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ALSO BLUE FLIGHT-POTOMAC PURSUIT SQUADRON-F.A.C. NEWS

"MEETING AT COLLEGE PARK AIRPORT -- THE NATION'S OLDEST"

"MAX FAX"

MAY - JUNE 1978

NEXT MEETING DATES: June 7, July 5, and August 2 at College Park Airport 7:30 PM

CONTEST SCHEDULE

MAY 21 -- The Silent Flight Meet, Warminster Naval Air Center, Warminster, PA. sponsored by the Flying Bucks -- includes OHLG, Catapult, A-1 Towline, Coupe, 020 old timer, Rubber Scale - contact Jim VanSant, 337 Parkview Ave, Penndel PA 19047 or call 215-757-2513.

May 28 -- DAYTON SECTOR SPRING MANUVERS at Wright Field, Dayton Ohio 0900-1700 includes 12 GLORIOUS FAC EVENTS.

JUNE 4 -- FAC- GHQ CONTEST at Durham Conn. This will include a challenge for WWII Combat by the Blue Flight of the Potomac Pursuit Squadron of the D.C. Maxcutters.

JULY 15 & 16 -- FAC NATS AT JOHNSVILLE --SEE THIS ISSUE OF MAX FAX FOR DETAILS.

JULY 22 -- D.C. MAXCUTTERS SCHOOLYARD SCALE RC CONTEST AT COMSAT

AUGUST -- 26-- D.C. MAXCUTTERS SUMMER FUN FLY at COMSAT

OCTOBER 8 -- FAC GHQ FALL CONTEST AT DURHAM CONN.

CLUB NEWS by Pat Daily

This will be very abbreviated since we are short on space this issue due to the great number of articles--keep it up. Anyway this issue will have old MAX the Maxecuter ace piloting a Blackburn Skua and keeping a sharp eye out for Germans. Also a nifty review of local hobby shops by Rich Hensel, a book review by Don Srull, part one of a great kite article by Gordon Lyon(part two with illustrations in next issue), a battery article by Allan Schanzle, and an 0.20 Old Timer article by Marty Schindler. A lot to read, eh?

Welcome to Roger Laudati and Don Gray and Lin Reichel as new MAXCUTTERS, YEA!

START BUILDING NOW FOR THE FAC NATS--only about 10 weeks to go!

NOTE: MAXCUTTERS WILL FLY EVERY FRIDAY EVENING AT COMSAT, ALL HANDLAUNCH AND CATAPULT CONTESTS WILL BE ON THE THIRD WEDNESDAY AT COMSAT WITH MAKEUPS ON THE SECOND WEDNESDAY OF THE FOLLOWING MONTH --GOT THAT?

I have seen some nifty bones and completed planes that might make some pylon polishers shudder for the upcoming Thompson Races at GHQ and at the FAC NATS- Jim Daily just finished a GOON and a CHAMBERMAID, Allan Schanzle has his HUGHES raring to go, and yours truly in covering a new TOOTS. So get to it gang, the races are almost upon us. Get those WW II jobs tuned up too!

Pat

A SURVEY OF SOME OF YOUR FAVORITE HOBBY SHOPS

By Rich Hensel

Rolfe Gregory, George Leffler, Paul Spreiregen, and a few others, in fact the majority of members responding to this survey say that Corr's is their favorite hobby shop. In each case the reasons are about the same: it has the best overall selection of wood, kits, and accessories. I have to go along with this somewhat, but my problem with Corr's is their hours. They aren't open evenings, and though Saturdays aren't bad, day-time parking downtown can be a pain. They will give a 10% discount to club members.

CORR'S HOBBY CRAFTS, 9th & H Sts., N.W. EX-3-6181 Mon. thru Sat. 9 to 6

Pat Daily likes Happy Hobbys in Gaithersburg because Bob Clint, the guy who runs the joint, will order anything that you want, and if it's available he'll get it fast. Plus most of his stock, including the R/C stuff that he specializes in, is at excellent discount prices. ex. Last summer I bought a three-channel Ace outfit from Bob for a little over a hundred beans. Also he can get the Ace gear you buy there serviced locally because he deals directly with Fred Marks who lives in the area and designs some of the radio gear for Ace. Therefore I suggest (I'm sure Pat will agree) that if you're in the market for an Ace system, or if you are just getting into R/C, then go see Bob Clint. Incidentally, Bob has those little green CO-2 chargers. The ones that most area shops don't bother to carry.

HAPPY HOBBYS, 12123 Darnstown Rd., Gaithersburg (301) 869-1037
Mon. Tue. - Thur. - Fri. 11 to 9. Sat. 10 to 5. Closed Sun. & Wed.

Our leader, Herr Meyers, thinks that Model Masters in Virginia is one of the best. When I wanted to know why, he just gave me that s--- eat'm grin of his and said, "Check it out." Well, I'm glad I did. Outside of Corr's, this place has the best selection of balsa I've seen in the area. ex. Sig 1/20 sheet. They have a huge array of accessories - KB, Goldberg, DuBro etc., plus the largest display of X-Acto tools that I've ever seen. Their inventory of R/C gear and kits is fairly good, but there isn't too much in the way of FF or rubber powered kits. They do have the Aristo Craft ply-span. If you're not familiar with this covering material, it comes in two weights. A 17½ x 23½" sheet of the light-weight variety goes about three grams. This would put it in the top five or six in the chart by Cliff McBaine that was in the June-July newsletter. It is non-porous (shiny on one side) and has excellent wet strength. Several hobby dealers have told me that the real Japanese tissue hasn't been manufactured for many years. I don't know whether this is true, but the ply-span is an excellent imitation, and Model Masters is the only place I've seen it. Their discount policy is 10 to 15% - depending in the item - to club members only.

MODEL MASTERS, 6920 Braddock Rd., Annandale, Va., 941-4900 Mon.-Thur.-
Fri. 10 to 9. Tue.-Wed.-Sat. 10 to 5. Closed Sunday.

Don Snull says Arlington Hobby Crafters is a good hobby shop. My first impression was that the place is like a miniature Corr's. They have a little bit of everything: boats, planes, trains, cars, plastic models, etc. I didn't see much of a wood selection, but they have a decent assortment of accessories and a good variety of covering materials including colored silk. Recently I heard a club member asking about the

Fly-N-Things WW-1 kits by Vintage Aero. I forget who it was, but Hobby Crafters has them. Discount policy - no discounts.

ARLINGTON HOBBY CRAFTERS, 625 N. Glebe Rd., Arl. Va. 522-6442 Mon.-Thur.-
Fri. 10 to 9. Tue.-Sat. 10 to 6. Sun. 11 to 5. Closed Wednesdays.

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While we're mentioning kits, if anyone is looking for the old Tern Aero jobs a place called P.D. Craft House in Silver Spring has four of them: the Aeronca C-3, the Porterfield, the Curtiss Robin, and the Ryan ST. On second thought scratch the Ryan. By the time you read this it will be gone.

There is one member of this club (there's one in every club) who says that his favorite hobby shop is in Gettysburg, Pa. Sorry, Allan, but the last time I was in Gettysburg 'twas back in '53. However, should I chance to pass through in the near future I'll "check it out", as Stew says, and file an official report.

Talking about far away places, suppose you find yourself down in the Waldorf area wandering around aimlessly, maybe what you need is a quick fix - like the feel of balsa wood and the sight of many airplanes hanging from a ceiling. If so, then stop in at Doug's Hobby Shop. It's an interesting place, and he's an easy guy to talk to. You'll find a fairly good stock of kits, R/C gear, and lots of accessories. His discount policy is up to 20% on planes, radios & related gear, on purchases \$10. or more to club members.

Speaking of discounts, you're not going to believe this, but stay awake and hear me out. There is a small hobby shop in District Heights. It's stashed away in one corner of a drug store, and the following is what I saw in the display case: Super Tigre .61 R/C Blue Head ABC, list price: \$92.50 - his price: 64.39., Super Tigre .23, list: 42.95 - his: 32.95., Kraft .61 R/C w/muffler, list: 99.98 - his: 74.95., Cox Conquest .15 R/C list: 59.95 - his: 39.98. All radio systems go for about 20% off, and if what you want is available, he will order and get it fast. The fellow who operates this tiny shop didn't want me to use his name (hell, at those prices maybe the stuff is hot; I don't know). Anyway, he's there only a few hours a week, and the regular store employees will not be able to help you. I know. So, see me if you're interested and I'll give you his name and try to explain how to catch him when he's there.

At this point I feel that I must say something about Red's Hobby Shop in Wheaton. I've visited lots of shops in the last few months - possibly three times the number listed above. I didn't include them because, in my opinion, they weren't worth listing. We all joke about Red and his lottery tickets; we gripe about how difficult it is to order anything through him; we bemoan his policy of no discounts, but in fairness I must say this: compared to what I've seen, Red has a well-stocked shop. And with the exception of one or two others, his selection of kits in general and rubber powered kits in particular is as good as any and better than most. RED'S HOBBY SHOP, 2537 Ennalls Ave., Wheaton, Md. 949-7313 Mon. thru Fri. 10 to 9. Sat. 10 to 6. Closed Sundays.

Finally, all the shops listed above are in the phone book. But not all have their hours listed, so call before you start out. You might save yourself from a lot of wasted time and trouble. ex. One night last fall I made the trip from Greenbelt to Happy Hobbys in Gaithersburg. When I arrived I found a locked door and a sign saying that they are closed on Wednesdays. At that point I was less than happy. I wheeled around, dashed

up the steps and out into the parking lot; damned near tore the car door off its hinges; jumped into the car and then proceeded to slam the door on my fingers, thus adding injury to insult. But we can find a double moral here. First: always call ahead. Second: as my old ambulance partner, Eley, used to say, "You gotta be smarter than the door." Right?

NICOLAI IVANOVICH LOBACHESKY
AND HIS CONTRIBUTION TO THE SECRETS OF
CHARGING NICAD BATTERIES

One of the world's most famous mathematicians was Nicolai Ivanovich Lobachesky (1793-1856). His primary field of interest was in non-Euclidean (non-3 dimensional) geometry. In one word he taught the world the secret of success - it even rivals Murphy's law. By the way - have you heard of O'Dell's law - "Murphy was an Optimist?" Anyway, ole Nickie shed his grace on the scientific community in one simple word - plagiarize! In fact, there was a song written several years ago by one Tom Lehrer, a disciple of Lobachesky (and math professor at Harvard and MIT - really) and part of it went something like this:

"Plagiarize, Plagiarize,
Let nobody's work evade your eyes,
Remember why the good Lord made your eyes,
So don't shade your eyes,
But plagiarize, plagiarize, plagiarize,
But be sure to always call it, please, research."

In accordance with this profound philosophy, we have recently "researched" the subject of NICAD battery charging (by reading George Meyers' R/C Techniques in the February 1978 issue of "Model Aviation") and came up with (Ivan would call it "copied") the chart below. It's useful, even for the novice R/C'er who would like to charge any milliamp hour (mah) rated 4.8 volt battery with any constant rate charger designed for 4.8 volt systems (not the 2.4 volt ACE pulse system). Look at the charger and read the charge rate printed on the case. For the 100 mah battery that comes with the ACE system, their charger is 33 ma. Find this value on the bottom scale of the graph and go vertically until you hit the 100 mah line and go horizontally to find a full charge time of 5 hours. Simple, eh what? Thanks, Nickie, (and George).

by Allan Schanzle

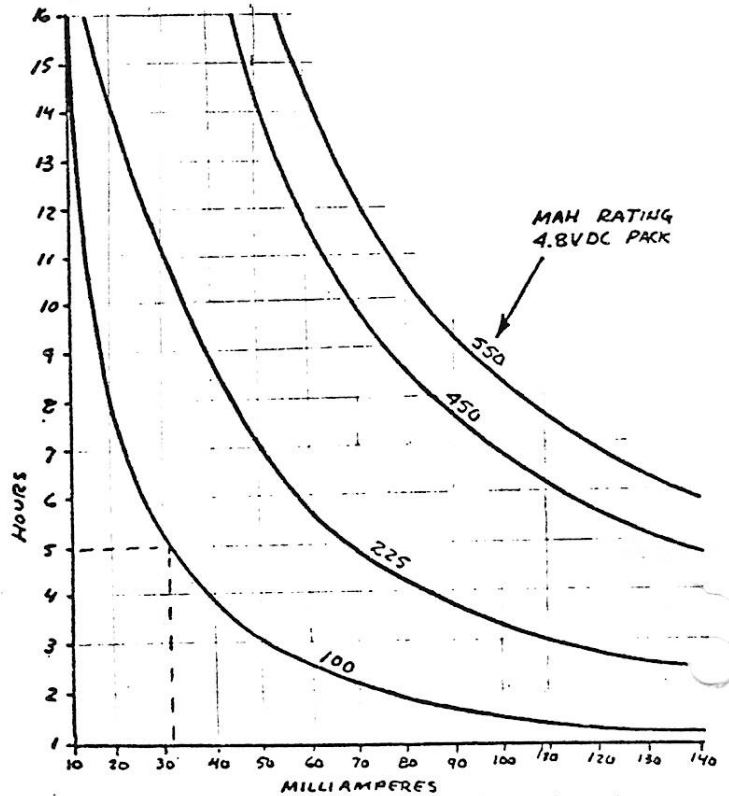
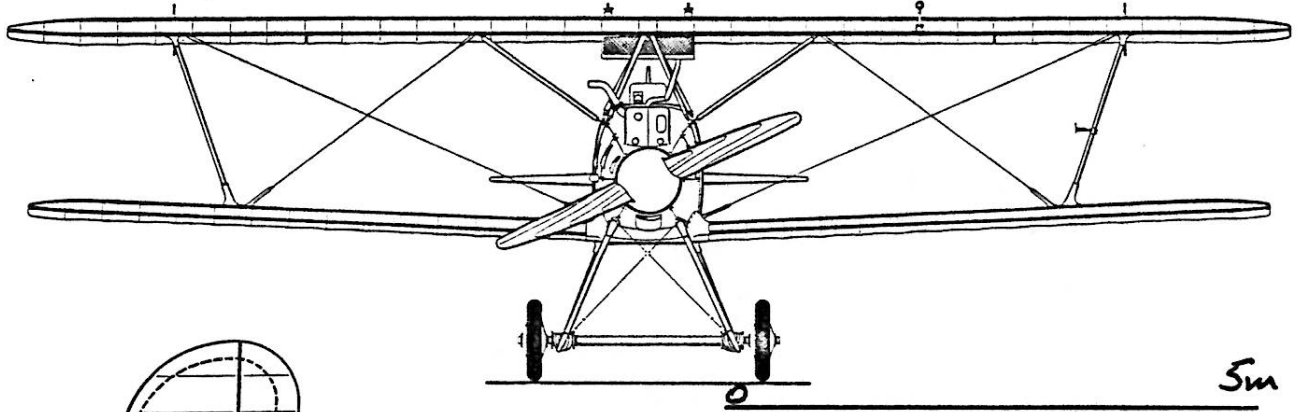
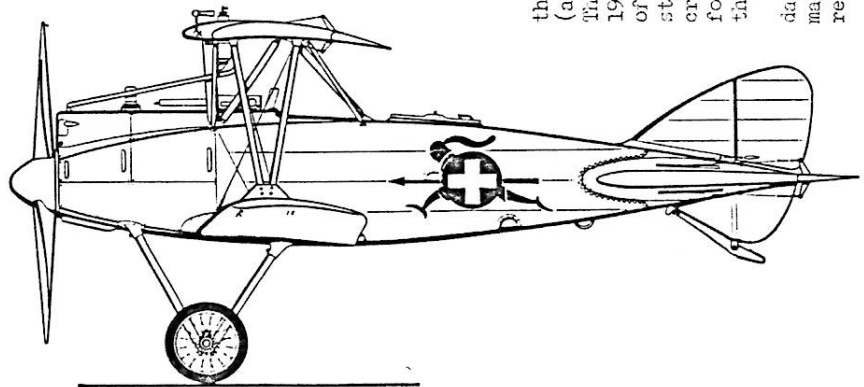
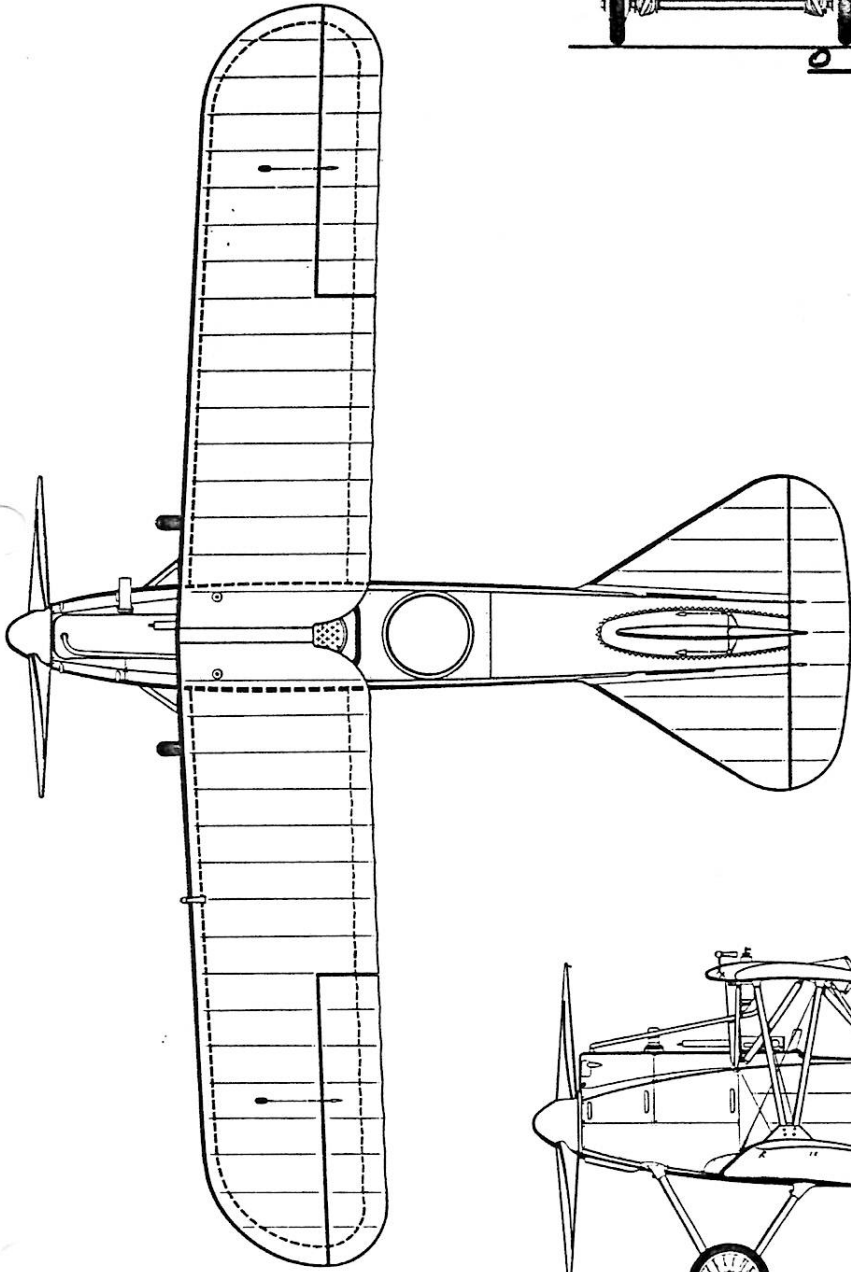


Fig. 1: Handy guide for estimating charging time, when mixing various manufacturers' equipment.

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Mini-Book-Review.
 "The Aircraft of the Swiss Air Force Since 1914" by Jakob Urech
 Published and printed in Switzerland, 1975

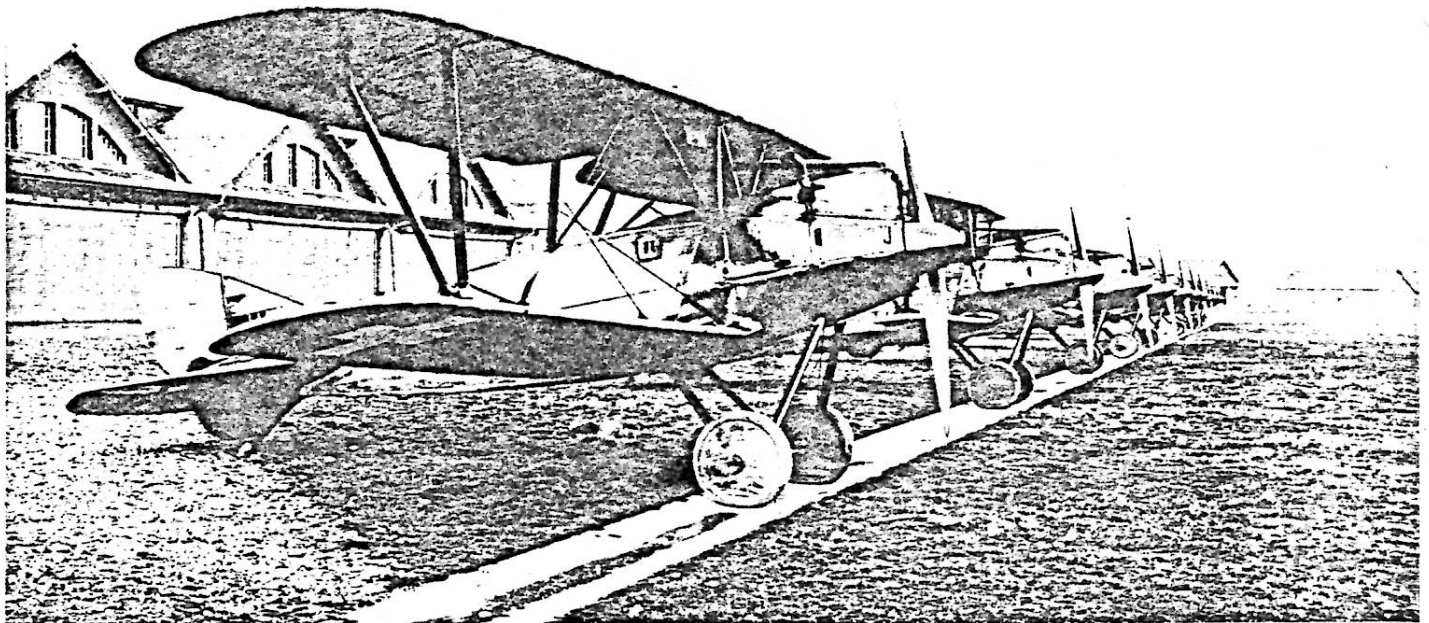
One of the finest books for scale model buffs and aircraft historians that I have ever seen has recently hit the market. The book is not cheap (about \$30), but it is a tremendous collection of photos and 3-views. The 367 page volume covers all Swiss military aircraft in service since 1914; over 150 in all, from the Dufaux 4 of 1909 to the C-3605 Schlepp of 1970 (how's that for obscure?!). Most impressive from the modelers standpoint is that each aircraft is treated with a brief technical description, photos, and a large three-view rendering. To illustrate the format of this fine book, one of the interesting early aircraft covered, the Zepp LZC-II2, is shown on the following pages.

Wher can you buy it? Hah--- that's the tough part. We found one one day while combing through the Smithsonian Book Store. Other book stores may have it, but it will take a little searching. But that's what makes research fun, isn't it? (No Daily, you can't borrow mine.)

Don Strull

Zepp LZ C-II 2

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Designed by Zeppelin-Werke, Paul Jarai, chief-engineer, Lindau, D
Manufacturer Luftschiffbau Friedrichshafen, D
Year of manufacture 1918
Purpose Long-range reconnaissance
Crew 1 pilot, 1 observer
In service in Switzerland: From 1920 until 1927
Number of aircraft procured: 20, of which one had to be handed over to France
Registration marking 801 to 812 and 814 to 820
Service life 500 flying hours

Technical data

Type of construction Biplane, 1½-strutter, wire-braced, light metal, wings, fuselage, empennage and control surfaces fabric-covered
Dimensions Span 12.00 m; length 8.00 m; height 3.70 m; wing area 31.20 m²
Weights Empty weight 1035 kg; permissible load 435 kg; max. take-off weight 1470 kg
Power plant Model: Maybach Mb IVa (400 kg)
Designed by: Maybach-Motorenbau, Friedrichshafen, D, and Canstatt-Daimler & Cie., Canstatt, D
Manufacturer: Maybach-Motorenbau, Friedrichshafen, D
Type: Six-cylinder liquid-cooled four stroke in-line engine, individual cylinders, 2 « Maybach » carburetors without floats
Cylinder bore 165 mm; piston stroke 180 mm; piston displacement 23.10 litres; compression ratio 6.08 to 1; boost: none;
Rated altitude: constant power up to 1800 m a.s.l.; rated power 260 hp at 1400 rev/min
Propeller Two-bladed, plywood type « Smolik », D = 3.10 m, S = 1.90 m
Equipment Observer camera, oxygen installations
Armament Machine-gun, trajectory through plane of propeller, firing synchronized with engine, observer machine-gun
Performance
Max. horizontal speed 180 km/h
Max. rate of climb 6.5 m/s
Service ceiling 8500 m a.s.l.
Endurance 4 hours 10 minutes
Range 480 km

Only 10
weeks to
the F.A.C.
NATS —
Be sure
and pre-
register!

0.02 REPLICAS
OLD TIMER EVENTS
By Marty Schindler

\$1.50.

The shipping charge for these kits is 75¢ per kit with a maximum charge of \$1.50.
For those who like to build from plans John Pond, Old Time Plan Service,
Box 3215, San Jose, California 95156, has the following 0.02 Replica Plans
Available:

Cat. No.	Name	Manufacturer or Designer	Span	Price
11C3	Brooklyn Dodger	Cal-Aero	32	2.00
11E3	Foo-2-U	Oobarski 5/39	36	1.75
11G1	Gas Champ	Simmons (MAN 12/40)	38	1.75
11E4	Interceptor	Goldberg	37	1.25
11E4	Miss America	Zaic	30	1.00
11E4	Miss America	Wagner (MAN)	42	1.50
11E3	Pacemaker	Ohlsson	34	1.50
11E4	Powerhouse	Taibi (MAN 11/39)	36	1.50
11E5	Sailplane	Goldberg	39	3.00
11E6	So Long	Englehardt	32	1.50
4E4	Stratostreak	Garami (AT)	33	1.75
11E3	Valkrie	Goldberg	38	1.75

Remember to include 15% of the plan's price for handling and shipping charges when ordering plans from John.

For those who like to use home brewed fuel in their Cox TD 02s
The following is a good fuel:

- 65% Nitromethane
- 17% Propylene Oxide
- 8% Castor Oil
- 10% MPG Oil (Motorcycle Oil)

It appears that the right propeller for the 02 is a Cox grey 4.5 inch diameter by 2 inch pitch prop.

For those who wish to scale their own 0.02 OLD TIMER the average span of the model is 36 inches with a wing area of from 140 to 160 and weighing around 4 ounces for free flight old timers. For radio control assisted old timers the span can be increased to about 40 inches with a wing area of around 200 square inches and weighing almost 8 ounces.

At the Old timer Champs both free flight and radio control assist 0.02 replica events are scheduled to be flown. For both events the current S.A.M. rules specify a timed engine run of 20 seconds. However due to the low weight lifting capabilities of the 0.02 replica Old Timer Model the R/C event is usually flown as a fuel allotment event with a maximum fuel allowance of 14 cubic centimeters. Therefore, the 0.02 R/C event will be flown as fuel allotment event at this year's S.A. M. Champs.

With the Society of Antique Modelers Annual Old Timer Championships scheduled to be held July 25, 26, and 27, 1978 at The Air National Guard Coyle Drop Zone on route 72 in New Jersey (4 miles Northwest of the inter-sections of Routes 539 & 72), Pat Daily thought a write up on some Old Timer Events would be of interest to the members.

I first became acquainted with Old Timer Model Flying by attending The Fourth Annual Stockton Old Timers Contest in October, 1964. It was at this contest that the first steps were taken to establish The Society of Antique Modelers.

During this same time period and continuing to the present day

John Pond sponsors special Old Timer Events flown at each AMA Nationals.

One such event was an 0.049 powered half scale event with a perpetual trophy donated by Frank Ehling.

With the introduction of the Cox TD 02, a special Old Timer event was introduced for the 0.02 cubic inch engine size. The Southern California Ignition Flyers (SCIFs) club is generally given credit for establishing this most popular of all Old Timer events. The .02 Replica event appears to have completely vanquished the 0.049 powered half scale event and the Ehling Perpetual Trophy is now awarded to the winner of the 0.02 Replica Old Timer special event at the Nats.

The .02 Replica event proved so popular that two California Companies, Cal Aero-Models and Micro Models, started producing kits for this event. However, when the cost of Balsa went sky high and in spite of the price of these kits going from \$6 to around \$10; the manufacturers found it was not economically feasible to keep producing these kits. These manufacturers have now switched to producing scaled Old Timer Models for the R/C Trade using 0.15 to 0.25 cubic inch size engines.

Have recently learned that J & R Models, 5021 W. Sheridan, Phoenix, Arizona 85035, are producing the following CAL-AERO 0.02 Replica Model Kits:

Playboy Senior at \$9.75

Strato Streak at \$9.75

So Long (cabin model) at \$10.75

Brooklyn Dodger (cabin model) at 10.75

ROTARY-WING KITES: Introduction and Example

G.E. Lyon

The rotary-wing or autogiro kite presents an interesting and instructive introduction to a very modern form of flight. As Tyrrell [1] has remarked:

The problems involved in the consideration of the air flow through and around the rotor, in the various conditions of auto-rotation, ascent and descent, the attitude of the rotor in forward flight, the effects of the variation in the velocity from hub to tip and the constant change in relative velocity from the advancing to the retreating side of the disc, all constitute headaches for the designer.

A kite enjoys several advantages over other, powered, methods of investigation of rotor dynamics. There is no starting or transmission problem, and no noise. The final product is appealing to a spectrum of ages, from children to the most jaded adult. And tools, materials and construction are simple. The kite presented in a subsequent section is a culmination of a series of autogiro kites by the author. Earlier models often flew as well, but were not as serviceable--flying is not the sole criterion of importance. For example, prototypes with longer rotor blades or rearward placed stabilizers tended to break the rotor upon landing.

II. AUTOGIRO--A BRIEF HISTORY

Juan de la Cierva y Codorniu was awarded many prizes for his invention of the autogiro. The 1932 Degenheim Medal to Cierva mentions that it is "for development of the theory and practice of the autogiro." [2] Cierva's original motivations were to achieve safe low speed flying characteristics for aircraft; he did not focus initially upon vertical or near vertical ascent and descent, but rather, stall prevention: An autogiro's rotor is not powered by any engine, so engine failure during flight only causes descent.

Since the rotor of an autogiro is unpowered, a wire tether or gliding can replace the towing function of the propeller found on practical autogiros. There

G.E. Lyon 4/77

have been numerous man-carrying rotor kites. Two of the more famous ones are the FA-330 submarine observation kite (Fig. 1) which achieved limited deployment on German submarines in WWII, and the post-war Benson "giro-glider". The British also developed a small, manned rotor glider in WWII. On a smaller scale, Charles Chubb of Pitcairn Autogiro Co. designed and built in the late thirties a very handsome gyro-kite which was flown and exhibited at the Smithsonian Institution (Fig. 2). Chubb's kite had a rotor about thirty inches in diameter. Unfortunately the move into the Air and Space Museum damaged the kite, although photographs of it are still available [3].

III. AUTOROTATION AND ROTOR DYNAMICS

J.A.J. Bennett, one of Cierva's collaborators, has described the autogiro as "...basically a powered glider with rotating wings." [4] The airfoil shaped blades of the rotor are inclined negatively to the disc of rotation, so that in straight descent they merely glide down on a helix path centered at the rotor hub. In forward autogiro flight the axis of the rotational disc is pitched back from the direction of travel. In this respect the disc presents to the airflow a surface not unlike that of an ordinary kite.

A detailed depiction is given in Figure 3. Lift from blades advancing into the airstream can be analyzed into two components: Y, a lift force parallel to the axis of rotation that causes the blades to "cone" upwards as one might expect; X, a thrust in the disc plane which keeps the blade advancing into the airflow. (See Fig. 3-b)

The explanation has ignored the fact that outer portions of the rotor fly much faster than inner segments. In actuality only inner parts of the blades absorb airstream energy as shown in Fig. 3-b: Outer blade parts work in a helicopter mode, transferring energy to the air by pumping it downward through the disc. The two mechanisms reach a stable equilibrium under steady airstream conditions, and the rotor neither overspeeds, windmill fashion, nor stops. Fig. 3-c shows a simplified version of the rotor disc acting to deflect airflow downward, thereby generating lift.

Discussion to this point has ignored another important point mentioned by Tyrrell, namely that retreating blades in the airstream develop appreciably less lift. Lift is not symmetric about the rotational axis. Fortunately centrifugal forces on the blades exceed lift forces by a factor of ten, so hinging each blade to flap upwards at the tip will remove any rolling forces. Cierva was the first to realize the usefulness

This is part 1 of a 2-part article. All figures will be in next issue.

pinwheel in action. Blade pitches may be too negative, or, since the angle is slight, about five to seven degrees, too flat. The airfoil shapes of the blades may be defective--keep the trailing edge sharp-- or the chord of the blades may be too narrow. The blades can be covered with heat-shrink plastic for greater efficiency.

(3) Erratic "weather-vaning". The frame is warped or misaligned. Add tabs on the stabilizers and fin. Check the stabilizers carefully for correct longitudinal alignment. Break and reglue frame pieces if tabs can not correct wandering.

(4) Blade slap. If the rotor is hitting the stabilizers then find less turbulent flying winds or stiffen the frame to remove longitudinal torsion flex. When the blades hit the "spine" of the framework the amount of blade droop should be cut, or the blades shortened. In all cases be sure that the rotor is balanced carefully.

V. DESIGN VARIANTS

A seesaw rotor hub will work well, and under some conditions with steady winds, truly rigid rotors can be trimmed out. Chubb's kite had dihedral wings placed quite forward, and these were also good rotor protection; however the stabilizers will work when placed far aft. A recent wind-up model [5] had neither stabilizers nor rotor hinges, relying instead upon bluff bodies (small rectangular blocks) on the rotor tips to limit rotational speeds to a very narrow range. Bluff bodies will work to limit rotor speeds of a kite too, and are especially effective on a rigid rotor in brisk winds.

VI. REFERENCES

- [1] Tyrrell, L.D. "Helicopters, Past and Present--I," The Aeroplane, (August 23, 1946), p. 217.
- [2] Pioneering in Aeronautics, Recipients of the Daniel Guggenheim Medal, 1929-1952. (Daniel Guggenheim Medal Board of Award, New York, 1952), pp. 19-21.
- [3] Garber, P.E. Private communication with the author, February 1977.
- [4] Bennett, J.A.J. "The era of the autogiro." The Journal of the Royal Aeronautical Society 65, n.61v(October, 1961), pp. 649-659.
- [5] Spector, L. "Spinner." Model Aviation, (February, 1977), pp. 48-50, 94-95.
- [6] Sauners, G.H. Dynamics of Helicopter Flight. (John Wiley & Sons, Inc., New York, 1975.)
- [7] AGARD Lecture Series No. 63 on Helicopter Aerodynamics and Dynamics. (North Atlantic Treaty Organization AGARD-LS-03. Available through N.T.I.S., Fort Royal Rd., Springfield, Va. 22151.)

of hinging for forward flight. Flapping hinges also neutralize gyroscopic effects which would otherwise prove troublesome in gusting winds.

IV. A ROTOR KITE

Figures 4-6 show a general layout of a good, proven autogiro kite. The rotor blades are fairly short, and the stabilizer wing separation broad to reduce broken "pinwheels" to a minimum. The materials are spruce or pine, with balsa at joints in the tail, and light plywood on main frame joints. Areas of the fan can be covered with good quality model plane tissue, silk, or heat-shrink mylar (such as the Seal-Lamin used to cover photos). In any case, keep the upper part of the fin very light, or it will destabilize the kite. The stabilizers are 1/16" sheet balsa set 12" apart. The surfaces have their lower edge aligned parallel with the base line used to draw the plans, and are canted upwards and outwards at 45 degrees to provide stability in the roll axis.

A couple of rotor variants have been tested successfully. The "rigid" or "unhinged" version relies upon elastic properties of a nylon tubing (called "inner nyrod") to gain flapping actions. The willow tube is non-stretch resistant to torsion forces, so the angle of attack for the blades is preserved. This type of rotor is also not easily broken, since blades can flex in the disc of rotation ("lead-leg hinging"). The tubing, and the light threaded stock used with it can be found in any radio-control hobby shop. The more complex rotor head has distinct flapping and lead-leg hinges. Even this second rotor is not very hard to assemble, since it too is an ad hoc adaptation of threaded stock and nylon clevises from RC models.

Flying Tips

Several broad classes of problems have been investigated in the course of building various prototypes. The reader will find the following observations useful in trimming rotor kites.

- (1) Kite troubles over in flight. Solutions (do one or more): include a lighter rotor, e.g. softer balsa stock for the blades; larger stabilizers or a wider stabilizer base; ballast in the lower kite frame (man-carrying rotor kites have this built into the design); higher tether point. The last suggestion will usually suffice but there are limits to how close one wants the string to the rotor.
- (2) Rotor decay (ceases to spin). The blades should turn about 500 rpm and give the impression of a good

BLACKBURN ROC

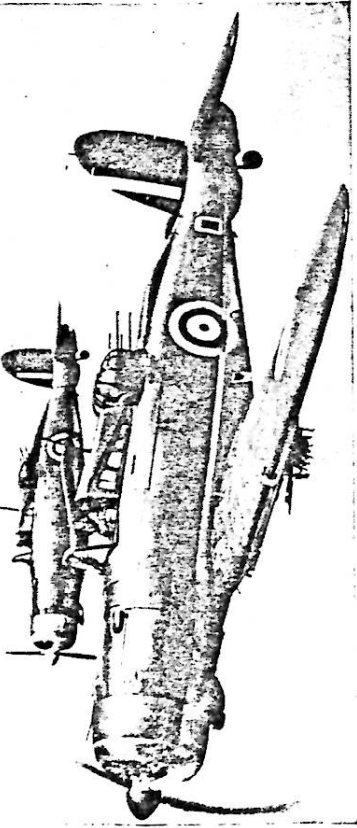
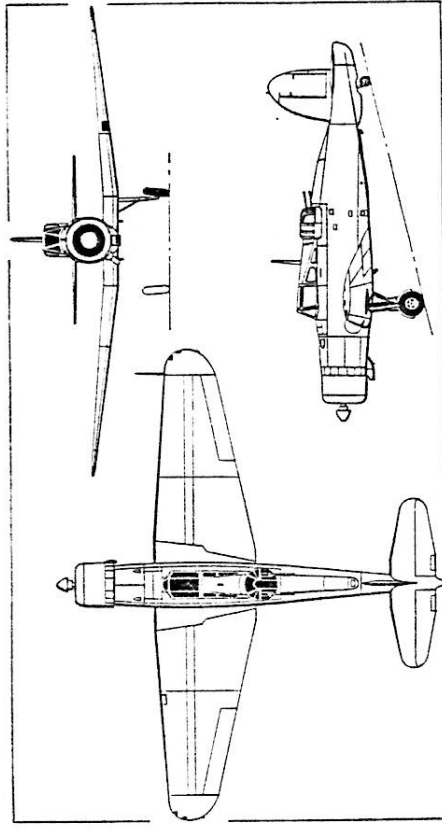
It would be idle to deny that the two-seat single-engine turret fighter concept was a failure. The weight and drag of a power-driven gun turret seriously impaired performance, and the idea of bringing a quartette of machine guns to bear in broadside attacks on enemy bombers proved tactically unsound. The Roc, contemporary with the Boulton Paul Defiant and its shipboard equivalent, was the Fleet Air Arm's first aircraft to be equipped with a power-driven turret, and after a brief period in first-line service during which it never operated from an aircraft carrier, it was withdrawn, subsequently serving as a trainer and target-tug.

The Roc was essentially a fighter variant of the Blackburn Skua shipboard dive-bomber, and the design and construction of the two aircraft were fundamentally the same. Meeting

GREAT BRITAIN

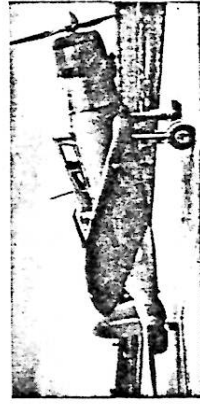
the requirements of specification 0.30/35, the Roc was ordered on April 28, 1937, and the contract for 136 aircraft was sub-contracted to Boulton Paul Aircraft. The Roc differed from the Skua in having a slightly wider fuselage in order to accommodate a Boulton Paul "A" power-driven turret with its four 0.303-in. Browning guns, and increased wing dihedral. The first three production aeroplanes (L3057-3059) served as prototypes, and the first of these made its initial flight on December 23, 1938. The third machine (L3059) was experimentally fitted with twin floats to specification 20/37, being completed in this form in December 1939, and a further 133 Rocs (L3060 to L3192 inclusive) were built, production terminating in August 1940.

The Roc entered service with No. 806 Squadron in February 1940, this unit operating



four Rocs together with eight skuas, and in June six Rocs joined No. 801 Squadron, but after a few months No. 802 re-equipped with Fulmars and, in 1941, No. 801 received Sea Hurricanes. The remaining Rocs were employed for various second-line duties, some having their turrets removed.

Type: Two-seat Shipboard Fighter. Power Plant: One 905 h.p. Bristol Perseus XII nine-cylinder radial air-cooled engine. Armament: One Boulton Paul "A" power-driven turret containing four 0.303-in. Browning machine guns with 600 r.p.g. plus eight 30-lb. bombs on underwing racks. Performance: Maximum speed, 196 m.p.h. at 6,500 ft.; cruising speed, 135 m.p.h. at 13,000 ft.; range, 610 mls.; endurance, 4.5 hrs.; initial climb rate, 1,150 ft./min.; service ceiling, 15,200 ft. Weights: Empty, 6,121 lb.; loaded, 8,800 lb. Dimensions: Span, 46 ft. 0 in.; length, 35 ft. 7 in.; height, 12 ft. 1 in.; wing area, 310 sq.ft.



The first production Roc (L3057) which flew on December 23, 1938 for the first time.

ft./min.; service ceiling, 15,200 ft. Weights: Empty, 6,121 lb.; loaded, 8,800 lb. Dimensions: Span, 46 ft. 0 in.; length, 35 ft. 7 in.; height, 12 ft. 1 in.; wing area, 310 sq.ft.

Convert your Blackburn Skua to a
Nifty Blackburn Roc with these 3-views and
maybe you can fend off a Hun with that
Boulton-Paul Turret!
For Super Photos of the Skua see the
inside cover of March '78 Aeroplane Monthly.

RIGHT OFF THE FLIGHT DECK

Build and fly this thrilling miniature of Britain's most famous "carrier" fighter—the Blackburn Skua

by
EARL STAHL

THE Blackburn Skua, two-seater fighter and dive-bomber, one of the most widely used weapons of Britain's powerful Fleet Air Arm, is designed to meet the exacting demands of aircraft carrier planes. Because of its deadly striking power, wide range and fine performance, it is considered a most formidable fighter.

Structurally a low-wing monoplane of all metal construction, the Skua is similar in many respects (except beauty of line)

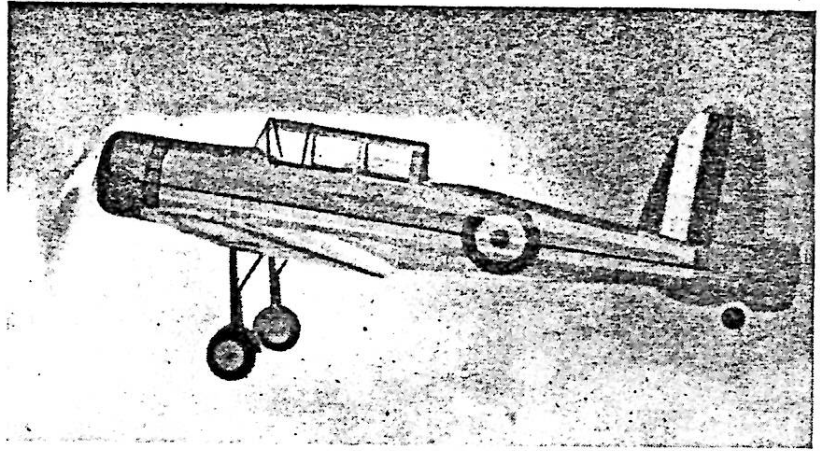
to the Vought Vindicator scout-bomber of our own navy. Like the Vindicator, wings fold to conserve deck space yet they are strong enough to take the stress of screaming dive-bombing attacks and sharp pull-outs once the explosives are released. Flaps at the wing trailing edge reduce diving speed and for slow approach upon boarding. An arresting hook lowered from the fuselage belly stops the craft on deck. The plane is divided into a number of water-tight compartments to keep it afloat in the event of emergency landing. A very complete set of aviation equipment makes possible long over-water flights.

Offensively and defensively the Skua is a powerful foe. In special racks beneath

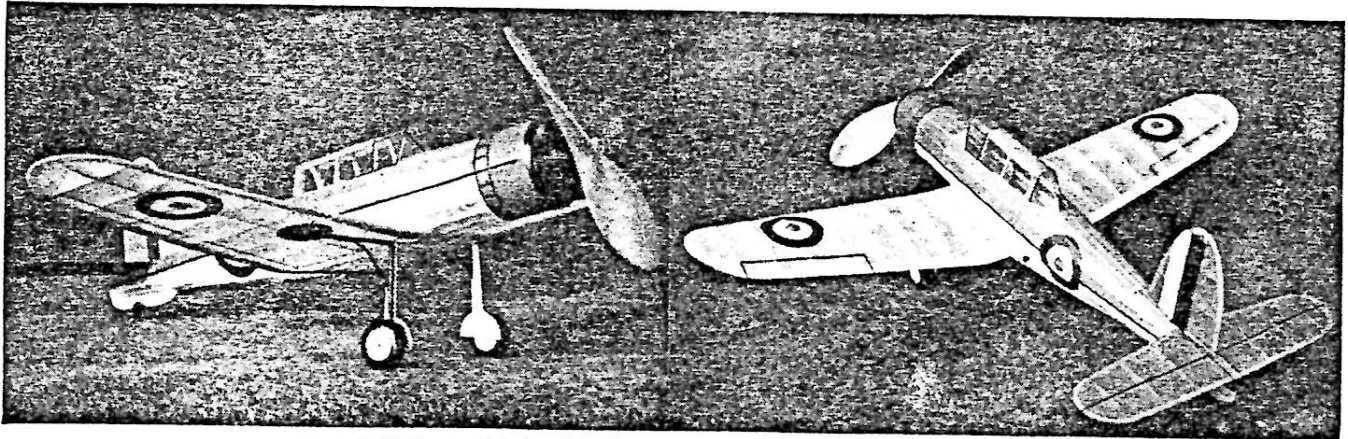
the wings nearly a half ton of bombs of varying sizes and types can be carried. Four forward firing machine guns jut from the wing leading edge and the observer's cockpit is equipped with two free-firing Brownings. The engine is Britain's famous air-cooled, sleeve valve 900 h.p. Perseus producing maximum speed of 250 m.p.h.

A modified version of the Skua is the Blackburn Roc. In most respects this plane is similar except that it is fitted with one of those deadly, power driven, multi-gun turrets. The enemy is blasted from the sky by flying along side and delivering a terrific broadside.

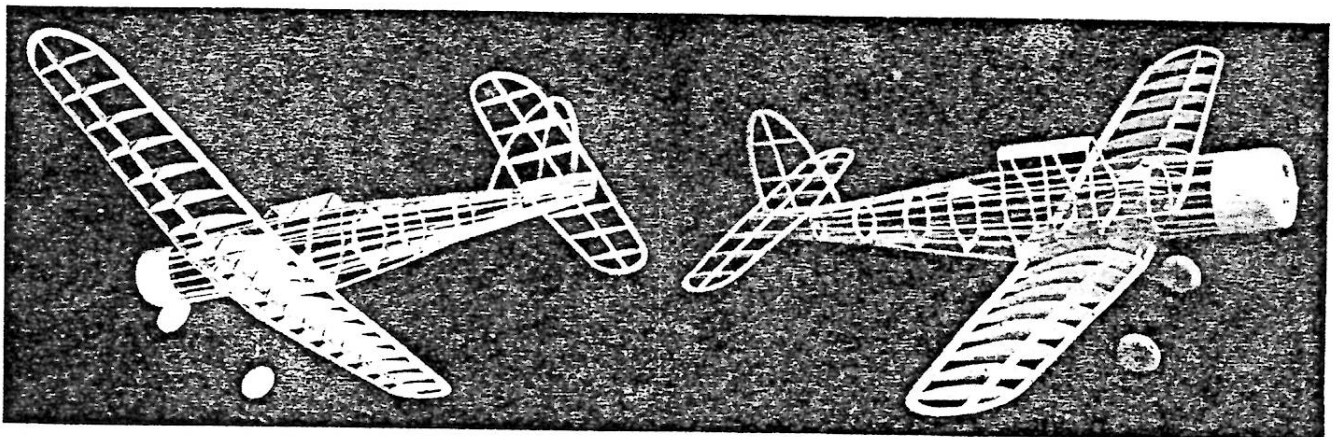
Despite its rather unusual appearance,
(Continued on page 40)

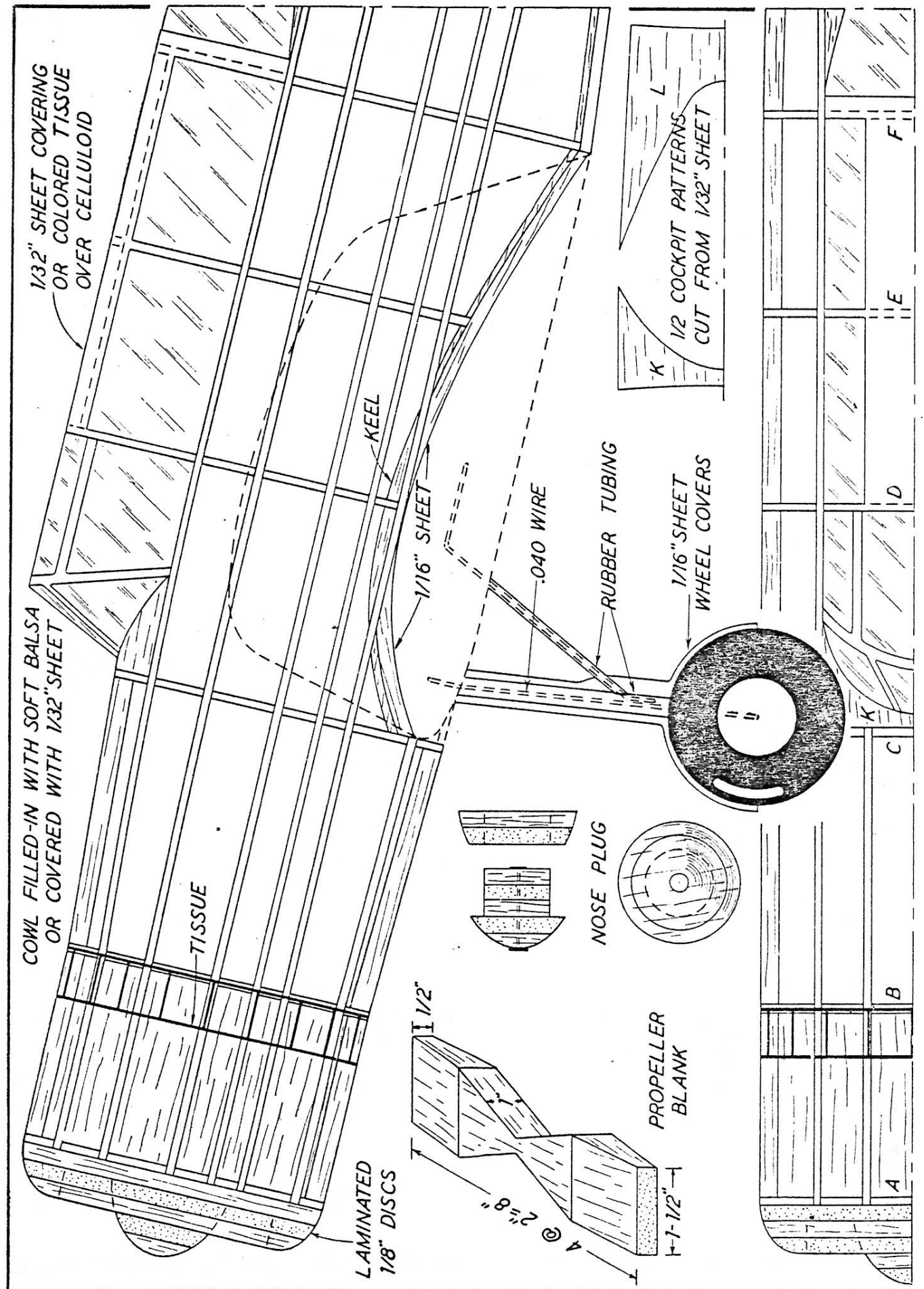


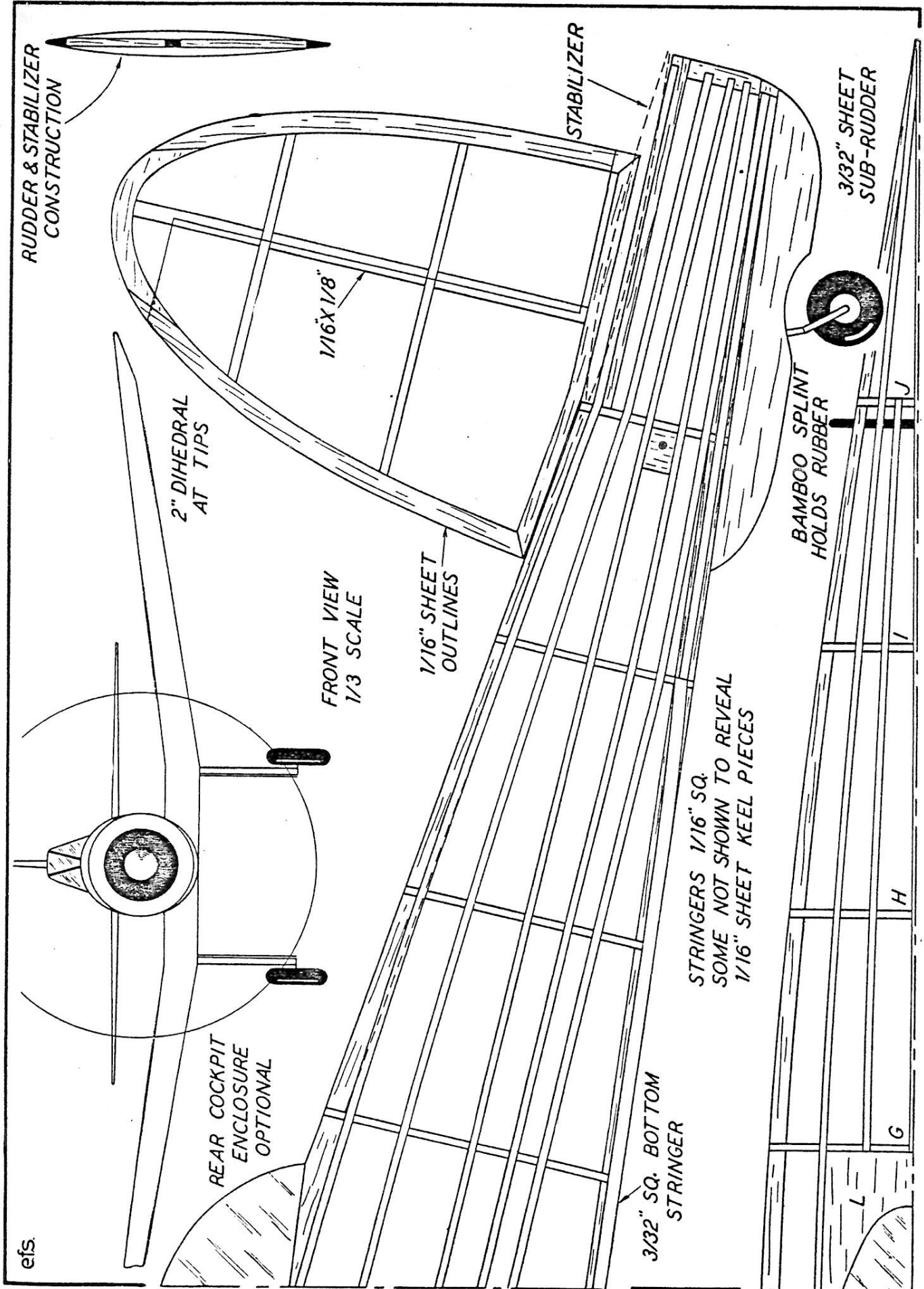
Model in actual flight, not posed



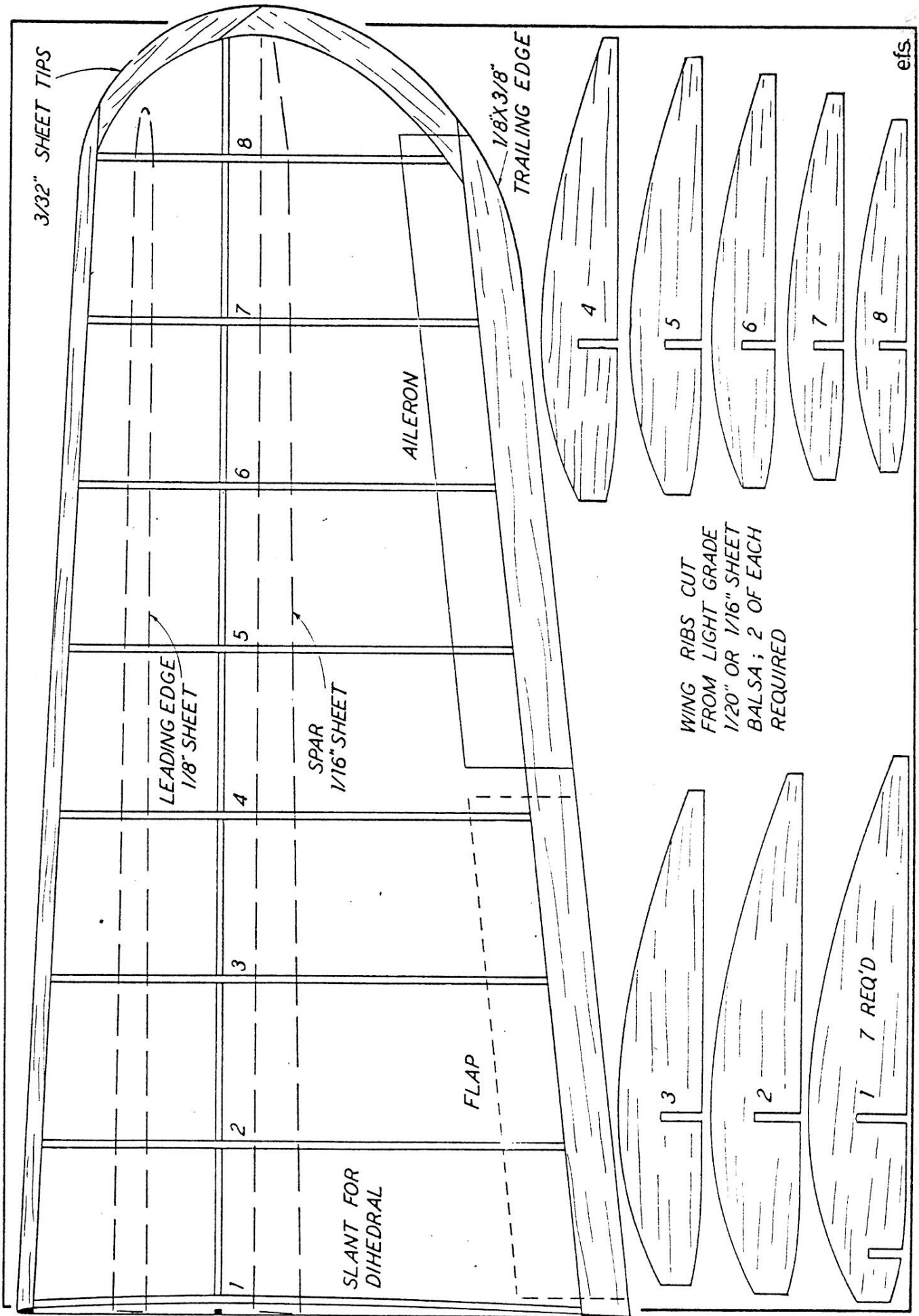
Built in careful detail, it is most realistic and thrilling in flight. The light yet strong and efficient structure is clearly evident







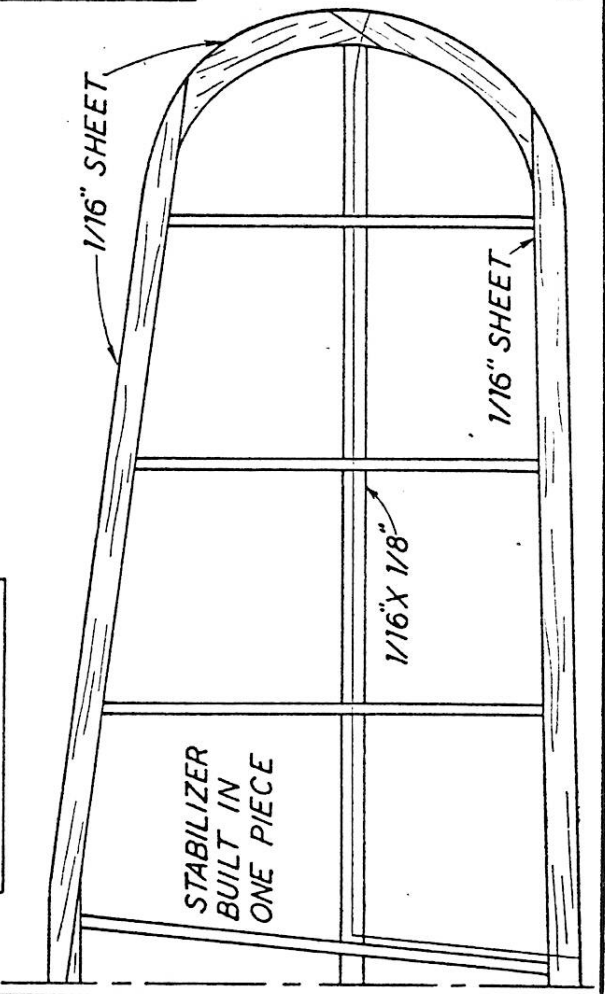
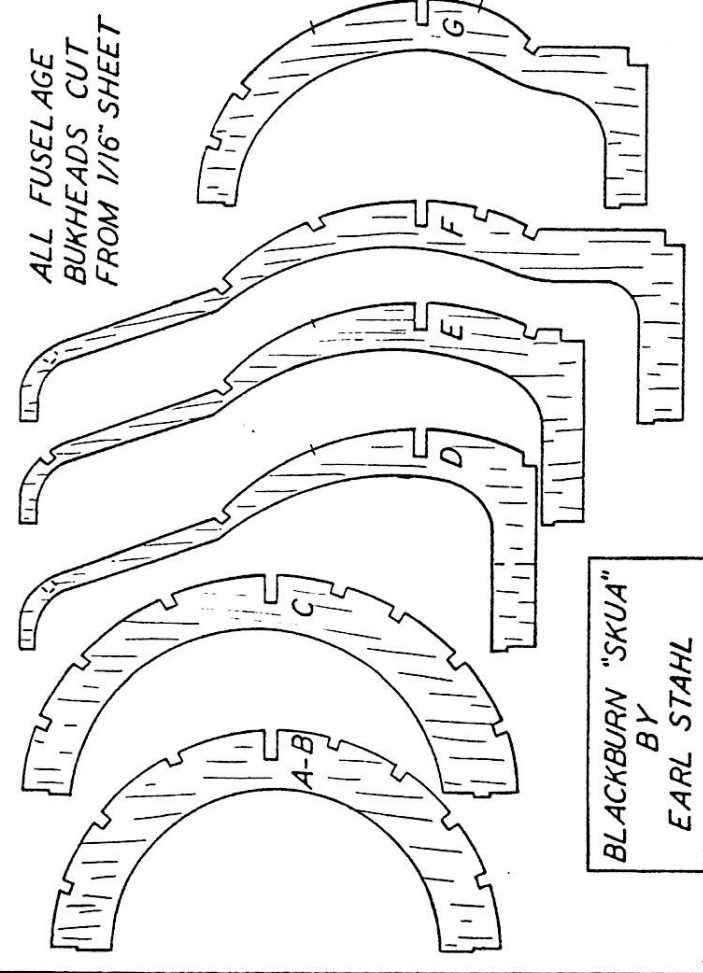
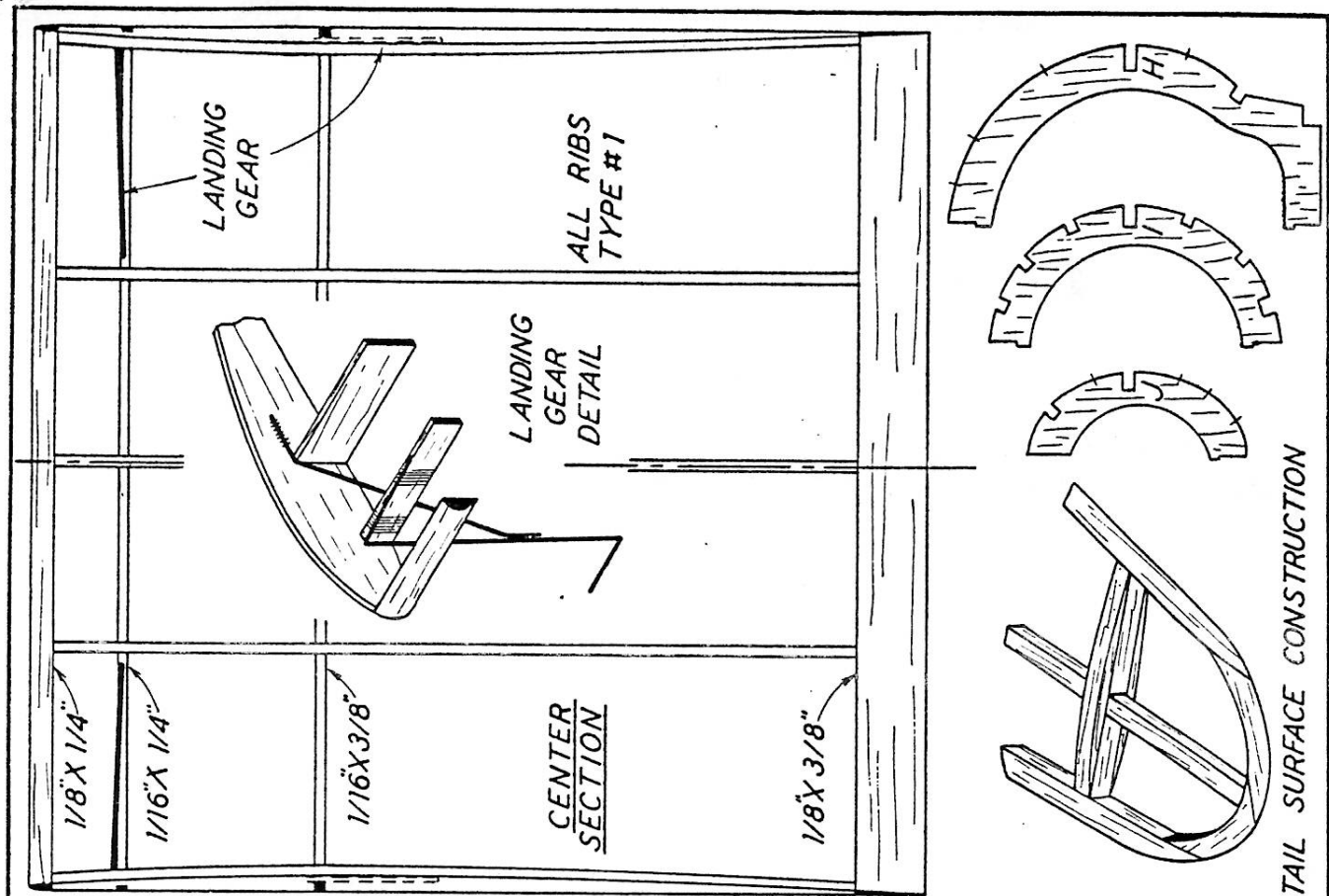
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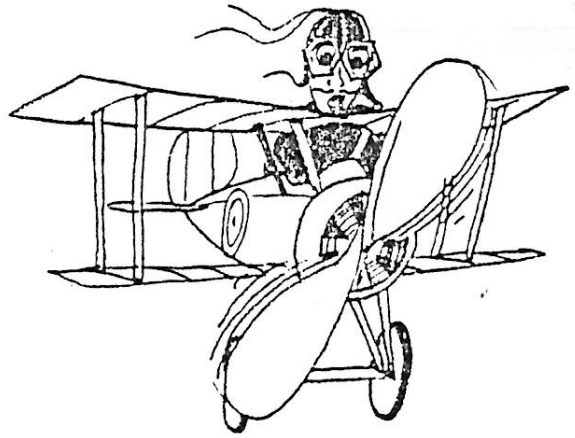
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ANNOUNCING THE FLYING ACES CLUB Nationals

AT JOHNSVILLE NAVAL AIR STATION
WARMINSTER, PENNA.



JULY 15, 16 1978

Help it happen at Johnsville!

TEN EXCITING EVENTS!

- SAT. JULY 15, 1978 (9 AM TO 6 PM)
- | | |
|------------------|--------------|
| FAC RUBBER SCALE | WW I COMBAT |
| FAC POWER SCALE | WW II COMBAT |
| EMBRYO ENDURANCE | NO-CAL SCALE |
- SUN. JULY 16, 1978 (12 PM TO 5 PM)
- | | |
|--------------------|--------------|
| THOMPSON TROPHY | PEANUT SCALE |
| A M A RUBBER SCALE | JUMBO SCALE |
| NAT. CHAMP TROPHY | |

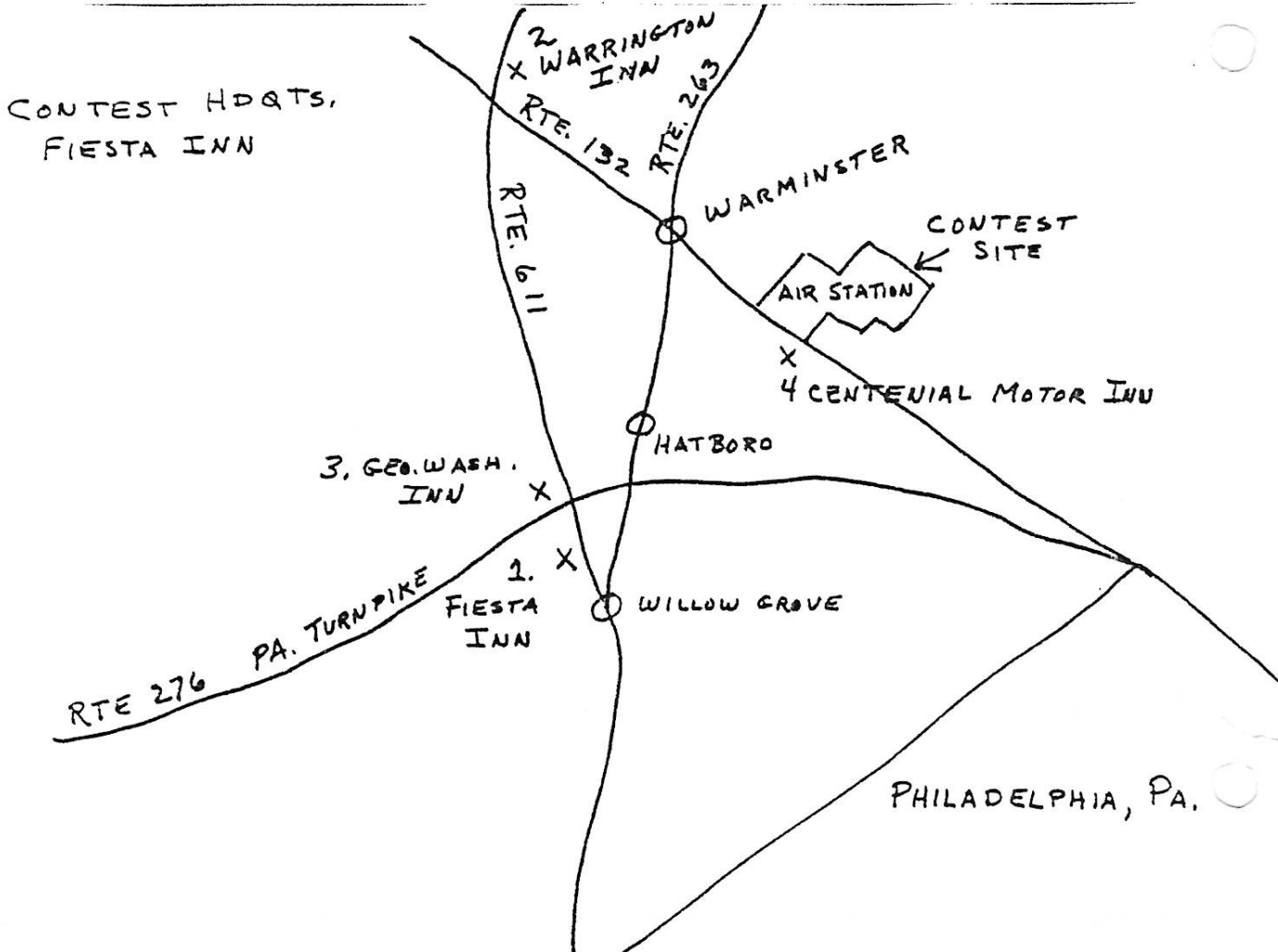
REGISTRATION:

\$3.00 (by mail) \$4.00 (at field)
 \$1.00 per event with \$5.00 max.
 LIN REICHEL, C.D.
 3301 Cindy Lane
 Erie, Pa. 16506
 Tel. 1-814-833-0314

A M A SANCTION No. 469

THERMALS!

Also
Greve Races



FLYING ACES CLUB

NATS RULES 1978

1. FAC Rubber Scale - As per FAC rules. Two models allowed to enter.
2. FAC Power Scale - As per FAC rules. A bonus will be given for different power sources. (I.C. engines - 0 pts.; co/2 +5 pt.; electric +10 pts.)
3. Embryo Endurance - As per FAC rules.
4. No-Cal Profile Scale - As per FAC rules.
5. WW1 Combat - Mass launch. No changing rubber motors. Min. wingspan 14", Max. span 30". Multi-winged aircraft only. Must have at least 40 pts. FAC scale scoring. Must be in wartime colors.
6. WW2 Combat - Mass launch. No changing rubber motors. Min. wingspan 14" Max. span 30". Must have color schemes of pre-war or wartime colors. Must have at least 40 pts. FAC scale scoring. Contestant must be prepared to furnish proof plane was in actual combat.
7. Peanut Scale - As per FAC rules.
8. Jumbo Scale - Min. wingspan 36" for monoplanes, 30" for multi-winged aircraft. Scale judging as per FAC rules.
9. A.M.A. Rubber Scale - As per A.M.A. rules.
10. Greve Trophy Race - As per FAC rules.
11. Thompson Trophy Race - Mass launch. No changing rubber motors. Max. wingspan 24". Must qualify for T.T. Race by flying in the Greve Race, as per FAC rules. Must have at least 40 pts. FAC scale scoring.

Trophies will be awarded through three places in each event and merchandise prizes will be awarded to as many places as we can supply. In addition, there will be a NATIONAL FAC CHAMPION TROPHY awarded to the high point winner. Awards for Saturday, July 15th events will be given out at the banquet on Saturday night. Sunday, July 16th awards will be given out at the end of the days flying.

Deadline for early registration, motel accomodations, and the banquet must be in my hands by July 1, 1978. You need not send money for motel or banquet to me. Pay for them when you get there. If you plan on coming to the premier scale meet of all time, please register in advance as it will help very much with the planning. Make all checks payable to Lin Reichel, 3301 Cindy Lane, Erie, PA 16506.

If you plan to attend the banquet, we have to have a solid commitment from you, as the restaurant has to have a confirmed number of dinners or they will not be able to handle us. Lets all plan to attend the banquet. Where else can you rub elbows with so many fine scale modelers? Let us know if you plan to attend and how many in your party, wife, kids, etc. Price will be about \$7.50 per person.

Gretchen Norman will be arranging activities for the wives and kids while the guys are flying. Lots of things to see and do in the contest area. So plan on bringing the family with you. Maybe it will even help you to attend. More on this in future newsletters.

MOTEL LIST

The Fiesta Motor Inn will be the contest headquarters. We will take reservations for this motel only. If you wish to stay at any other motel you must make your own arrangements.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Fiesta Motor Inn Rates
Rt. 611 & Turnpike sgl. \$20.00
Willow Grove, PA dbl. 24.00
19090 Ph. 215-659-9300 3. Geo. Wash. Motor Inn
Rt. 611 & Turnpike sgl. \$19.00
Willow Grove, PA dbl. 24.00
19090 Ph. 215-659-7200 | <ol style="list-style-type: none"> 2. Warrington Inn Rates
Rt. 611 & L32 sgl. \$20.00
Warrington, PA dbl. 24.00
18976 Ph. 215-343-0373 4. Centennial Motor Inn
255 E. Street Rd. sgl. \$18.00
Warminster, PA dbl. 22.00
Ph. 215-441-0460 |
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