November 1970 75¢

RC MODELER

THE WORLDS LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS

THIS MONTH

VOLUME 7, NUMBER 10

R/C MODELER Magazine is published monthly by R/C Modeler Corporation, Don Dewey, President. Editorial and Advertising Offices at 171 W. Sierra Madre Blvd., Sierra Madre, California 91024. (213) 356-1066. Entered as second class matter at Sierra Madre, California and additional offices. Subscriptions $7.50 per year, $14.00 two years. Single copies 75 cents each. Add $1.00 for postage outside U.S. and Canada. (Except APO's) Change of address notices, undelivered copies and orders for subscriptions are to be sent to P.O. Box 487, Sierra Madre, California 91024. Not Responsible for unsolicited manuscripts, which must be accompanied by return postage.

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COVER: Bill Marlen's S.E. 5 against a backdrop of the Sydney Harbour Bridge and the modern Opera House in Sydney, Australia. The lovely model is Cassandra Styles, an American girl who is in great demand as a fashion model in Australia. 4 x 5 Ektachrome by Clive Kane. **FRONTSPIECE**: A beautiful Proctor Antic built by Dick Kidd, RCM's Technical Art Editor. Photographed by Randy Kidd at Pasadena, California. Antic is 4 years old and original RCM test prototype for Lou Proctor. S.T. 56, Kraft radio, immaculate workmanship.

VIEW POINT

BY DON DEWEY

In this issue, we are departing drastically from our usual monthly format for R/C Modeler Magazine. Before you look through the pages and decide that all of columnists are on strike, and that construction articles are a thing of the past, let me point out that this issue is devoted almost exclusively to the 1970 A.M.A. Nationals.

With this November issue, we have tried something entirely new. We doubled our personnel covering the Nationals, and have tried to present it as graphically as possible — to the point, hopefully, where you thousands of modelers that cannot attend the world's largest RC meet, can feel that you had actually been there. Each year, following the Nat's, we receive letters from virtually every part of the country stating that the coverage of the Navy hosted event was simply not adequate in any of the model publications. And, I am sure, the Academy of Model Aeronautics, who did a job this year at the Nationals that was so magnificient it is virtually hard to describe, must have felt slighted at the half-way coverage that appeared in each of the model publications including our own. We hope that you will like this Nat's portfolio, and that it will remedy an unfortunate situation that existed in past press coverage. RCM, each month, presents more construction articles for radio controlled aircraft than the other publications combined, and thus it is our feeling that one issue devoted to the nation's largest meet and its attendant top fliers is not at all out of line. We hope you will agree.

By the time that you get further into the coverage of the 1970 A.M.A. Nationals, you will discover that we have also given complete coverage to the Free Flight portion of the

Nationals. If this, at first glance, seems to be the "straw that breaks the camel's back" to you, just stop and think about it for a moment. First of all, we have been asked by the free flighter's if we would include a section on their aspect of modeling in R/C Modeler Magazine. The reason given to us, was that free flighters have felt that the coverage that they have received in the other model publications is much akin to television's "token Negro" of a few years ago. Without resorting to the all too familiar cliches about the "good old Bunsen burners" or my son's prowess with his Delta Dart, I will say that I obtained my start in modeling in the free flight ranks, as did many other RC'ers of today. Free flight is not only one of the finest places to learn pure aerodynamics, but it is, in fact, the "father" of RC. The first radio controlled model aircraft were simply large free flight models with controllable rudders to bring them back to their point of origin. But, as in today's somewhat chaotic society, a communications gap exists between parent and child. We RC'ers, with our sophistication of today's proportional control systems, feel that the "parents" are old fashioned and a generation or more behind the times. Conversely, free flight enthusiasts have often felt that RC'ers were simply flying "powered bricks" around the sky with little regard for the art and aesthetics of aerodynamics.

Today, and in the months to come, the generation gap is going to narrow down to a point of non-existence. The trend in radio control aerobatics will be more on aerodynamics, and less on brute power, as the new FAI designs come into being. The emphasis will be on lighter wing loadings and more smooth and graceful maneuvers. And in the field of free flight, the radio control "module concept" will become a popular reality. This module concept will allow the free flighter to always return to the launch site so that, as the larger free flight flying sites become a thing of the past, any high school football field, golf course, or community park can be utilized as a contest site. Free flight models would not receive a signal during powered ascent, the guidance equipment being used to keep the model from drifting too far down wind and return it to the field for a landing. An additional option would be that of dethermalizing by radio command where a held rudder function would produce a steep spiral dive to lose altitude at the

modeler's discretion. And before the "purists" in free flight take pen in hand to write a big bold never in a letter to the editor; and before the RC'ers take their mightier-than-the-sword in hand to scream about frequency interference, let me assure you that these things are coming to pass. And, as in any segment of society, each of us has a right to our own pursuit of happiness. We do not, however, have the right to infringe upon the rights of others. Therefore, any problems that may evolve from these ideas can be, and will be, worked out to everyone's mutual satisfaction and enjoyment of their own phase of the hobby and sport of aeromodeling.

We, at RCM, invite your comments concerning this addition to RCM. It is our feeling that each of us has something to learn from the other. We can all benefit from a mutual association and interchange of ideas. We hope you agree.

■ ■ ■

This year on November 27, 28, and 29, R/C Modeler Magazine is sponsoring its Third Annual Winter Nationals, hosted by the Tucson RC Club. The site of this meet will, again, be the Marana Air Park located about 30 miles west of Tucson, off of Interstate 10. For those of you who have attended this meet in the past, the excellent facilities of the air park for an RC model airplane meet are well known. Perhaps, however, it would be in order to restate some of these facilities for those who have not attended previous meets.

First of all, all flying is done from a concrete runway approximately 1 mile long by ¼ mile wide. Flight line facilities include permanent rest room accommodations for men and women located inside of flight line buildings; a snack bar operating during hours of flying; indoor facilities on the flight line for repairs, storing of airplanes, charging of batteries, etc. In addition, there is parking space provided for contestants just off of the flight line so that planes may be conveniently loaded and unloaded. Other facilities at the air park include bachelor quarters for any contestant (male only) who wishes to remain at the park and avoid the trip to Tucson (about 30 minutes via Interstate 10); complete restaurant and bar facilities (in addition to the flight line snack bar); a heated swimming pool; and very congenial air park personnel who go out of their way to

(continued on page 86)

F.A.I. R/C DESIGN MADE EASY (?)

by H.L. STROUP

Every serious American aero modeler must have felt chagrin, dismay and disappointment by our "loss" of the FAI Internationals last Summer. Alibis and "cop-outs" went something like this:

1. We was robbed!
2. The judges were prejudiced against the ARF planes flown by some of our team.
3. The judges didn't like our flying style.
4. We have been too busy practicing the "hokey" Class C manuevers instead of the FAI Pattern.
5. We weren't properly prepared or coached and didn't know what to expect.
6. Overconfidence. After all, we **always** win the Internats.
7. Bad Luck – poor engine runs, etc.
8. Our team was too old – approaching middle age. (Proponents of this point of view surely never heard the coordinated genius and virtuosity of performers such as Heifetz, Horowitz, Rubenstein or Pablo Casals in their 60's, 70's and even 80's.)
9. Our planes were designed for the "snappy" AMA Class C Pattern – not for FAI maneuvers.

None of these excuses may be attributed to the members of our team. They took the defeat with the outstanding sportsmanship, characteristic of each of these fine gentlemen.

In my private opinion Bruno Giezandanner was so well prepared, practiced and "fine tuned" he could have flown snap rolls through a key hole, blindfolded, during the week of the contest.

The purpose of this article is to address item #9 – Are there or aren't there aerobatic designs or design elements more suited to the FAI Pattern than to AMA Class C? Is there a flying style more appropriate to one pattern compared to the other?

Before addressing these issues, I want to state that I am not a physicist, aerodynamic engineer or even well versed in higher mathematics. I am a pragmatic, cut-and-crash designer and will attempt to use empirical logic in arriving at conclusions.

I believe it is rather obvious the FAI pattern **does** require a slightly different combination of aerodynamic compromises and flying style than the AMA Class C manuevers. I term these "aerodynamic compromises" because no **single** design can be ideal for every manuever and all flying conditions. Individual style and expertise must also be considered. Contest flyers learn the eccentricities and shortcomings of their particular planes and learn to compensate for them. Phil Kraft could fly a powered barn door with ailerons with a little practice. (Come to think of it, he does.)

My approach is simply this – let's look at **each** element of design and try to conclude how each fits in with the demands of the various FAI manuevers. We may then develop conclusions about a total design which best suits these flying requirements with minimum compromises.

From a very general standpoint, FAI manuevers are expected to be flown **smoothly** and **gracefully**. Our current trend has been toward extremely fast, highly responsive designs. This type of design probably reflects our obsession with pylon racers. We have been so impressed with the "grooveyness" and "straight up" control of these guided missiles we have looked for some of the same qualities in our pattern ships. The recent availability of higher performance, large engines has contributed to the trend. It is not at all unusual to observe 500 to 600 square inch, 5 to 6 pound pattern planes with over one **horse power** engines. It is even more common to see 7½ to 7¾ pound contest planes with only 600 to 635 square inches of wing area. With this kind of wing loading, glide characteristics approximate that of a dropped man-hole cover! Touch-and-Go looks like a "crash and went" and such planes land similar to a pylon racer. Obviously, turbulent air doesn't effect these planes too much. A 25 to 30

ounce wing loading is fine for flying in hurricanes, but a plane like this just stops flying if the airspeed gets too low.

The human element should be considered, also. All other factors being equal, precise control and minute corrections are easier with a pattern plane which is flying at moderate speeds. The additional split-second required for reaction time can make the difference between a "flubbed" manuever and a good score. Certainly, not many parts of the FAI Pattern require excessive speed. Controlled, slow flight is highly desireable most of the time.

Conclusions:

Medium to light wing loading (18 to 20 ounces) is a must.

WING

Let's first consider two factors nearly everyone will agree with – symmetrical airfoils and 0– degrees incidence between the wing and stab. The small amount of positive wing incidence (1/16 inch) in some designs isn't enough to be considered a departure from the principle. Very few designers or contest flyers can agree on the remaining elements of wing design. Regardless of which points-of-view I take – I'll get letters. So here goes!

Size

If we could fly aerobatic models with a 15 foot span and with power loadings no greater than our traditional designs, we would have much smoother performing aircraft. This is a function of more favorable Reynolds numbers and inertia. Since engines of this size aren't made and we would have trouble fitting these monsters into our automobiles, we have trended toward smaller and smaller aircraft. As mentioned before (in a different way), in order to achieve satisfactory lift and true flight paths these smaller models must be flown quite fast. Forgetting trends and fads, let's try to look at the problem objectively. We should fly the largest model possible, within the limitations of AMA accepted power plants and ease of transportation. Since most of our powerful new breed of large engines will pull up to 7½ pounds through vertical manuevers, we should use this maximum manueverable weight as the basis for arriving at optimum size. Projecting a 20 ounce wing loading with 7½ pounds available we arrive at a wing size of 864 square inches. (I can hear the screams of disagreement now!)

Conclusions:

Our "ideal" plane will weigh approximately 7½ pounds and have about 864 square inches of wing area.

Planform

During the past few years we have trended to tapered wings. The rationale has usually been to achieve better rolls and reduce inefficient drag at the tips. Theoretically a tapered wing will roll more easily than one with a constant chord but the theoretical difference is nearly too small to be noticed in actual flight. We have all seen constant chord wings roll beautifully. Probably the greatest advantage to a tapered wing is the thinner section toward the tips. If the tip is the same thickness and has the same lift as the root, it will "bounce" in gusty air. The drag of a constant chord wing at high speed doesn't bother me and at low speed the drag is negligible. If we made the wing thinner at the tips without reducing the chord, we would have a snap-rolling "demon" because the tips would stall at much higher speeds than the root. So, we must also reduce the chord to achieve satisfactory tip thickness at about the same airfoil thickness percentage as the root.

Theory suggests tips at 60% of root chord with 1/3 of the taper at the leading edge and 2/3 at the trailing edge. Several designers have tapered to about 75% with all the chord taper at the leading edge claiming a dihedral effect. I recently built two wings for the same fuselage. Both had the same airfoil, span, tip and root. One had all the taper at the leading edge and the other was tapered 1/3 in front, 2/3 in back. I could detect no difference in stability, penetration, aileron response, rudder response or any other flying characteristic. Since many of us have had bad tip stall experience with the 60% taper, we have been using a milder taper (70 to 75%).

Conclusions:

70 to 75% taper.

Tips approximately the same shape and percentage of airfoil thickness as the root.

Location of the taper will be "designers choice".

Airfoils

Most sharp leading edge wings tend to enter a stall suddenly and without warning. The recent research by Dr. Eppler suggests a rounded leading edge with maximum camber further forward than is customary. All other research supports the blunt or rounded leading edge theory.

Airfoils exceeding 15% create additional drag with no appreciable increase in lift. Many designers have

intentionally increased the thickness to as much as 20% for the purpose of increased drag for slower flight. These designs get a lot of "bounce for the ounce". If you have ever been in a jet aircraft you can feel what happens when the flaps are lowered. Thick wings create this kind of "down flat" turbulence all the time. Since our "ideal" design will be large, there is no need for additional drag. In fact, we will need good penetration.

Conclusions:

The airfoil will have a rounded leading edge.

Airfoil section will be 15% of the chord.

Aspect Ratio

Traditional designs have ranged from 5:1 to 6:1 with 5.5:1 considered optimum on most charts. Low aspect ratio wings roll easily and were particularly appropriate for the old Class I and Class II designs. A higher aspect ratio gives greater stability on the roll axis, smoother turns, better tail slides and a more predictable recovery from spins. Overall, I have seen much smoother executions of most manuevers with medium to high aspect ratio wings.

864 square inches at an average 6:1 aspect ratio translates to an average chord of 12 inches and a span of 72 inches. A 14 inch root tapered to a 10 inch tip represents a 72% taper and an average chord of 12 inches.

Conclusions:

6:1 Aspect Ratio
72 inch span
14 inch root chord
10 inch tip chord

Ailerons

Many theorists claim greater efficiency for integral ailerons than for the strip type. I have trouble detecting a difference. I have seen many Kwik Fli's that did not excute high scoring axial rolls. A Kwik Fli, built in Memphis (by Keith McClure) rolled beautifully with the integral ailerons glued solid and strip ailerons added. I find it more difficult to build integral ailerons so I take the easy way out. My only problem with strips is to keep the little beggars **straight**. I wish someone would develop a material or construction technique to insure straight strip ailerons. (Yes, I've tried laminating two pieces together!)

Conclusions:

No appreciable difference between integral or strip ailerons.

Dihedral

Hardly any current designer recom-

(continued on page 79)

A southern gentleman . . . Jim Kirkland wasn't as gentle with the competition in D Pattern as he was with Liz Boznos, a Nats visitor. Jim, in first place all the way. New ship, the Intruder. (Navy photo)

39th ANNUAL

AMA NATIONALS

1970 GRAND NATIONAL MODEL AIRPLANE CHAMPIONSHIPS SETS NEW RECORDS AND STANDARDS OF EXCELLENCE.

BY JERRY KLEINBURG

Above: Larry Leonard and Miss Liberty Bell, 5th in Class D Expert. Popular RC'er retained National RC Championship at Chicago Nats. Also placed 1st in Formula II, 4th in Formula I. Above, left: Let's go – we came to fly! Theme of Jerry Kleinknight who waved off each of the 82 contestants in Formula I, 51 in Formula II. 5 rounds in qualifications., 5 rounds in finals. Great job done by all Nats officials.

This year the word "Grand" was added to the title of the yearly AMA modeling extravaganza. There couldn't have been a better single word to describe the 39th Annual Grand National Model Airplane Championships that unfolded from the 27th of July to August 2nd at Glenview Naval Air Station north of Chicago. The flying, the models, the fliers – all set new records and standards that'll be remembered a long time!

And Northern Illinois – with Lake Michigan sparkling in the East, dark green bumper crops and trees spreading in all other directions, and a blue friendly sky capping it all – showed its attractive best to a record number of modelers who came from virtually every section of the U.S. as well as from Canada, Japan, Mexico, Malta, England, Belgium and Australia to join in the 7 day modeling whirlwind. But it was the aerodynamic side of nature they were primarily interested in as models of every description, size and variety were carefully unpacked and prepared for the competition onslaught that erupted once the necessary registrations were completed . . .

In RC, an assortment of 8 different events – the most so far – were available to tantalize fliers and spectators alike. And some of these were divided into Novice and Expert categories as well as into Junior, Senior and Open age groups so that there were trophies galore to reward the skilled and fortunate fliers who answered the siren call of aerial competition. It was to Larry Leonard of Los Angeles and Larry's Hobby Center in Northridge, who came to defend his 1969 RC crown, that the 1970 RC National Championship went again as "Lucky" Larry garnered trophies in Formula I and II as well as in the tough D Expert event to earn the tallest trophy for himself, the lovely Pat, and for his club, the Valley RC Flyers. But for Larry, and all the other top competitors, it was a long hard week . . .

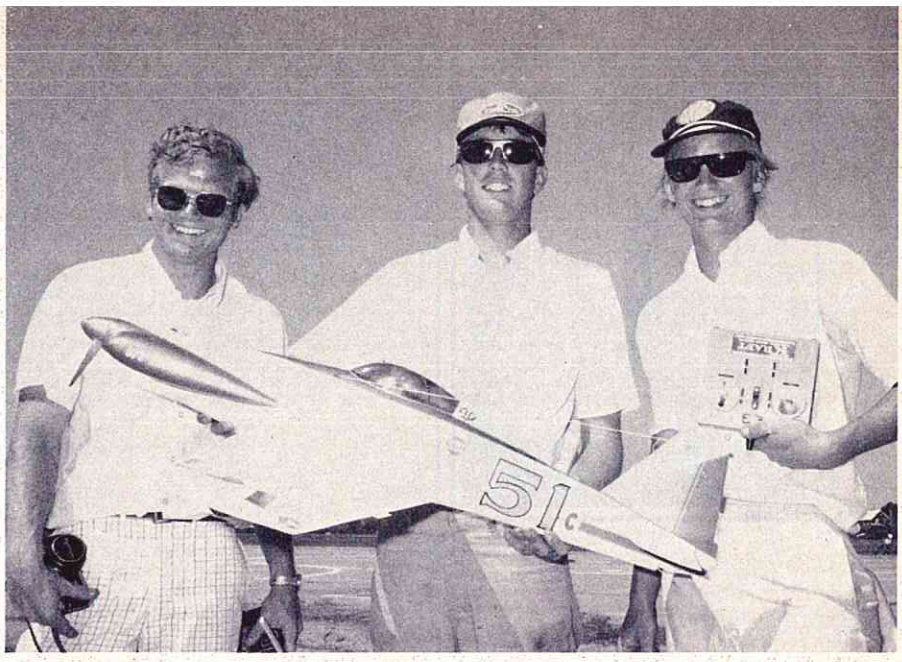
PYLON

Contest action started hot and heavy with the qualification heats in Pylon I and II. Experienced Glen Spickler as Pylon Director, together with a competent staff consisting of Jerry Kleinknight as Starter, Jack Fabri as Flight Coordinator, Bernice Williams at tabulation, and Lois Ehmke setting starting positions, kept the heats moving along at a fast clip so that all of the 82 entries in Formula I and the 51 in Formula II had ample opportunity to compete for the top 20 slots in each category. A few crashes and one spectacular head-on in mid-air between Jerry Nelson and Dick Allen didn't draw attention away from the amazing times being posted in both events with all the qualifiers in Pylon I being well under the 2 minute mark. Here's a complete rundown on the top 20 in both events:

FORMULA I

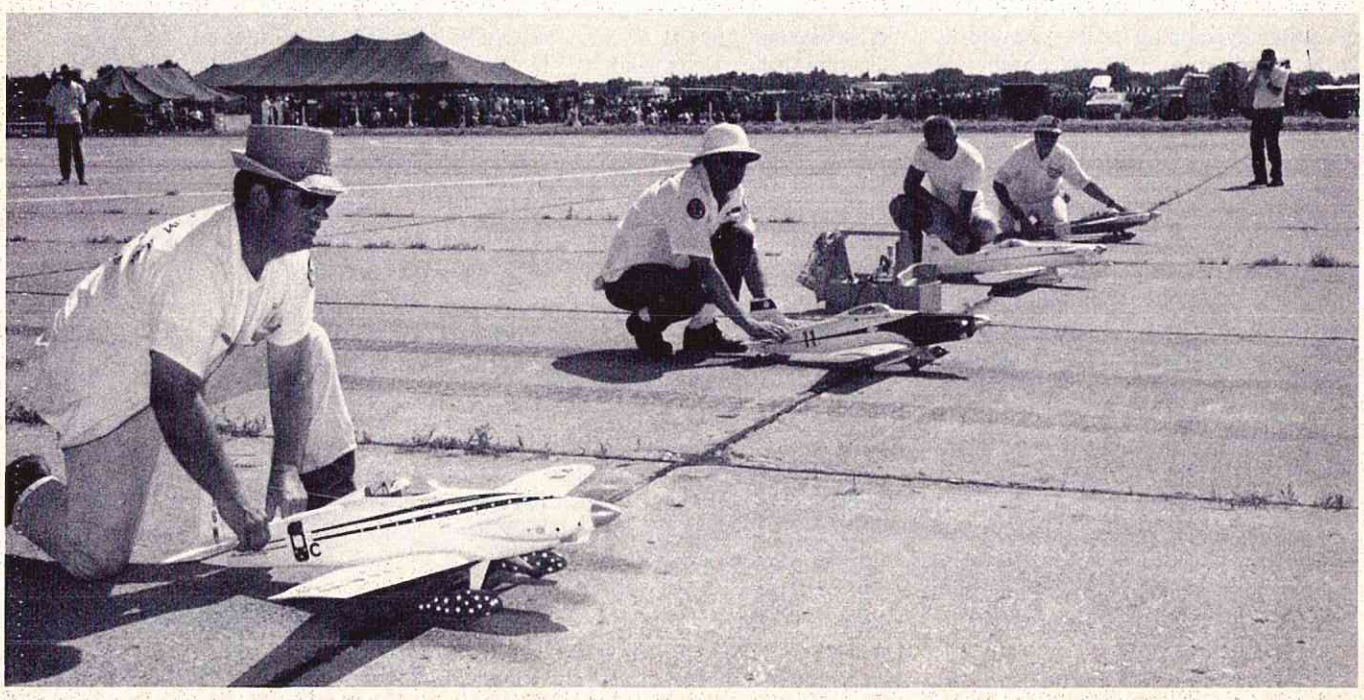
Larry Leonard	1:38.7
Bertken-Smith	1:46.0
Telford-Violett	1:47.8
Dave Johnson	1:48.5
Prather-Schauer	1:49.9
Bill Salkowski	1:50.9
Vern Smith	1:51.7
Tom Baker	1:52.9
Hal deBolt	1:53.4
Faber-Nupen	1:53.7
Walker-Scott	1:54.3
Austin Leftwich	1:54.5
Gary Korpi	1:54.8
Marty Barry	1:55.2
D. Brink	1:55.7
Bob Upton	1:56.0
Al Sager	1:56.0
Hal Coleson	1:56.1
Paul Byrum	1:57.5
Cliff Weirick	1:57.7

FORMULA I

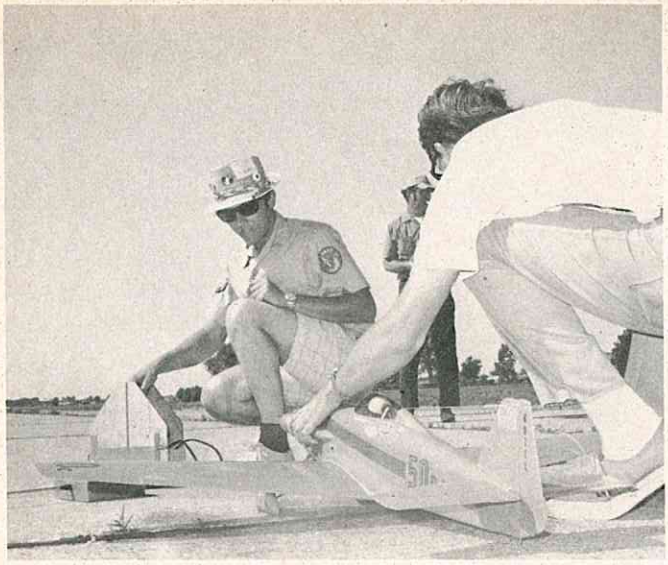


The B&S team – 1st in Formula I. Brother Chuck Smith (r) joins Jeff Bertken and record holder Bob Smith (l) for team portrait. Ship, a Super Minnow with laminar flow wing. Lee-K & B 40, Kraft radio. 1:36.9!

Left: The 'spoiler'. Al Sager, SOB stalwart and Mustang. A strategic win in the last heat. 2nd place winner at 1:43.8. K & B 40, Logictrol. Above: Vern Smith, a dark horse. York Area RC'er dealt a pair of treys, placed 3rd in both Formula I & II. Gus Geissinger holds. ST 40ABC hot.

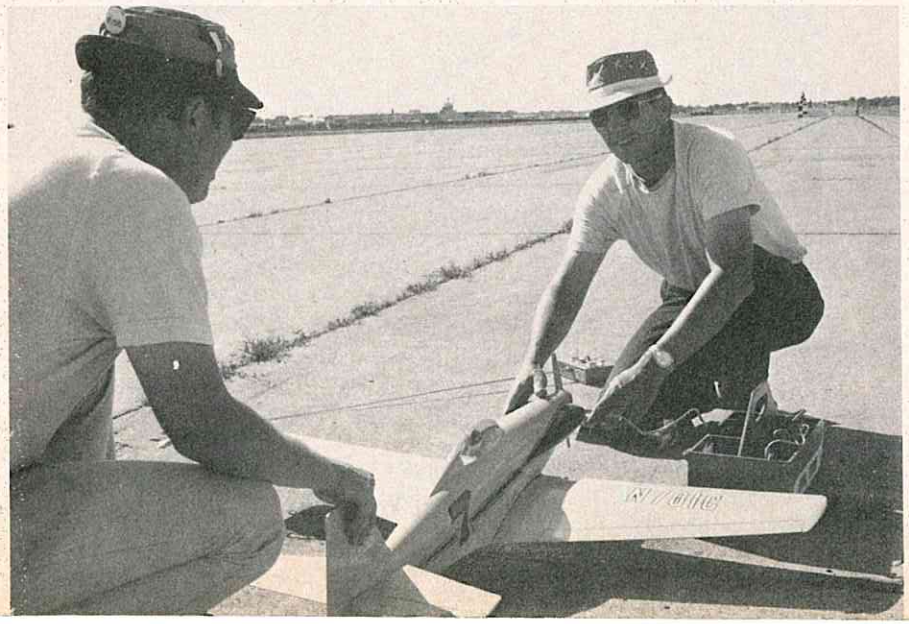


At the mark! 17,000 RPM and ready . . . Nats pylon racing layout excellent, crowd control and accommodations good. Bleachers provided.



1:38.7 in Formula I. Larry Leonard placed 4th with fading engine. Minnow has Lee-K & B 40, Kraft radio.

Nupen-Faber entry 6th in Formula I. 1:53.7 for Minnow. K & B 40, Kraft radio.



Above:
Is this the way? Miss Model Aviation, Suzann Bowie shows race starting style. Continental Airlines stewardess had sense of humor, enjoyed her Nats chores. Left: Scott-Walker entry logged 1:53.7. NVRC Annandale Spl. K & B 40, Kraft. Bob Scott (L) also Pattern Director.

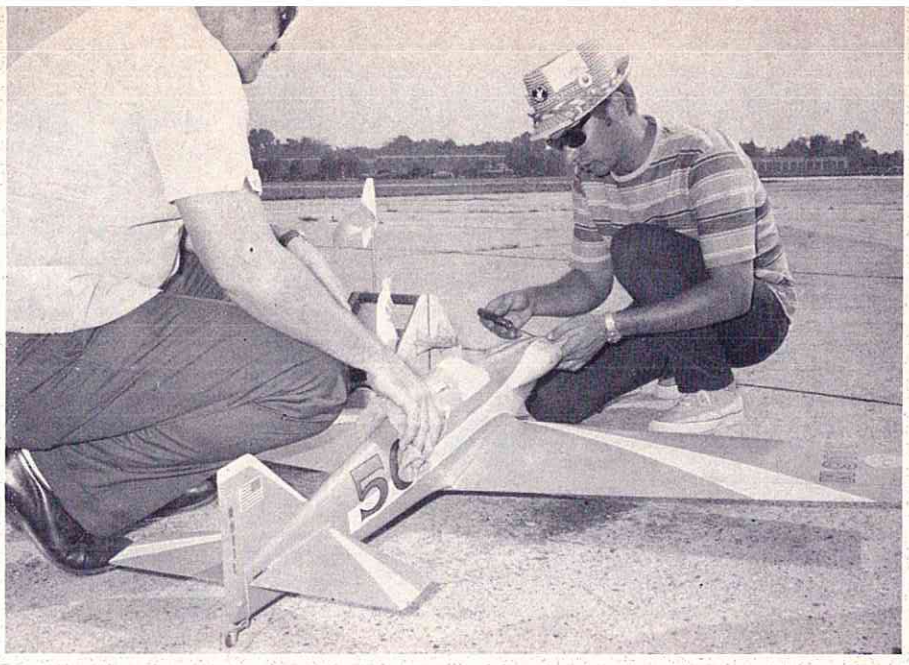
FORMULA II

FORMULA II

Bertken-Smith	1:43.8
Larry Leonard	1:48.9
Maurice Phillips	1:51.0
Dick Allen	1:52.0
Vern Smith	1:52.4
Tom Baker	1:52.5
Whit Stockwell	1:52.9
Prather-Schauer	1:55.2
Telford-Violett	1:56.2
Bob Noll	1:56.6
Ed Keck	2:00.2
Austin Leftwich	2:01.5
Chuck Smith	2:04.5
Gus Geissinger	2:06.5
Pete Waters	2:07.1
Don Lowe	2:07.9
Dave Keats	2:08.9
Ray Davis	2:09.6
Henry Krauer	2:13.7
Tom Kelley	2:14.0

Pylon II finals on Friday led to the expected win by Larry Leonard with 5 straight winning heats after Bob Smith was eliminated by servo failure that caused him to crash during his second race. Ed Keck placed 2nd with 18 points followed by Vern Smith and Austin Leftwich with 17 points each. The Telford-Violett entry was 5th with 16 points followed by Whit Stockwell in 6th place who also received the Best Senior trophy for Formula II racing. Bryon Sattler was the top Junior.

The Saturday Formula I wind up was a lot tighter show that kept the crowd on the edge of their bleacher seats until the last heat. As if it was a Hollywood script, flyoffs were needed to sort out the top places. Vern Smith started the upset by spoiling Larry Leonard's perfect string of winning pylon heats when he pressured the usually super cool Larry into cutting a pylon on his very last heat. Larry's ship had been picking up an added tenth of a second on each succeeding heat as his engine began to show the effects of high RPM and 50% plus nitro fuel and, with Vern's ST ABC engine doing the opposite in each heat, Larry took the chance and shaved the number 3 pylon a few inches more than usual. It proved too much as the alert flagman waved the cut. Another 'spoiler' from the east coast, Al Sager, did the same to Bob Smith who was still a bit shook at seeing his team mate Larry lose his first race in almost two years and nicked the same number 3 pylon. And so it was a flyoff for the number 1 spot to wind up an exciting afternoon of flying. This turned into a cliff-hanger when Al lost a prop on the extra flight takeoff and Bob, in turn,

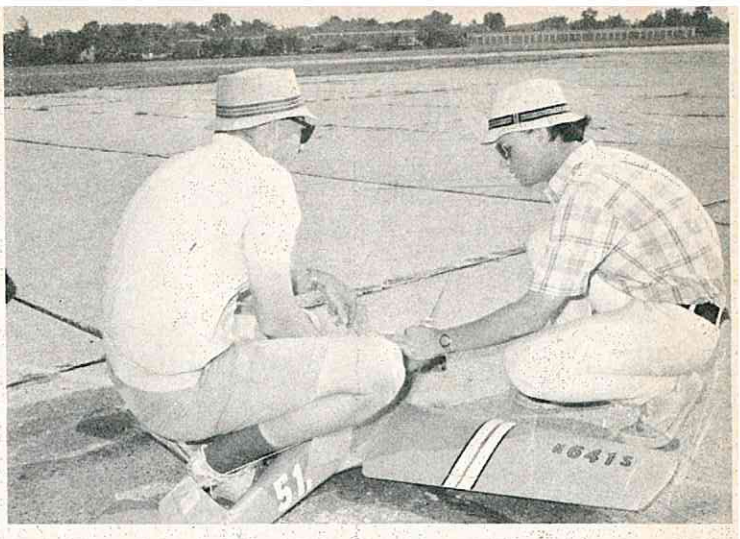


Tops in Formula II. Larry Leonard posted a 1:48.9 with 5½ lb. stretched Minnow. Lee-K & B 40, Kraft radio. 50% plus nitro fuel. Paul White holds.

Ed Keck and 2nd place Formula II winner. Caldron racer had K & B 40, Pro-line radio. 2:00.0.

Leftwich P-51 was sharp in chrome mylar covering. Original radio by Carl Schwab and Austin Leftwich. Ship 5 lb. 2 oz. 55% nitro home brew fuel. ST .40 ABC. 4th place.

Genial team . . . Violett and Telford were 5th in Pylon II. Modified Minnow used St 40ABC. 5 lb. 6 oz. Kraft radio.



Stockwell and Stockwell, Bob and Whit. Tough luck didn't stop them. Whit 6th in Formula II, best Junior.

Al and Terry Prather had 5½ lb. original with Palmer glass fuselage, new wing design in Formula II. K & B 40, Kraft. 1:52.7.

Jeff Bertken guided critical turns for Larry Leonard. Concentration, cool nerves a must in pylon racing . . .

obliged with an engine flame-out just after making the turn at the 1st pylon. The re-run was an anti-climactic easy win for Bob who had showed what his Lee-K&B 40 Minnow could do when he logged a sizzling 1:36.9 in an earlier heat that day. This is the way Formula I sorted out as weary fliers cleaned up their planes and headed for a shower and spectators buzzed over the speedy performances: Bob Smith followed by Al Sager at 19 points each, Vern Smith 3rd with 18 points, Larry Leonard 17 points, Bob Upton, Bror Faber and Marty Barry at 16 points apiece. Best Junior award went to Jim Hiller, while Best Senior went naturally to Bob Smith. (Bob went on to compete in Ft. Worth in the SW Racing League Championships after his Chicago triumphs and posted 9 more winning heats but was beat out by Texan Ed Rankin who managed to put 10 heats together in the 106° weather! Bob's 1:43.5 to Ed's 1:44.5 didn't stand up when Bob's faithful K&B engine couldn't start on the last round . . .)

In summing up the racing events it's hard to foresee much faster times than were posted during the 1970 Nats. Superb nerves and piloting accounted for the low times as racers wore aerial grooves slim inches from the number 2 and 3 pylons to trim speeds. They can't get any closer. Engine output from the K&B's and the Super Tiger ABC's were universally boosted by high nitro fuels of the 50 to 60% variety. It also appears the new ST ABC has 'arrived' and is slated to assert its supremacy among speed merchants from the way it proved its sturdy running 'gut' as running times built with the liquid dynamite fuels used in Chicago. And with the times of well under two minutes seen in the Formula II event, it seems the NMPRA is now faced with the dilemma of where to go from here in providing a 'beginner' racing event . . .

D PATTERN

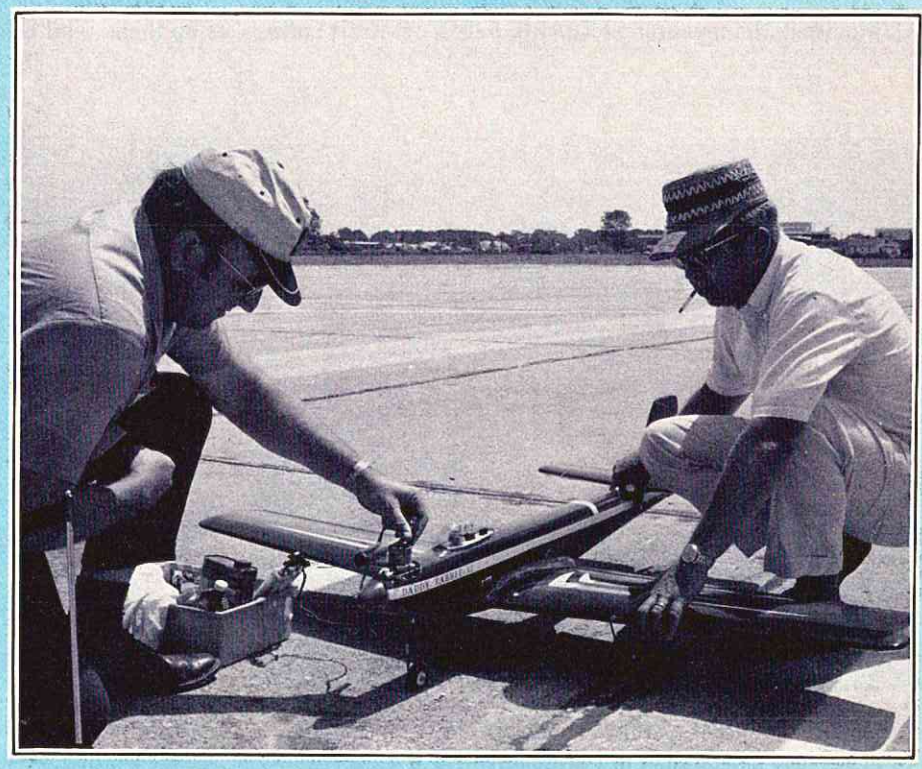
Next on the Chicago Nats RC menu was AMA's FAI aerobatic event that drew 104 combined Novice and Expert entries. It started with a record 8 rounds of elimination flights that saw some 667 flights logged. At an average time of 6.38 minutes per flight, this amounted to a whopping 98.5% use of allocated time and indicated the efficiency with which the Pattern Event Director, Bob Scott, and his crew ran things without being oppressive in the process. (Incidentally, some 110 officials were required during Nats week as AMA pulled all the stops to bring about the smoothest Nats ever . . .) It took a lot of quick work by Jim Backelor and his tabulating crew to keep up with the flood of flight scores and to accurately total them out to identify the top 20 who would be vying for invitations to the FAI team selection finals in Memphis in September as well as for the Nats hardware in the finals that were to be flown on Friday and Saturday morning. Although there were separate trophies for the Novice entries, it's interesting to note no Novice fliers were in the top 20. (This is the first year for the D Pattern event and classification into either Novice or Expert is mainly a declarative act by the flier himself. It appears that at the Nats at least, most fliers know their abilities . . .) Here's how the top 20 qualifiers were listed on Thursday night:

Jim Kirkland	Fla.
Jim Whitley	Ga.
Ron Chidgey	Fla.
Jim Oddino	Cal.
Larry Leonard	Cal.
Phil Kraft	Cal.
Jim Martin	N.J.
Jim Edwards	Ala.
Don Coleman	Ala.
Tony Bonetti	Del.
Bob Smith	Cal.
Norm Pate	Ill.
Bill Salkowski	Cal.
Doug Spreng	Cal.
Don Lowe	Ohio
Cliff Weirick	Cal.
John Dougherty	Ark.
George Hill	Va.
Bob Noll	N.Y.
Al Dupler	N.Y.

D Pattern finalists had 6 rounds of flying (they logged 117 of 120 flights of an average of 9.25 minutes each. The missing 3 flights belonged to Bob Noll who left when he received word of the death of his father . . .) Three rounds were flown Friday during rough windy weather in a tough cross-wind location while Saturday morning's 3 rounds had virtually calm air and cool temperatures. The quality of the flying was superb throughout, however, and was best typified by a comment heard on Friday from one of the many RCer spectators who said, "It's blowin' like hell out there but they make it look like there ain't no damn wind around!" With ideal conditions on Saturday, every finalist girded himself to make every maneuver count. Phil Kraft, grim jawed and determined walked away from the flight line after his 5th round declaring that the flight had been given the best he had. The judges evidently agreed and Phil posted the highest single round score of the meet, a very respectable 4785 points. But it wasn't to be enough as Jim Kirkland, a former national champ, maintained the pressure he had applied from the very first round. "I may not be able to stay up with the young guys," he said seriously, "but I'm here to keep 'em honest!" Jim's reservations were unfounded however as veteran pattern masters prevailed most significantly. And the southeast corner of the U.S. once again showed it has an abundance of aerobatic skill by taking 5 of the top 7 slots. California wasn't far behind with 7 fliers among the top 20

(continued on page 77)

FLIER	BEST 3	1.	2.	3.	4.	5.	6.
Kirkland	14,140	4765	4660	4710	4570	4665	4545
Edwards	14,045	4360	4580	3960	4530	4710	4755
Kraft	14,025	4585	4525	4655	4500	4785	4575
Whitley	14,000	4685	4455	4370	4725	4590	4535
Leonard	13,890	4400	4555	4600	4735	4530	4325
Coleman	13,735	4425	4545	4345	4670	4285	4520
Chidgey	13,665	4565	4490	4445	4495	4605	4385
Page	13,555	4520	4260	4505	4435	4530	4345
Martin	13,480	4435	4050	4455	4525	4500	4230
Bonetti	13,440	4455	4205	4500	4400	4415	4485
Lowe	13,320	3785	3400	3995	4310	4670	4340
Oddino	13,305	4265	4380	4490	4205	3985	4435
Salkowski	13,185	4295	4380	4435	4165	4340	4370
Spreng	12,860	4100	4440	4080	3220	4095	1460
Smith	12,855	3585	4385	4345	4010	4125	4040
Weirick	12,760	3955	4095	4125	4210	4365	4185
Hill	12,480	4285	4165	4030	3950	575	3565
Dupler	12,160	3685	3320	4140	4100	3920	3730
Dougherty	11,805	3860	3815	780	3830	4115	3540
Noll	11,775	3845	4160	3770	—	—	—

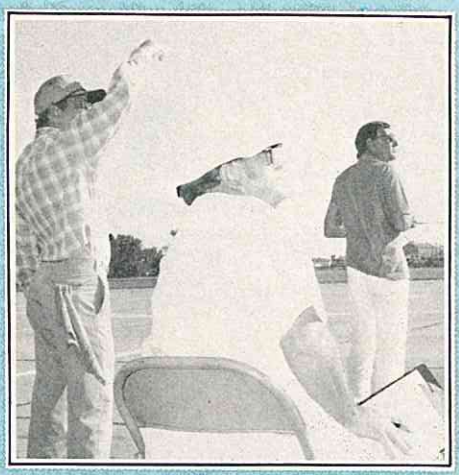


Winning pair . . . Jim Whitley cranks Daddy Rabbit VI while Jim Edwards holds. Whitley 4th, Doc Edwards 2nd in tough D Expert pattern event. Both used Pro-Line radios. Webra engine. Calibre of flying was remarkable; sportsmanship outstanding. Winners in every respect . . . .

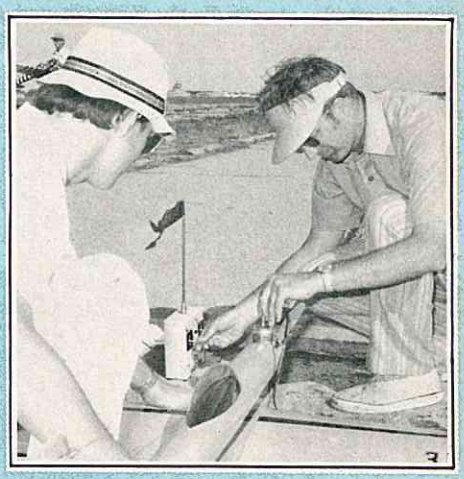
Phil Kraft and 3rd place winner had best single flight score of 4785 points. 1967 World Champ's new bird weighs 8 lbs., has Webra and Silence-Aire. Kraft radio.

Draggin'-Fli was Doug Spreng entry. Placed 14th. 8 lbs., Webra, Kraft radio. Doug new Kraft associate.

Weirick and Co. Cliff flew 7 lb. Draggin'-Fli in DX finals with Webra, Silence-Aire muffler. PCS radio. Harold Goldclank was extra operational hazard.

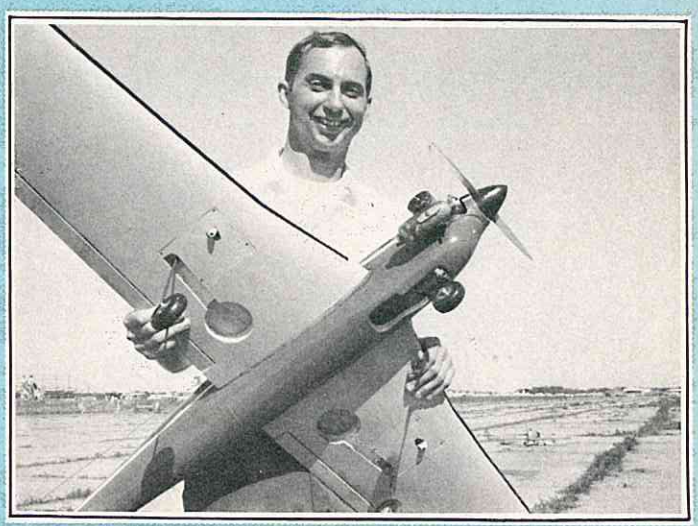


Bonetti on the line. Judge Sam Crawford follows Tony Bonetti maneuver during DX finals round. Placed 19th. Doug Spreng called.



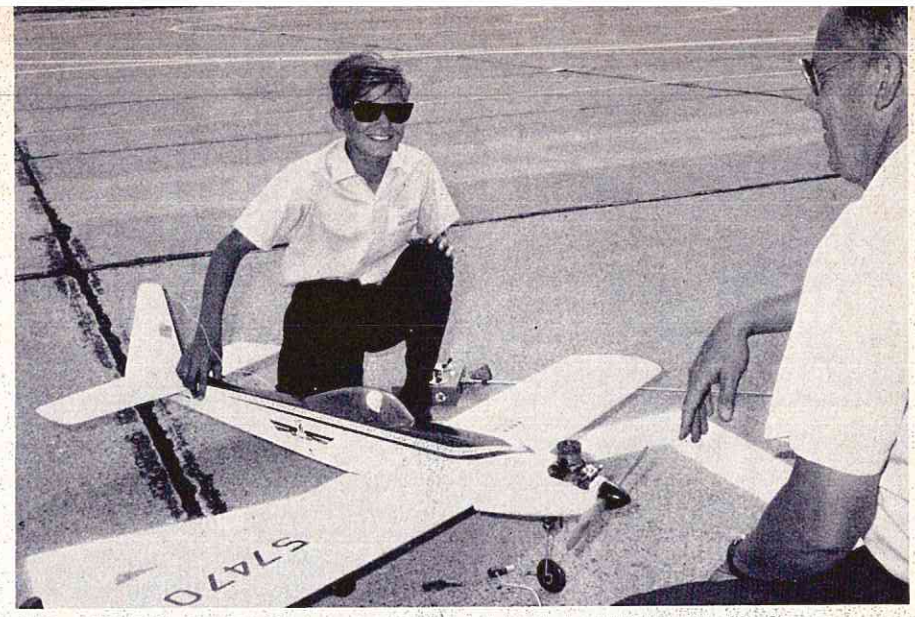
12th place Jim Oddino readies for DX round. Ship used Lee-Veco 61, Pro-Line radio. Whit Stockwell assisted.

NVRC'er George Hill Virginian . . . A Hill-Violett design. KDH retracts, Webra 61, KO muffler in 8 lb. ship. 16% wing section, Pro-line radio.



FAI Avenger was 8th place Norm Page entry in DX. Positract retracts, Webra 61, Enya muffler in 7½ lb. bird. Pro-Line radio.

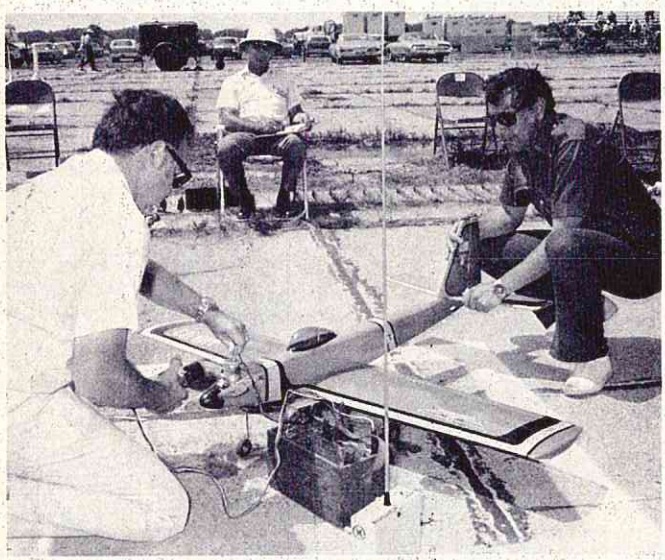
D PATTERN



Left: Bill Hiller, top D Pattern Junior. Hybrid ship had Webra 61, Kraft radio. Above: The rest of the Hiller team. Jimmy and Bill Sr. ready for D Pattern round.

Jerry Worth was 4th in DN with "Rampage" original. 7¼ lb. Webra, Pro-Line. Acrylic enamel over Dupont 30 primer. Balsa, silk construction.

Left: Karen-Lee Kulp shows Dan Santich's "Spear". USAF team member used OS 60, Logictrol radio in 6½ lb. bird.



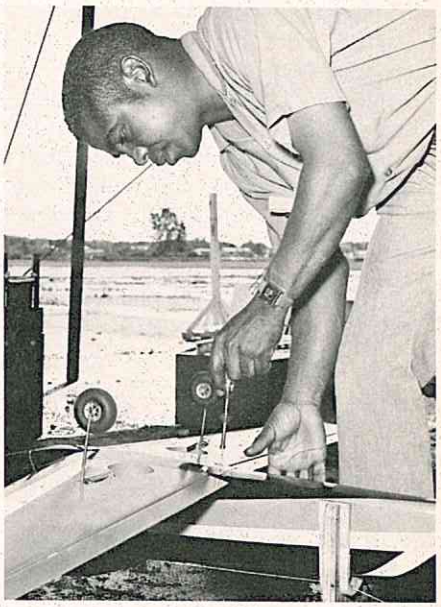
Above: Lee Shulman brought Platt designed "Contender". K & B 40, Citizen Ship radio. 5½ lbs.

8-Ball is new Lloyd Nicholson design. 7 lbs., ST 60, BK retracts, Royal 70 radio. Fibreglass fuselage.

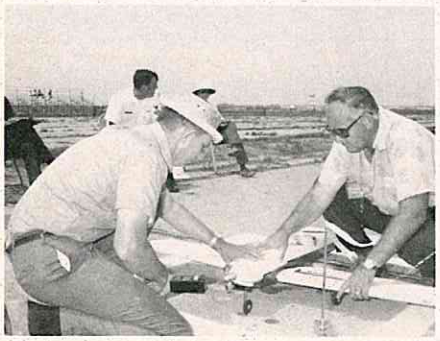
Florida DN entry was Kaos by Ron Moss. 5½ lb. lightweight handled easily by ST 60. Kraft radio. Joanne anticipates engine bark.

Dave Grunewald and DG Delta original were DN entry from Wisconsin. 7 lbs., 800 sq. in. Webra, Pro-Line radio. Carl Weber helped.

Thunderbird, Dan Carey's DX entry. Veteran flier had Veco 61, Logictrol, weighed 6½ lbs. Ft. Worth seemed cooler at times . . . (Navy photo)



Jim Grier's Anonymous was rare Nats casualty. Neat ship had retracts, ST 60. Orbit radio. (Navy photo)



Hank Walker had Lanier entry in DX. Veco 61, Kraft in NVRCer's ship. George Hill holds.

"Epitome" was Jim Vanderwalker's DN design. Featured Taurus wing, ST 60, Perry carb, Kraft radio. Only 5½ lbs.

Brian and Lois Ehmke were DN Pattern team. Kwik-Fli III had ST 60, Perry carb, Kraft radio. (Navy photo)

SOARING

While the pylon eliminations were churning along, in another flying site in St. Charles, Ill. 40 miles away, an unofficial soaring meet was underway. Sparked by the organizational efforts of Dan Pruss and Dave Bert as CD, some 40 glider devotees came from the length and breadth of the country to vie in A (750 sq. in area and less) and B (over 750 sq. in.) events. Fifteen minute maxes (timed from launch line release) with a-point-per-second penalty for overtime, were allowed. Tow concentric circles, 15 and 30 feet provided 100 and 50 point bonuses, respectively, if the gliders were brought to a stop within their confines on landing, rounded out the rest of the operating rules for the simple and enjoyable meet. Electric winches were provided with 300 meter line lengths to give initial lift to the graceful birds in the well run experimental contest.

Dr. Walter Good, the well-known RC pioneer, outpointed everyone handily and showed his ample accumulation of free flight know-how as he found vertical air while everyone else faltered during the closing rounds of the meet. An airborne pressure sensing transmitter that fed a hearing aid receiver helped Walt detect the rising currents. Another notable performance was seen in the efforts of Mark Smith of California and Orbit Electronics, who demonstrated a deft flying touch and judgement in both glider events. AMA officials and observers were impressed with the results of the meet and it appears an official glider event has the best chance of being the next RC event addition in the annual Nationals.

CLASS A

Mark Smith	Cal.	2739
Bob Andris	Cal.	2215
Rick Walters	Cal.	2148
Sam Crawford	Cal.	2136
Bud Pell	Mich.	1742
John Nielsen	Ill.	1282
Earl Pell	Mich.	1237
Dale Willoughby	Cal.	1234
Sigi Telzer	Ontario	1161
Max Geier	Ill.	794

CLASS B

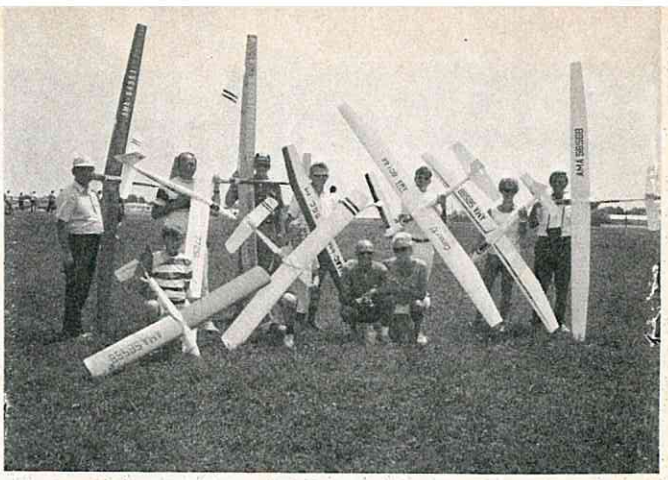
Walt Good	Md.	3780
Jack Hiner	Ill.	2445
Dan Pruss	Ill.	2282
Sam Crawford	Cal.	2259
Mark Smith	Cal.	2229
Ed Smith	Mich.	2193
Rich Bremer	Mich.	2134
Ray Vandierdonck	Mich.	2124
Earl Pell	Mich.	2048
Rick Walters	Cal.	2040

Mark Smith and Windward II original, 1st in Class A. Also a 5th in Class B. Windward II has 650 sq. in. wgt. 30 oz. with Orbit radio. A deft touch spelled success. Windward kitted by Mark and father.

Tuned in. Walt Good and another max. Bill Northrop (l) watches winning performance. Walt scored 3480 points, outdistanced everyone. Altitude sensing transmitter in Walt's Cirrus glider helped. Kraft radio.

Sam Crawford and 4th place Graupner clip wing in Class A. Genial Sam's ship under 3 lbs. Kraft radio. A glider pro from the Formula I ranks.

Dan Pruss and 3½ lb. Kurwi 33. 108" span, 840 sq. in. Kraft radio. 3rd in Class B. Dan, organizer of experimental meet, showed RC gliding has Nats potential.



Greater Detroit Soaring and Hiking Society turned out enmasse for Nats week glider meet. Lotsa spirit. Site, Flying Fools field near St. Charles, Ill.

Jerry Nelson and "Easy Juan". 105" span, 850 sq. in. 3 lbs., Kraft radio. Nelson famous for all fibreglass KA6E.

Dick Bremer readies. Dave Bert, meet CD, holds Kurwi and Dan Pruss mans electric winch. Smooth test meet held during Nats week was well attended.

Neil Liptak and "Molly Mawk", a Carl Lorber design. 108" span, 820 sq. in. 2½ lbs. Kraft radio. 19 year old flier been in RC 5 years.

A tweek's just right. Howard McEntee trims B Class Graupner Cirrus soarer at gliding competition. E.K. Logictrol radio.

SCALE

Scale flying at the Nats is always a treat – an exciting treat, at that and this year was only an exception in that it was a lot more so for fliers, spectators, officials, and the press alike. More entries, bigger and more detailed planes, better flying performances, and ingenious innovation were primary ingredients that brought wonder and admiration from the immense throngs who came to witness the 1970 show . . .

There were 43 entries this year with 28 making one or more of the 74 official flights that were logged. Four rounds were offered contestants who shared two mornings of flying with the D Expert finalists. Virtually perfect conditions for scale flying existed for the majority of the time allocated. Don Lindley, Scale Director, and his staff, made sure things rolled smoothly so that the contestants could take full advantage of their opportunity. (Nats action by the AMA Executive Council created a separate RC Contest Board for all Scale categories due to the growth and vigor of these events. This move is expected to further give Scale buffs a shot in the arm . . .)

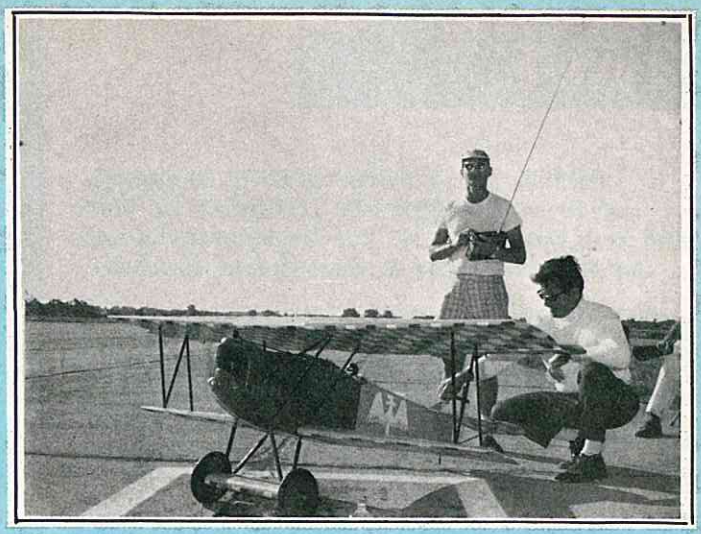
All the big guns were there – McCullough, Atkinson, Hester, Noll, Bertrand; plus a few not established previously as Nats competitors. Two (not one, mind you) B-36's were the main attraction with their 6-engine complexity and near 20 lb. weights. They were readied during periods of high spectator tension as everyone 'knew' they would abort for some reason. Successful flights by both brought forth very audible reaction as they were launched by their respective creators, Walt Burgin of Iowa and Ken Drummond who brought his **number** 2 version to Chicago. The major fact of the 1970 scale action was the almost complete dependability of flight performances of most of the scale fliers and their gems. There was the usual type of nervousness and apprehension by the pilots but steady performances by many such as John Roth and his Ross twin powered Volksplane, or the big winner Ed Ellis did much to 'routineize' the flying. The major contributor to this condition was Ken Drummond who fired up his behemoth no less than 4 times (he took less than 30 seconds to get all six Enya 19 engines percolating and to get the

(continued on page 76)

Tops in Scale. Ed Ellis of the Indian City RC Club flew 100% scale Spirit of St. Louis. 10 lbs., 80½" span, 2½" scale, ST 60, PCS radio. Immaculate.

Bud Nosen and 2nd place Jug gem. P-47, 10½ lbs., 675 sq. in. wing, 1½" scale, Webra 61, Micro-Avionics radio. Rockets, bombs, electric canopy, cowl and wing flaps.

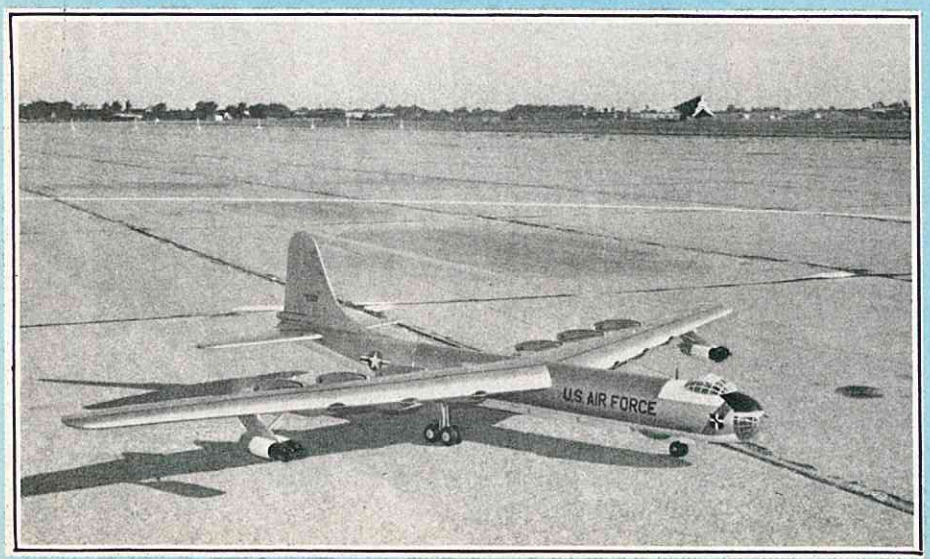
Liberty Sport by Dick Graham was 3rd in biggest ever RC Scale Nats event. 10 lbs., 2-2/7" scale, ST 71, Logictrol.



Well known ¼ size Fokker D-VIII by Bill Bertrand was 4th in 1970 classic meet. 14½ lbs., O & R Compact 1.23, 17 x 6 Woodcraft prop, Orbit radio. Scale flying speed.

5th place John Roth Volksplane had new Ross Twin engine. Smooth running, dependable. Plane flew well. 9¼ lbs., ¼ size, 72" span, Kraft radio.

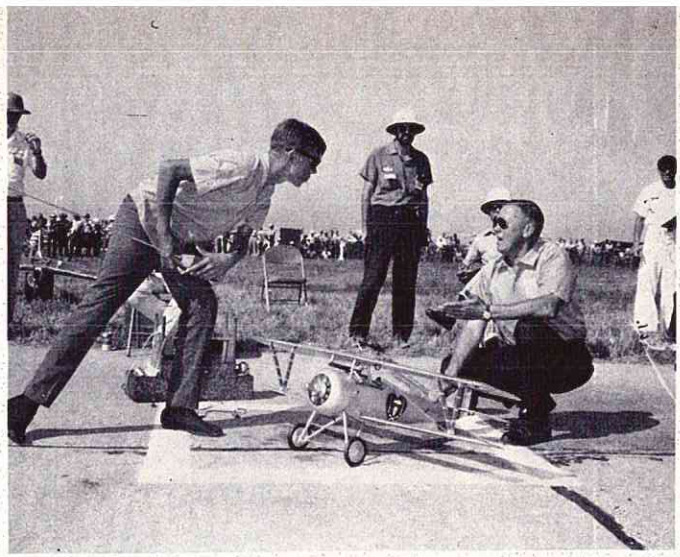
Nats sensation. Ken Drummond was winner of 1970 Best Achievement Trophy for 19 lb. ½" scale B-36. 6 Enya 19's ample power. 7 channel Logictrol.



Taxi out. Drummer B-36 made 4 flights, flew very well. Rotated realistically on takeoffs, landings. Articulating landing gear trucks took loads. Ship based upon Japanese Kayo kit. Balsa construction. 2nd ship for Ken.

1970 NATIONALS

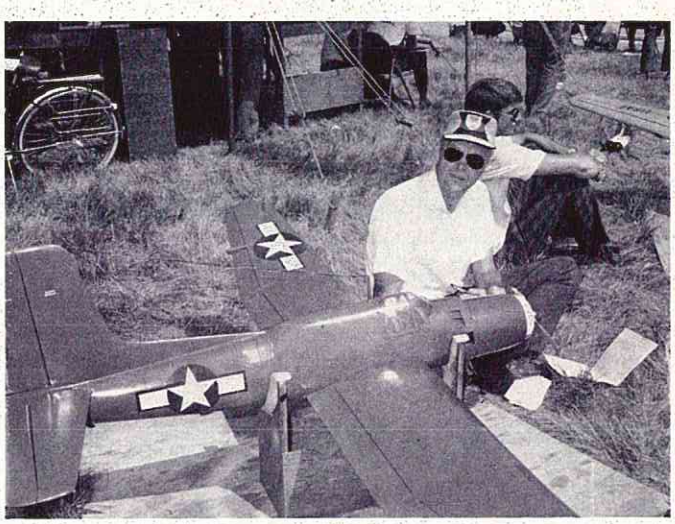
SCALE



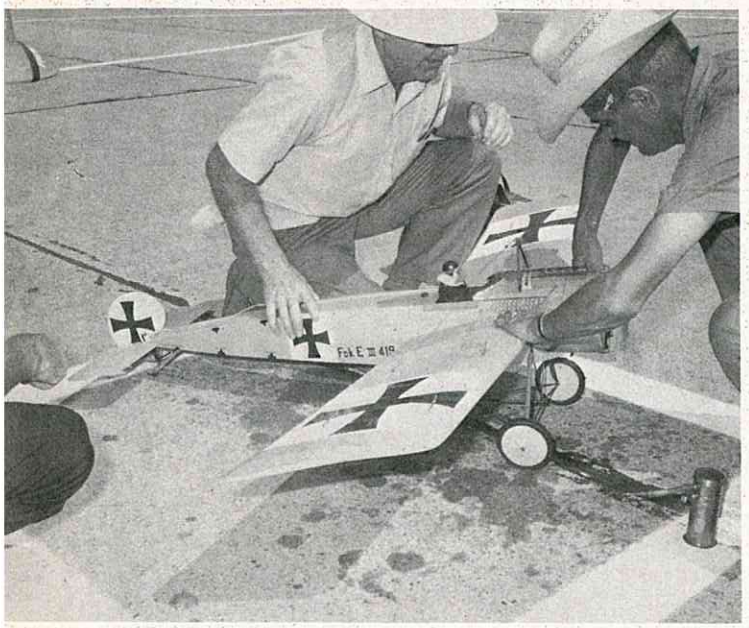
Bill Hiller listens to advice of Bill Sr. during early scale round. Enya 45 in 5 lb. VK Nieuport 17. Kraft radio. Scale Operation Judge, Ron Connor of the Chicago Scalemasters, checked all flights for rules observance.

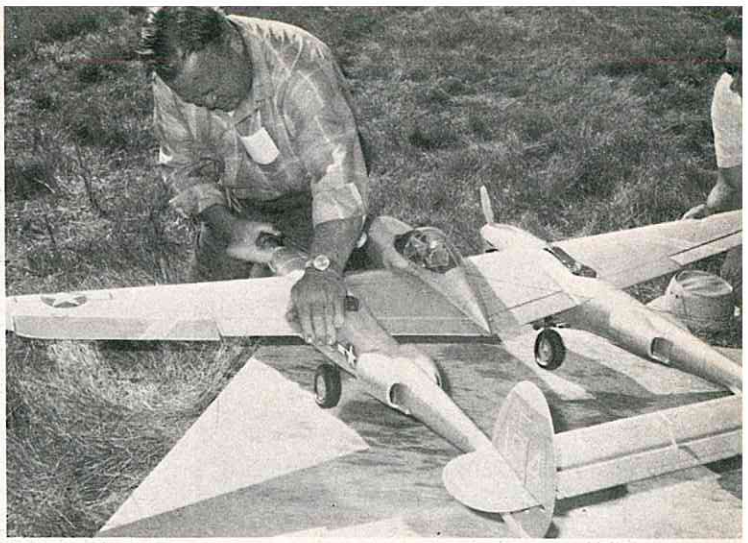
Walt Burgin's B-36 weighed 18½ lbs., used Enya 15's. ½" scale, Logictrol II. Test flown on 4 engines originally.

Best Junior in Scale. Jim Hiller and Top Flite SE-5A. 6½ lbs., ST 60, Kraft. Note tire detail, typical of Hiller winning effort.



Above: Claude McCullough and latest version of his well known Douglas XTB2D-1 Attack-bomber. 1-3/16" scale, 11 lbs., Enya 60, Logictrol. Left: Dave Noll and PT-17 from a Sterling kit. 11½ lbs., ST G60, Orbit. Chip Schoonover helped.





Above, left: Frank Mock (R) and Fokker E-3. ST 56, Kraft radio. Bob Green assisted.

Above: Only major crash casulty was P-38 by Doug Swanningson due to engine flameout. 13 lbs., 1/8th size, deBolt retracts, flaps, Veco 61's, Logictrol. Jerry Knautz assisted.

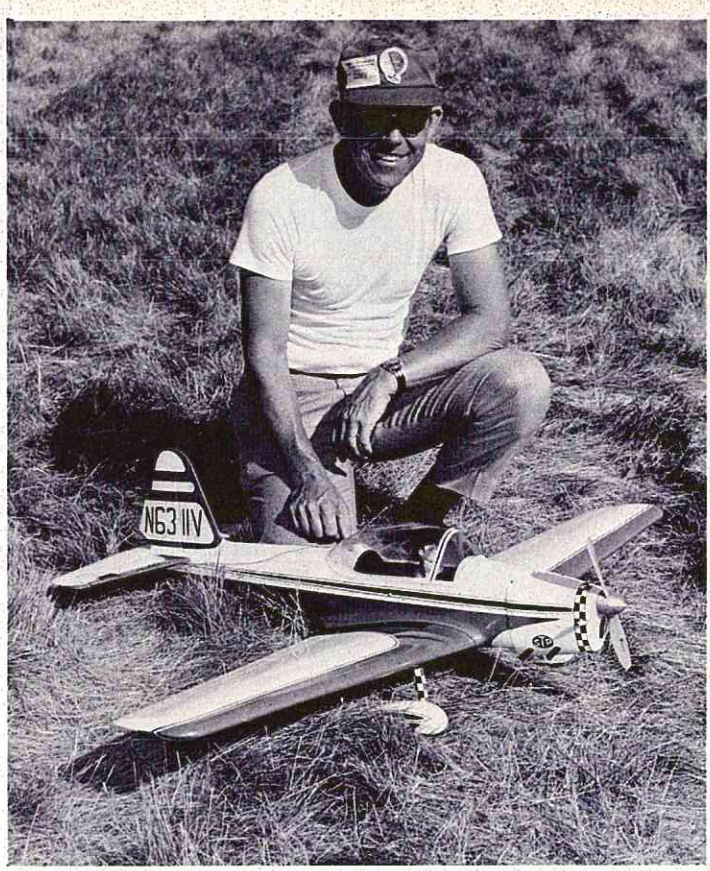
Left: Bud Wolfe and replica of Shinn 2150A. 4½ lbs., 2" scale, Enya 45, Logictrol II. Flew well.

Below, left: Maxey Hester and Zlin Akrobat. 2" scale, Enya 60, KO muffler, Logictrol radio.

Below: VK Nieuport 17 by Bill Johnson had ST 60, Kraft radio. 5½ lbs. Don Condon holding.

SCALE

Stafford Chipmunks popular in scale. This one by Don Condon had ST 60, Logictrol II, weighed 7 lbs.



Suzann Bowie, Miss Model Aviation, hefts Len McCoy's T-34 Mentor. Sig kit, Veco 61, 8½ lbs., Lakin nose gear.

2" scale Gypsy Moth by Bob Green is veteran of contest trails. 8¼ lb. ship uses ST 56 with a Veco carb. Logictrol radio.

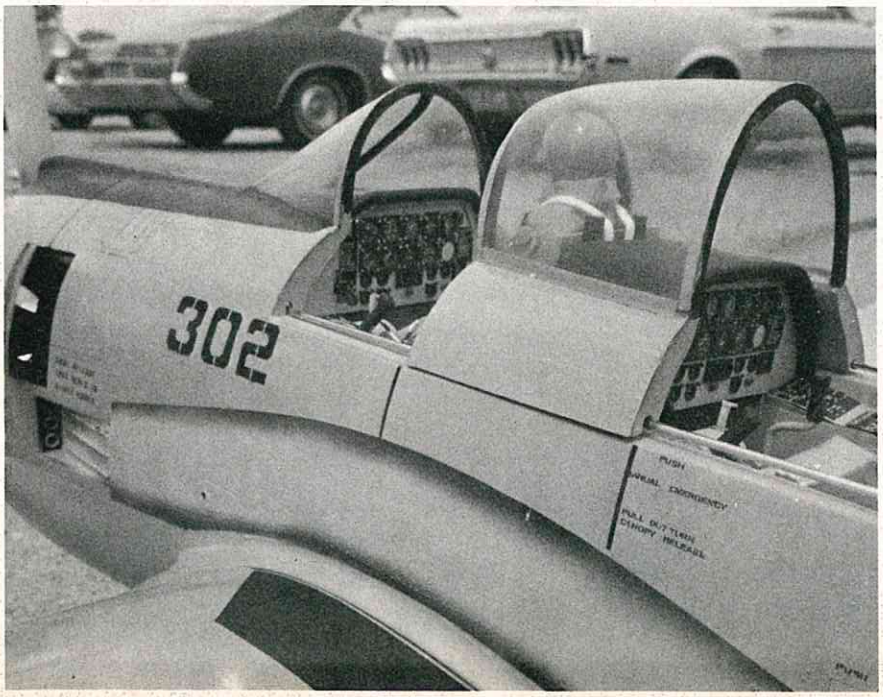
Nats favorite. T-6G Texan by Don Neill of Lincoln, Neb. 7½ lbs., Enya 60, Kraft radio. Neat.

Best Senior in Scale. Whit Stockwell and Stafford Chipmunk replica of 1966 Krier conversion. Lee-Veco 61. Perry carb, Kraft radio in 7½ lb. gem.

Paul Martin showed his 76½" span Boeing 707. 14½ lbs. 2 ST 60's, original pneumatic retract gear. Flown often.

Dan Santich brought his neat Chipmunk from Japan. USAF team member used an Enya 60, Orbit radio in his 6 lb. ship.

Another Krier Chipmunk was 6 lb. ship by Bob Underwood of St. Louis Dignal Chasers. Enya 60, Perry carb, Kraft radio. From Stafford kit.

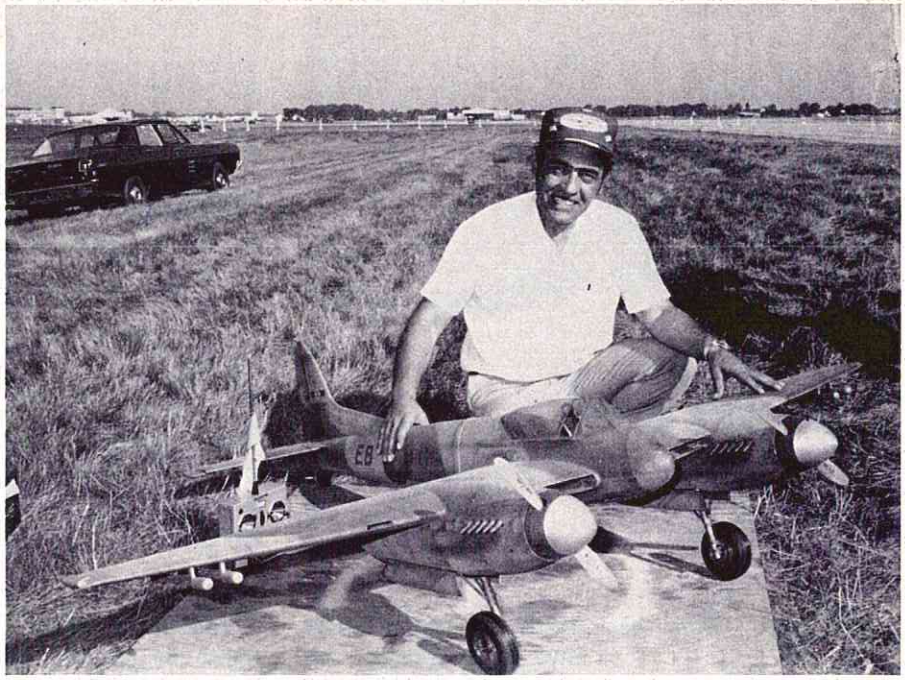


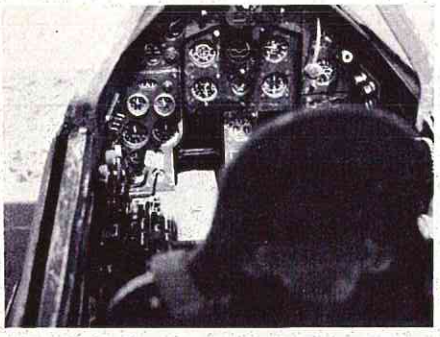
Above, lt: Hal Humphrey brought a beautiful T-28B to Chicago. Scalemaster member used a ST 71 in the 10¼ lb. replica. Kraft radio.
Above: Cockpit detail in Hal Humphrey's T-28B. 1.67" scale, ship based upon 1965 Platt design. Took 1½ years to build . . . Left: More cockpit detail in the Humphrey T-28B. Like real . . . .

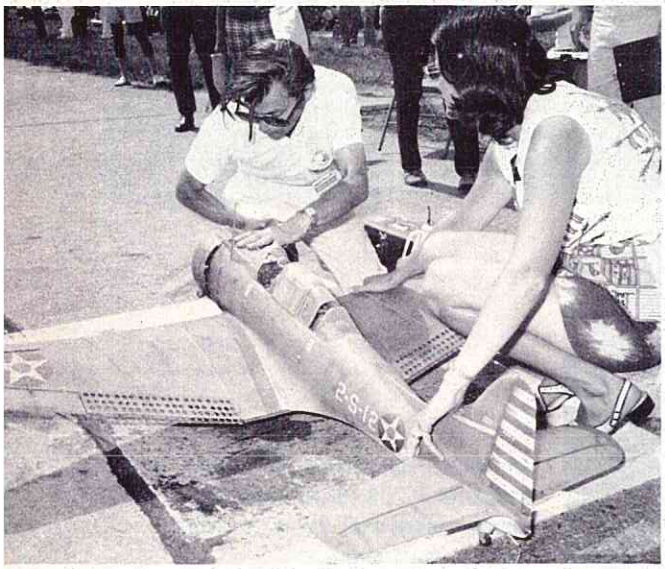
1970 NATIONALS

SCALE

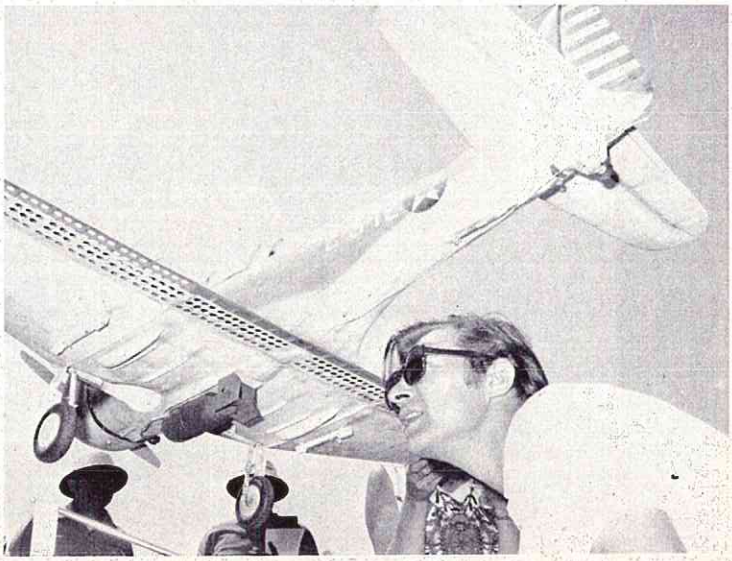
Right: Dario Brisighella received top scale points for his superb Sea Hornet. 18 lb. ship spanned 78¾" for 1.75" scale. Webra 61's, Kraft radio. Below: Cockpit detail of Brisighella Sea Hornet. None better. Center: Anxious crew awaits decision. Rubbing prop spinners cause Brisighella concern, prevented flight 4 times. Dick Swenson, Roger Olsen sweat it out. Dwayne Brown, Flt. Line Coordinator, gets story. Below, rt: Taxi try. Heartbreak for Dario when power loss forced abort on 4th try. Sea Hornet was tops in the Toledo show, disappointed many at the Nats. Flew well in test hops without spinners.







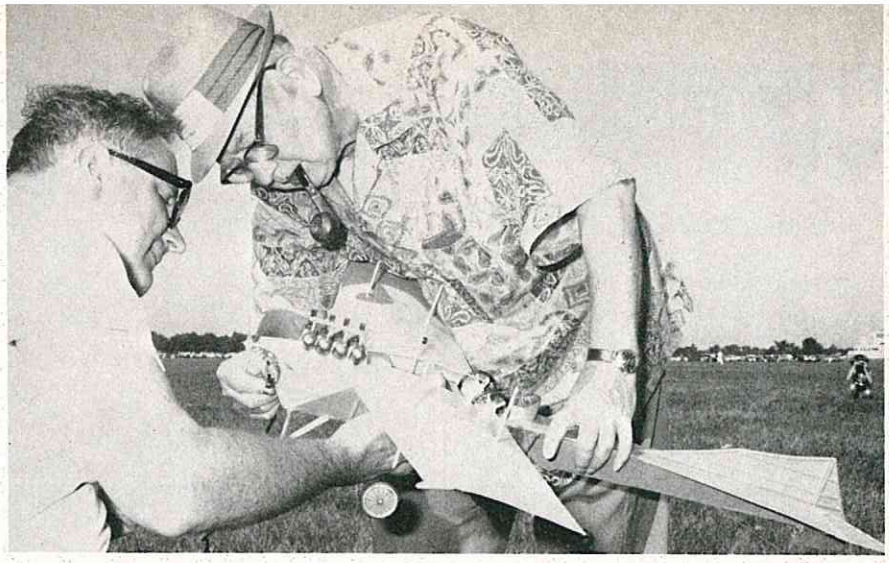
Dave Platt and famous Douglas Dauntless that sparked a new realism trend in scale. Gear problems prevented flight. Dave, Top Flite designer.



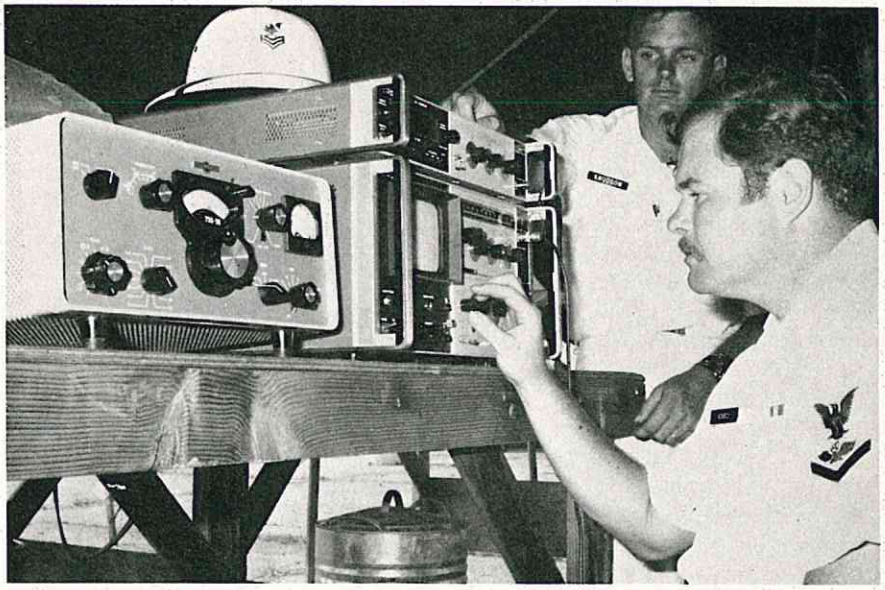
Underneath look-see . . . Douglas Dauntless detail meticulous. ST 71 power, Kraft radio, Dave, RCM's Scale Editor.

SIDELIGHTS

Each year as the annual task of trying to 'capture' the Nats on paper draws to a close it's realized how much is not adequately portrayed. Two -dimensional paper and words cannot substitute for the sights and sounds and spirit that abounds each Nat's week. The buzz of the traditional hangar where hundreds of models rested on rows of benches as they were attended to by their avid fliers who are there for the social aspects of the hobby as well as the competition. The expanse of runway and its 4 flight lines of aerobatic planes overhead . . . . The multitude of other events there is not time to see and photograph and cover from filmy microfilm to rocketing jet ukies . . . (However we did make time for an old-timer such as C.O. Wright who has been admired for many years, as he forgets his 75 years and cranks up his venerable Antoinette once again for another qualifying flight in free-flight scale that put him among the top ten in that event . . .) Or the Delta Dart hubbub in a hot hangar where nobody notices the heat as some 2000 youngsters make their first genuine flying model and clutch real trophies for their effort. (This year, once again it was Ralph Penetti and his fellow RC'ers of the Pittsburgh ARCS along with Bob Underwood of the St. Louis RC Assn., Ed Abram of Quaquaga, N.Y., and the Windsor High School, Bill Risko, and Ken Wilson who sparked the Delta Dart program so successfully. It actually took some 50 people to run the show which promises to keep on growing as momentum is gained . . .) And the multitude of Navy people who try to understand what it is that make modelers tick, but welcome them back each year . . . The special citation given Phil Edwards of Berryville, Va., for his photo coverage for AMA each year as well as recognition of the Toledo Weak Signals Club for their contribution to building Trade shows and fund raising for AMA projects . . . The monitoring equipment loaned by Collins Radio Corp. and Hewlett-Packard to guard against radio interference . . . And finally, the decision that the Nats will be back in Chicago for 1971 so that we can get in line early (as we check out) for a motel room next year!



In free-flight Scale C.O. Wright readied his famous Antoinette for a qualifying flight in a brisk wind. Ship won 1961 and '63 Nats, was 2nd in '65. Son Bob, holds.



AC-3, Vince Kennedy, and AC-1 Larry Knudson attend radio monitoring equipment essential to meet safety. Collins receivers and Hewlett-Packard tracking generator loaned by respective radio corporations.

Colin Cliff came from Warragul in Australia for 1970 Nats, was given a tour through the scale exhibit by John Worth.

FREE FLIGHT

By Vic Cunnyham

To start off RCM's free flight coverage we have a first hand report of the 1970 AMA Nationals held at Glenview Naval Air Station near Chicago, Illinois, on July 27 through August 2, 1970.

This Nationals was the smoothest run and best officiated one I have seen (in my 16 years as a competitive flyer, I have attended 9 previous Nationals.)

The weather was, for the most part, nice, but each day it was different from the previous one. About half of the maxes (3 minutes) drifted off the base. The Navy recovery team was superb, working without showing the usual signs of grouchiness after a few days of running around in that heat. The average temperature was in the mid-nineties with the humidity at the same level.

In the following report I'll try to give you the highlights in each category.

Monday: Indoor Events

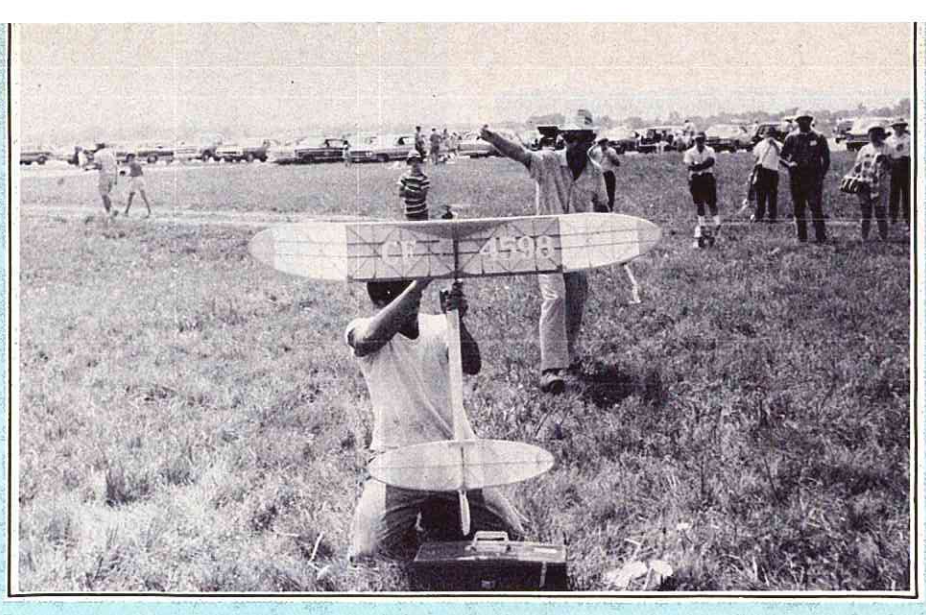
The site for the Indoor events was the Washington Park Armory, on Chicago's Southeast side. The almost lighter-than-air-aircraft took to the rafters. The Armory had a maximum ceiling of only 90 feet, with lights hanging down 30 feet and an equal distance apart. The floor space is 330 feet long by 144 feet wide, with the actual flying area limited by a row of Howitzers and other military vehicles stationed around the perimeter of the building.

It could be safely said that the rubber events were dominated by Jim Richmond of Oak Brook, Ill., who won First Place in Open, Cabin, Tissue, and Stick, all three events, as well as a third in Indoor Scale. He also walked away with the Category Championship Award for Indoor. Bucky Servaites was runner-up for this award, only 30 points behind Jim's sterling performance. However, Bucky's spirits were evidently not dampened as he went on to be Free Flight Category Champion and Grand National Champion as well. Bucky is from Dayton, Ohio.

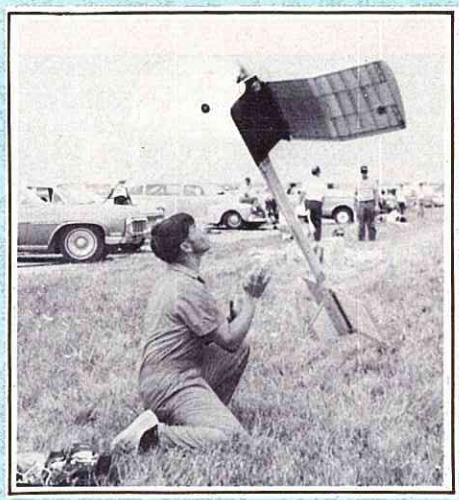
Tuesday: Indoor Hand-Launched Glider

Things started off in an uneasy fashion as Event Director, Bud Tenny, calmly walked around and asked the contestants to keep all their tools and

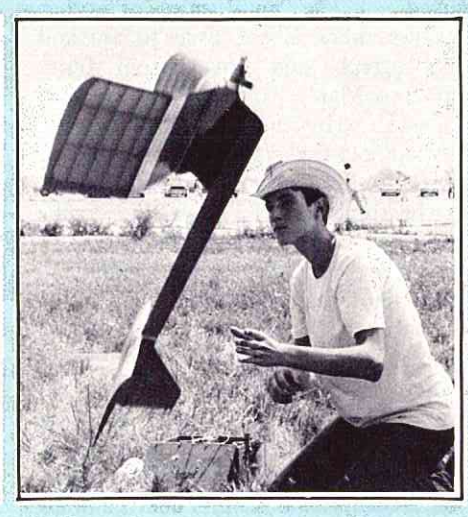
(continued on page 57)



Andy DeMello, Toronto, Ontario, Canada. 1st place Open A Gas. 350 sq. in. auto. stab. and rudder O.S. Max .15.



Larry Miller U.S.A.F. 1st Open B Gas elongated Starduster.



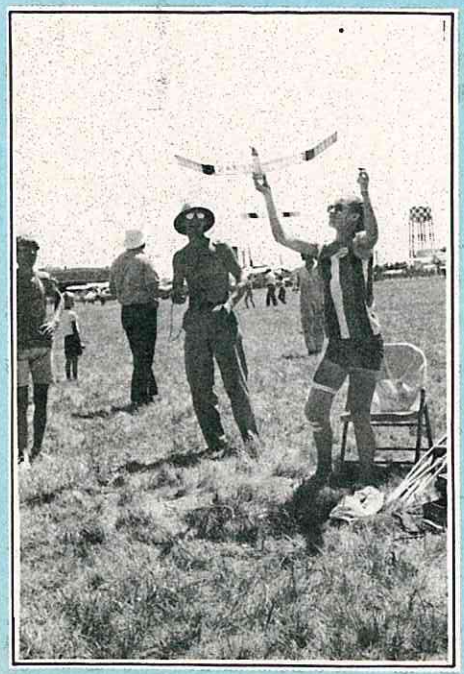
Mike Taibi, Lakewood, Calif., 2nd B Gas Jr. Starduster 600. Super Tiger .23.

Outdoor hand launched glider pros (Terrific Texas Trio). Right to left: 1st, Don Chancey. 2nd (tie), Dick (King Neptune) Mathis, 3rd, Tommy T. (Mr. Show Business) Deadon.

Ed Weiler, Goleta, Calif., Geodetic Galaxie 585, Veco .19. Really honks on. Maxed out, A Gas.

Dave Roundsoville, beautiful F.A.I. power model didn't place.

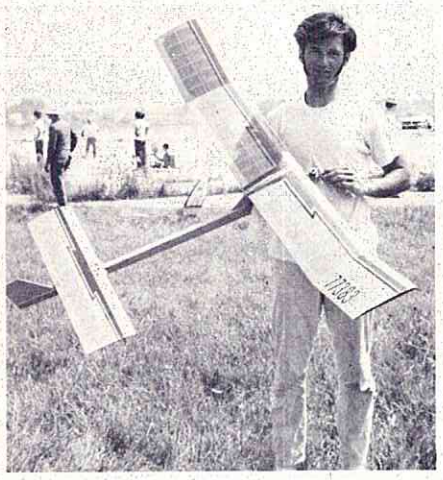
Left: Glen Schautz, Owosso, Mich., V.T.O's his MonoKoted Nig-Nog. 3rd, Open C Gas. Above: Bob Watson, Morton Grove, Ill., C Gas Bean Bogan. A 1957 design still competitive today.



Far left: Suzan Weisenbach, Cleveland, Ohio, 2nd Jr.-Sr. Coupe. A real competitor. Left: Mike Taibi, 2nd in Jr. F.A.I. Power. K & B .15 powered Sal Taibi design.

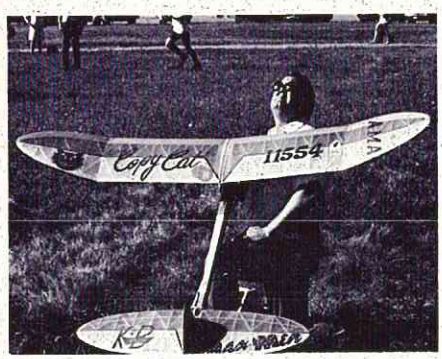
Joe Beton holds his "B" Plagiarist. A John Warren design. S-T 29. Excellent construction techinques.

Tom Hutchinson, Pasadena, Calif., F.A.I. Power Open 3rd place. K & B power for original design.

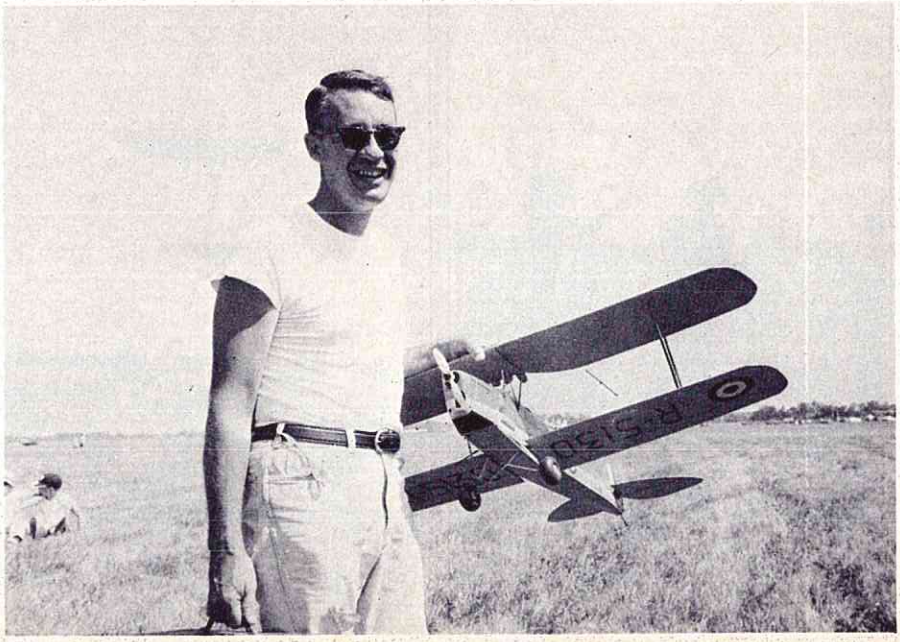


Dennis Bronco, 2nd in Open A Gas. Original design loose St .19 straightforward, functional design.

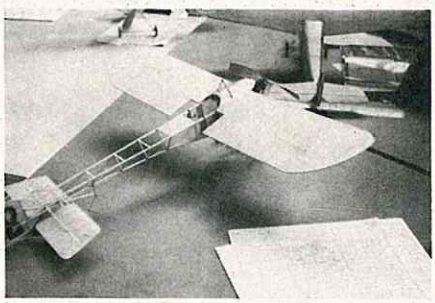
Sandy Rounsaville, holds her husband Daves' A ship, a Mathis Headhunter design. ST .15. Both were among the prettiest seen at the Nats.

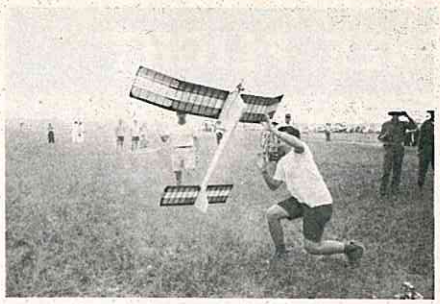


Above: Vic Cunnyham, Jr. Class B Copycat Torp. 29 similar to Mexi-Boy. 830 sq. in. 30 oz. Right: George Lewis, Warren Mich. Open. F.F. scale De Havelin Tiger Moth DH 82A, Sabre 1.5 cc diesel.

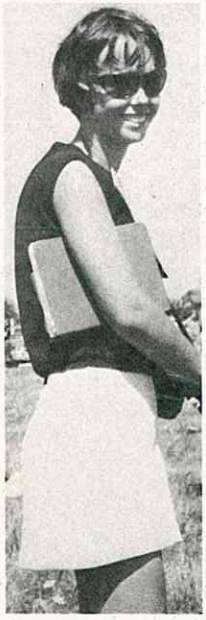


Left: Eddie Taylor, everybodys favorite kid helper. Takes his H.L. gliders for a fling. Eddies father flys those backward models. Below: Tom Peadon, Dallas, nice soft indoor scale 1st in 1969 didn't place this year.





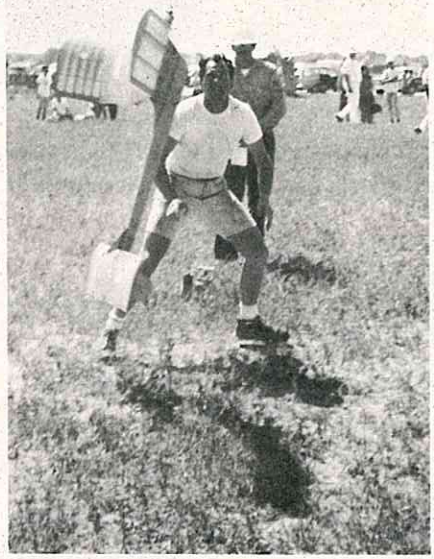
Marty Thompson, Jr. National Champ. C-Gas Starduster. If these pics only had soundtracks! Marty's from Livermore, California.



Above: Jr. Scale, Mark Lapansie, Jr., Grosse Pointe, Michigan. Fleet Trainer Kinner – Cox 049. Right: Busiest person on the field, Annie Gieskieng, National Free Flight Society. She is editor of the "F.F. Digest" publication.

Suzan Weisanbach heaves her glider as high as most fellows. Leg injury from her B-engine, which pulled off its mount only two days before.

Carl Fries, St. Louis, Mo., Class A Dragstar, nice construction. S-T 15 engine.

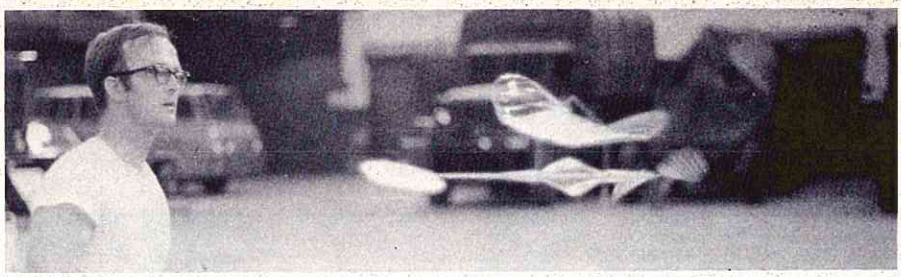


Earl Thompson, Livermore, Calif., with C-Gas original. He's Marty (Jr. Champ) father.

Lewis Cleveland, Tullohoma Tenn., 3rd in Sr. F.A.I. power S-T 15 power.

FREE FLIGHT

Fsssstt . . . Neat little Jetex job grabs some sky.

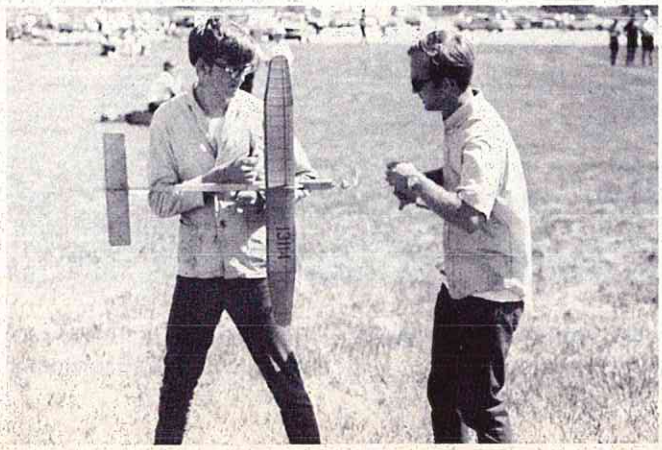


Grand National Champion, Bucky Servaties, testing his indoor cabin ship.

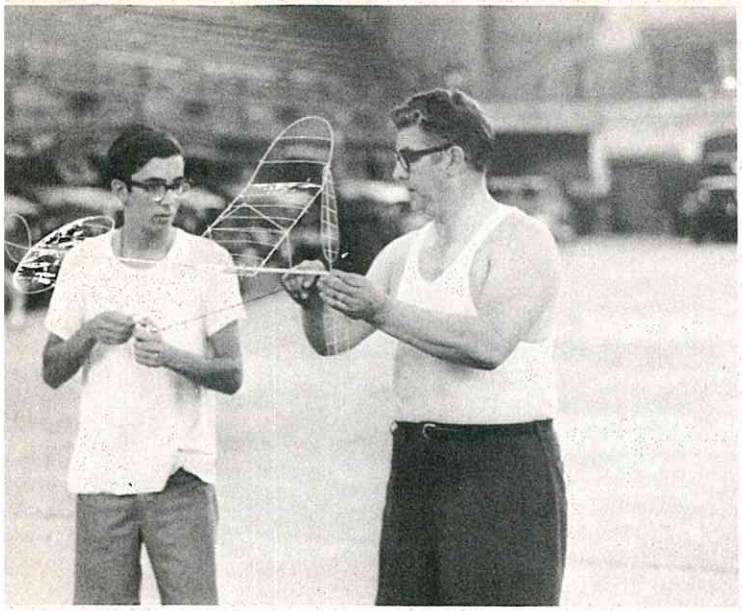
Far Left: Tom Hutchinson, Pasadena, Calif., launches his class A ship TD.051. Left: Ralph Kuenz launches his 1" to 1' scale Hawker Hurricane.

Manny Andrade, holding his breath, launches his Microfilm stick model.

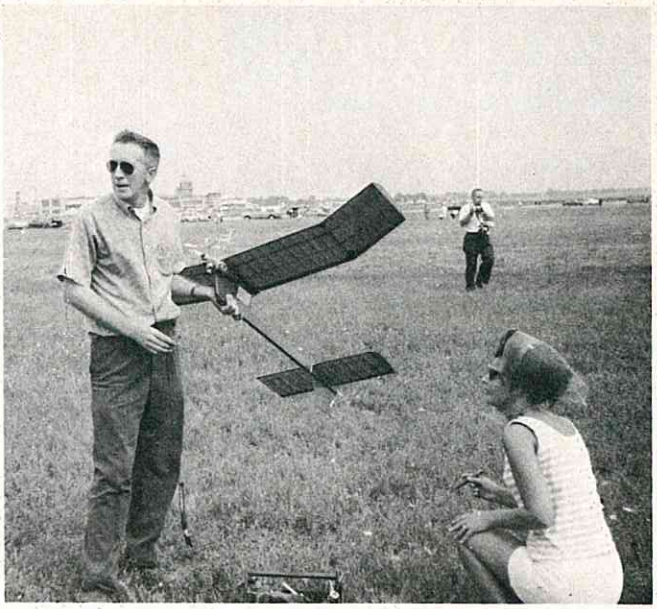
Chuck Schoblohers nice Stinson Reliant 47" span Enya 09, timer cuts throttle. Wylan plans.



Far left: Van (on left) and Bucky Serveties twisting the gum bands on Bucky's coupe model. Left: Mike Taibi launches his Class C Starduster.



Paul winds while his father Manny Andrade holds. Getting a Microfilm model ready.



Glen Lee past national champ readies his Class A Starduster.

Above, left: Glen Winkel, F.A.I. Power Jr. He had problems! Above: Paul Kosmalla launches his 1/2 A-A Uranius. Left: Mrs. Ron Martelet holds her hubby's beautiful Bristol Bullet scale.

1970 NATIONALS

1970 CANADIAN R-C NATIONALS

AND MEANWHILE . . .

Up in Canada they were having their RC Nats also. Normally there's care to avoid an overlap, but this year when the U.S. Nats had to be slipped due to Navy training schedules in Chicago, the conflicting dates became inevitable. However, this didn't stop us from covering the affair since we were in the neighborhood. A quick all night 450 mile trek up Interstate 75 got us to Sault Ste. Marie early for the Sunday wind-up flights. And it was well worth the trip . . . .

'Official' greeter and meet major domo was the Glitch Editor, E. Nino Campana who quickly made sure introductions were well in hand all around. Dave Henshaw, MAAC President was there with his caller for the pattern event, Perc Grondin, the energetic Editor of the MAAC Flyer; John Mertes, the meet CD; Jim Elgie, President of SoMoRaCC and the district MAAC representative; and Jean Rivard, Editor of the amazing FBI news of the Montreal RC Club who was accompanied by fellow club member, Jean-Guy Gregoire.

Weather was a bit showery but flying proceeded evenly in the beautiful greensward of the SoMoRaCC flying site layout. Events being concluded were 4 classes of Pattern and scale. In short order winners were announced, trophies presented, and a neat custom observed – a sip of champagne for winners and officials to asuage any competition inequities, imagined or otherwise, that was poured from a 104 oz. 'Texas Pint' known up north as a Jereboam. Regardless, no one noticed the rain . . .

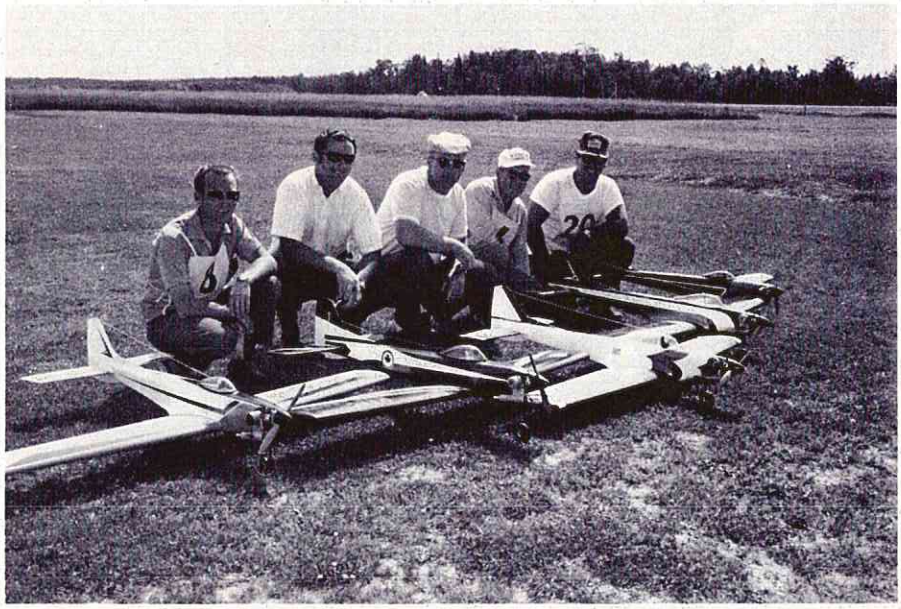
And here's how the winners finished (the flying, that is . . .)

CLASS A
Jim Boyd – Gowenstown, Ont.
Garry Titze – Dryden, Ont.
Ted Highnell – Clarkston, Ont.
CLASS B
Keith Brown – Stoney Creek, Ont.
Bob Harris – Brantford, Ont.
Charles Mills – Chatham, Ont.
CLASS C
Ivan Kristensen – Guelph, Ont.
John Frazer – Pontiac, Mich.
Gerard Shaw – Orillia, Ont.
CLASS D
Warren Hitchcox– Oakville, Ont.
(Winner of Heathkit of Canada Trophy)
Len Roe – Genison, Mich.
Jean Rivard – Montreal, P.Q.
SCALE
Frank Knowles – Guelph, Ont.
Fred Brydges – Guelph, Ont.
John Klassen – Thunder Bay, Ont.

At the Canadian RC Nats . . . Warren Hitchcox took 1st in D Pattern with latest Firebird II original. 6¼ lbs., ST 60, CRC radio. Silron covered.

Frank Knowles and VK Nieuport . . . Another 1st for veteran scaler in CaNats. 6 lbs., Merco 61, and a Stewart Dwens Skyleader radio.

Crusader was Ivan Kristensen's tool in winning Class C at 1970 CaNats. Enya 60, CRC radio.



Gord Silvers, Gerry Shaw, Len Roe, Dick Grieve, and Bob Steven show "REACC" lineup flown in Canada. Len Roe design. Len 2nd in D Pattern at Soo.

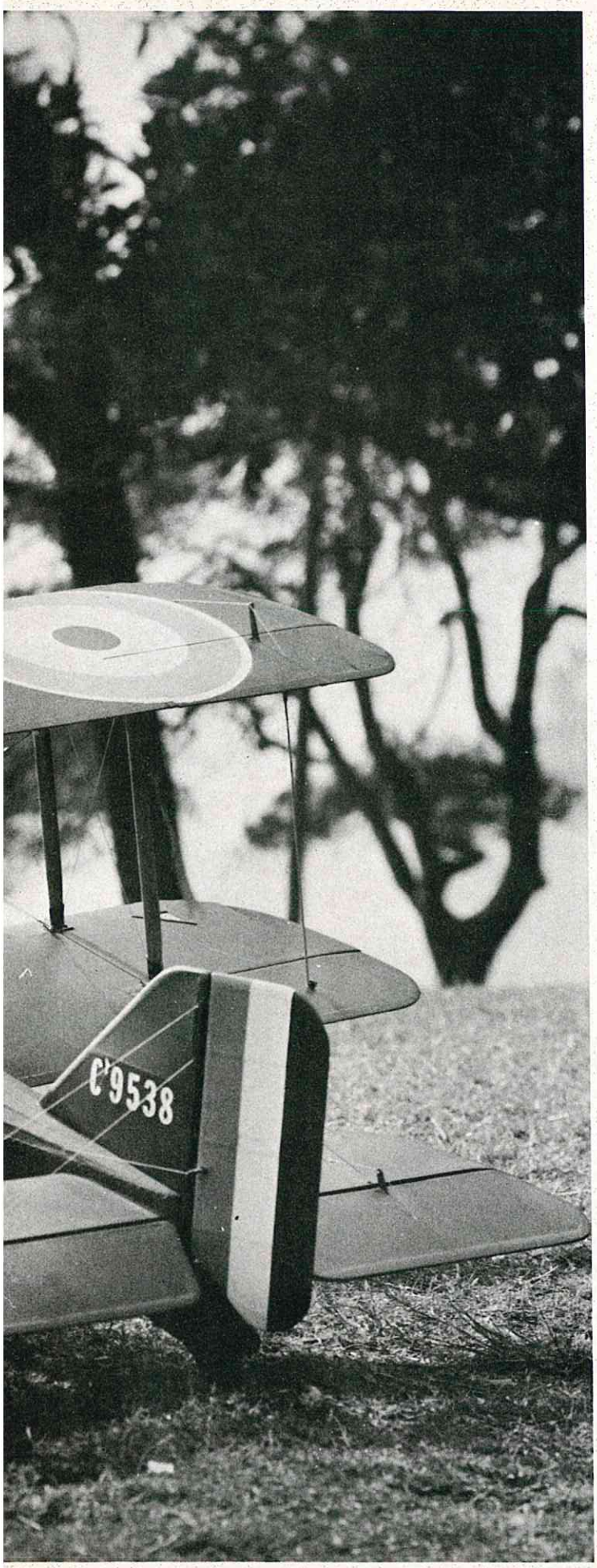
Jean Rivard puts Nytron Mk III through paces in Sault Ste. Marie, Ont. site of 1970 CaNats. Webra, Canair (Logictrol Pro-Series) radio. Jean-Guy Gregoire (r) called.

MAAC brass winds up . . . Dave Henshaw, MAAC Pres. has Perc Grondin assist in readying RCM Expert for CaNats flight. Enya 60, PCS. Jim Elgie, Judge. No. 32 is Garry Titze, youngest contestant, placed 2nd in A Pattern.

CD and DC . . . Jack Mertes CD'd Canadian RC Nats, Dr. E.N. Campana Soo chiropractor helped keep things from knotting. Bob Stevens' Aeromaster.

John Klassen was 3rd in Scale with Chipmunk, a universal favorite. Veco 61, Logictrol, 5½ lbs.

Left: Mosquito Mk 9 was by Tom Dietrick. Only 8 lbs., 72" span, 1.67" scale. K & B 35s, CRC radio. Right: Usually behind the camera, RCM's Jerry Kleinburg and Dr. Nino Campana are caught by photog Glenn McIntyre.



PORTFOLIO OF AN S.E. 5

BY BOB YOUNG

The photographs on this, and the following pages, are some of the most spectacular ever presented in a model publication. Taken by Clive Kane, a leading Australian fashion photographer and a very active modeler, they are of Bill Marden's S.E. 5 which appears on this months cover. Bill, incidentally, is the current holder of the Australian R/C sailplane record. - - - - Don Dewey

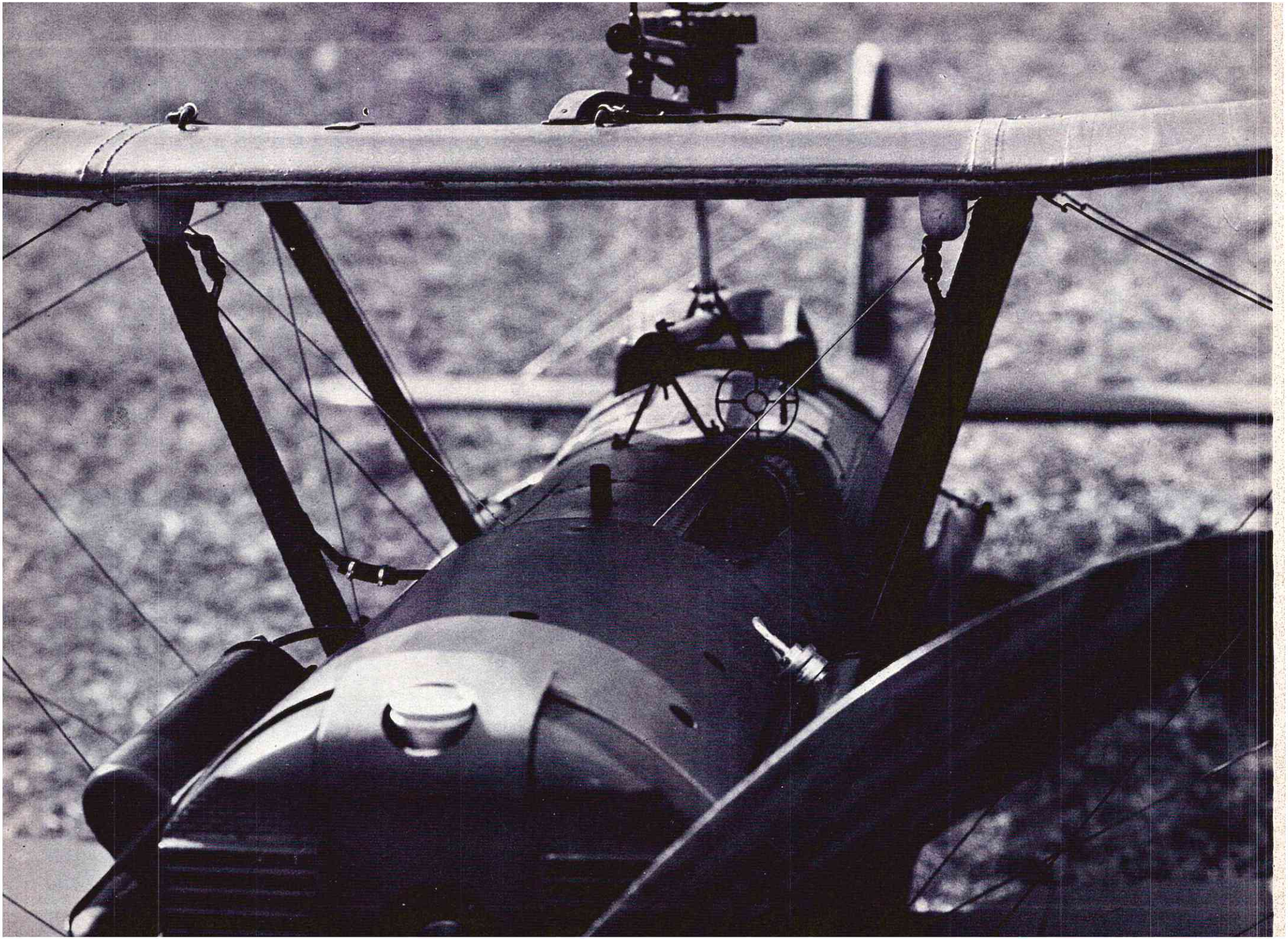
This model is based on the Top-Flite S.E. 5 kit with some modifications. It represents an aircraft of No. 2 squadron, Royal Australian Flying Corps, and carries the Boomerang marking used by that squadron from June-March 1918. The red streamers on the rear interplane struts, are those used by a flight commander and the letter A denotes an aircraft of "A" Flight.

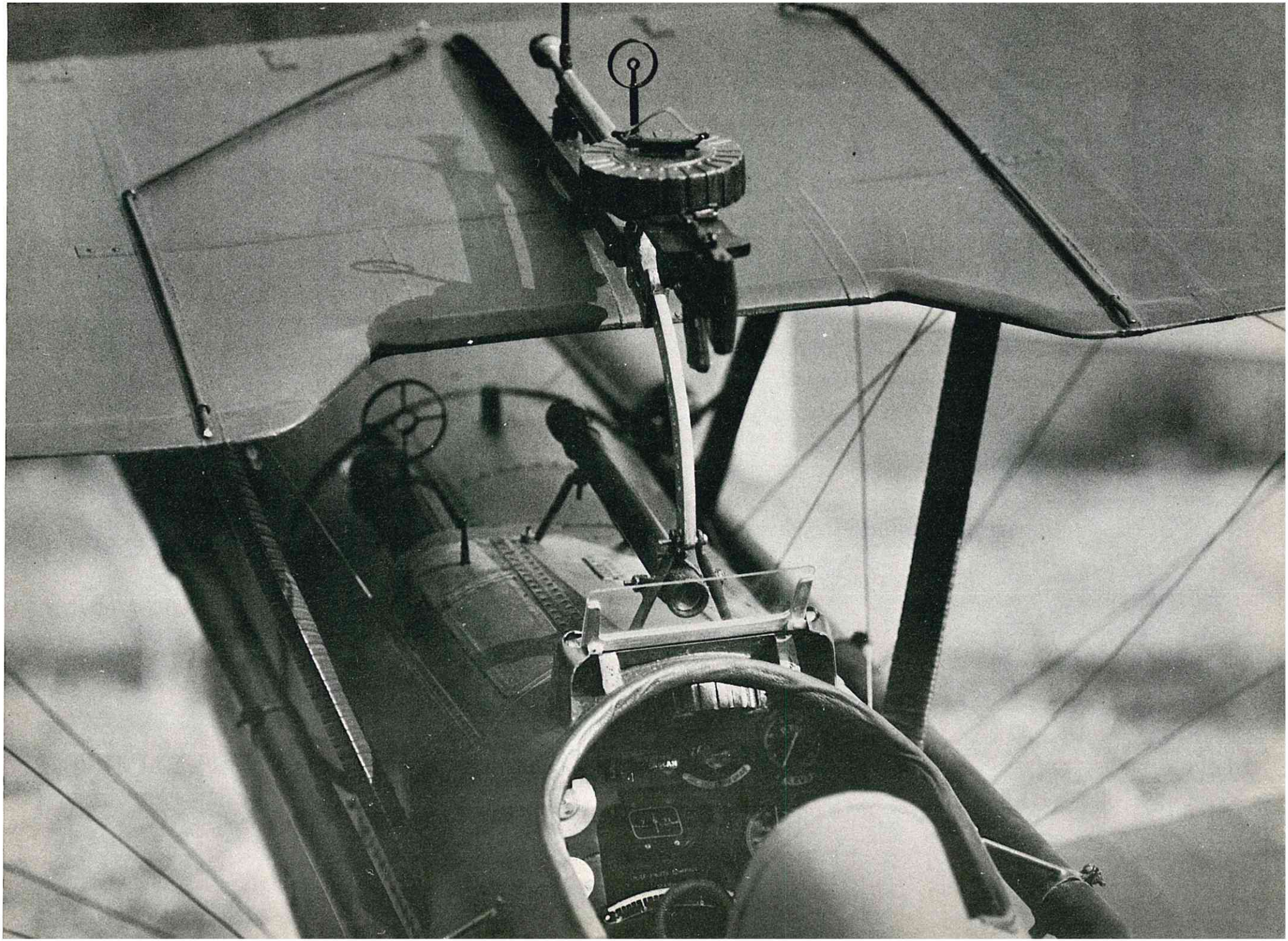
Points of interest in detail construction are mainly as follows: Scale instrument panel with reduced photo copies for instruments and makers name plate faces, etc., were made from original hand drawings. Turned aluminum instruments faces, with appropriate dummy screws, fixing Lewis gun holder and brackets, fuel pump lever, switch, etc. Padded seats. Williams Bros. Vickers and Lewis guns with operable mount for latter. Aldis scope has windage and elevation adjustment as on original. (Bill is a gunsmith.)

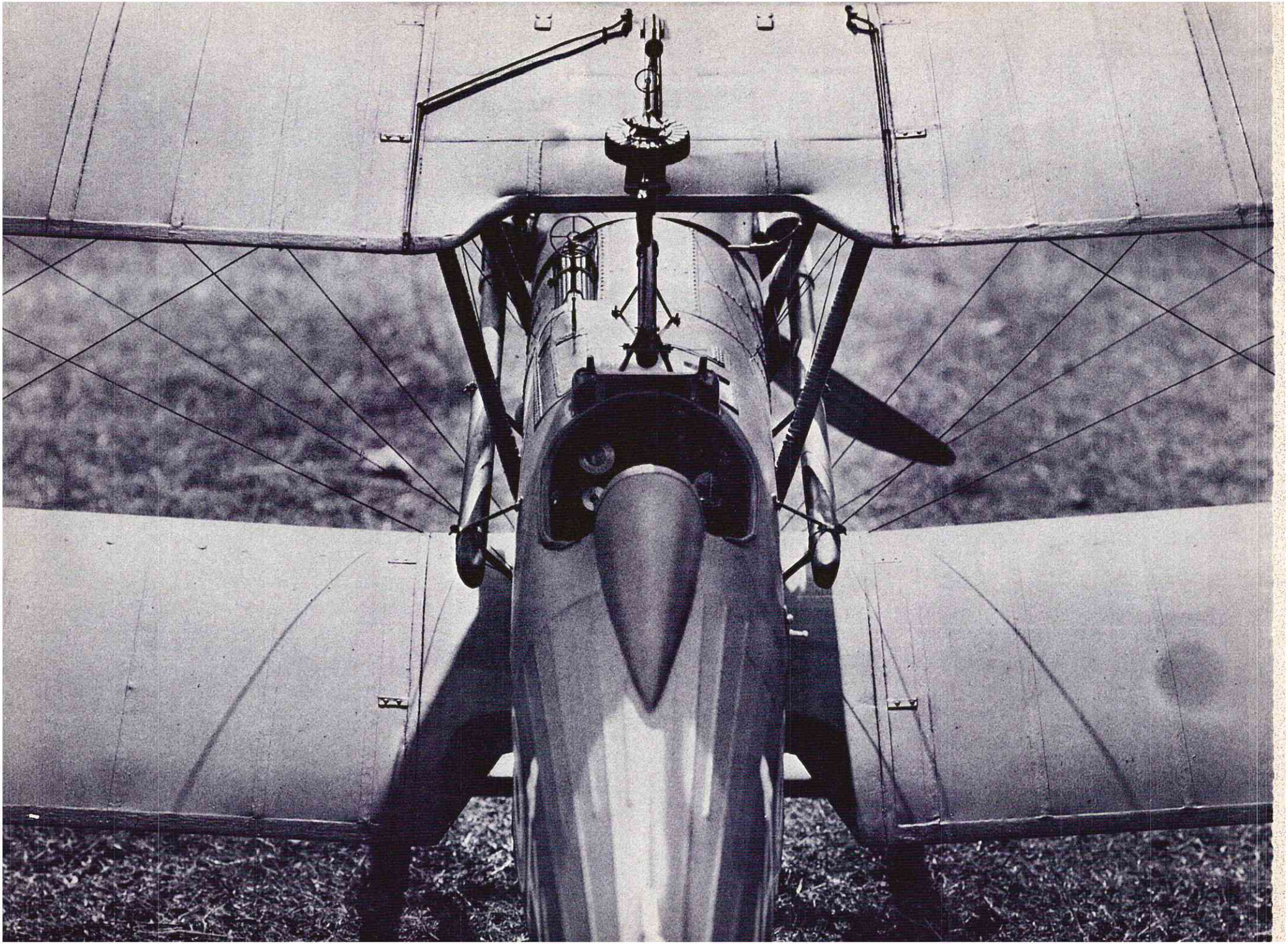
The U/C shock door in the spreader and O ring shock cords. Dummy spark plugs, Tacho drive, etc., are featured. 3/32" studs and nuts are used for mounting the scale prop, which is laminated from Ash and Mahogany. The Radiator and pivot tubes with hose clamps are made from scrap aluminum, which is used throughout.

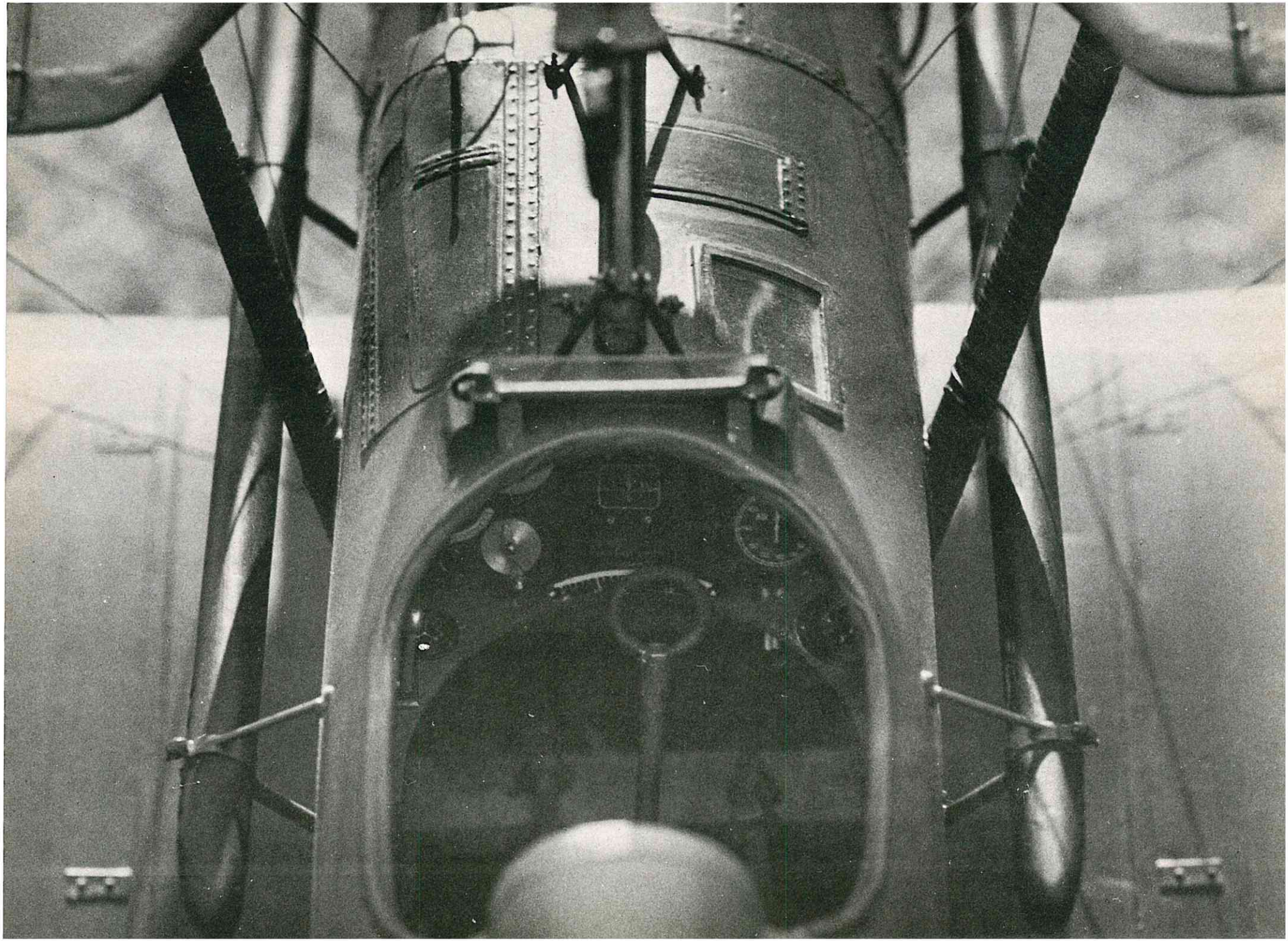
The lines of rivets on metal undershields, gun and ammunition access hatches, are formed from a simple punch and die set, using filing card or heavy bond paper to represent the metal sheet. These are contact cemented into place. Rib tapes are made from brown paper strips doped in place with the heavier tapes from nylon ribbon material.

The windshield and Vickers fairings are formed from annealed aluminum sheet by panel beating. The centre section struts are taped with 1/8" nylon ribbon and doped in place. Turnbuckles were omitted for quicker access to the radio installation, which is a Silvertone Mark VII. Motor is a Merco 61 with a special hand made muffler, that sends the rubbish out underneath the nose, clear of the detail work.










C'9538

C'9538

NEW PRODUCTS

Ace R/C Incorporated, 203 W. 19th Street, Higginsville, Missouri 64037, has added an exciting new item to their line of radio systems and accessories for the sport flier. This consists of two molded foam wings both 35" in span with a semi-symmetrical airfoil, constant chord at 5½", and a tapered section with a 5½" center chord and 4" at the tips. Designed by the late Dick Adams, the wings will be packaged in two 17½" sections so that any amount of dihedral may be easily put in simply by the use of a good epoxy type cement. No dihedral braces are required. The only reinforcement recommended by Ace is the use of some Scotch glass reinforcing tape going span wise about 1" from the trailing edge on the bottom of the wing. Designed for ball park type flying, this particular foam wing comes beautifully finished and may be used as is, or finished with a mist coat of Sears Polyurethane spray available in cans. It may also be trimmed with regular MonoKote, or Super Solarfilm. The constant chord section comes in at just under 3 ounces in weight, while the tapered wing weighs just over 2 ounces. This is quite respectable when you consider the strength and the flexibility that is attained. Price of these wings has been set at $2.95 for either section and will be available through all Ace dealers. If there is no dealer near you, you can order directly adding a $.50 postage and packing charge. Ace also has several plans for small aircraft utilizing this wing including the Skampy 2. Tested, approved, and recommended by RCM.

Finishing Touch Specialties, 5940 East Paisano at Montano, El Paso, Texas 79925, is offering custom club decals with three to four week delivery from date of order. These are extremely high quality, fuel-proof decals available in five colors – red, white, blue, black, and yellow, and in any design in a 4" x 4" area. Finishing Touch Specialties will do the art from the club's color sketch. Prices are $60.00 for 200, $75.00 for 300 and $100.00 for 500. Tested, approved and recommended by RCM.

George Matsu, Box 137 Belen, New Mexico 87002, is producing an item entitled Space Legs for Transmitters. Now you can protect your transmitter by using Space Legs, as well as having the transmitter sitting upright next to you without worrying about it falling down. These legs enable you to operate the sticks of your transmitter without actually physically holding the box. It also enables you to keep your transmitter clean since it is not lying flat on the ground, and even with your antenna fully extended, the unit cannot fall over. Priced at $1.55 per pair, Space Legs are quite simple to attach and will fit all transmitters even the older types. Tested, approved and recommended by RCM.

MRC Model Controls, 2500 Woodbridge Avenue, Edison, New Jersey 08817, has announced a new retail price for their outstanding MRC Digital F-700 proportional system. The 5-channel system, complete with three servos is now priced at $270.00 while the F-700 5-channel system complete with four servos is priced at $300.00. RCM has completely checked out one of the newer units and have found it to be of exceptionally high quality and equal to, or surpassing, the unit tested in a previous RCM review. Only the price has been lowered. Tested, approved and recommended by RCM.

C & T Model Specialties, 19 Dogwood Road, Boonton, New Jersey 07005, has produced a set of long drills for those hard-to-do RC drilling jobs. Consisting of a set of six 12" long twist drills, they feature 135 degrees split point tips and have been high speed surface treated. For example, a complete RC installation can be drilled after your model has been completed. Available in six sizes they may be used for the following applications:

1/16" dia. – Push Rod Clearance Hole, Servo Mounting Pilot Holes.

5/64" dia. – Tap Drill for 2-56 Machine Screw, Pilot Hole for 2-56 Sheet Metal Screw.

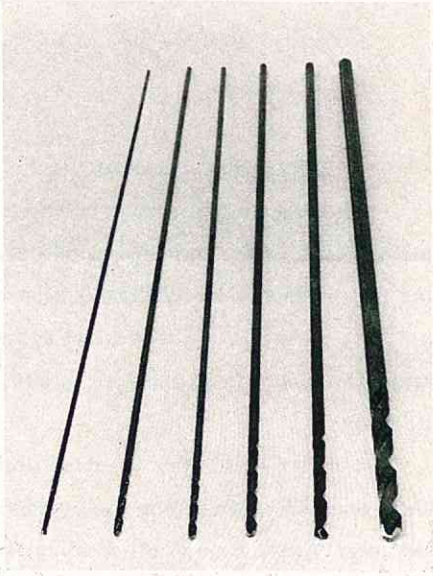
3/32" dia. – Inner dia Hyrod Clearance Hole, Fuselage Clearance Hole.

1/8" dia. – Landing Gear Wire Holes, 4-40 Blind Mounting Nuts.

5/32" dia. – Landing Gear Wire Holes, 6-32 Blind Mounting Nuts.

1/4" dia. – Fuel Tubing Clearance Hole.

The drills may be purchased in sets of six for $15.00 postpaid. Please send check or money order to C & T Models Specialties, 19 Dogwood Road, Boonton, New Jersey 07005. You will wonder how you ever modeled without these drills. Tested, approved, and recommended by RCM.



Cartay Products Company, Box 397, Drasco, Arkansas 72530, is producing an all-new field box called the Flight Hanger. This is an exceptionally well designed field box that allows adequate room for the carrying of fuel, transmitter, starting batteries, starting motor, as well as the numerous accessories needed by the active RC enthusiast at the field. An upper swing out drawer is provided for tools, etc., as well as having room for the longer size propellers. The lower swing out drawer contains the three no-wobble metal legs which can be attached in a few seconds, then restored in the box to facilitate transportation. In addition to the above, the Flight Hanger contains numerous small plastic bottles for carrying those smaller items such as glow plugs, washers, screws, bolts, etc. Although slightly higher priced than most commercially available field boxes RCM has tested, approved, and recommends this unit to your consideration. Price is $39.50 direct from the manufacturer.

Taran Products, 466 Giannini Drive, Santa Clara, California 95051, has released several new items that will be of interest to RC fliers. The first in a set of knurled aluminum control stick ends that can be installed on virtually any transmitter stick. With a dedent on the top of the stick, it converts your plastic transmitter stick into one of the easiest and smoothest handling sticks you have ever experienced.

The second product from Taran is a set of wing anchors priced at $1.25 and consisting of long nylon bolts, over-sized nylon washers, and wing bolt anchors. This is a well constructed unit designed for proper wing mounting. Also from Taran is a set of new style hinges designed to easily slide into a control surface slit made by a #11 X-Acto knife and secured in place with the use of any model cement. No pinning is necessary to hold the hinges in place since it will bond perfectly with virtually any type of glue commonly used by modelers. This is extremely flexible hinge that comes as close as possible to the flexibility of the old figure eight nylon stitched hinge. Tested, approved and recommended by RCM. ●

1970 NATS: FREE FLIGHT

(continued from page 36)

paraphernalia nearby and be ready to leave via the side exits. The Chicago riots were a few blocks away and they had picked up rumors of a possible "happening" in the Armory. Fortunately, no such incidents occured.

Dennis Bronco, of Lakewood, California, flying a Lee Hines' modified Sweepette (as were 60% of the people), started off as high man and seemed to be the one to beat – which nobody did. Dennis threw two flights of 1:04 for a solid five second lead over his closest rival, Bob Watson, from Morton Grove, Ill. Bob was flying a Dennis Kargol design, an interesting glider with just tip dihedral and a flat center section.

Marty Thompson, of Livermore, California, topped all the 16-years-and-under crowd for first place. This was only the beginning of five first places he took that week, as well as Junior National Champion, only missed Grand National Champ by a mere 23 points! No junior contestant has come this close for quite a few years.

All indoor glider flights were to be completed by 3:00 p.m. so the floor could be cleaned, and a new group could take over for indoor scale.

Indoor Scale

It is amazing to see the detailed work done on these lightweight birds. For the most part they were very scale-like in flight as well as physical appearance.

Ron Partelet, of Chicago, Ill., won first with his Pilatus Porter. Charlie Sotich used the same subject as his entry, for fourth place. Charlie's was covered with micro-lite rather than the usual condenser paper. Earl Thompson captured second with a nice 1911 Cessna. Jim Richmond (Mr. Indoor) took third in scale with most winners high on the flight times with less emphasis on scale points.

One gorgeous model, a Ford Tri-motor by Fulton Hungarford, had the most realism I have seen in a indoor scale ship, but it didn't place as competitive times were quite high.

Wednesday: A-1/A-2 Glider

Back at Glenview for the outdoor events we found the beautiful and silent Nordic gliders sharing the lime-

light with the "B" gas aircraft. It was a nice day for anyone used to Chicago weather, but a little windy for the California boys.

In the Junior category there are two separate events, A-1 and A-2, the former being the smaller and easier to build of the two.

There was the usual compliment of Top Kicks and Jetstreams in A-1 as well as Talons built from plans, and originals or scratch-built from magazine plans, flown in A-2.

Tom Hutchinson's Dragmaster (Model Airplane News), popular simple design, took fourth place. It is soon to be kitted by Kyosho Corporation in Japan. Peter Allnutt, from Toronto, Ontario, Canada, maxed all the way for the only all-max score in any towline event or age category. The competition was quite keen as only 1:05 seconds separated the first five places. Another Canadian, Don Mackenzie, of Agincourt, Ontario, won first in Senior A-2. Marty Thompson won again for Juniors in A-2 with John Petchler, Of Hamden, Connecticutt, first in Juniors with an A-1 size aircraft.

B Gas

In the greasy gas event those .23 and .29 size K & B's and Super Tigers are sounding better every year. More fliers are using from 50-65% nitrated home brew fuels.

Larry Miller, with a modified Starduster, won first in Open with five maxes.

In all free flight events a three minute max is the procedure for the Nationals. In gas events a 13 second engine is run for VTO (vertical take off), and an 11 second engine run for hand launch. After three maxes in a row you cut off 2 seconds of the engine run on each successive flight, until someone misses or reaches the five second engine run; nothing shorter than five seconds for obvious safety reasons.

After Larry Miller came James Messer of New York, in a clear second place as well as a four way tie for third. All four of these fellows either lost their ships, broke them, or had an over-run; all reasons which stop any further flights, causing this massive four way tie for third place.

Marty Thompson did it again in Junior B and Gary Meyers won Senior B gas. In case you're thinking Marty Thompson didn't have much competition, forget it! In B Gas he racked up two maxes more than Larry Miller, the first place Open winner. Marty didn't miss a max at all, he just quit. He simply didn't need any more time than that!

Thursday: 1/2A Gas

In 1/2A Gas open, Dennis Kargol of Iowa, showed them all how with six maxes in a row and then ran out of time. Dennis was flying a lightweight aircraft for the wind, but his 6½ ounce Geodetic Galaxie performed like a champ.

The wind blew, and blew some more on Thursday, not calming down at all until 3:00 p.m. With only two hours left in the contest, the boys really started to hustle.

The usual complement of Galaxies and Stardusters was evident all week, with a reasonable amount of contestants flying Ramrods, Witchdoctors, Spacers, and Space-Rods. Approximately 40% of all the 1/2A's were original designs.

Grady Turner of Longview, Texas, won first in Senior 1/2A with four maxes.

Wakefield

There were many models, outstanding in construction and design, prevelant in this event and the quality of flying was quite superb. These models have a harder time handling the wind than most.

Frank Heeb, of Xenia, Ohio was first in Open. Of all the interesting models flown, the attention getter was Urs Schaller of Switzerland, who was 16th at the last World Championships. His model was a true work of art.

Helicopter

This event was won by Glen Lee, repeating last year's victory. Second and Third places were also the same as 1969, only vice-versa. It's time for a change.

Scale

The Scale event elicited the only complaint I heard during the week of the Nats. It seems they have combined Rubber with Gas for the Nationals. It is difficult to combine any scale events since a different judging criteria is used for rubber than for gas scale in the rule book. The rubber models have a slightly better chance, since on the flying side of the coin, they can jump off the ground layer of air a little easier than the gassies.

First place went to a gas powered M-8 Loening by Fred Stark, of Xenia, Ohio. Second place open was a rubber powered Bristol M-1 by Ronald Martelet, Chicago, Illinois.

Friday: A Gas

Friday started and ended as a picture perfect day for Free Flight. The Easterners (east of the Rockies) always say Californians have all the best weather – well two days at the Nats, Friday and Sunday, had weather typical to California's "great day" contests.

There were very few .051 converted 1/2A's. Maybe the wind on 1/2A day "did-in" too many multi-event ships.

The eventual winner in this unusual occurence had the best airplane. Usually the "best" planes have a bit of bad luck allowing the mediocre planes to end up on top. Andy DeMello, of Toronto, Canada, had an O.S. Max .15 powered ship that flew like it was on

rails. It had an auto-rudder, auto-stab, was 350 square inches in area, and weighed in at only 12 ounces. He maxed on the five second engine run, the only one to do that all week. Close at his heels were Bill Wall and Dennis Bronco, who were also on the five second engine run but failed to max.

In the Junior category, Marty Thompson took first place in A Gas. Marty had a pretty good week. He took first in A-2 Nordic, A Gas, B Gas, C Gas, and of course Junior National Champ.

Second in A Gas Junior went to another Californian, Randy Weiler, of Goleta, California, with his Galaxie 585 and a Cox .15 up front. Watch out for this up and coming junior!

Brian Webster, Manchester, Tennessee, topped all the senior fliers in this hotly contested event.

Unlimited Rubber

The Mulvihill Trophy, one of modelings' most coveted awards, was won by Willard Smitz, of Kenosha, Wisconsin with 12 maxes. This event is the one I feel was most affected by the three minute max. George Perryman from Smyrna, Georgia, was second. He made eleven maxes and blew his twelfth. That's a lot of flying and retrieving, fellas!

Mike Taibi won Junior Unlimited Rubber (and it wasn't a Starduster either!). Mike beat Eric Hatschec, of New York, by only ten seconds. Mike Bailey, who won the Mulvihill Trophy last year, won Senior Unlimited Rubber at the 1970 affair.

Saturday: F.A.I. Power

After the calm sunny day experienced Friday, Saturday was a bit of a disappointment. It was windy for the majority of the day, with the drift in the opposite direction to that observed all week.

Even without the tuned-pipes the engines seemed to turn better than ever, not quite as good as with a pipe, but better than in pre-pipe days. Super Tiger was the standard equipment with some K & B's and Rossi's turning up ear covering peak RPM's as well. There were not, however, as many auto-rudder or auto-stab models as one might expect.

Bob Watson, one of Chicago's hot-shot fliers, showed them how by maxing all the way with a Hans Seelig design. He was the only one to do this in F.A.I. Power. James Haught, of Arlington, Texas, won the junior age group. Paul Andrade, Walnut Creek, California, a busy, busy boy in senior

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make the modelers happy. A contestant need never leave the air park for the entire meet if he so desires, as all necessary facilitites are available at the site. For those of you who are coming with your families, or those who do not wish to stay at the air park, the Tucson RC Club will be happy to make advance reservations at a Tucson motel. Special rates are provided for those who make advance motel reservations for this meet. A blank is provided elsewhere in this magazine for those who wish these advance reservations either at the air park or at a Tucson motel.

The past two RCM Winter Nationals have proven highly successful. Last year's meet saw 135 contestants flying in the four pattern categories and Formula I. At this year's meet, if advance indications are correct, approximately 150 modelers from all sections of the country will be present. If our manufacturing friends support us as well as they have in the past, we will have prizes of merchandise for the first five places in all categories in addition to trophies for the first three places in all categories. Class C fliers note that this year we are flying Class D pattern instead of Class C, due to the apparent trend of interest in this class.

This year, in order to insure more pattern flights per flier, we will be prepared to open up a fourth circle, thus enabling eight flights at a time to be going on. Also, many innovations and changes are being planned for the Goodyear event in order to further optimize the running of this event. Finally, in the way of weather, for some strange reason, we have heard a little grumbling from some circles (most of it eminating from a point in New Jersey) about our constant "sunshine and mild weather." In all seriousness, we have not had the best breaks from the weatherman for this meet, but if the law of averages holds up we are due for good weather this year. Records show that the average temperature for this time of year (Thanksgiving) are between 75 and 80 degrees with less than one chance in ten of rain occurring. All we can say is that if things are going to average out, we should have one helluva heat wave this year! While we can't guarantee the weather, we can guarantee that you will have an enjoyable time at one of RC's largest national meets – this year's RCM Winter Nationals. Why not play on coming?

2. Span – 72 inches
3. Wing area – 864 sq. inches
4. Wing Loading – 20 oz. per sq. ft.
5. Aspect Ratio – 6:1
6. Planform – Tapered 14 to 10 inches
7. Sweep – for floors not for R/C wings
8. Average Chord – 12 inches
9. Airfoil – Tapered 15% root, 15% tip, symmetrical
10. Ailerons – Strip or Integral – your choice
11. Dihedral – very little, 1 or 2 degrees
12. Wing Placement – mid wing or bottom – your choice
13. Fuselage length – 52 inches
14. Nose moment – 10 inches spinner to leading edge
15. Tail – 24 inches trailing edge to rudder and elevator hinges – build it light!
16. Fuselage shape – Conventional, no bulges
17. Stab Area – 20% of Wing (172 sq. inches)
18. Stab Aspect Ratio – 3:1
19. Stab Shape – symmetrical or flat – your choice
20. Fin area – 10% of wing (86 sq. inches)
21. Elevators – Split, separate horns and adjustable Kwik Links each side.
22. Rudder – 4 inch chord at bottom, maximum travel.
23. Wing, Stab, Thrust – 0-0-0 degrees incidence.
24. Engine Offset – little or no right thrust
25. Engine, Wing, Stab Planes – Parallel, close together
26. Engine – The most powerful you can find.

Obviously, it isn't easy to build a sturdy 864 square inch plane at 7½ pounds. The project will require careful selection of wood and ingenious construction techniques. I believe if the project is properly executed, it will not only fly the FAI pattern well but will be a winner in AMA Class C, too.

Many of you will not agree with my conclusions, but I'll bet one thing – the 1971 Internats will not be won with a small, fast, short-coupled model. It will be won with a larger, smoother, slower design.

Now, if a lot of you inventive types out there in R/C Land do steal all my good ideas and design your own plane, I'll cry a lot.

But then, I'll cry a lot if you don't.

to clear the turbulence. A clean fuselage top will allow for a lower fin with the potential for sub fin and rudder. We should attempt to get as much of the fin/rudder at or below the thrust line as possible for two reasons:

1. Rudder effectiveness.
2. Help neutralize the spiral flow of prop blast on the top of the fin/rudder.

Conclusions:

Conventional size fin and rudder.
Sub Rudder – below thrust line.

THRUST ANGLES

Again, this is a subject of much disagreement. Unless other design factors compensate for it, downthrust is undesireable because the nose tends to lift as soon as the power is reduced. A slight positive wing angle is often combined with downthrust quite successfully. Since this configuration is difficult to build accurately and adjust for optimum results, I would rather go for the easier 0-0-0 degrees plan and not fool around adjusting and trimming.

R/C Modeler published some highly technical data which showed both down and side thrust to be inefficient. I didn't understand the formulas or the technical terminology but will take it on faith. (And personal bias.)

Right thrust has been the subject of prolific research, trial and error, prejudice and argument. Research shows two forces at work:

1. Prop torque which causes a roll to the left.
2. Prop wash on the top of the fin which causes a yaw to the left.

As, I understand it, right thrust won't do a damned thing for torque induced roll but will, at least, help reduce yaw. After experimenting with every plane I have ever flown, I have come to the profound conclusion that just a silly millimeter of right thrust (certainly not 2 or 3 degrees) may help a little and surely won't hurt. If I can see a little right thrust then I am at least assured there isn't any left.

Conclusions:

No down thrust.

Little or no right thrust (too much and it will really "getcha" at the top of the Top Hat where ((inverted)) you will have left torque and left thrust).

SUMMARY

After all this verbiage, bias, judgement and argumentative rationale, we must have come up with a set of design criteria which will make an airplane when combined. Here's the way it shakes out:

1. Weight – 7½ pounds

smoother because deflection does not move the elevator suddenly into the airstream. There is probably some validity to this point of view. On the other hand, the Kwik Fli with a flat stab has about the softest elevator response of any contest design I have ever flown. One version of my RCM X-PERT (flat stab) was extremely sensitive around neutral elevator even with the CG well forward. The final version, (also flat stab) was reasonably soft on elevator with the tail moment increased by only 3/8 inches.

The stab is somewhat similar to the feathers on an arrow – a primary function of keeping the rear end directly behind the front end through drag. The airfoil stab may be built extremely thick for this drag but fairly light because of progressive thickness reduction at the leading and trailing edges. In spite of these advantages, I have difficulty plotting and building such a stab accurately. My "easy out" is to build it 3/8 inch thick, flat, and carve thinner at the leading edge. Long tail moments and/or tapered trailing edge elevators can also create the desired soft elevator response.

Conclusions:

"Designer Choice" – flat or symmetrical stab.

Elevators

During the past couple of years I have seen several planes that just wouldn't "trim out" properly on the roll axis. No amount of aileron adjustment, rudder adjustment, or thrust change would correct the problem. After thinking and swearing a lot I checked the elevators and found one was lower than the other. This is difficult to check because the rudder placement won't allow a clear "line up" view of both elevators. Because balsa has such a tendency to warp even after finishing or covering, I suggest non-connected, split elevators with two Kwik Link rods attached to one main elevator push rod. Each Kwik Link should be attached to its own elevator horn on each side. If you haven't tried it you will be surprised how troublesome trim problems may be corrected this way.

FIN AND RUDDER

The formulas and charts usually call for about 10% of wing area. As with much design research this proportion has been tried and true over many years in a host of various designs. I couldn't argue with it – few designers do. Fin shape is a different matter. If the plane has a turtle deck or a large canopy, the fin should be fairly high

wing with a 50 inch chord, 6 inch span and 4 inch thick airfoil – even for 3 seconds?

Recent wind tunnel tests (according to Fearless Leader) suggest we need more lateral area at the tail rather than at the front to aid in "Knife Edge." Increased lateral area forward of the fin (even turtle decks) must be designed carefully otherwise turbulent air may be presented to the fin and rudder. A straight wing, plenty of airspeed at entry, and an effective rudder seem to provide the ingredients necessary for successful execution of the "Knife Edge."

Conclusions:

Simple, conventional fuselage shape.

Wing Placement

The mid wing configuration, expounded by the theorists and made practical by Art Schroeder (The Eyeball), certainly provides for a better balanced plane. This design factor probably enhances all rolling manuevers. Problems arise with ease of building and landing gear and equipment placement. Such a design obviates subminiature radios and/or turtle deck construction. Even though I agree with the design principle, I have seen too many low wing planes execute perfect rolls with just a touch of elevator. Nyet, Nyet, I don't feel the extra effort is worth the marginal benefits. The placement of thrust line, wing and stab on parallel planes, as closely as possible, makes sense.

Conclusions:

Midwing placement desirable but not absolutely necessary for optimum performance.

STABILIZER

Area

The charts usually plot the size at 20 to 25% of wing area (including elevator) with an aspect ratio of 3:1. I must agree with the experts. Dr. Eppler (Dr. Walter Goods' article, "Computer Designed Airfoils", *American Modeler* Feb. 1970) believes a smaller stab may be used with his airfoil because of minimum center-of-pressure travel. Since I haven't yet seen the designs in contests, I'll stick with the charts.

Conclusions:

Stab/Elevator will be 20-25% of Wing Area

3:1 aspect ratio

Shape

Airfoil or symmetrical shape versus a flat stab opens a Pandora's Box of controversy. Proponents of the airfoil shape contend the elevator response is

Art Schroeder, reflect design experimentation over many, many years by many, many people. We certainly couldn't challenge these findings and design principles but could arrive at some point within feasible ranges which would best serve our purpose.

My own experience agrees with Art Schroeder's recent observation that a long nose moment causes the nose to drop too much in the turns. This condition is annoying since you are constantly "pulling up" the nose throughout the pattern. Some theorists claim a longer nose moment creates an element of stability because of the gyroscopic effect of the prop. Mathematically this may be true but, when you are actually flying, it merely creates a pain in the elevator thumb. The only useful purpose of the nose moment is to counterbalance the much longer tail. It is a convenient place to stick the heaviest elements of our airborne machinery – engine, nose gear, battery and tank.

Since we are developing a rather large plane, we can arrive at the nose moment in a very pragmatic way. The tank requires about 6 inches, ¼ inch for the firewall and 3¾ inches for the engine compartment. The remainder of the fuselage will cover wing chord and medium/long tail moment.

The benefits of a fairly long tail moment are obvious. We are looking for smooth performance. Our tail moment will give smooth response on the pitch axis. This built-in stability may be overcome for spins and the Double Stall Turn by using large control surfaces. In fact, this type of configuration will allow **slow** snap rolls. Have you ever seen one? A large rudder is not only a **must** but it must also have maximum travel. Too many models have large rudders but the control horns are too long to make the barn door swing. Let's swing it!

Conclusion:

Short nose moment

Fairly long tail moment

Fuselage Shape

Many Europeans have gone to an extremely deep fuselage configuration above and forward of the wing – ostensibly to better execute the "Knife Edge" manuever. Even if it worked, it would seem a bit ridiculous to design a plane, which is difficult to build, just to add one or two points to one of 18 manuevers. Actually, the problem seems to be to keep the **tail** up rather than the nose. Imagine for a moment what kind of an "airfoil" such a design represents. Would you try to fly a

FAI R/C DESIGN

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mends enough dihedral to effect flying characteristics. Dihedral is anachronistic as far as contest designs are concerned. There are so many negatives we shouldn't even consider it.

Conclusions:

Just enough dihedral to avoid the appearance of cathedral.

Swept Wings

We have yet to see a highly successful swept wing design. The Phoenix is about the closest "cut at it" so far, but must be flown quite fast. Generally, swept wing planes are "touchy" requiring constant, careful handling to avoid re-creation of a kit. The small amount of benefit (dihedral effect) seems to be more than overcome by the difficulty in building accurately, problems in achieving correct C.G. location and "hairy" flying characteristics.

Conclusions:

No sweep for the "heap"

FUSELAGE

Length

Most charts show fuselage length at about 75% of span. Since we are using a rather high aspect ratio wing, we can probably reduce the percentage slightly and still maintain a fairly long fuselage. A long fuselage will result in a long tail length for soft elevator response.

We should also consider the practical matter of available wood sizes. With 48 inch sides and a 4 inch rudder we have a total length of 52 inches without splicing. Considering our 72 inch span, the 52 inch fuselage will represent 72% of the span,— well within the ranges of the design charts.

Conclusions:

52 inch fuselage including rudder.

Moments

The percentages, shown on the charts by Chuck Cunningham and stated in a slightly different way by

Nats in Chicago and the FAI finals in Memphis in September this year will set the design and equipment style of the U.S. team. It's also fairly certain that these two major pattern happenings, together with the World Meet, will bring about an added upsurge in aerobatic interest and participation throughout the country for the next year and a half at least.

D NOVICE WINNERS:
Dave Brown
Tom Walker
Adam Sattler
Jerry Worth
BEST JUNIOR – Bill Hiller
BEST SENIOR – Bob Smith

A & B PATTERN

Some 58 entries were received for the 'beginners' categories with only 29 actually making flights. The decision to include these pattern classes were based upon recommendations of the RC Advisory Committee headed by Jim Kirkland who authored many of the event ideas for the 1970 Nats. Ed Shipe, Nats RC Manager, helped arrange time for A & B pattern by working out the 'time-sharing' scheme that made Pylon, D Pattern, and Scale events so effective. Kemp Bunting, who deserves much credit for the field operation of RC events in his job as Nats RC Director (don't be surprised if Kemp is a main administrative cog in the upcoming 1971 World Championships) implemented the Kirkland recommendations and fitted it all together using the Shipe time-sharing idea.

This all boils down to the fact that many A & B pattern fliers missed an excellent opportunity to fly at the Nats this year although good plans had been made to give them the chance. Even the Best Junior trophy went begging in B for lack of a contestant! Although it's felt that it will take a while for a Nats event to take hold, with other events clamoring for official status (soaring, for example) it's not known whether A & B will make the Nats list for 1971. A lost opportunity perhaps. In any case, the 29 that did fly put in 108 flights that averaged 8.4 minutes each.

A PATTERN WINNERS
H. Clark
J. Marshal
P. Goell
Brian McAvoy – Best Junior
Randy Shartle – Best Senior
B PATTERN WINNERS
Steve Buck
K. Fisher
B. Mathews
None – Best Junior
Steve Buck – Best Senior

with a husky and wicked looking P-47 and took 2nd place for his efforts. We mentioned Bud last month as exercising his scale talents at the UGLY Meet in Sault Ste. Marie, Ontario earlier this year. He didn't disappoint any of his boosters in his Chicago performance with the Jug which featured operating rocket and bomb ordinance, an electrically operated canopy, tip lights, and working cowl and wing flaps. Bud flew the ship well despite its small 675 sq. in. wing which supported almost 11 lbs. with a fully cowled and hidden Webra 61. The 1½" scale gem was controlled with a Micro-Avionics 6 channel radio.

This was the 2nd year for Dick Graham and his Liberty Sport biplane, both of whom hail from Ottumwa, Iowa. A 'sleeper' entry, Dick's ship quietly garnered scale points which were effectively multiplied by Dick's flying skill on the flight line into the winners' circle for 3rd place this year. A ST 71 hauled the 10 lb. ship that scaled 2-2/7" with a Logictrol II radio.

Here's how they lined up:

Ed Ellis — Spirit of St. Louis (15,236)
PCS — Super Tiger 60
Bud Nosen - P-47 Thunderbolt (14,828)
Micro-Avionics — Webra 61
Dick Graham — Liberty Sport (14,574)
Logictrol II — Super Tiger 71
Bill Bertrand — Fokker D VII (12,613)
Orbit — O & R Compact 1.23
John Roth — Volksplane (12,001)
Kraft — Ross Twin

1970 NATS: PATTERN

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As might be expected, all the D Expert finalists had original aircraft. There were a few new ships such as Kirkland's Intruder, Kraft's No-Name balsa log, and Leonard's Miss Liberty Bell, but in the main well-proven ships were in the majority. All had mufflers, principally of the blow-thru type, most featured retracting landing gears, and 13 of the top 20 used the Whitley Pro-Line radio. Ships were heavier on the average and were aerodynamically cleaner, generally. Construction ranged widely but balsa structure was prevalent. Foam cored wings were favored among the elite fliers and wooden Top Flite props were almost a universal choice. All fliers used 60 size engines with a definite preference for Webra Blackhead engines in evidence. With the likelihood that the 1971 World Championships will be hosted by the U.S. in Virginia in September (a final decision will come from AMA next October), it's fairly certain that the

One more important facet was that official flights were launched, for the most part, from the grass. This was much easier on modelers' knees and timers' feet. This also leaves the runways clear for the cars which had to be accessible for faster, safer getaways for retrieving.

To John Worth, Pete Sotich, Ron Morgan and scores of others (too many to mention but none-the-less important) . . . our hats are off to you for pulling off one Great National Model Airplane Championships. •

1970 NATS: SCALE

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19 lb. bird rolling down the runway for a beautiful rotating takeoff), to treat everyone to the amazingly realistic flight performances of his ½" scale B-36. Ken was awarded the Best Flight Achievement Trophy for his historic performance.

Top scale workmanship points went to Dario Brisighella who then had the heartbreak of not being able to get off the ground due to prop spinners that rubbed and robbed his Sea Hornet of critical power so that his ship, which caused a sensation at Toledo last February, could barely taxi. Stalwart Dario and his loyal crew worked furiously to overcome the various ailments but it was to no avail in each of the 4 times they brought the beauty to the starting line. With spinners removed there was no trouble in flying the twin engined 18 lb. model, but at the Nats this was a no-no. So with reluctance Dario put her away for the next time.

Although multi-engined planes drew most attention, it was the single engine planes who put in the most air time and gleaned the majority of the hardware. Ed Ellis led the parade with an immaculate and gleaming 10 lb. Spirit of St. Louis that was 100% scale and flew solidly despite the tiny tail surfaces that discouraged previous efforts at duplicating the historic Lindberg solo Atlantic crosser. Ed's version was big, a 2½" scale job that spanned 80½". Ed, who belongs to the Indian City RC Club, used a Super Tiger 60 for power and a PCS radio in his 1st prize winner. Besides the top scale prize, Ed also was awarded the Sterling Award for the Best Scale Model at the Nats.

Bud Nosen is a relative newcomer to Nats competition who came from Two Harbors, Minnesota to the Nats

second to none.

Bob Sifleet was second with a seven year old sheeted wing "Maximus" Moose, powered by an O.S. Max .35. Glen Schautz was next with his "Nig Nog". Boy, those "Nig Nogs" can climb! His was MonoKoted with an auto-rudder and auto-stab.

Grady Turner, Longview, Texas, tied for first in senior with Brian Webster, of Manchester, Tennessee. Grady flew a Mathis-designed 1000 square inch MonoKoted bomb.

Rocket

This is the most difficult event of all to photograph. Just about the time you see a nice model ready to go on an official flight, you focus, he lights his wick, you wait . . . . nothing. He has to re-fuse and try again. The trick is for the loader to get a good fire when he also gets good air. Approximately 50% or 60% of the flights are delayed due to no fire on the Jetex. Much care and caution must be made on loading these in order to obtain consistent runs. The open winner was Don Chancey of Richardson, Texas, with an original design. Charles Krickel won junior rocket and Denny Dock in the senior age group.

Summary

In summing up the Glenview Nationals, it should go down in the annals as the finest Nats we have seen. Nice, efficient, organized; are proper and fitting words for all concerned; timers, officials, retrievers, just to name a few.

events all week, won his age division. Paul had some bad luck on preceding days with models being both lost and stolen!

Hand Launched Glider

With F.A.I. Power flights going off on one side of the flying area, Coupe' models and motors being twisted in another, the hand launched glider area in the center takes on the appearance of a three ring circus, with the center ring belonging to the glider boys. There were just about as many thrills, crashes, roars (some in pain as arms got sore or dislocated!) It really is quite a show watching these gladiators perform. The launching techniques are a sight to behold.

One contestant, Susan Weisenbach (yes, a girl) has to be the most courageous contestant. After having her leg ripped by an engine pulling off one of her gas models, she had to be rushed to the hospital for numerous stitches and bandaging (she didn't know exactly how many stitches, she was afraid to watch). This didn't stop Susan. She put down her crutches long enough to fling her gliders and wind up her rubber models.

Another act that was quite amusing was the "Terrific Texas Trio", Don "The Winner" Chancey, followed by Dick "King Neptune" Mathis and, last but not least, Mr. "Tommy T" Peason (Mr. Show Business). They came to conquer and did just that! They drove up from Texas knowing they had to live up to their big magazine article (Flying Models) on "How to Do Your Thing" in hand launched gliders. Their reputation at stake, they pulled no punches. They sold kits of their gliders in the hanger, held a seminar on how to trim gliders on Wednesday evening, had a beautiful display of gliders on view (between their shows) in the main hanger. Then to top it off they took first, second (a tie), and third. That was too much. The tie for second was with less heralded, but none-the-less talented, Charles Markos, of Deerfield, Illinois, proving it's hard to out-sling a Texan, but it can be done.

Dave Uthoff, of Crystal Lake, Illinois, out-flung the junior fliers with a very respectful 294 seconds.

Ronald Ganser of Pittsburgh, Pa., copped the first place in senior, beating out Grady Turner (another Texan) by only seven seconds.

Coupe D'Hiver

Coupe, as it is commonly called, is the 1/2A of the larger rubber models. It had a little Wakefield flavor, having five flights and the restrictions on weight, cross-section area, and less rubber for power than I use to hold the wing on my C Gas ship.

There should be a big push on to emphasize this as a junior or beginners event, as it is an ideal size model with which to begin.

Joe Macay, Southfield, Michigan, took first with only twenty seconds separating the first six fliers.

In the junior/senior combined event, John Petchler, Hamden, Conn., won with our bandaged heroine, Susan Weisenbach capturing second.

C Gas

The only C Gas kit on the Market is the Starduster 900 by Competition Models. C gas was just that, Starduster day, with 40% or 45% of all the planes flown being Stardusters.

Marty Thompson was the junior winner with more flight time than second and third scores combined, and only seven seconds less than open first place, which went to Frank Wolff, of Massapaqua, New York. Frank flew an original ship that didn't get as high as some others, but had a glide that was

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