-blade bush while chasing during the night-flying event.

The Host Town, Taft, California:
The merchants of Taft had banners welcoming the FFLers, and the citizens made it pleasant to go the couple of miles to town for supplies or to eat or sleep. It's refreshing to feel welcome and know a whole town is getting behind a FF contest. Contrary to popular opinion, FFLers have money to spend just like real people, and there are enough of them to justify more towns exerting a little effort to attract contests.

The Officiating: Things ran smooth-
ly with few waiting lines for timers and few complaints. There were 634 entries, but it wasn't over-officiated or congested at all, which lent an air of informality most of us like. Clubs all over California pitched in to run specific events. The guiding force was Gene Spence of Taft, and the actual CDs were Al Vela and Sandy Norton—thanks guys.

The Camaraderie: What a beautiful world it would be if everyone in it were as nice as the over 500 contestants, friends, wives, and kids who were involved in the meet. (There would have been 1000 if Grand Championship winner Jim Scarborough had brought his whole family.) Everyone had time to tell his story or listen to yours, and the bull sessions were rich as the top personalities in FF discussed the intricacies of the sport.

Tent City: Over a hundred living units, ranging from a tent made of cleaning bags and dowel rod to megadollar mobile homes, made the site look like a small city. It was a family affair for many, and the shared experience of camping really added flavor to the contest.

The Airplanes: The West Coast has long been the trend setter in free flight, but it was interesting to see the infiltration of Eastern-style high-climbers in the gas events. The tiny Texas-based "Mini Pearl" was probably the most frequently seen type. There were plenty of Stardusters too, as well as (continued on page 77)
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and then... there were ten!

no — not little Indians... but 10 nifty little Control Line models that deliver real fun flying... and are they easy to build! Only 6 to 9 die-cut parts (depending on the particular kit) to glue together; a motor mount (that's ready to bolt in place); also the complete control system (less.

KIT S40 BEGINNERS CHEROKEE

slight modification). A perfect ship to learn to fly on (first time flight instructions on the plan). They're great little flyers and so light you can't hardly hurt them. We've got 10 of them in the line now, 9 at $2.95 and the Bipe at $3.50. Tools you need are generally found around the house. So take a look at them at your dealer. You'll love them... and so will your pocketbook.

KIT S38 BEGINNERS SHOESTRING

handle and lines); decals, landing gear, wheels, etc.; which makes building a lark and assembly literally in minutes! Use any .049 engine (you might even have around from an abandoned ready-to-fly plastic job, it may require

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*Du-Bro NY-STEEL Kwik-Rod Assembly KR30®*
Satellites, Texans, Bogans, Hysterias, Rambunctious, Condors, and at least one of almost anything ever designed. No one design had a monopoly on victories either. Generally, most new ships seem one design had a monopoly on victories of almost anything ever designed. No Satellite design, Bill Warner in Scale competition. Other repeat winners were Bill Hunter in D Gas with his own Satellite design, Bill Warner in Scale Power, and Harold Thomas in Coupe. Night flying, which rarely is wild, was won by Mike Taibi (Starduster 900), with Texan Tom Peardon (Rambunctious 1040) second. Their hi-thrust ships were capable of over five minutes on a ten second motor run! Until you've seen night flying, you can't believe it.

To get Harold Thomas in A Gas you would have had to do more than seven straight maxes. In fact, the times in every event were nothing short of awesome. Five straight maxes in HLG would give one a chance to flyoff with the top three. Nordic A-2 boiled down to Bob VanNest and Bob Isaacson with nine maxes each settling first place shortly before trophy presentation. The only two men left flying on the whole field, and they tangled towlines! VanNest prevailed by 25 seconds. Three of the top four Nordic places were won by Dragbuster designs.

The third best Wakefield flier in the world, Bob White (otherwise known as the "Goodfather"") handily won his event. Ed Carroll edged Bill Hartill in FAA power by 14 seconds using a high aspect ratio pylon design, while Hartill flew hi-thrust. The Old Timer events were hard fought (there were almost as many O-T events as all others put together) with Otto Bernhardt managing firsts in 30-second Antique Gas and Class A Old Timer.

It is interesting to note that the "name" fliers did not dominate the contest as much as was expected. To be Grand Champion for the second consecutive year is a real feat which Jim Scarborough pulled off handily. His closest competition was Senior Champion Gerry Geraghty (last year's Junior Champion). Champion of the Junior was Randy Bunch, Second in Open to Scarborough was Gerald Dyer, who received the Open Championship award. Team Champions were the Satellite City group (Bill and Bob Hunter and Bob Deshields) who were professionally efficient in every way.

Bits and Pieces Which Stick in My Mind: Hardy Broderson's "C" job augering straight in from great height—no K&B RR 40 ever sounded like that. One kid haplessly throwing his HLG into a "Trash mover" (dust devil)—it went up and in several other directions simultaneously. One mass, at least ten gliders, piggyback A-2 launch into the world's biggest downdraft. Don McGovern and Vic Cunnyngham's prac...
bomb you planted on our truck before you left didn't work, guys, but it's the thought that counts. The kids having a blast flying, or just helping Dad, or just playing. How fresh the beauty queens, provided by Standard Oil (owners of the site), looked compared to the fliers who generally looked as if they had been on the losing side of a war. The OT ship, a Cavalier, I think, which kept flying into the same spot among the campers, but each time was caught in mid-air to great applause.

The tactical flying in HLG, a war of nerves with everyone standing around looking at one another. The great Texas vs. California glider team challenge, which Texas won. The beautifully decorated models everywhere—some rivaled dragsters for gaudiness. FF manufacturers comparing problems and sharing solutions. The help given by West Coast fliers to easterners accustomed to the conditions. How much longer five-minute maxes seem compared to three-minute maxes. Ditto for 15 second motor runs. The general absence of poorly trimmed, crashing airplanes. It could go on forever.

The only thing lacking at the USFFC is tradition, but it won’t be long because it’s here to stay. FF everywhere will benefit from its success.

Bronco

(continued from page 89)

sprockets which drop from the main gears in case of turbo-prop damage and can't be reversed. With this knowledge, we can put a delay system on the Bronco. Using brass sheet and tubing, I made a set of small hooks and mounted them into the elbow of the main gears with silver solder. I allow the hooks to release on takeoff, not using a hold-up device.

After sanding well, I used Ditzler light grey acrylic primer. This primer shows up defects, fills well, is light, and makes a great base for colors. Wet sand everything with 600 wet or dry sandpaper. Use a vacuum and tack rag to get rid of the dust. I used Sig Supercoat dope. Spray the muntions pods and undersides Brilliant White. The dope is sprayed on dry, therefore from a greater distance than usual, and produces the camouflage dull finish without additives. Practice on scraps.

The green surfaces are Sig Forest Green with four oz. of Light Red added to each pint. To achieve a feathered color line on a camouflage paint job, run the masking tape through your
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Grasping the Infinite

(continued from page 26)

...even at the height from which he started the dive, the speed bird took no time to reach the required speed run altitude. He did pull it out, but we noticed the engine beginning to sound a little erratic. Nevertheless, it ran the "invisible" speed course between the two electronic speed traps at a great rate of speed. Additional breathtaking runs were made before the engine abruptly cut, and he brought the ship in on a fast glide.

What a spectacular experience! No NATS we ever attended could come close in terms of excitement to the first 20 min. of this DCCR-run world record trial.

Maynard’s associate, John Spalding, rammed the hand electric starter against the spinner and the engine quickly burst into life. Taking a couple of steps back, Maynard adjusted one of the two needle valves with the throttle control on his Logictrol unit and indicated to John to "let her rip." And rip she did—at a 40°
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Activity continued for three days: record attempts, soaring plane record attempts, and RC helicopter attempts. No one made more official record attempts than Maynard Hill; nor did anyone encounter more trouble with erratic engines. Certainly no one worked harder or more persistently. Many younger men would have been put to shame by his abundant energy and ingenuity.

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We don't want to slight our long-time friends and former CL Speed competitors, Bob Violett and Cliff Telford. They too were busy; most of their speed runs were close to Maynard's, and the latest one was something to behold.

Unlike Maynard, who gained a lot of speed on those fantastic straight-down dives, Violett (the pilot of the team) brought their RC speed bird in at a smaller angle. On this run the ST 60 ABC was still in tune and rumbled like the devil. On the downwind run it shat ted the air at 197 mph. The entire speed run between the traps was done with one wing down, banked to the pilot. Still the bird tracked straight and true. Upwind time was 193 mph.

Later, the team clocked speeds over 200 mph, but half of the speed run was always a little too slow to bring their average time up to the required 203 mph.

Both teams hand-launched their respective birds differently. Maynard's was released at a fairly rich, slow engine setting, then quickly brought up to a rich rev. The Telford-Violett team, however, revved up the engine to peak and the high-pitched roar shattered the air, and spectators instinctively stepped back as Cliff released the burden so fiercely. It was a majestic sight to the ears of speed merchants everywhere.

Not without their problems, this team of commercial airline pilots by trade would total the ST 60 ABC job one day after Maynard did the same with one of his ships. A real crime, for as even Maynard admits, Bob Violett builds beautiful aircraft.

Maynard's went first. Very soon after the release of the craft, he noticed a 50 ft. altitude, but nevertheless struggled upward. Someone had forgotten to turn on the switch in the plane. "Heads up" was the loud cry as the plane continued at a steep climb. The engine proceeded to peak itself out, and the bird continued straight and true. Upwind time was 193 mph.

Later the team clocked speeds over 200 mph, but half of the speed run was always a little too slow to bring their average time up to the required 203 mph.

Not long afterward, Maynard was painting the sky with flights of over 200 mph, though that second pass was a constant source of heartbreak. He was using his second speed bird—identical to the one he "totaled." Sunrise gave birth to the second day of record attempt achievements. Gentle breezes and blue skies promised another day of perfect record-breaking weather. Conspicuous by its absence was the Telford-Violett team, nowhere to be seen. Not until two o'clock in the afternoon did they finally show up with one of their speed jobs. Working all through the night, Bob tried to iron out a critical radio range problem he had the first day. "There was a 50° bank, but neither of us could break out. This was something to behold."

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passed with the solution nowhere in sight. Sundown threw Maynard and company did not take much notice of the Telford-Violet team's dilemma—they were much too busy flying like crazy.

Trying desperately to avoid the range-caused crash of their ST 60 ABC ship, Telford and Violet labored right into darkness, taking no chances. Their last ship was a TWA tuned-pipe job which held a great promise of clobbering Werner Kaseberg's 198.8 mph mark. Only the day before they had taken just such a chance with disastrous results. Cliff Telford launched the ST 60 ABC job dead level. The speed bird tracked nicely about seven to eight feet from the ground, engine burning the calm air. Without warning, the ship did four or five beautiful consecutive fast axial rolls to the left. Turning on its back, the bird met the ground a few seconds later. After picking up the pieces, the team walked over to their equipment-filled station wagon and pulled out their second ship—now sporting the tuned pipe TWA 61. "We're not through yet," Bob exclaimed. All that remained now was installing some of their Pro-Line gear into the ship, a mere technicality. Bob would labor once again all through the night. Some spectator noting Bob Violet literally sweating while trying to overcome the radio problem as darkness was beginning to close in said "Why don't you guys give up?" Neither Violet nor Telford even bothered to look up, or perhaps they really didn't hear him. For a moment there was silence. Then one of the DCRC members who heard this said, "'give up,' never heard that expression before, is it English?" Looking downward and wearing a slight grin on his face, we heard yet another DCRC man say, "oh, it's in the English dictionary all right. It just isn't American."

Back to the motel they went while Maynard and company drew out two giant altitude planes and started the detailed preparation for an onslaught at his own altitude record of 28,519 ft. At the conclusion of the three days at Dahlgren, we asked Maynard Hill, Bob Violet, Cliff Telford and Stu Vance to write their thoughts on their personal efforts. Read on as the participants unwind their struggles.

First, Maynard Hill: "My impressions! Over the Labor Day weekend of record trials, DCRC and Dahlgren RC Club members probably contributed over 500 man hours to the effort. To me it's a great feeling to be part of such a huge team effort. CD Tom Carey deserves a lot of credit. He and Stu Vance proved that the basic system is capable of giving accurate measurement to .05 sec. This is contrary to the previous belief of some people. When the model is down within the prescribed course and altitude, Stu's crew obtained results accurate to within two percent at 200...
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**Text Content**

- Clearly they were good enough to demonstrate once again that there is some sort of "barrier" at 200 mph. Haven't Gussinger and Smith, and now Telford and Violet and I appeared to bump hard into it? There are now over 80 timed passes that sit around the 185 to 195 mph (averaged of two-way speed runs) and the timers haven't once granted us an official record.

- "It does look like a super engine will be needed to get above 200. We weren't exactly using putt-putts out there, so it may still be available before the record falls. I had a great team. We were busy as bees in a honey pot as we tried every trick in our bag, including high nitro fuels that would burn a hole in your pants. We were making progress but not enough to get to the goal before we made splinters out of two speed birds. My team was definitely the underdog since I can't make the immaculate airplanes that Bob Violet produces, nor could I make an engine go as fast as Cliff Telford. I've had a lot of fun and excitement with models, but this weekend was the greatest ever. I promised my crew I'd try harder to polish the bumps off next time, but it remains to be seen if I'd try again. After six years of it, I'm beginning to think RC speed is not my bag.

- "It wasn't bad when I set the old record (1967) at 140 mph, but 200 is something else again."

- "Werner Kaseberg, I salute you, one more time."

- "(That doesn't sound like the Hill we saw out there. Besides, some day in the future we would like to try for this RC record, and we would like to be able to say that we beat out Maynard Hill.)"

- Next, the brilliant Stu Vance: "The judges need no special training, but the corridor judges must be in the edges of the line of flight of these 200 mph missiles. It takes courage, steadiness and perseverance over several hours of intermittent speed runs. We have normally found it impossible to keep one set of
course judges on for more than half a day, and they probably do not do the job more than once in a Records Trial period. The attitude judge, particularly, is in a dull and repetitive job since he is stationed perpendicular to the center of the course at a distance of 900 yds. and thus feels left out. We keep him equipped with a walkie-talkie so he knows of the action, and we converse with him from time to time to keep him happy.

"Timing depends upon two expensive electrical chronometers calibrated by an official timing agency (at this meet the U.S. Naval Ordnance Laboratory near Washington, D.C.), with each clock connected to a set of buttons, one at each end of the 200 meter central section of the course, and in the hands of two persons. The complexity of the problem is not recognized until one realizes that the speed plane passes the trap in less than two and one half sec., and that reversal of course takes less than five sec. This means that timers must locate the aircraft, anticipate the point at which it will pass the timing pole, fix on that (with no possibility of parallax between timers), see the plane come into their field of view, push the microswitch buttons, and then prepare within five to seven and a half seconds for a pass from the other direction. A typical speed attempt consists of five passes through the trap, either upward and downwind or vice versa. This function is performed by the chief time. He has three assistants—two assistants each to read one clock and a recorder to record their called out speed.

Lastly, the airline pilots Bob Viollett and Cliff Telford: "There are several problems involved in attempting to break the world speed record for RC models. A few of the more pertinent facets of this endeavor may be of interest.

The aircraft must be structurally stronger than any other type of RC model. Primary differences are in the wing construction and engine installation. Wings, used on 40-powered pylon airplanes, are not strong enough. Extra spacing of the foam cores and an increase in surface tensile and compression strength are necessary to prevent twisting and bending. The aerodynamic loads at 200 mph are considerably more than at 150 mph. The engine mount must be very firm and able to withstand the G forces induced by a .60 turning 20,000 rpm. Meeting these requirements and still keeping the machine under the required F.A.I. wing loading is a difficult task.

"Control surface size, movement and method of hinging are other areas of dif-
ficulty and peculiar to a speed vehicle. Any hint of surface flutter at 200 will result in uncontrolled flight and probable loss of the airplane.

"I have built three of these airplanes and am presently drafting the fourth, and hopefully, final, design. A fiberglass mold for the fuselage is a must. It will save weight and space and reduce construction time.

"Pro-Line Electronics is working with us to try and solve the problems, and perhaps what evolves might slow the attrition rate of pylons airplanes which have the same problems but to a somewhat lesser degree. One cannot compromise on surface rigidity and positive control because it is difficult enough to fly the airplane through the course without spongy control response.

"Horsepower is a necessary ingredient. The record that stands now we think cannot be broken by the two percent margin with available engines unless they are augmented substantially with tuned exhaust systems or mini pipe supercharging. Every gimmick that is added, however, has its associated problems and thus further complicates the effort. Cliff is the power-producing half of the team, and is applying his 20 years CL Speed experience to our goals. We now know how much is needed and the best way to get it. That, of course, is a speed secret and cannot be divulged at this time.

"Results: One of our speed birds was powered by a Supertigre 60 ABC. The best run on it was 198 mph into the wind (eight mph). The downwind run was missed because of a clock malfunction. I flew too low on this pass, and the run would have been negated anyway. This airplane lasted for two test flights and three official flights.

"Our second plane was powered by a Wisniewski 61 TWA. The best flight on this was again 198 mph into the wind (ten mph). The downwind time was missed. We made three attempts with the full tuned pipe but failed to get the pipe to "come in" and subsequently burned up the engine—when our fuel..."
cut-off failed to work in flight. Later an engine change-back to a Supertigre was in vain—we blew it when both prop blades let go. This airplane made seven official flights and is still around to be used on an engine, radio test bed, and more record attempts. 

"Conclusion: Failure to break the record at this attempt has further dedicated Cliff and I to overcoming the difficulties associated with it, and perhaps the technology achieved in doing so will benefit the rest of the radio controlled airplane sport."

As speed engine designers and speed aircraft design specialists the authors would be branded extremely selfish if we didn't mention at this point some things that could greatly help any RC pylons racing merchant or potential RC speed participants. The following articles could conceivably help any RC flier who ever wanted to get just a little more knowledge about squeezing some extra power out of his RC engine. Many of you pylons racers, for example, would be shocked to find out how old some of the new speed secrets really are. Try to dig up some of these: "Close Up on Speed," (April 1962 American Modeler); the more recent "No Speed Limit," in the April 1970 M.A.N.; "Engine Development in the U.S.A.," in the July 1970 Aeromodeller, and finally the "Mid-March," 1970 Competition Newsletter (AMA).

Epilog

Just as we submitted this article to AAM, we learned that the Soviets have captured nearly every FAI world record as a result of a special three-day session held just two weeks after the DCRC trials. Goukon and Myaining claimed 213.7 mph and an RC seaplane speed of 182.6 mph. Built? Suppose the Russian CL speed merchants set up the engines for the G/M team? Roger Theobold, the TWA to the Russian CL speed men, and Natalenko in particular made an almost exact duplicate and called it the Start. He, however, made the silly mistake of using a drum type induction system—long ago tried and abandoned by our CL speed merchants—and at the last FAI CL speed Championships the Russians came in sixth, eighth and seventeenth. Our guys took first, second and fifth with the third place taken by Brian Jackson using an American designed plane and engine. However, in the 1968 CL FAI speed championships the Russians using the Star were only about ten mph behind the Americans, and therefore the 213.7 and 182.6 could possibly be true.
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AMA News Bits
(Continued from page 109)

Delta Dart = Improved PR

Delta Dart programs continue to serve many purposes: promoting model aviation, providing youngster with a fun and worthwhile activity, and creating better public relations for model clubs.

For example, the AMA chartered Nor'Westers (Portland, Oregon) and the Oregon Museum of Science and Industry (OMSI) conducted a Delta Dart program with joint sponsorship. We hear that, since then, the club has been holding meetings in a room offered by OMSI. A nice feature of the OMSI facilities is club members may be allowed to fly Indoor models there.

License Check a Must

Everyone who flies at the AMA chartered Saginaw Valley RC Club (Mich.) field must have AMA and FCC Licenses and also be a member of the club or an invited guest of a club member. That's the way it should be for everyone's protection. Making sure that all flyers conform with these requirements is fairly simple, according to a report in the SVRCC Newsletter. If each member does his part. If someone is flying who the SVRCC member doesn't know or doesn't know to be in compliance with the requirements, the member should ask to see the unknown flyer's licenses and ask whose guest he is: if the unknown flyer doesn't meet the requirements, letting him know the facts usually will adequately handle the situation.

Contest Packing

Frank Schwartz (AMA 123), editor of Glow Plug, newsletter of the AMA chartered Middle Tennessee RC Society (Nashville), feels there is a right and wrong way to pack to go to a contest.

He writes: "Assuming you have a truck or station wagon, be sure to put the tent and field box forward. If you stop suddenly (the tent and field box were in the back) they might slide into the planet.

Use hanging racks to hang the wings. Securely place the fuel and also deck chairs. Coming home: throw the broken wings and destroyed fuselages in, dump the tent (you can fold it up later), chuck in the field boxes and take off for home. .next year will be better."

Mylar

It sure took a lot more time to write this than it has to cover the wing. Pin drop on the crack and it penetrates and hardens in three seconds. Sure saves time! Any excess on the surface just sets there so wipe it off with a piece of tissue. If you get it between your fingers, get the razor blade out and prepare for surgery! This material is very similar to Eastman 910. It doesn't warp structure (I build indoor jobs with it) and works great on plywood/balsa or balsa/balsa lamination as well.

Now to cover the outboard sections: Lay a piece of paper with a slot cut in it over the mylar, balsa tip dihedral break and spray contact that area. Set the wing down on the rest of your painted mylar, and cut the outboard panels, allowing for overlap at the inboard dihedral breaks and also for the center panel to overlap those breaks by at least 3/16" past the ribs. Set the outboard panels in place, paint side down, touch iron same as tips, to center of outboard dihedral rib and inboard dihedral rib and at the LE and TE both ribs. To contact the overlap along LE and TE, lay a card on the bottom of the wing near overlap and spray lightly. Let dry and trim to %". Complete seal same as tips. No balsa fill is needed here since the angle is shallow. Use the same piece of slotted paper to spray contact the mylar over the inboard dihedral rib. Fit the center section and seal.

It took a lot more time to write this than it has to cover the wing. Pin
rigid polyurethane foam for your floors

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2. Glue it...
3. Dope it...
4. Cover it...

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P-51

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letters of As, Ps, Bs, etc, and pin them in
place. Cover all other stars, stripes,
moons, and whatever you don't want
painted or fit the cut out pieces in. Fit-
ting is easy since they are all identified.

I used black letters with gold edging
later. Spray the letters with whatever
color you've decided. Do it lightly and
then again. Let it dry. Replace the cut out
and spray blue, then replace them.
Spray the stripes and replace. To get the
gold shading on the black letters, pull all
the pins out of the stencil, move it
down toward the TE about 1/8" in with the
letters out, so you can see through,
pin around the letters, and lightly spray
Kandy Color gold base.

As soon as this is dry, remove the
stencil and look at the results. A whole
gang of letters, stars, strips, and bars
over clear mylar! Are they all sharp? If any edges are too fuzzy or have bled,
don't despair. Use a very fine brush and
little lacquer thinner and clean it, then
dry with a kleenex. This won't affect
the mylar at all. In fact, if you don't
like the job, soak a rag in thinner and
wipe it all off, and do it over. Painting
only takes a few minutes anyway.

We always use the lightest color for
the main color because it can be sprayed
lightly and look great. In the case of the
Satellite "500" A Special, the main
color is Kandy Color Lime Gold. Whatever
color you choose, remove the paper
shield from the other section of your
taped down mylar at this time. If you
want the top and bottom to be the same
color, and go ahead and spray the entire
piece. You might want to pin stars back
in place since lime gold, for instance,
could turn blue stars green.

Covering and heat shrinking involves
the same process as earlier described.
Just remember what you registered your
design from, such as the center spar, and
lay it up that way. Be certain to allow
for all overlaps when you cut the separ-
ate panels. You can turn the mylar paint
side down and put the stencil under it,
and your previously marked points for
dihedral breaks will show through. This
will assist in making your cuts. It's a
good time to put all of the pieces back
in the bags and hang up your stencil
someplace. It will come in handy if you
want to do a T-shirt or another wing in
a different color just to show what kind
of artist you really are.

Mylar is very tough, but all models
g et rips, tears, snags and holes eventu-
ally. If you are at a contest and the
covering is damaged, it can easily be re-
paired on the field with Scotch tape and
later the section can be replaced with
mylar painted the same as the rest of
the surface (contact the edge of the re-
pair to seal). I've had a pound of bacon
go through the top of my wing tip from
the refrigerator in my trailer and in this
case I used MonoKote "trim film" over
the huge hole and went ahead to win
the San Valers Annual in Class C.

To keep your surfaces gleaming like
new, clean with a soft cloth and DuPont
Enamel Reducer (small amount) and
dry with another soft cloth.

Refer to the following for size, use,
price and ordering information: 1/4 mil
(.00025), Penny Plane, 2A, Coupe, light

94 October 1972
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Loughead
(continued from page 47)

The upper wing, built in three sections (seven-gallon gas tank located in the center section), was held in place by latches. A V strut, supporting both wings, was solidly bolted to the upper wing spar and fastened to the lower wing spar by a rigid pivot pin connection. On the ground, both wings folded alongside the tapered fuselage to cut-outs in the horizontal stab.
All this and a brand-new, untried, untested, 25 hp, two-cylinder opposed, water-cooled engine too! In fact, there was so much new about the airplane, Bud gave things more than his customary thorough going-over. To his amazement, and for the first time in his experience, nothing required re-engineering. A test site and date were picked.

As Bud settled into the cockpit on the afternoon of April 11, 1920, a pair of eager hands laid onto the S-1's 5-1/2 foot Jacuzzi prop and pulled it through. The little experimental engine whirred to life. While her anxious builders watched, the plane rose cautiously from the ground. Then, almost imperceptibly easing off at a couple hundred feet, Bud made a solicitous and gentlemanly "pass" at his controls—especially roll. Surprise! She responded.

With a new measure of confidence, Bud then climbed to 1000 ft. and leveled off. Because of the newness of the engine, he didn't want to open her up full bore. Nor, since longevity is undeniably linked with discretion, did he want to go too far from a suitable landing spot.

After a couple lazy 180s over the field, Bud decided to test out her landing characteristics and the effectiveness of the air brake wing. Making a long, low, slow-in approach, he cut throttle, and "she squatted like a duck" before he could release the air brake lever.

He taxied over to the happy onlookers to check out what further testing they wanted done. Shouting over the idling engine he said 'we noticed that engine compression seemed a bit low and we wanted to go back up and see if he could "kick it up a little."'

"No, it flies!" Allan grinned. "We'll finish testing later. Right now, let's get..."
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<tr>
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<tr>
<td>RK3-7</td>
<td>7</td>
<td>$1.25</td>
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<tr>
<td>RK3-15</td>
<td>15</td>
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'It dressed off and up to San Francisco.'

A few days later, all gussied up and shiney, the S-1 attracted favorable attention at the air show. Besides enticing potential investors in the struggling company, there was a definite sale contingent on a flight demo. After the show closed, Bud was called up to Redwood City, just a few miles south of San Francisco. Here they continued test work and attempted to improve engine compression.

But a disconcerting chain of events was already in motion, including the government's dumping of surplus aircraft on an already strained aviation economy. No individual buyer was interested in a $2500 airplane when he could get a brand new, in-the-crate Jenny for less than a quarter of that amount. And attempts to jack up lagging horsepower in the Loughead engine, as Bud would say later "were superfluous."

In our interviews, Bud staunchly maintained that all the ideas incorporated into the S-1 were sound. As far as the engine was concerned, it wasn't a lack of dependability but just a frustrating lack of "oomph." Today, Jack or Tony would dearly love to disassociate all kinship with that engine. But the fact remains, within the unitary function of the team—then and later—well, neither one of 'em should take any blood tests.

So the S-1 became a one-of-a-kind, and one more company went belly up. Yet, if that were the entire story, the whole thing would be a bore. Something was created that wouldn't die or disappear: During the 20s an aeronautical incubation was developing into a new era. Soon there was the necessary financial as well as experimental and technological progress. The air was supercharged with engineers, constructors, aviators and mechanics moving around in an exciting stream of growth and discovery. Within this whirlpool, Allan, Jack, and Tony would get it all together again.

It was the possibilities inherent in the basic idea that led to an improved and updated S-1, the Lockheed Vega. And there's one helluva success!

With basic Loughead engineering and construction methods, the influence of the Vega in both Douglas and Consolidated aircraft of the period is undeniable. And, although the old Loughead Co, eventually changed hands (and spelling), the foundation and the initial attraction was there. Begun by Allan, Tony, and Jack, this attraction subsequently drew the aeronautical young "comers" to follow Jack Northrop, Gerry Vultee, Larry Bell, George Prudden, Kelly Johnson and others to develop and spread their influence throughout today's aircraft industry.

S-1 a flop? Not a bit.

Loughead (1920) Personnel Interviewed: Anthony Stadiman, Shop Superintendent; John K. Northrop, Engineer;
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Special thanks to the sons of Allan H. Lockhead—John and Allan, Jr.

Specifications:

General Dimensions:
Length—20'
Height—7' 11"
Wingspan (upper)—28'
Wingspan (lower)—24'
Width of machine folded—10'
Wing chord—upper panel—4'
Wing chord—lower panel—2'

Performance:
Maximum Speed (sea Level)—75 mph
Minimum Speed (sea Level)—28 mph
Landing Speed—25 mph
Rate of Climb (from sea level)—700 ft/min
Climb—16,000'
Glide Angle—11 to 1

Endurance at sea level:
At high speed (miles)—225
At high speed (hours)—3
At economical speed—400 mi.
At economical speed—7 hrs.

Details:
Controls: Stick for elevator and original patented lateral control. Footbar for rudder.
Standard equipment: Tachometer, altimeter, water thermometer, oil pressure gauge, gasoline (sic) gauge. Complete set of tools. Other equipment on special order.
Fuel tank: Seven gal. Gravity tank located in the center section of the wing with gauge in view.
Tailsides: Independent, fastened to the body with shock absorber cord only.
Standard Finish: Fuselage (sic) maroon, Wings cream color. Special finishing work done to order.

Weights:
Total Weight (full load)—650 lb.
Net Weight—400 lb.
Useful Load—250 lb.

F.A.I. Model Supply
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October 1972

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A-JUSTO-JIG CO. BOX 176-A WESTFIELD, INDIANA 46074
Quasimodo
(continued from page 49)

When I took it out for its test flight, which proved to be a little hairy, I found out the hard way that aileron movement on a ship this size must be quite restricted. Moving the aileron links up on the control horns cured this and later flights showed that the ship was fast, as well as fully aerobatic and a great deal of fun to fly. At 3/4 lb, with a good 35, it’s about two-thirds demon. With careful wood selection and a lighter radio, a 19 should fly it nicely. My friends still insist it isn’t a potential beauty contest winner but I prefer to believe that, as proven by Volkswagen, functional design is beautiful design.

Construction

Construction is reasonably conventional, so I’ll just describe the more important details. You’ll see that the plans show some minor differences from the ship shown in the photos but nothing serious. Start by cutting tail group parts, ailerons and canopy sides from four sheets of 3/16 x 3 x 36” balsa. The stab is glued up from sheet cut crosswise; drops are used for the stab tips, dorsal and wing ribs. Build the wing next. A jig is a big help here, since the wing ribs have no straight lines to rest on a building board. Don’t omit the spar webs which add greatly to the general strength of the wing and, most important, be sure to reinforce the wing’s center section with fiberglass, since spar braces aren’t used. Aileron horns are bent up from 3/32” music wire and bearings are made from 1/8” brass tubing. Tip plates are added after the wing is covered but before it’s doped.

The fuselage is built upside down over the plans. Engine and tank compartments should be fuelproofed with epoxy resin or Hobbypoxy. The wing seal is made by taping Saran Wrap to the bottom of the wing, squeezing a bead of...
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Oh, yes, the name. Quasi-modo was the Hunchback of Notre Dame—small and ugly, but agile, vary agile.

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Education in Aeromodeling

One of the most effective ways of promoting the use of model airplanes is through a personal learning experience. Unfortunately however, there are few places where one can seek this form of training in the aeromodeling field. Once a member of a family is introduced to model flying and building, the enthusiasm and love for the sport is usually conveyed to the other members of the family—thus new people are introduced to aeromodeling. But what about all the others who have never seen or heard about this sport? How may they be introduced to it? When will they share in the experience?

One way, perhaps the most frequent one, is by happenstance when a person out for a Sunday drive observes a group of model flyers in action. He likes what he sees and stops to chat with one of the flyers to find out more about the activity—what it costs, where to get supplies, how long it takes to build, etc. A few more trips to the flying field, and our newcomer is hitting it off real well with the flyers, is invited to join the local club, and perhaps winds up under the personal tutelage of one of the club members.

Another way is through the now famous Delta Dart Program sponsored by the AMA and the Hobby Industry Association of America. This involves AMA chartered clubs and youngsters age 8-13 in the construction and flying of the easy-to-build and fly rubber-powered Delta Dart designed by AMA Technical Director Frank Ehling. Nearly 100,000 Delta Dart kits have already been distributed in this program.

Fairly new on the scene, but seemingly growing in momentum, is classroom instruction for model airplanes—some as part of other courses, but others solely concerning modeling. Cited below are several examples of recently concluded and/or continuing classes for model aircraft building and flying.

Although the AMA-HIAA Delta Dart Program is not set up in a classroom situation, Jack Smith (AMA 33249) found the Delta Dart model itself to be an excellent teaching aid while dealing with his class of low academic success students (either due to low ability or lack of motivation) at Middletown, (Conn.) High School, by setting up his own program using these models. "Needless to say," wrote Smith, "after nine years of near failure in school, it isn't very often that something gets these kids involved. Last year I bought some of the Delta Dart kits more out of frustration that anything else and passed them out to each kid. The results were quite satisfying, and a number of the students showed in their attention to detail a degree of concentration that I hadn't seen before."

Smith's conclusions about the Delta Dart's success with this kind of student were this:

"The end product belonged to the student; the time between the start of the project and completion was short (approximately 1/2 to 2 hours with adult instruction, including drying time); the physical principles of the project were demonstrated in a real way [flying the Delta Darts in the school auditorium after completing the construction of the model]; the test of the project gives a sense of reward—it flies!"

"The trouble," he continued, "is that all the projects must be carefully planned, give almost guaranteed success, include individual and simple instruction sheets and probably have all materials in individual kit form since these kids work at different speeds." Smith's Delta Dart classroom project fit these requirements; the teacher and the students were rewarded with a real sense of accomplishment.

Jack Netland, head of the science department at Northview Junior High School (Brooklyn Park, Minn.) was aware of the fantastic educational potentials of an aeromodeling course. Because of this, he provided his students with an exceptional learning experience within the framework of model (particularly Control Line 1/2A planes) building and flying sessions during school time. In order to make this program a success, Netland contacted Pete Simonson, president of the local Control Line model airplane club, the AMA chartered Minneapolis Piston Poppers, and told him of his plans. Soon after, Simonson was instructing a class of 40 eager kids, on a weekly basis, about the basics of model building and flying, keeping in mind their goal—to have a model plane contest between two local schools.

Netland related the success and enthusiasm of the program and added "It is quite rewarding to the individual involved, and also serves as an excellent connection be-
Robert Graham (AMA 19846), a member of the Platteville (Wisc.) school board and publisher of a three-county shopping guide, has been working with a similar project, but in evening hours and open to adults as well as youngsters. It was required that those under 16 be accompanied by an adult.

As a result of adverse opposition by members of the community to the noise and safety factors involved, Graham—a modeler of more than 20 years—recognized the opposition as a misunderstanding as far as model airplane activity is concerned and, therefore, felt that it was his duty to correctly represent aeronmodeling.

In an open letter to one community leader who opposed the operation of model airplanes, which was published in Graham's column in his Shopping News, Graham set the record straight. He first explained what modeling means to him. Then he continued to explain what modeling could mean to the community. In the same letter Graham wrote, “It would be my hope that if any citizen went to the school board and offered leadership in any kind of wholesome activity that would cause youngsters and adults to create, to accept challenges and aspire to accomplishment, that the board would grant use of school facilities...I do know of cases of youngsters being told they can't run their airplane engines because 'it is against the law'. So how can a ten year old cope with that? He needs the concern of an adult...Sometimes we hear the question, 'What is there for young people to do?' Isn't an activity that adds another common bond between parent and son or daughter worth a little annoyance?"

Schools interested in providing their students with an easy-to-do aeronmodeling program are encouraged to write to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C., 20005, for a free classroom quantity (35) of AMA Delta Darts. Requests (on school stationery) should include basic plans for the construction and flying program and the number of students participating. In return, AMA asks that teachers provide information concerning the project, especially how the Delta Darts were used as a vehicle to improve education and educational techniques in other areas, not just modeling.

Despite the major barriers that had to be tackled, Graham organized an aeronmodeling course open to the local public. The 10 weeks of instruction encompassed all the basics of model building and flying, and active participation in both. Selection of models was the student's choice; Graham anticipated those wanting to build and fly planes as basic as the Delta Dart and also planes as complicated as powered RC.

The class, therefore, was organized in order to provide instruction on all types of modeling to allow the student the freedom of deciding among any number of different planes and price ranges. Effects of trim adjustments, procedures for doping models, and instructions concerning radio and engine installation were only a few of the many areas that Graham's course dealt with. He also included movies to aid in the explanation of various points.

The individual efforts of Smith, Netland, and Graham will long be remembered by participants in their programs. However, these three different approaches to using aeronmodeling in an educational framework are not the only ways.

On a much broader scope, courses are available that encourage the students to pass on their aeronmodeling knowledge to others (as in a teaching capacity). In these courses, one main purpose is to point out the direct relationship between the knowledge of miniature aircraft and the similar science of full size aircraft.

Various schools, having developed an aerospace education program, have utilized simple model airplanes, particularly the Delta Dart. The results of incorporating model airplane activity were quite beneficial.

More specifically, C.H. Robinson, Dean of
A Little Fun with Modeling

PRESIDENT'S MEMO

One of the most important ingredients in airplane modeling HAS TO BE A SENSE OF HUMOR! This sense of humor will pay off in most of your other activities as well. Since I have a well-developed sense of humor, and the ability to enjoy laughing at myself, and occasionally do, I thought you might like sharing a few “ticklers” with me. I offer the following to you as a bunch of “tongue-in-cheek” suggestions.

To preserve a favorable “image” for airplane modeling, don’t crash your model planes before witnesses. If you just MUST crash your plane, try to do it neatly! (Directly into a trash can would be thoughtful.)

Don’t eat the glue off your fingers in public! You might be mistaken for a cannibal. If you are ashamed of the workmanship of your model—fly it in the dark!

Don’t appear in public with your AMA membership card in one hand and bandages all over your other hand!

When buying modeling supplies—be sure to get enough glue for your hands and pants as well as for your airplane!

Be sure to put down waxed paper before gluing your fingers together!

Be sure not to glue your new model to the workbench unless your engine has an unusual amount of power!

Neatness hint! Glue all of your scraps and trash together into one lump. Then you can throw it all out in one trip! You might even show how thoughtful you are by gluing a handle on it to bring a smile to the face of the trash man.

Be thorough! Count your fingers after cutting out the parts for your model. If any of them are missing, or unusually short, see a doctor as soon as you are through working!

If you happen to have one of the Italian engines, you might try a little garlic in the fuel. In Combat, nothing will come near!

Hopefully the reporting of these successful educational programs will serve as an example to those who are interested in sharing their personal modeling experiences and knowledge.

And this can be a family hobby! Mother can hold her hands over the kids’ ears while dad “talks” to the propeller that just whacked him on the hand!

Modeling can be educational! Probably sometime you will accidentally build two left wings for a monoplane! That will show you what a darn fool feels like. (I know, because I did it once!)

If you are a Control Line flyer, sometime try taking off with your handle upside-down! You probably will not enjoy it, but it is a great crowd pleaser!

If you haven’t tried golf, and wonder if it really is more fun, hit your airplane with a stick and see if it IS really more fun! Safety hint! Do not adjust the needle valve on a running engine by reaching through the prop. You probably aren’t fast enough!

For the heck of it—ask the cop what he’d rather you do than build and fly model planes. (I’m serious about this!)

There is a rumor that AMA Headquarters usually ignores all letters written to them in crayon. No one there reads “crayon”. (That isn’t as funny as it sounds). They also DON’T read the letters that you INTENDED to write, but never got around to it!

All of the above is a lot of “hocus”, but heck, your hobby is supposed to be a lot of fun. And I can’t think of any hobby that offers more just plain old fun, even if it starts with only a nickel glider.

John E. Clemens
AMA President
Feels Wanted in Club

What does a youngster get from association with a model club primarily of adults? Maybe only a little, but there is potential for much. How does one 11-year-old feel about it? Read what Tony Latini III (AMA 89685) wrote for the newsletter of the AMA chartered Weak-End Aero Modelers in Pennsylvania.

"If anyone asks me why I get to up-tight about being a member of the Weak-End Aero Modelers the answer would be very simple. What other type of club allows an eleven-year-old to be on equal terms as a thirty or forty-year-old man? What other sport allows a child? When I'm at the field, I feel I'm a part of the club. I help rope off the field, hold airplanes ready for takeoff, help cut the grass and everyone works together and helps me. Not because I'm a kid, but because I'm a member. Thanks fellows, and someday I hope I can help one of your boys and make him feel wanted, just as I feel now."

RC/WC Airplanes

Ton Schoonbrood of The Netherlands (Holland) sent us copies of the charts he compiled which show what size and weight airplanes were the most popular at the RC Aerobatic World Championships at Doylestown last September. The charts are a surprise in one respect; one might think that the winners have all settled into just one design niche, but this wasn't so.

In total model weight the bracket having the most models, but no top winners, was 7 to 7 1/2 lbs. Fewer were lighter than this. The winners came from higher weight brackets: 7 1/2 to 8 lbs, 1st and 2nd (Giezen-danner and Matti); 8 to 8 1/2 lbs, 3rd (Kraft); 8 1/2 to 9 lbs, 4th (Prettner); 9 to 9 1/2 lbs, 5th (Wester). Most of the wingspans were concentrated in the range of 60 to 66 inches with a fair number on the shorter side and very few longer. The winner had a 66" span while the runners-up had spans of 61 and 60 inches.

Wing areas were even more wide ranging, from the extremes of 3.7 sq. ft. to 6.1 sq. ft., though most models were concentrated between 4.2 and 5.0. The winner's model was bigger, 5.3 sq. ft., but runners-up were in the mid range, about 4.8 sq. ft.

Schoonbrood's charting was based upon a small portion of the RC/WC model data published in the September 1971 AMA Competition Newsletter. It is an interesting exercise which seems to reinforce the idea that the size and weight of the model doesn't matter near so much as the piloting skill.

Car Selecting Program

Mel Carver (AMA 5817), editor of Smoke Signals, newsletter of the AMA chartered Meroke RC Club, Inc. (N.Y.), related his car selecting procedure in a recent issue.

"Finally broke down and bought Cynthia (Mel's wife) a new car. Picture this, as my co-pilot (Cynthia) and I enter the showroom, very smooth looking sales assistant says to co-pilot, 'May I help you and that man with you (meaning me)? Is that a wing under his arm?' I answered him saying, 'There is no other way to buy a car. If this wing fits in the trunk, I then bring in a flight box, fuselage, fuel, starter battery, props, towels and fuel pump. If it all fits, I'm ready to buy the car.' At this moment, co-pilot interjects her thoughts on some minor points, such as what size engine, automatic transmission, price with trade-in, color, etc. and aside to me she says, 'Who is the car for anyway?'"

Keep 'Em Flying

A simple trick to keep a crack from getting longer if one gets in your favorite plastic ARF is to drill a 1/16" diameter hole at the end of the crack. According to The Connector, newsletter of the AMA chartered Aero Guidance Society, Inc. (N.Y.), this will reduce the stress concentration enough to prevent further cracking. In addition the newsletter suggests fixing the crack with 3M Super Strength Adhesive.

The newsletter also suggest a simple solution for removing nylon wing bolts in that awkward situation when they break off flush with the maple mounting block. Just heat a small screwdriver and push it into the screw; heat will melt the nylon and provide a slot for backing out the screw.

Observer System for Safety

Safety has always played a vital role in model flying, but up until just recently there seemed to be more talk than action. The AMA chartered Aero Sport RC Club (Highland Park, Ill.) has initiated the kind of action that all should consider.

The club's new safety program bases itself on the observer system, requiring someone at the field to be responsible for spotting full
size aircraft and keeping club flyers informed while their RC planes are in flight. All efforts are made to limit altitude and to provide the greatest separation between their models and full size aircraft. These points are in direct alignment with the official AMA Safety Code adopted during the Executive Council's February meeting.

The program was devised following the election of a safety committee consisting of six club members whose responsibility was to create the safety program and to ENFORCE IT.

Watch Those Guesstimates

Noting the report in an earlier AMA News section which credited a 16-year-old with 2,000 hours of RC flying, Jack George (AMA 4126) of Brandon, Fla., suspects that there was either a typographical error or a tremendous guesstimate mistake. Frankly, we don't know for sure whether a mistake was made, as the information came to us second-hand, but from Jack's calculations we suspect that he is right.

Jack feels that high RC flight time estimates are typical from all those who do not keep actual records. He keeps a written record of his flight time and has done so for five years—mainly for battery charging data. His figures show that it is very difficult for even an extremely active flyer to accumulate a huge number of flight hours and with flights of six to ten minutes, it is nearly impossible to keep track of the total time through memory.

Back to the practical side of Jack's record keeping, his experience indicates that frequent, unnecessary charging shortens battery life. He has never had a battery failure, which he attributes to his success to keeping records of charging and battery use.

Lone Flyer Nearly Loses Field

Irresponsible flying is an obvious problem which needs to be dealt with on a serious level. Ed Fronczek (AMA 22960), secretary of the AMA chartered Sky-Scrapers (Brooklyn, N.Y.) and AMA District II Free Flight Contest Board member, recently related one such incident. Fortunately the AMA file of reports of this kind is very thin. We are printing portions of his letter below in order to warn others of the potential harm of just one irresponsible act.

...Some lone RC flyer buzzed one of the Army's helicopters while it was on a jump exercise. The modeler in question was not one of our regular FFA flyers. We do everything in our power to try and find the modeler. We do not want to give him a blast. If we cannot find him or if he does not belong to AMA then we have a greater problem. If he does not belong to AMA then we will contact people in the area to find him. I don't think we will ask him to join AMA; he's brainless.

One thoughtless modeler can jeopardize all—be considerate and FLY SAFELY!

No Axes to Grind

The newsletter of the AMA chartered Woodland Aero Modelers (III) proudly proclaims that the club is "The only true general interest club in the midwest. We fly FP, RC, CL. We fly indoors and out. We participate in all types of contests, AND we fly for the sheer JOY of flying."

(Continued on page 110)
National Record Reviews

A REPORT OF SELECTED RECENT RECORD HOLDERS HIGHLIGHTING THE DESIGNS AND EQUIPMENT USED.

FF Class B Gas national AMA record, category I, Open age class: 24 minutes, 4 seconds, established by William J. Hunter (AMA 52203), Panorama City, Calif., on January 22, 1972.

The model is the "Satellite 600" of the flyer's own design. This has a wing of 65" span and 11" center chord, stabilizer of 38" span and 9" center chord. Airfoil of both surfaces is 9% flat bottom. Satellite City 1 mil mylar was used for wing/stab covering, and the fuselage was finished with K & B Super Foxy. The flight surfaces feature semi-geodetic construction to eliminate flutter under power. The airplane weighs 27 ounces.

A Tatone 40 long mount secured the K & B Torpedo .29 RR engine to the aircraft. Satellite City 40% nitro Climb Max fuel was carried in a pacifier pressure tank, and the engine was shut off by a Tatone timer and flood-off system. Satellite City fuse actuated the dethermalizer.

CL Class I Navy Carrier national AMA record, Junior age class: 471.39 points, established by Dale R. Johnson (AMA 32505), Berkeley, Mo., on August 15, 1971.

Dale's 30" wingspan Guardian was designed by Bill Netzeband and published in American Aircraft Modeler. It weighs 34 ounces and is powered by a K & B .40 rear rotor engine and hand-carved 8"D x 6"P left-hand prop. (The posed picture is with a standard prop in place.) A special rotor was built for reverse rotation, and the backplate was turned to a new location. Firing the T.D. Racing Fuel was a Fireball regular glow plug. The engine was pressurized, speed varied by means of a Custom Bill Johnson throttle in conjunction with a J. Roberts beltrak, customized, and J. Roberts handle. The airplane was finished with Aero Gloss dope. During the record flight, speeds of 89.86 m.p.h. (high) and 29.35 m.p.h. (low) were achieved.

Indoor FAI Stick national AMA record, AMA ceiling category II, Senior age class: 24 minutes, 13 seconds, established by Tom Sova (AMA 75424), Youngstown, Ohio, on August 29, 1971.

The photograph illustrates the substantial offset wing mounting and stabiler tilt employed for this original design. The wing has a span of 26.5" (flat) and chord of 5.4"; it is mounted on 3" posts above the 23.5" fuselage (of which 13.5" comprises the motor stick). The stabilizer is 13.5" by 4", and the prop diameter and pitch are 16" and 30". Power source of the 0.65 oz. aircraft was two 17" strands of .053" Pitelli lubed with glycerine and green soap. Covering was with Aerolite microfilm. The construction balsa and thrust bearing were from Micro-X.

Indoor H.L. Glider national AMA record, ceiling category II, Senior age class: 2 minutes, 7.2 seconds, established by Marty Thompson (AMA 26406), Livermore, Calif., on July 26, 1971.

Marty's glider, the "Sweepette 18 Mk 13," published in Model Airplane News, was modified on the spot between the 7th and 8th flights, a fact believed by Marty to be responsible for establishing the record at this high mark. The record was set during regular competition flying at the 1971 Nationals. In earlier official and test flying, the best single flight time Marty had achieved was 1:01, a performance but not quite enough to win. The modification was to sand .02" undercamber into what previously was a diamond shape airfoil. With the undercamber added, the last two flights were 1:03 and 1:04.2, resulting in the top Nats time for all age classes and also the record.

The Sweepette has a wing of 18" span and 4" center chord, stabilizer of 6" span and 2" center chord (and also anhedral), and overall fuselage length of 19". The 15.2 gram plane was constructed from 4-5 lb. Sig. balsa. Photo by Bob Meuser.

FF Class 1/4A Gas national AMA record, category I, Open age class: 14 minutes, 45 seconds, established by John Kamla (AMA 76130), Bellevue, Wash., on March 12, 1972.

John's airplane is the "Starduster 350," built from a Competition Models kit and powered by a Cox T.D. .049 engine swinging a Cox grey prop of 6"D x 3"P (cut to 5-13/16" diameter) and burning Sig Racing Fuel. The 52" wingspan model was covered with Sig Jap tissue and finished with Aero Gloss dope and fuel proofer. With a judicious use of cement and dope, the airplane weighed in at 7.5 ounces.

The engine was positioned upright onto a CM-I tank mount. Engine run timing was with a Tatone "A Tick-Off" timer, dethermalizer timing and actuating was with Sig fuse.
WERWAGE REPEATS AS CL STUNT WORLD CHAMPION

"He got his fuel!" That was the first thought of many in AMA HQ when the RCA Global Telegram was received from Team Manager Doc Jackson indicating that Bill Werwage of Berea, Ohio, had won the FAI Control Line Aerobatics Individual World Champion title for the second time in a row.

The reason why this thought was so much on the minds of the HQ people was that, in the middle of the week before the July 14-16 contest began, there had been an urgent telephone call from Mrs. Werwage who passed on word from Bill that the fuel he had been able to obtain in Finland, site of the 1972 CL World Championships, would not keep his engine running for a full flight. (Apparently something in the team’s planning for shipment of U.S. fuel had gone amiss, and the only obtainable fuel for test flying may not have contained nitromethane.) One of the other Stunt Team members also was having this problem, she said, portending disappointing results unless the right kind of fuel was obtained.

We aren’t sure how this fuel thing was resolved, but the important thing is that it was. Bob Gieske, Irving, Tex., placed sixth, and Gerald Phelps, Woodhaven, Mich., placed 14th. Together with Werwage’s first, this assured the CL Stunt Team World Championships for the U.S.

Russia took all the top honors in CL Team Racing: first, second and third as individuals and first as a team. U.S. individual positions were fourth (Allan Hodgkins/J. McCollum), 14th (Herb Stockton/Don Jehlik) and 15th (James Dunkin/Bill Wright). U.S. Team Racers finished third in the team standings.

U.S. individual placing in CL Speed found Chuck Schuette, Santa Monica, Calif., in sixth; Carl Dodge, Richmond Hts., Ohio, in seventh; and Bob Spahr, Jr., Thousand Oaks, Calif., in 13th. In team scoring, Italy was World Champion and the U.S. finished second.

FF TEAM FINALS, CADDIO MILLS, TEX., JULY 1-3

This was the culmination of the two-year competition program to select three-man teams to represent the U.S. in the 1973 Free Flight World Championships (for Wakefield Rubber, FAI Power and Nordic A-2 Glider models) tentatively planned for Austria. The Team Finals, hosted jointly by the Cliff Cloud Climbers of Dallas and the Ft. Worth Planesmen, consisted of 15 rounds--five per day per event--with the three in each event having the highest flight totals being named to the team.

The wind was high during most of the contest--over 20 m.p.h. reported some of the time, with gusts even higher--so that it is very remarkable for first place in FAI Power to be with a perfect string of 15 maxes. That such was possible is a certain indication that the field and its surroundings were good for chasing and retrieving.

FAI Power. Henry Spence, Arlington, Tex., is the one who maxed out to obtain a total of 2700 seconds. In second and third place were Frank Wolff, Massapequa, N.Y., and Tom McLaughlan, Pensacola, Fla., 2688 and 2662 seconds, respectively. Alternate team members, in the event any of the first three should find it necessary to drop out, are Jim Taylor (2656 seconds) and Earl Thompson (2652 seconds).

Wakefield. Frank Parmenter, Friendswood, Tex., and Bob White, Monrovia, Calif., were first and second; both had been members of the 1971 Wakefield team, and White had placed third in the ’71 WC. Joining these veterans is a relative "youngster", Jon Davis of Albuquerque, N. Mex. Parmenter had 2561 seconds for first, White 2530 for second, and Davis 2431 for third. Alternates are Fred Pearce (2427 seconds) and Jim Patterson (2424 seconds).

Nordic A-2. Hugh Langevin of Minneapolis, Minn., who also was a ’71 team member, placed first with 2315 seconds, followed by Paul Crowley, Warren, Mich., 2222 seconds, and Vince Croghan, Timonium, Md., 2148 seconds. Alternates are George Xenakis (2066 seconds) and O.C. Stewart (2045 seconds).

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

Official Sanctioned Contest of the Academy of Model Aeronautics


SEP 2-4—SIOUTHAMPTON, N.J. (A) groom RC Mest, Site: Millville Airport, Millville, N.J. 08332, Sponsor: Millville RC Society.

SEP 2-4—AMARILLO, TEX. [A] Monthly Model Mest, Site: MOC Field, Amarillo, Tex. 79105,

SEP 2-4—GREENSBORO, N.C. [A] 1st Annual RC Mest, Site: County Airport, Greensboro, N.C. 27401, Sponsor: Guilford County RC Flyers.


SEP 5-6—WICHITA FALLS, TEX. [A] Octavefest RC Mest, Site: MOC Field, Wichita Falls, Tex. 76308.


SEP 7—3, ALEXANDRIA, MINN. [A] 1st Annual RC Mest, Site: County Airport, Alexandria, Minn. 56308, Sponsor: Stearns County RC Flyers.


SEP 7—8-9, GREAT BEND, KANSAS [A] 21st Annual RC Mest, Site: Great Bend RC Club, Great Bend, Kans. 67530.


SEP 7—8-9, EL MARINA, CALIF. [A] 2nd Annual FF Mest (Cat. 1), Site: DNRC Field, El Marina, Calif. 93620.

SEP 7—8, MARION, OHIO (A) 9th Annual RC Mest, Site: Marion County Airport, Marion, Ohio 43302, Sponsor: Marion County RC Club.

SEP 7—8, FALLS CHURCH, VA [A] 1st Annual FF Mest (Cat. 1), Site: West Potomac Park, Falls Church, Va. 22041, Sponsor: Northern Virginia RC Society.

SEP 7—8, MEMPHIS, TENN. (AA) Memphis RC Mest, Site: Memphis Municipal Airport, 2700 E. Elder St., Memphis, Tenn. 38122. Sponsor: Magnificent Mountain Mesters.


LADIES AND GENTLEMEN,
DEADLY DICK WHO IS
FAMOUS FOR HIS MANY
SHORT FLIGHTS, HAS
TAKEN OFF!

MR. McBRAGG HAS
ASSURED ME THAT
DEADLY DICK HAS
NEVER YET FAILED
TO CRASH —

OH LADIES AND GENTLEMEN, THE
SMOKING CRATER IS SIMPLY AWESOME
BUT THE GRIMEX IS
STILL TICKING! I
CAN HEAR IT...

McBRAGG IS CLIMBING
DOWN INTO THE CRATER
TO RETRIEVE OUR
FAMOUS GRIMEX WATCH

WELL MR. SWIZZLE, YOUR
GRIMEX IS BUSTED - BUT
THE GALLOPING GHOST SYSTEM
IS STILL TICKING LIKE CRAZY!
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OVER-ALL LENGTH ..................... 37½"
MAXIMUM FUSELAGE DEPTH ............. 6"
OVERALL HEIGHT ....................... 16"
POWER ... KB OR OS MAX. .............. 40
CONTROL SYSTEM ................. 4 SMALL SERVOS
FUEL TANK CAPACITY .............. 3 OUNCES
FLYING WEIGHT ......................... 4 LBS.
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