R/C MODELER

THE LEADING MAGAZINE FOR RADIO CONTROL • FEBRUARY 1968 • 60¢

A few words about me.

I am Electronic Engineer and this is my day job.

From tender age two things attracted my interest and I managed to have them in my life.

The first was electricity and the second the bluesky.

I´ve found the model airplanes hobby in October 1973.

I love the wooden structures from scratch airplanes and boats also.

I started collecting plans, articles, books and anything else that could help the hobby of many years ago and have created a very large personal collection of them.

Since 2004 I became involved with the digitization and restoration of them and started to share the plans from public domain with my fellow modelers.

Now after all this experience I have decided to digitize, to clean and to re publish in digital edition and free of all issues RC Modeler magazine from 1963 to 2005 and others books and magazines.

Certainly this will be a very long, difficult and tedious task but I believe with the help of all of you I will finish it in a short time.

I apologize in advance because my English is poor.
It is not my mother language because I am Greek.
I wish all of you who choose to collect and read this my work good enjoyment and enjoy your buildings.

My name is Elijah Efthimiopoulos. (H.E)
My nickname Hlsat.

My country is Greece, and the my city is Xanthi.

Λίγα λόγια για μένα.

Είμαι Μηχανικός Ηλεκτρονικός και αυτό είναι το αληθινό μου επάγγελμα εργασίας.
Από μικρός δυο πράγματα μου κέντρισαν το ενδιαφέρον και ασχολήθηκα με αυτά.
Πρώτον ο ηλεκτρισμός και δεύτερον το απέραντο γαλάζιο του ουρανού και ο αέρας αυτού.
Το χόμπι του αερομοντελισμού το πρωτογνώρισα τον Οκτώβριο του 1973.
Μου αρέσουν οι ξύλινες κατασκευές αεροπλάνων και σκαφών από το μηδέν.
Ξεκίνησα να συλλέγω σχέδια, άρθρα, βιβλία και ότι άλλο μπορούσε να με βοηθήσει στο χόμπι από τα πολύ παλιά χρόνια.
Έχω δημιουργήσει μια πολύ μεγάλη προσωπική συλλογή από αυτά.
Από το 2004 άρχισα να ασχολούμαι με την ψηφιοποίησης τους, τον καθαρισμό τους αλλά και να τα μοιράζομαι μαζί σας αφού τα δημοσιοποιώ στο διαδίκτυο (όσα από αυτά επιτρέπεται λόγο των πνευματικών δικαιωμάτων τους).
Σήμερα μετά από όλη αυτήν την εμπειρία που έχω αποκτήσει, αποφάσισα να ψηφιοποιήσω, να καθαρίσω και να ξαναδημοσιεύσω σε ψηφιακή έκδοση και ελεύθερα όλα τα τεύχη του περιοδικού RC Modeler από το 1963 μέχρι το 2005 και κάποια άλλα βιβλία και περιοδικά.
Σίγουρα είναι μια πολύ μεγάλη, δύσκολη και επίπονη εργασία αλλά πιστεύω με την βοήθεια όλων σας να την τελειώσω σε ένα καλό αλλά μεγάλο χρονικό διάστημα.
Ζητώ συγγνώμη εκ των προτέρων γιατί τα Αγγλικά μου είναι φτωχά.
Δεν είναι η μητρική μου γλώσσα γιατί είμαι Έλληνας.
Εύχομαι σε όλους εσάς που θα επιλέξετε να τα συλλέξετε και να τα διαβάσετε αυτήν την εργασία μου καλή απόλαυση και καλές κατασκευές.
Το όνομα μου είναι Ηλίας Ευθυμιόπουλος.(Η.Ε)
Το ψευδώνυμο μου Hlsat.
Η χώρα μου η Ελλάδα και η πολη μου η Ξάνθη.

RCM Magazine Editing and Resampling.

Work Done:

1)Advertisements removed.

2) Plans building plane removed and hyperlinked.

3)Articles building plane removed and hyperlinked.

4)Pages reordered.

5)Topics list added.

Now you can read these great issues and find the plans and building articles on multiple sites on the internet.

All Plans can be found here:

Hlsat Blog RCModeler Free Plans and Articles.

http://www.rcgroups.com/forums/showthread.php?t=2354459

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

Hip Pocket Aeronautics Gallery Free Plans.

http://www.hippocketaeronautics.com/hpa_plans/index.php

James Hatton Blog Free Plans and Articles.

http://pulling-gz.blogspot.gr/?view=flipcard

Vintage & Old-Timer RCM Free Plans.

http://www.rcgroups.com/forums/showthread.php?t=2233857

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Thanks Elijah from Greece.

R/C MODELER

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EDITOR'S MEMO

THIS month, RCM salutes the National Miniature Pylon Racing Association and the pilots that comprise its nationwide membership. The Goodyear pylon event actually began some three years ago with an idea on the part of one man — Jerry Nelson. Returning from the Reno Air Races, he felt that realistic R/C aircraft could be raced against each other instead of the clock. With enthusiastic support from a handful of California fliers, the preliminary experiments and talking began. The first construction articles for Goodyear racers were published that year — Joe Martin's "Denight Special" and Dick Rigg's "Aeolus," both presented by RCM.

The first two contest seasons consisted of activity that was limited primarily to West Coast fliers, with the rest of the country watching, and talking about, the new event, but with little actual activity outside of the California area. The basic structure for a national organization, designed to develop and promote this exciting new event, was formed — the NMPRA. With this stimulus, a few scattered Goodyear racers began to appear in other parts of the country, along with talk about how the event was dangerous, that it would never last, and that only the "pro's" could handle the aircraft.

But "last" it did — and the explosive impact of the Goodyear event was fully realized in 1967 as it was accepted on a provisional, or probationary, basis by the A.M.A. and made a part of the '67 Los Alamitos Nationals. Nearly eighty entrants participated in the first Nationals Goodyear event, with the final consensus of opinion that it was, without any doubt, the most popular competitive event of that week long contest.

With the 1968 contest season close at hand, we predict that the Goodyear event will be the dominant contest category, with a greater number of meets held throughout the country, attended by a record number of NMPRA pylon entrants flying faster and better aircraft under improved safety conditions. This will be the event of the year — and, in fact, of the years to come — offering all of the thrills of full scale racing, and attracting great spectator interest due to the ability of the public to identify and associate with this type of event and its inherent excitement for both contestant and spectator alike.

We predict, too, that 1968-69 will see the birth of an International class of pylon racing for military type aircraft as well as a biplane racing event, all under the auspices of the NMPRA, and very similar to their full scale counterparts at the various national air shows.

In all, it promises to be a great year for pylon racing and the National Miniature Pylon Racing Association. We salute the founders, officers and members of the NMPRA for their untiring and unselfish contributions towards making pylon racing the most exciting reality in R/C today.

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While on the subject of Goodyear, we cannot, in good conscience, refrain from commenting on a few statements put forth by Maynard Hill, writing in the "Channel Chatter" section of the December issue of Flying Models Magazine. In describing the 1967 Nationals, and turning to the subject of Goodyear, Hill stated: "There's no question that this event is in for some real inspection and criticism in the near future. . . . Things could be done within the present rules to improve safety. . . . But things seem to be getting looser rather than tighter. Nothing short of a drastic reduction in engine size or enormous increase in drag seems to make any sense now. Hopefully, some of the advocates of this event will soon look into bringing reason into the bedlam. As a starting experiment, they might try a race using present airplanes with an 80 foot crepe paper streamer tied on the tail. The models will fly well, their speed will decrease and their stability will increase. It would also look spectacular. This experiment would give a little feeling for what a real challenge it would be to race 6 foot minimum span models with .19 engines. An airplane of these latter specifications would provide a real outlet for aerodynamic and engine experimentation — in a much safer environment."

Every person — each writer — is entitled to his own opinion. In this writer's opinion that statement could almost be considered ludicrous if it weren't so pathetically unfounded in fact based on sound knowledge. The "bedlam" mentioned exists, I fear, only in the mind of the writer.

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Goodyear pylon is a **racing** event designed for **racing** aircraft. The "6 foot minimum span models with .19 engines" would make about as exciting a race as pitting two desert tortoises in leg irons against each other over a ten mile course, and stimulate all the nerve shattering experiences of a chess by mail contest. The "crepe paper streamer" bit would serve to create a nice mess around the far pylon, and to the spectator, might even be reminiscent of the maypole dance of his grade school days.

Perhaps, thinking along these lines, we should also eliminate the pattern event, for the 80 MPH contest ship must dispell only **one seventh** less kinetic energy upon impact than the 110 MPH Goodyear ship. And that is fact, not fancy. And, while we're at it, let's eliminate all altitude record attempts. Joe Schmaltz in Podunk might want to try for the existing record, and during his practice attempts (without the aid of radar tracking such as they use at Dahlgren) might lose his aircraft. Can you imagine the repercussions of an R/C mode. colliding with a Boeing 727 airliner at 15,000 feet?

You can't eliminate every aspect of life simply because there is an element of danger involved. Every year, more people are killed in traffic accidents — both drivers and pedestrians — than in any similar period of any given war at any point in history. Yet, we don't see Detroit **decreasing** the horsepower of their automobiles by putting in smaller engines. Nor do we see them slow down these vehicles by making them larger and boxier.

Let's take the full scale national air races as yet another example. If a Goodyear racer at 200 plus MPH, or a P-51 at 400 MPH, should get into trouble during a race, and if the pilot were unable to successfully abort his flight path, a great number of spectators would be injured and killed. The spectators keep coming to these races, however, and the P-51 has not yet been required to remove its engine and replace it with a stock Volkswagen mill.

Danger is inherent in life, itself. Parachutists participate in the sport **because** of the personal danger involved. As one parachutist said to this writer — "when the fear is gone, or if the danger were removed, I would quit the sport." Spectators go to see the air races **because** of the thrills and excitement — and, yes, the **danger** — of the races themselves.

Every contest director — every event coordinator — at every Goodyear contest, is acutely aware of the potential danger of the event. Every R/C'er flying a Class III contest type multi should be quite aware that his machine is only **one-seventh** less dangerous than a Goodyear ship. Every flier should be personally aware of his responsibility to fly in a safe and sane manner, according to basic AMA prescribed rules of safety, realizing that **any R/C aircraft he flies is a potentially lethal weapon regardless of its size, speed, power, or weight.** And that includes the "6 foot minimum span .19 powered aircraft." Let's not single out any one phase of the sport for a concentration of criticism — particularly when we do not fully understand all of the facets of the subject on which we're speaking.

●

It is not the critic who counts, nor the man who points out how the strong man stumbled or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes up short again and again; who knows the great enthusiasms, the great devotions, and spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement; and who at the worst, if he fails, at least while daring greatly; so that his place shall never be with those cold and timid souls who know neither defeat nor victory. — Theodore Roosevelt.

TOP OUT

JERRY KLEINBURG

Your columnist, recovering from an operation. . . .

Paul Lowe's Phoenix has its retrac gear checked by Clete Brow who manufactures them. Paul will CD the 6th Wright Bros. Memorial Annual coming up in June in Dayton, Ohio.

A LONG time ago the modeler's parents and neighbors chided him for his flying toys "that didn't even look like airplanes". Long narrow fuselages, elongated landing gears, Venetian blind-like slats on the wing, and engines that pointed downward were "proof" he was wasting his time. Then came WW II with its "Flying Grasshopper" and its long narrow fuselage, elongated gear, wing slats; along with fighter planes with engines canted downward. And the parents and neighbors were proud when the modeler — and others like him — were asked by the government to bring his talent and imagination and love of airplanes to work for the war effort. . . .

A short time ago the modeler was kidded by his friends for "playing with radio-controlled toys. Golf and hunting is more 'manly', rather than spending time with a flying plastic gadget using — of all things — ice chest expanded plastic for wings", they said. Then they read of a 4 passenger plastic airplane with expanded plastic wings that would soon appear from a production line molding "hundreds a day". And this was just a start. . . . So they asked themselves, "What is this persistance that drives the modeler, that strengthens his mind against our opinion? Is there a secret belief or knowing, which we do not perceive. . . ?" But to the modeler they voiced none of their doubt as he continued to seek to improve his models. However, the modeler knew. . . .

Eyelid device on "Doc" Martin's jet testbed is visible from aft end shot. So are wing flaps as Doc and CL-5 ready for successful test hop in Houston, Tex. Dynajet fine in all metal 6½ lb. ship. Eyelid flap varies jet outlet, controls power.

EDITORS! Take a bow . . .

R/C newsletters seem to get better all the time. Better technical articles, better pictures, and most of all — better portrayal of Mr. Joe R/Cer and his trials and tribulations as he journeys within R/C-land.

Some 80 different N/L's are received by TOP OUT each month with the list growing every week. As mentioned before, they're all read and digested, and of course some of the material is shared among these lines. Unfortunately, a hard choice is faced each month on all we would like to share but must be sacrificed on the altar of magazine economics. However, each N/L is absorbed to become part of an overall "understanding" resulting from molding their diversity of opinion, comment, and of the problems printed within those pages coming from many, many places. Each issue is then filed with its brothers to build the club's history which develops so that very often the feeling comes to this reader of belonging to the organization. . . .

In most cases the character of the N/L reflects that of its editor whose enthusiasm ebbs or grows as he feels his efforts are serving a good purpose. Most editors are surprised to hear themselves referred to as historians, but that's mainly what the job boils down to. And N/L contents are principally a reflection of people with R/C as a backdrop. As was said in a recent letter to Nino Campana, editor of GLITCH, "newsletters represent more of a human event than a literary effort". And that's the way it seems with those whose longevity bespeak of their popularity and usefulness — for the sponsoring club and to R/C everywhere.

With these thoughts in mind and in recognition of the dedication, effort, and club support given newsletters, R/CM's Fearless Leader has been prevailed upon to establish an annual award to the club publication achieving best excellence in content and widest acceptance starting with the 1968 calendar year. Fact is, we'll make several awards to include best single contribution, best technical content, as well as Newsletter-of-the-year for best overall performance as our salute and tribute to the voluntary work and contributions which bring newsletters into being. All newsletters received will be automatically entered and to make it easier, just send them directly to TOP OUT at 2512 W. Craig Pl., San Antonio, Texas 78201. And happy writing!

SALUTE TO D, K, & C

Although their modesty is bound to protest, a word or two is in order for a fine job Messers Dewey, Kampen, and Cunningham did in their various stints in December's R/CM in succinctly picturing R/C's state of art for those beginning to dabble in this fine madness. There may be some sort of unwritten journalistic rule about not passing posies to colleagues, but we'll risk it to make sure that beginners — and others — read back to December's issue and the comments of these three unstanding (most times) model oracles. Their summary of R/C as it is today deserves review by all so that whenever a bright-eyed but puzzled newcomer comes a-querying, he may be readily referred to that super concentration of the R/C spectrum! Except for a detail — or two. . . .

Now, for rudder only and class II where propo is to be used, a couple items deserve attention when you're selecting or installing equipment. But first an item of general interest: The transmitter throttle function has no centering spring and often employs a nylon ratchet device to keep the throttle positioned. It usually has "clicks" which give you throttle movement reference. Because of this noncentering feature mode I and II come into being and complicate our R/C like a little. So, for class I and II fliers (and others) throttle may be on the right (mode I) or left (mode II) depending upon your desires — usually,

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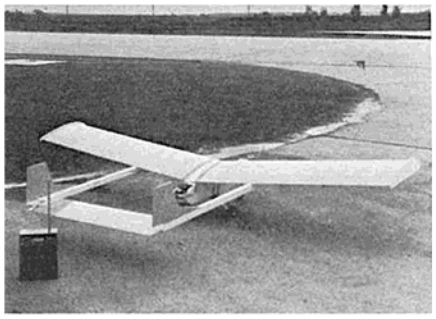
Jean Munninghoff shows profile of "Doc" Martin's foam nosed metal jet. Simple construction, strong. Is 6th experiment to create scale F-111B masterpiece.



Weather research ship by Clark Besancon and Jim Simpson. 8½ foot span, 11½ lb. with 2 Mercos in tandem. F&M propo'd, ship will haul silver iodide flares into storm clouds for South Dakota Institute of Mines.

whether or not you're right handed. All this, Chuck Cunningham ably described. However, from here on the rudder function requires a mite of care to remain clear, so we'll give it a try.

In mode I, where throttle is on the *right* stick, horizontal movement of the *left* stick is the *normal* rudder position, so make sure the corresponding receiver output is plugged into the rudder servo for correct installation. In mode II, horizontal movement of the *right* stick is normally designated on factory pamphlets "aileron" — but only for those who are uninitiated into class I and II! For rudder rollers, friends, the *right* stick's horizontal output is taken to the *rudder* servo if mode II is your fare. See?

Now that we have cleared (ahem) this item, let's move on to the trims, those little deals that make it possible to offset warps, torque changes, and the effects of weather. Trims vary in location; with Bonner sticks having *mechanical* trim (the stick moves a little when trim is moved) located with the stick itself, while open-faced Kraft-type sticks have electrical trim (only the airplane's surface moves, not the stick) with trim levers located where manufacturers think best. On this latter type trim, it's best to observe locations and mentally check their movement in relation to each stick to see if they'll be comfortable to you. You'll find in most cases, vertical *left* stick movement is trimmed on the *right*, while vertical *right* stick movement is trimmed on the *left*. Don't worry, this is normal for the majority of Kraft-type stick layouts, but since there may be some variations, while fiddlin' with that shiny box, see where the trims are placed and how they feel with the cross-located trim orientation. Trim action is important in flying and it is used more than most new R/Cers realize, especially in class I. So, check out these features too when you're sizing up the magic boxes. . . .

THE MAIL BAGGE

Sometimes the mail brings news we're not happy to read, but is newsworthy never-the-less. In this case, we'll let Jan Sakert (Liki-Titi, R/CM July '67) tell his own story:

"A couple of weeks ago I was in the process of fabricating a re-fueler with an empty gallon fuel can. While soldering the vent and fill tubes into it, the — thing went off like a 500 pounder! God must certainly take care of R/C modelers . . . because my face and eyes weren't touched. But from my neck to belly button I'm pretty well burned. All's healing nicely though . . . and in a few weeks more I'll be able to go home and finish that re-fueler!"

To news of this nature there's little to be said beyond offering our sincere wishes for a complete and speedy recovery. The Hawaii newsletter reports Jan rinsed the can with water and that it was ⅔ full when Jan put the butane torch to it. . . . It's obvious *hot water and detergent* are minimum requirements for cleaning if a lesson is to be learned from Jan's unfortunate experience.

● A letter from the erstwhile editor of

Scully Bros., Dick and Cal, show "Mr. Ed," red MonoKoted Cl. III stunter with "profile" for knife-edge flight. Lots of wins for Pt. Arthur club. Enya 60 and Logictrol in 6 lb. bird. Foam wings with "Lien" modified Bosch section, Feldschau tips.

OILY BIRD, Bob Talley, brings a story worth repeating:

"Don't like to brag on my flying but this is too good to pass up. Picture this 1st flight at the New Orleans contest, a class II shoulder wing plane with 12° dihedral (you know how well this'll fly inverted). Anyway, at the bottom of a vertical 8, the model inverted, something falls out. A quick throttle back and oh joy, the smoothness of propo! The engine dead now and still inverted we carefully pass over the field and decide the tall weeds would be best for an inverted landing.

"Carefully, and ever so precisely, we steer it into a smooth, gently, nose high inverted landing! Everyone congratulates me on the finesse and the great flying job. My chest swells with pride . . . But now a small glimmer of doubt creeps in. If the ship was inverted, why was I holding up elevator instead of down? Then comes the crushing blow of truth. What had been flung from the plane at the bottom of that 8 was the fuel tank hatch, the fuel tank, some rubber padding, and — the battery pack! That's right, all *that beautiful, smooth, precise, etc. handling of the propo controls had been just for show. The entire performance was that of an inverted glider!"*

It might be added that loss of all those parts made the ship tail heavy and together with the normal down elevator Bob had at the bottom of the vertical 8, the nose high

Bill Feldschau is R/C newcomer, is strong flier and contender in Cl. II. Placed 2nd at Houston, 1st in San Antonio. Modified Cat with Enya 60 and Logictrol 5.

Oily Bird Bob Talley and Cl. II "Tally Ho! II." Pair won event at Houston meet. Bob is editor of Port Arthur R/C newsletter. Ship has Merco 61, Logictrol 7.

inverted glide resulted. Musta been balanced just right otherwise not to roll out with all that dihedral. With no damage and a borrowed tank and pack, (they were found later), Bob went on to win 2nd place. And this is something that's becoming a habit with Bob. Collecting class II trophy wins, that is.

● From Thailand, a short note telling of the formation of a Thai modeling organization. Here's what Yongyuth Napasab said: *"We, the modelers of Bangkok, have organized a club which is under process to get permission from the government — we call it "Modeller Association of Thailand" or MAT. Maybe you could help us in contacting other U. S. modeler clubs. I am president of the club."* It's hoped some of our club secretaries or newsletter editors (such as Reed, McGinnis, Stream, Chisolm, Rankin, Deckert, Campana, Rosenberg, etc.) will take a moment to drop Yongyuth a line (or newsletter) for encouragement and inspiration. It takes a 15 cent stamp, and his address is: 9 Soi

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TOP OUT

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Santisuk Sukumvit Rd. Bangkok, Thailand. I'm sure the MAT guys would appreciate the attention and I'd like to hear more about any correspondence.

● Don Lowe, of the Dayton, Ohio WORKS (who doesn't know of their annual Wright Bros. Memorial Meet?) writes of his thoughts and concerns following their great contest this year (95 contestants!):

"After reading your write-up on the WBMA this year and in response to some rumblings here and there, I thought it necessary to express my views.

"As you know we used altered flight patterns this year . . . we always have in Class III. The prime objective of this has been threefold: (1) to provide relief from the Pattern millstone that we've had for years; (2) to maintain pattern difficulty; and (3) shorten flight time to provide more flights. We never advertise the maneuvers of this special pattern except to note in the contest flyer — as we did this year — *that a special pattern would be used. These patterns have* not *been revealed to any until Friday before the contest to early arrivals. To my knowledge there have been no or minimal complaints about this and the top fliers emerged winners, as they did this year. . . .*

"Let me make myself clear when I say I realize we have an obligation to fliers at our contests provide the best in facilities, prizes, and competition conditions which are humanly possible. This I believe we have done for the past 5 years and I'm proud of our record. I might add also that it is easy to be critical but unless one has been personnally involved in putting on a contest of the magnitude of ours, he hasn't the foggiest notion of the blood, sweat, and tears, and money *that's required to get the job done. The return the WORKS get for such a job is very intangible and for some, not worth the effort. We make* zero *monetary profit since all funds — including entry fees — are turned into prizes. . . .*

"Our rewards are satisfaction in a job well done as well as in some measure of favorable publicity. We certainly can't avoid criticism, but when it appears unfounded, it stings. Anything we've done has always been with the view towards improving the quality of the meet, in providing contestants with an enjoyable and profitable weekend, and in advancing the RC art.

"Since our hides are thick and we feel we are serving a worthwhile purpose, we plan to again run a WBMA in 1968, probably the 3rd weekend in June at Wright-Patterson AFB at Dayton. Again, we'll try to make it the best contest in the country!

"Incidentally, we very much appreciate the contest coverage you gave us last year and would appreciate any possible in the future. This publicity serves two purposes: (1) It inflates our ego; and (2) it is very *instrumental in keeping the Air Force interested in providing continued support. RCM publicity was very important in the Air Force continuing its support in 1967 and I'm sure it will be important in the future.*

"Jerry, I would appreciate your publishing as much as the foregoing as you can to help explain our position in this matter." Paul Lowe WBMA CD for 1968.

We can readily share Don's feelings because a good deal of critism, while well intended, does little good where the willingness for follow through does not materialize. The frustrations of responsible serious efforts stem also from an unresponsive and indifferent membership used to and indeed calling for inaction. Don's comments, as much as anything else, are part of — and reflect — the discussion that has taken place for the past 5 years, as a way has been sought among pilots who really care enough to try, to bring improvement to the pattern event and to keep it a viable and useful sport. Serious effort in this regard often runs into difficulty due largely to the lack of a workable organized effort to usably accumulate contest experience and to guide development so as to assure betterment of the Pattern event continually. Despite a great deal of talk and theorizing, not much actually takes place, mainly because few believe it's possible or really want to devote time and money to overcome the many obstacles. Witness the demise of the Presidential RC Advisory Committee — *it never met, organized, or acted!* It's been mainly another exercise in day dreams. It's a set of circumstances that happens more often than most wish to face up to.

Currently, we're pinning our hopes on the Steering Group Concept that was outlined here in the December issue. We hope it provides a means by which the "organized effort" we often speak of may materialize. Failure once again to find a workable way to maintain even and steady progress will result in the familiar frustration Don's letter reflects — magnificent local efforts beating themselves against an environment which keeps them down to a hit-or-miss, disconnected and isolated proposition done in hopes — mind you — of finding something, almost anything, that'll catch on! In the meantime, of course, the sands of time run on and opportunities lost, never return. . . .

● Captain Jim Simpson dropped in one day via a B-52 (Jim's a navigator) and our talk touched on many RC ports, things, and people. In thinking back on how many RC planes he's built (check his Midget Mustang in the RCM Annual) Jim estimates it's been about 250! This turns out to be a reasonable figure since Simpson-built ships are used by many and Jim's services are widely sought. However when our conversation touched upon his latest enterprise, a twin engine research job, time flew by, and Jim and the SAC crew headed back to Rapid City before the full story could be learned. A short time later, a letter from ol' Prop Buster, Clark Besancon (Ba-zan-son) filled in the details of the Besancon-Simpson weather research plane project!

Built to be eventually used by the Institute of Atmospheric Sciences at the S. Dakota School of Mines and Technology, the plane is an 8½ footer powered with 2 tandem arranged Mercos, a 61 up front and a 49 in back. Coming from the thick Clark Y wing which houses the radio and servos, are twin booms to support the tail section. All-up weight is a whopping 11½ lbs. without payload. Fuselage is a simple box, open on the bottom to provide a flare bay to house a ten pound payload. The research ship will carry its load to as high as 12,000 feet as part of IAS's extensive research program in weather modification.

Clark relates that the pilotless aircraft is to be used to fly two silver iodide flares into the right kind of clouds which will help in determining what may be done to minimize hail and to cause less damaging rain to fall instead. Clark wasn't too enthralled by the idea of pursuing such a project. However Jim Simpson changed his mind and shortly came up with the design and plans from which Clark, now somewhat more enthusiastic, built the Boomer Buster — as I jokingly call their Monocoted monster. Flight testing is now in process with first flights successful and showing a need for more aileron differential to increase the sensitivity of the 16 inch chord wing. Elevator flutter is another recent bug that has been detected and a stiffer tail structure is in the works to eliminate this problem. So far, the plane hasn't begun its altitude qualification flight, or in other words, to see how high it'll go. It's sure though, with the team of Simpson and Besancon, we'll be hearing a lot more of their adventures with Boomer Buster. . . .

● From Al Rosen of Montreal a short note and a couple pictures of his RC stock — a C.G. Skylark and a Digitrio -4. Al is active with the MARS club and regularly contributes to MARS PULSE, their newsletter edited by Bob Milne. Al's ship is just a bit different and reflects a timely note — it's decked out in Israeli air force markings.

● And while in Canada, over in Saute Ste. Marie (a name that intrigues me) Doc Nino Campana sends a pack of pictures of the Soo modelers, a congenial bunch whose exploits are followed in GLITCH, which Doc ably edits. The club flies a wide assortment of bombs and duds, and seems to have an enjoyable time doing so. Although leaning heavily toward Sunday flier action, contest capability exists along with a group who prefer to design their own. All in all, a well rounded group (right, Stan?) made up of fliers from both sides of the northern border. (Come to think of it, the border is *north* for the U. S. and *south* for the Maple leaves. Wonder what meaning Canadians get from the song, "South of the Border"?)

CON-TRAILS

● Out on the contest trail, in Houston we find that Norm Rhodes is keeping Cal Skully trying with Norm edging Cal and his new original "Mr. Ed" in Cl. IIIE. "Mr. Ed," incidently, is a "side area" design soon to become more popular in view of the new maneuvers calling for 'knife edge' flying. Other winners at Houston were:

Cl. IIIE Rhodes, Scully, Len Hudson
Cl. IIIN Geo. Salmon, Jess Hogan, Bill Reynolds
Cl. IIO Bob Talley, Bill Feldschau Sr., C. Adkins
Cl. IISr. Craig Bliss (ole Lurch)
Cl. I Buddy Brammer, Dick Dixon

Hit of the contest was the demonstration of E. D. "Doc" Martin's latest jet, the largest in a long series Doc has built. This one was no. 6 of a group he's building and

(Continued on Page 9)

TOP OUT

(Continued from Page 8)

is a testbed to work out and test fly the flaps and "eyelid," an engine control feature. The ultimate Doc's working toward is an F-111B with folding wings, retro gear, fire extinguisher, etc! Doc has plans for 12 test ships all together to reach his goal, and no. 6 disappointed no one as it lifted off and circled the field at a steady pace. It was a thrill for the Sunday crowd who cheered as Doc landed it easily and smooth after a satisfactory air check of the eyelid, a flap device to alter the engine outlet to control power via radio. All in all, Doc's project has been an amazing display of tenacity and dedication to an idea, and we'll be on hand in the not-too-distant future when no. 12 lifts its metal wings skyward.

GLITCH editor, Nino Campana with "Pal Joey," uses Controlaire GG. (That's not a soapbox Nino is near. . . .)

Cloudbuster and Stan Lyons, uses Min-X, ST 61. Ship met sudden end to 3-year career on next flight.

● The Alamo RC Society launched their sanctioned contest activity with the 1st Alamo Regional in San Antonio. It was the first RC contest for the Alamo City in 11 years, and despite rain a congenial group turned out with representation from Oklahoma, Louisiana, and Texas who finished in this order:

Cl. IIIE — Cal Scully
Cl. IIIN — Mal Trosclair, Gary Pannel, Geo. Salmon
Cl. II — Bill Feldschau Sr., Wil Cowen, Chuck Staten
Cl. I. — Buddy Brammer, Chuck Winchester, Dick Dixon
Scale — Pat Hardick, Ivan Munninghoff

● Don Blackburn of the Amarillo ARKS relays results of their late season meet with these details of 1st place winners: Cl. I Jr. — John Bird; Cl. I Open — Dan Santich; Cl. II — J. R. Cox; Cl. IIIN — H. R. Dickson; Cl. IIIE — Bob Pierce; Goodyear — Don Downing; Scale — Bob Pierce. Hi-point winner was that comer, Bob Pierce of Ft. Worth!

● A close check of the results of the Houston contest along with those of the San Antonio meet (together with the New Orleans and Shreveport meets we'll have later) show many of the trophy-ites are those irrespressible Oily Birds of Port Arthur, Tex. Just for the heck of it, here's a recap of 1967's sanctioned meet wins of the most contest-going gang we know: 21 firsts, 9 seconds, and 10 thirds out of 10 contests entered! This result was in Pattern only and the 21 firsts were 8 in Cl. I, 5 in Cl. II, 6 in Cl. IIIE, and 2 in Cl. IIIN — to show they're a well balanced club who make contests fun despite serious competition. Not to rest on their laurels, it looks as if they're really out to set further records. For 1968, the Oilys say they are buying a bus — a motel on wheels, as Cal Scully calls it — to haul models and pilots near and far. So, competitors, beware of the Oily Bird Express!

In closing, a word to the gals from that gentleman and ladies man, Cal Scully: "Wives, how about having your husband take you out to dinner one of these evenings — sort of an appreciation supper for your *kind understanding, no complaint and full support* in his obsession-er — a — hobby? Talk to us husbands. Set up a time, place, and — let us have the money. *We will do the rest!* (Choke! Sorta gets ya right there, doesn't it?)

SoMoRaCC CD, Jim Elgie, with Beachcomber. Merco 61 and PCS. R/C activity on increase in Canada.

Bill Fleet and C.G. Falcon 56. Bonner 4RS propo in SoMoRaCC prexy's neat bird.

Montreal MARS flier, Al Rosen shows his C.G. Skylark with OS 49. Digitrio 4 and Israeli AF markings.

Original creation of Holger Lundhild features alum. fuselage, Digitrio. Ontario plane flies well, sturdy.

EDITOR'S MEMO

(Continued from Page 5)

We are pleased to welcome Dave Platt, renowned British scale modeler, and author of several RCM scale articles, to the United States. Effective October 23, 1967, Dave was appointed as chief of the design staff for Top Flite Models, Inc., of Chicago.

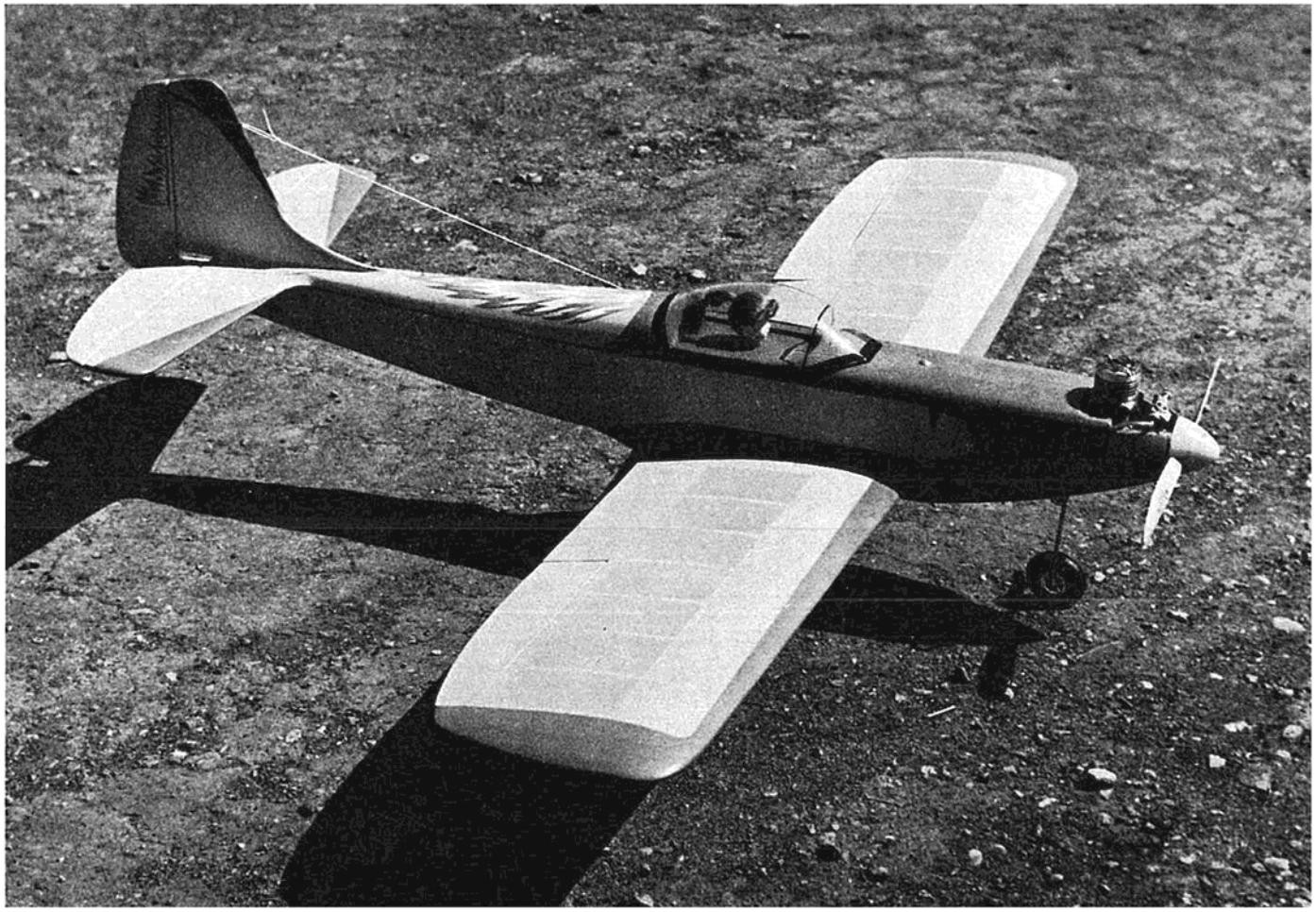
●

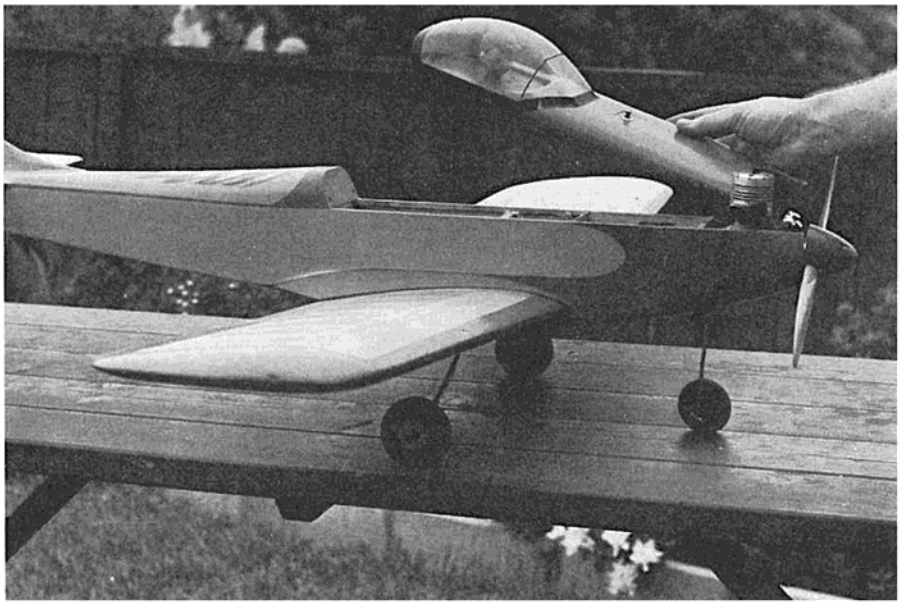
In closing, we'd like to apologize to our South African flying buddies who promptly reminded us that our Internat's coverage listed the South African team standing as fourth, when in reality, they obtained third place team honors. Thanks to Don MacKenzie and C. H. Wessels, Team Manager, for pointing out our error. . . .

"I will never again discriminate against the SA team . . ."

"I will never again discriminate against the SA team . . ."

"I will never again. . ."





FIREFLY

A candidate for 1968's winners circles, the Firefly performs every known maneuver. Designed for up to .49 engines and spanning a scant 52 inches, it is fully aerobatic on a good .35. With its twelve percent airfoil and a Merco .49 it climbs out like a scalded eagle! By George Harris.

THE Firefly started out to be a protest against the increasing size of multi models and the rising cost of balsa. It was designed to be fully aerobatic with a .35 size mill and to hold full house proportional without squeezing. The first one built has been flown with a McCoy .35 and a Merco of the same caliber and will do the A.M.A. pattern with either. After the first flight the aileron link on the left side was adjusted one turn and no changes have been made since. Twelve flights were made the first day out without braking a prop, the only fault seeming to be insufficient rudder for consistent snap rolls.

A second model was built with a larger rudder, wing fillets and a few minor improvements in structure, including widening the fuselage to take three of the larger type servos side by side. The PCS gear was transferred from number one to number two, and, just for fun, a Merco .49 series 2 was dropped in behind the spinner to see if the beast would handle the power. When the loud lever was pushed forward the Firefly rolled almost six feet then climbed out like a scalded eagle! No trim changes seemed necessary so the first flight included multiple snap rolls in either direction from either side up. The plane will fly hands off in a straight line or will hold a gentle turn without sliding off. Loops have been started with one wing intentionally low and, using elevator only, the plane will finish the loop with the same wing low condition.

In spite of the stability the plane will do any maneuver possible with a model and is ideal for free style aerobatics.

A few of the design features should probably be explained. The ailerons look a bit strange from the tip end but this built in washout prevents tip stalling and makes the model very stable at low speeds, so tight turns can be made in the landing approach without dropping a wing. I used this method of getting washout on gliders many years ago and it is very effective. All the wing ribs are the same basic size and no special jigging is needed since all the washout is in the ailerons themselves. Because the model was intended to move around rapidly a 12% airfoil was used, but this seems to provide all the lift necessary, even in a slow glide. The control surfaces may look large to some people, but with proportional you don't have to use full control all the time yet it is there when you need it for the violent maneuvers. I used about 30 degrees up and 20 down on the elevators, 30 degrees each way on rudder, with 25 up and 15 down on ailerons. For reeds these should be reduced by almost half rather than cut down on the surface areas. I like lots of access without turning the model over and removing the wing, so the top hatch is removable in one lump from the spinner to the trailing edge of the wing and is held by a single Camlock. The wing fillets prevent buffeting in high speed maneuvers by eliminating vortex shedding at the junction of the wing and fuselage. If you don't believe in aerodynamics take my word for it, it works. I have watched various models through a small telescope and the tail buffeting can be seen by the light rippling on the surfaces, especially in tight turns. Try it sometime. The cockpit canopy was designed into the fuselage instead

Flying is simply a matter of winding it up and letting it go. Take it easy on the controls until you get the feel of it, then you can start tying knots in the exhaust trail.

of just being stuck on like a wart and a few curves were added here and there to get away from the basic box.

No real attempt was made to keep the model particularly light, because a fairly high wing loading and plenty of inertia will help the plane through multiple snaps, Lomcevaks and things, even in a stiff breeze. Weight of Firefly number two is a little over 4½ lb. and could go up to 5 without any problems. The first model is now flying with F&M 3+1 and makes the smoothest rolls you ever saw with the coupled ailerons and rudder.

Now you have been brainwashed, how about building it. Structure is very simple and there are few parts to cut out, all materials being stock sizes with no 48 inch or extra wide sheets required. A variety of available hardware can be used to suit your own taste.

WING.

Build the wing first because you will need it before you can finish the fuselage. All the ribs can be cut in a stack then the tail ends of the outer few can be cut off and the extra notches made as needed in certain ribs. Before starting assembly glue the ply nose ribs to the ribs R2 and R3 then trial fit the landing gear blocks and drill holes in the ribs for the leg retaining brackets. This is easier than trying to do it after the wing is built. Enlarge the holes in the balsa ribs so the nuts can seat down on the plywood. The slotted spar web may seem like work but it makes a very strong and light spar without having any breaks completely through spar or ribs and simplifies accurate assembly. Glue the bottom spar to the lower edge of the web and pin down flat on the plan, the rear spar will then need to be packed up ¼ inch with scraps. Fit and glue all ribs in place then add the leading edge, trailing edge and top spar strip, plus the dihedral braces. All top sheeting can now be added. When this is dry, prop up the tip rib 2 inches at the main spar and pack the rear spar ¼ inch above that. The other wing is then built in the same way. If you use a jig or dihedral board the whole thing will be put together at once, of course. When dry, turn the wing over and add the landing gear, then complete the bottom sheeting and install the aileron hookup. The sweep back of the landing gear does several things. It allows the gear to be secured in the high strength leading edge box but puts the wheels back behind the C.G. Also it lowers the plane and allows use of a commercial gear with only one small additional bend. The ailerons are built upside down on the plan, since the top surface is so near flat that the difference won't be noticed and it is easier to incorporate the washout this way. Aileron horns can be cut from nylon rudder horns and are raked forward to prevent reverse differential. The 60 degree bellcranks give just the right amount of differential between up and down motions. Note that when the ailerons are built they will belong to the opposite wing, when turned right side up. Confused — don't worry, they will only fit one way so Murphy's law does not apply. Tips are cut from soft block and can be hollowed if you are ambitious. The trailing edges of the tips are best shaped with the ailerons in place to match the weird washout contours.

FUSELAGE.

The sides are cut from standard 36 inch long sheet and the nose doublers will come out of the pieces left over at the tail end. The thin ply webs are ample, since they are not used for rigidity but for bursting strength, to stop the sides from splitting along the grain. I used contact cement for laminating because it is quick and won't cause warping. Complete the sides with webs, doublers, longerons, braces, motor mounts and the ¼ sheet wing saddles, which stiffen the sides and hold them straight when the rear ends are pulled together. This makes fitting the fillets easier. Install formers F1, F2, F3 and the wing tie down F4 with the hardwood block glued and screwed in place. The tail ends can then be pulled together and fastened. Rather than show complete formers for the rear fuselage, which probably wouldn't fit, I prefer to cut spacers to fit the natural curve of the sides. The bottom sheet can now be added and the top deck stuck on. Cut the plan view of the deck block first then there will be enough big pieces left to make the wing fillets. Don't forget to mount the nose gear while the front end is still open.

Now, fit the wing in place and drill through the holes in F2 to ensure accurate alignment of the leading edge dowels in the wing. Drill the hole for the wing tie down screw, then remove the wing and glue the leading edge dowels in place. The wing is now replaced and bolted down so that the fillets, lower nose block and leading edge fairing can be fitted closely. Complete the nose blocking and carve everything to shape. The top hatch is made by pinning the ¼" x ½" rails along the top of the fuselage sides and sticking the ½ inch sheet on top. This is carved to match the fuselage contours, after which the cockpit area can be cut to suit your taste. The front end of the hatch is cut to suit the particular noise maker being used. Dowels are added to the rear of the hatch and the Camlock, or a screw and nut plate, is installed on F2. Note that the bump on top of F2 acts as a locator to align the hatch.

By using widely spaced motor mounts and an insert plate different engines can be installed and there is plenty of room for a large tank to feed a thirsty mill. Regular 8 oz. tanks will fit, or even the rectangular Taurus tank if the neck is cut off and a rubber stopper from a Pylon tank is installed.

TAIL SURFACES.

Structure is very simple and can be built over the bottom sheet laid on the plan. Leave the leading edge of the tailplane center section square to take the fillet piece, which is shaped after attaching to the fuselage. Key the fin into the notches and add the small fairing pieces to hide the lousy fit. The bevelled edges of the control surfaces are like I used way back in the old control line days and make a nice neat fit for tape, nylon, or metal hinges. It must be a good arrangement, it showed up in a recent R.C.M. article. A commercial elevator horn can be used and moved off center to put the horn at one side of the fuselage.

FINISHING.

I used silk on the wings and lightweight silkspan on the rest. If you sheet the wing all over you can use paper on everything,

The author's 7-year-old daughter, Wendy, with Firefly $2.

or just slop paint on the bare wood. Since my planes are built to fly and not for exhibition (that should get some comments about lazy characters), I wouldn't attempt to lecture on how to get a super finish. Just use your favorite method and nice bright colors.

There is room inside for any of the name brands of proportional gear, so no particular type has been shown. (I probably wouldn't get a kick-back anyhow!) The servo rails or platform can rest right on top of the ¼" sheet wing saddles, which will leave plenty of clearance for the aileron servo. Due to the thin wing the aileron servo may stick up above the top surface of the airfoil, but since the wing is bolted on, only total disintegration will knock it loose.

Flying is simply a matter of winding it up and letting it go. No nasty habits have shown up so far, but take it easy on the controls until you get the feel of it, then you can start tying knots in the exhaust trail. If you have flown multi more than a couple of week ends there should be no trouble. The model is very forgiving and quite rugged. At our local field we have what seems to be a strange type of interference limited to a small area which is deadly to fly through at certain times. Number one model with the F&M gear went through the bad spot at about 50 feet after take-off and proceeded to crash in neutral when a strong case of fail safe set in. It came down almost level but quite hard and only a broken prop resulted. Full up transmitter had no effect at all, but everything worked fine back at the pits.

Well, if you read only the important parts of this you should have the model finished by now.

Build two, they are small.

LIST OF MATERIALS:

SHEET BALSA:

8 of 1/16 x 3 x 36 Wing sheeting.
2 of 1/16 x 4 x 36 Tail sheeting.
3 of 3/32 x 4 x 36 Ribs, fuselage bottom.
3 of 1/8 x 4 x 36 Fuselage sides & formers, wing spars.
1 of 1/4 x 4 x 36 Wing platforms, center rib, tail tips.
1 of 3/8 x 4 x 36 Elevators, rudder, stab. fillet, nose sides.
1 of 1/2 x 4 x36 Hatch, fill blocks.

STRIP BALSA:

10 of 1/8 x 1/4 x 36 Spars, longerons, tail diagonals.
4 of 1/4 x 1/2 x 36 Tail outlines, hatch rails.
2 of 3/4 x 3/4 x 36 Shaped L.E. stock.
1 of 3/16 x 3/4 x 36 T.E. stock.

BLOCK BALSA:

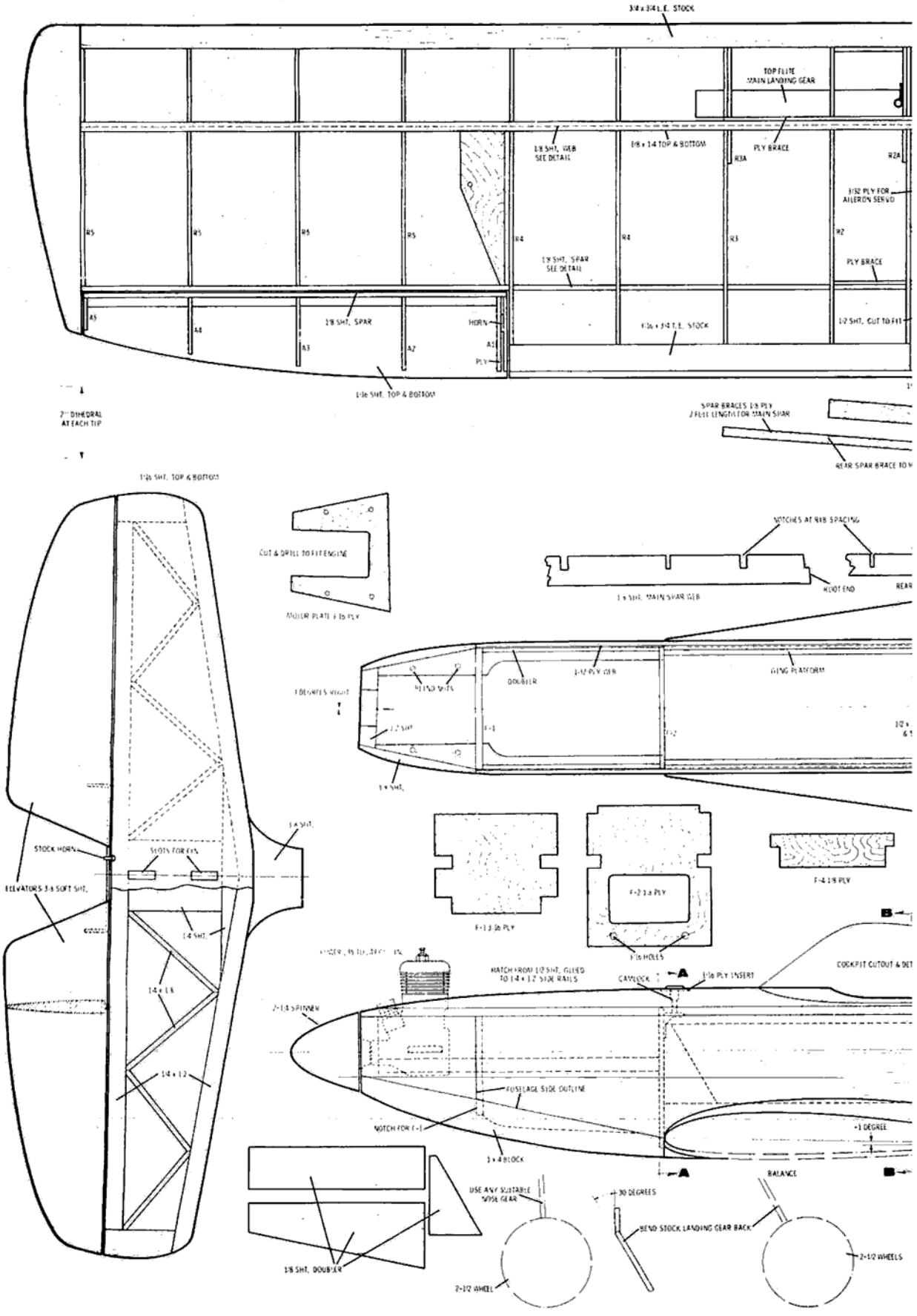
1 of 1 x 4 x 36 Top deck, nose, fillets.
2 of 1 1/2 x 2 x 12 Wing tips.

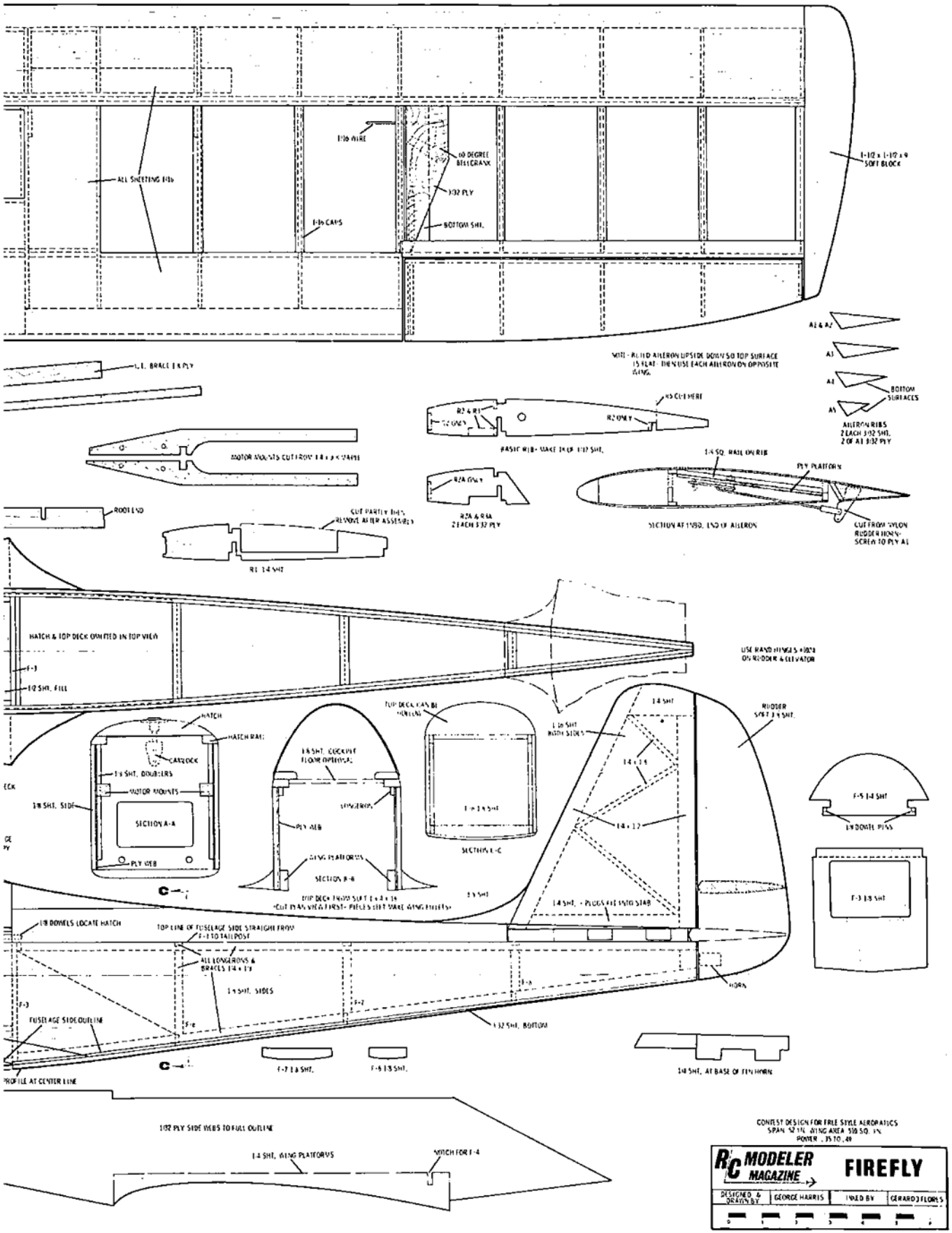
PLYWOOD:

1 of 3/16 x 6 x 12 Firewall & motor plate.
1 of 1/8 x 12 x 24 Formers, dihedral braces.
1 of 3/32 x 4 x 12 Ribs, bellcrank platforms.
1 of 1/32 x 12 x 24 Fuselage webs.

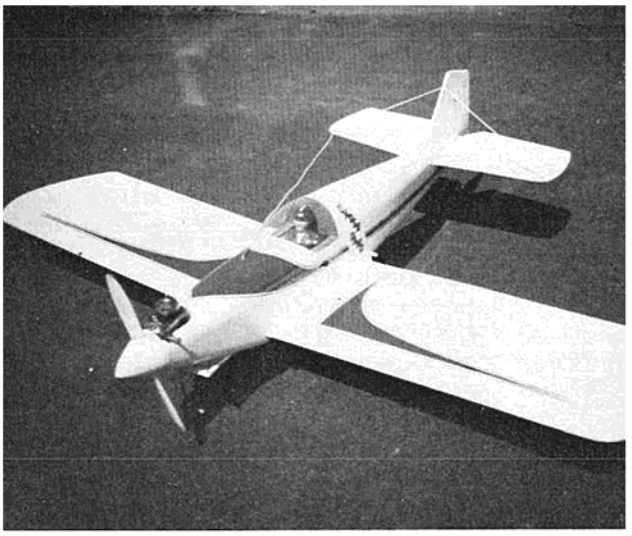
MISCELLANEOUS

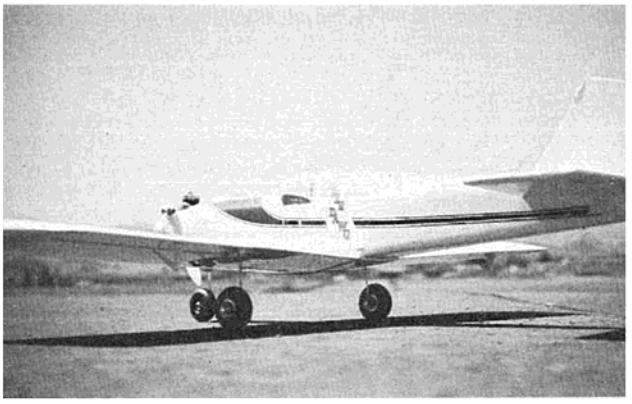
Pair of 3/8 x 3/4 x 9 maple motor mounts, 3 inches of 1/8 dowel, 3 inches of 3/16 dowel, Top Flite Taurus main landing gear set, nose gear and other hardware to suit.


3/4 x 3/4 L.E. STOCK
TOP FLITE MAIN LANDING GEAR
1/8 SHT. WEB SEE DETAIL
1/8 x 1/4 TOP & BOTTOM
PLY BRACE
3/32 PLY FOR AILERON SERVO
1/8 SHT. SPAR SEE DETAIL
1/8 SHT. SPAR
HORN
PLY
1/16 x 3/4 T.E. STOCK
1/2 SHT. CUT TO FIT
1/16 SHT. TOP & BOTTOM
2" DIHEDRAL AT EACH TIP
SPAR BRACES 1/8 PLY
FULL LENGTH FOR MAIN SPAR
REAR SPAR BRACE TO
CUT & DRILL TO FIT ENGINE
NOTCHES AT RIB SPACING
1 x SHT. MAIN SPAR (SB)
DOUBLER
1/2 PLY (SB)
WING PLATFORM
1/4 SHT.
STOCK HORN
SLOTS FOR HS
ELEVATORS 3/8 SOFT SHT.
1/4 SHT.
1/4 x 1/2
1/4 x 1/2
F-4 1/8 PLY
F-2 3/8 PLY
F-1 3/8 PLY
1/16 HOLES
MATCH FROM 1/2 SHT. GLUED TO 1/4 x 1/2 SIDE RAILS
CAMLOCK
1/16 PLY INSERT
COCKPIT CUTOUT & DE
2-1/4 SPINNER
FUSELAGE SIDE OUTLINE
NOTCH FOR F-1
1 x 4 BLOCK
+1 DEGREE
BALANCE
USE ANY SUITABLE NOSE GEAR
30 DEGREES
BEND STOCK LANDING GEAR BACK
2-1/2 WHEELS
2-1/2 WHEEL
1/8 SHT. DOUBLER


1/16 WIRE
10 DEGREE BELLCRANK
1/32 PLY
BOTTOM SHT.
ALL SHEETING 1/16
1/16 CAPS
1-1/2 x 1-1/2 x 9 SOFT BLOCK
A2 & A2
A1
A2
BOTTOM SURFACES
A1
AILERON RIBS 2 EACH 1/32 SHT. 2 OF A1 1/32 PLY
NOTE - BUILD AILERON UPSIDE DOWN SO TOP SURFACE IS FLAT. THEN USE EACH AILERON ON OPPOSITE WING.
L.E. BRACE 1/8 PLY
R2 & R1
R2 ONLY
MOTOR MOUNTS CUT FROM 1/8 x 3" PLYWD
BASIC RIB - MAKE 24 OF 1/32 SHT.
1/4 SQ. BASS ON RIB
PLY PLATFORM
R2A ONLY
R2A & R4A 2 EACH 1/32 PLY
SECTION AT 1/2SD. END OF AILERON
CUT FROM NYLON RUDDER HORN - SCREW TO PLY A1
ROOT END
CUT PARTLY THRU - REMOVE AFTER ASSEMBLY
R1 1/4 SHT
HATCH & TOP DECK OMITTED IN TOP VIEW
F-3
1/2 SHT. FILL
USE RAND HINGES #102 ON RUDDER & ELEVATOR
HATCH
HATCH RAIL
CATROCK
1/4 SHT. DOUBLERS
MOTOR MOUNTS
1/8 SHT. SIDE
SECTION A-A
PLY WEB
1/8 SHT. COCKPIT FLOOR OPENING
STRINGERS
PLY WEB
WING PLATFORMS
SECTION B-B
TOP DECK FROM SHT 1 x 4 x 14 (CUT RYAN VICA FIRST - PIECES LEFT WARE WING FILLETS)
TOP DECK (AS BUILT) OMITTED
1/16 SHT BOTH SIDES
SECTION C-C
1/4 SHT
RUDDER SOFT 3 SHT.
1/4 x 3/4
1/4 x 12
1/4 SHT. - PLUGS FIT WING SEAT
F-5 1/4 SHT
1/8 DOWEL PINS
F-3 1/8 SHT
1/8 DOWELS LOCATE HATCH
TOP LINE OF FUSELAGE SIDE STRAIGHT FROM F-1 TO TAIL POST
ALL LONGERONS & BRACES 1/4 x 1/8
1/4 SHT. SIDES
HORN
FUSELAGE SIDE OUTLINE
1/32 SHT. BOTTOM
PROFILE AT CENTER LINE
F-7 1/4 SHT.
F-6 1/8 SHT.
1/4 SHT. AT BASE OF FIN HORN
1/32 PLY SIDE WEBS TO FULL OUTLINE
1/4 SHT. WING PLATFORMS
NOTCH FOR F-4
CONTEST DESIGN FOR FREE STYLE AEROBATICS
SPAN 52 1/2 WING AREA 510 SQ. IN.
POWER .35 TO .49
RC MODELER MAGAZINE
FIREFLY
DESIGNED & DRAWN BY
GEORGE HARRIS
INKED BY
GERARD J FLORES

Three-foot span, three pounds . . . and 75 m.p.h. with a .15! Definitely not for the beginner, the Under Dawg was specifically designed by RCM as an experimental pattern ship for the new, small digital systems that will make their debut this year.



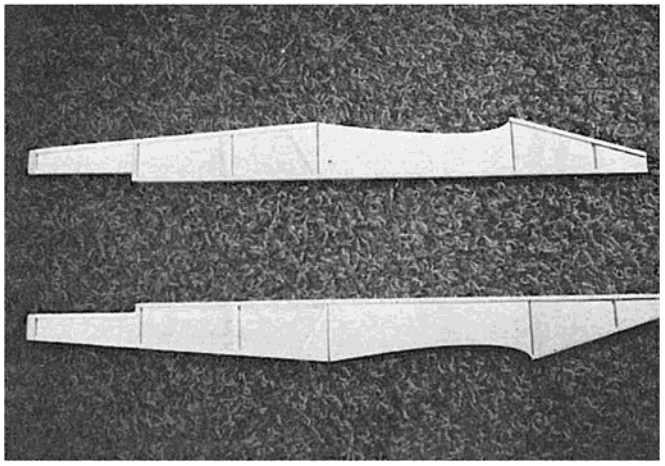


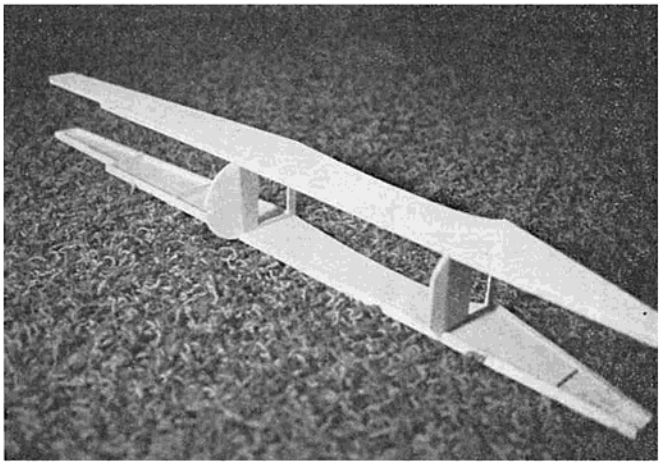
By
DON DEWEY
EDITOR

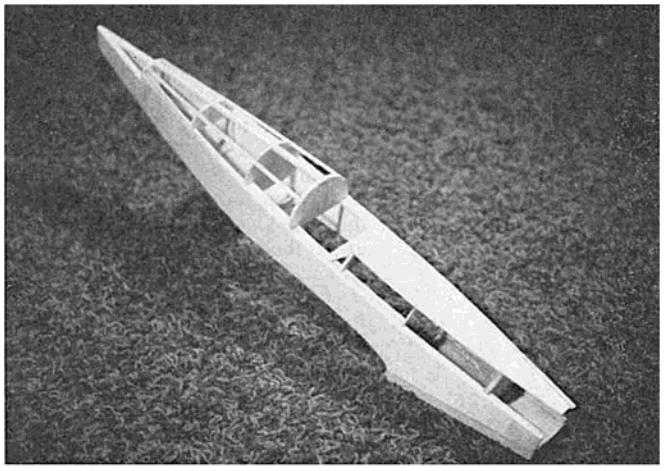
BOB ANDRIS
AERODYNAMIC ENGINEER

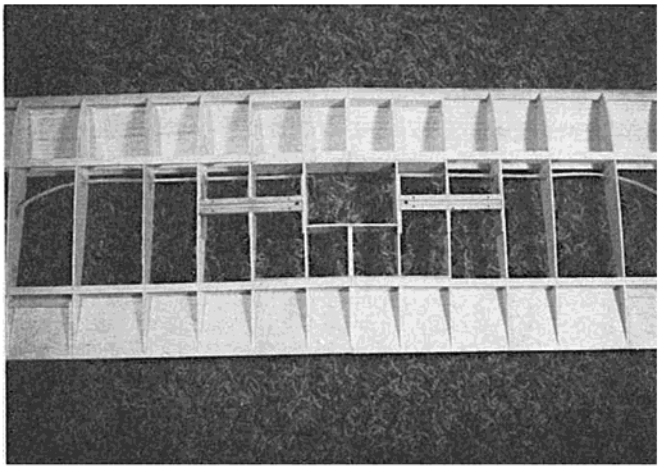
KEN WILLARD
CONTRIBUTING EDITOR

UNDER DAWG









The Under Dawg was designed by a committee. Now a committee has been defined as "a group of people who, when no one can decide what to do, gets together and decides nothing can be done." But, this committee was different. They never got together. So something was done.

Let me tell you about it.

Shortly after the Top Dawg came out, I received a phone call from Fearless Leader (Dauntless Dewey — you know — "Dauntless do it that way — do it this way!")

"Hey, I really like that Top Dawg, especially the size and wing planform. But lemme' tell you what I've done. I was doodling with it and sketched in a low wing — then I moved the gear back and added a nose wheel — now it looks like a real sporty contest job. Y'oughta see it!"

Slightly miffed — not seriously, you understand, because whenever you argue with the boss you wind up six inches tall — since the Top Dawg is one of my favorite designs, I said "Sounds interesting — you gonna' build it?"

"I'd love to, but what with paste-ups (that's editorial talk) and printer's deadlines, I won't be able to get to it. How about you?"

Like I said, you don't argue with the boss. "Send me the sketches and I'll see what I can do — it may be a little while."

"Oh, that's OK. Next month will be fine!" Uh-huh!

Next day the sketches came — air mail special delivery! Boy, when some guys turn on, they really turn ON! So I opened the envelope, spread out the drawing, and after a quick once over, I grudgingly admitted "Hmmm. Not bad — not bad at all. In fact, it looks pretty good. Oh, come on now, Willard, why don't you admit it? It looks great!"

So I admitted it.

That night Bob Andris, a fellow R/C'er and aerodynamic engineer by profession, stopped by to talk about an idea he had (I wonder now what it was?) and I showed him the Dewey-eyed sketches. He took one look at them and said "Boy! That I've gotta build!"

"OK, you're on. And while you're building it, how about taking some construction shots and making up a set of plans?"

"Sure — uh, do you think Don would mind if I made a couple of small changes?"

Oh-oh, I thought to myself. Here it comes. He'll want to shorten the nose, lengthen the tail, taper the wing, widen the fuselage, narrow down the fin, move the landing gear forward, eliminate the nose gear, etc., etc., etc. And how in the devil would I explain **that**?

"Well, uh," I uh-h-ed. "What did you have in mind?"

"I'd like to cut the thickness ratio of the wing down to 15%."

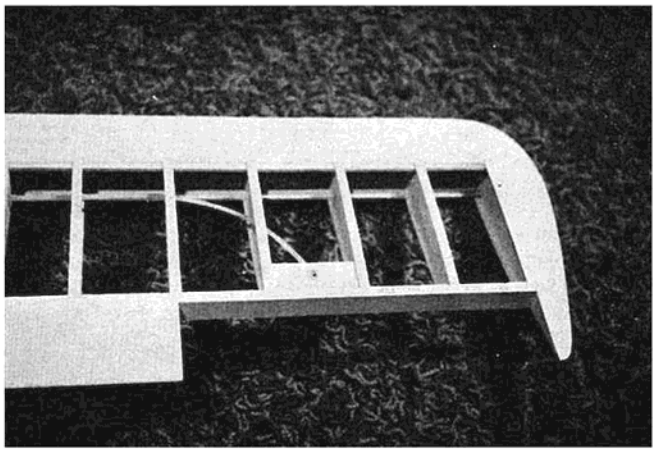
Whew! Quickly I agreed — and the project was under way.

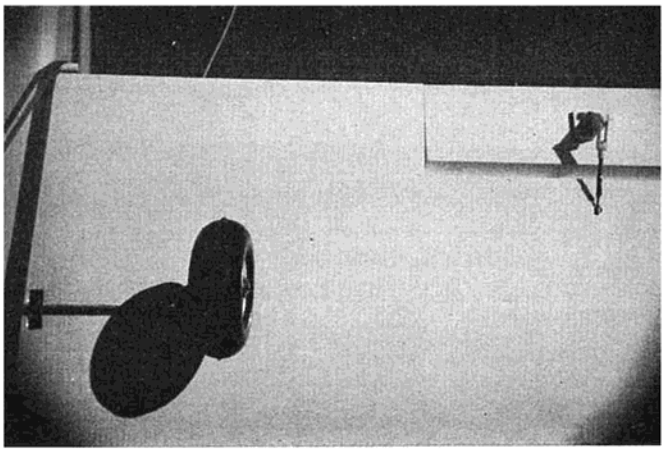
As for the name — well, if you have an airplane with the wing on top, called the Top Dawg, and you put the wing underneath in a design variation, what else? It's the Under Dawg!

It wasn't long before the prototype was finished and ready for covering. We used the new Super MonoKote, which is still under development. Although it's really ready now, in small quantities, the big problem is maintaining consistency in a big production run. It won't be long before it's available in quantity, and I think you'll like it. Also, the present "wet" MonoKote works very well for trim patterns over the new material.

Test flights on the prototype were exciting, and I want to hasten to stress two things. First, I've always said that if a design can't be flown with rudder only, or rudder and elevator, I'd warn you. OK — take heed! The Under Dawg has to have full house control. It only wallows when you apply rudder. But, with the ailerons the turns are excellent, and the roll rate is extremely rapid, but solid.

Second, be warned that this airplane is definitely **not** for a beginner. At three pounds, with the Max .15 and semisymmetrical three foot wing, the Under Dawg has been timed at 70-75 mph in quiet air in level flight, so it gets up around 85-90 in





some diving maneuvers. It moves!

Spins, with power, are hard to believe. The airplane really winds up, but the nose stays down, with no tendency to go into a flat spin, and when the controls are neutralized the spin stops almost instantly.

The airplane will do the full stunt pattern, although tail slides are tough because of the low aspect ration, permitting a fall-off if you're not perfectly lined up.

Take-offs are great. On landing, it's best to keep a little excess speed for a good flare — if you come in nose high the sink rate is pretty rapid, and there isn't much flare left! The gear is pretty rugged, though, and can take quite a beating. In fact, it has!

After the test flights, as luck would have it, Bob had a trip to Los Angeles lined up, so we arranged for a side visit to **R.C.M.**, and he took the Under Dawg to show it, along with a set of the plans, to the one man Top Dawg Modification Board. Well — there went the plans, and Under Dawg No. 2 was under way.

Next day I get a phone call from the T. D. D. M. B.

"This job really goes together fast, compared to a big contest airplane. I've got the fuselage about done already. Incidentally, Bill O'Brien has been making construction notes on the one he's building. Want to use them?"

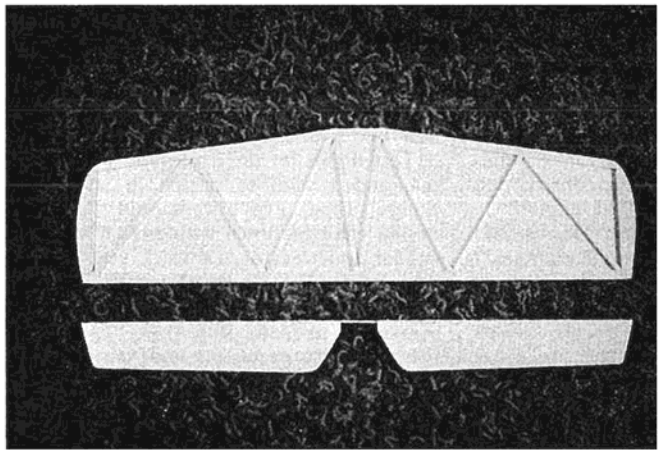
I have to admit that the "glue this to that, then sand" part of design articles is less interesting to write about than the conceptual and testing aspects, but that it is very important to the readers. So, I quickly accepted the offer, and here are the construction notes.

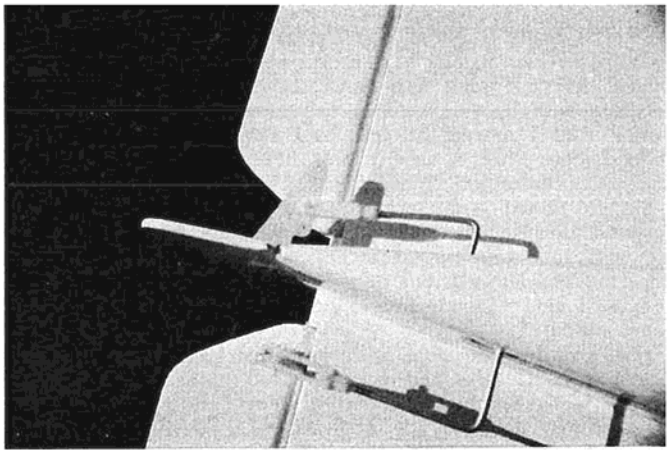
CONSTRUCTION

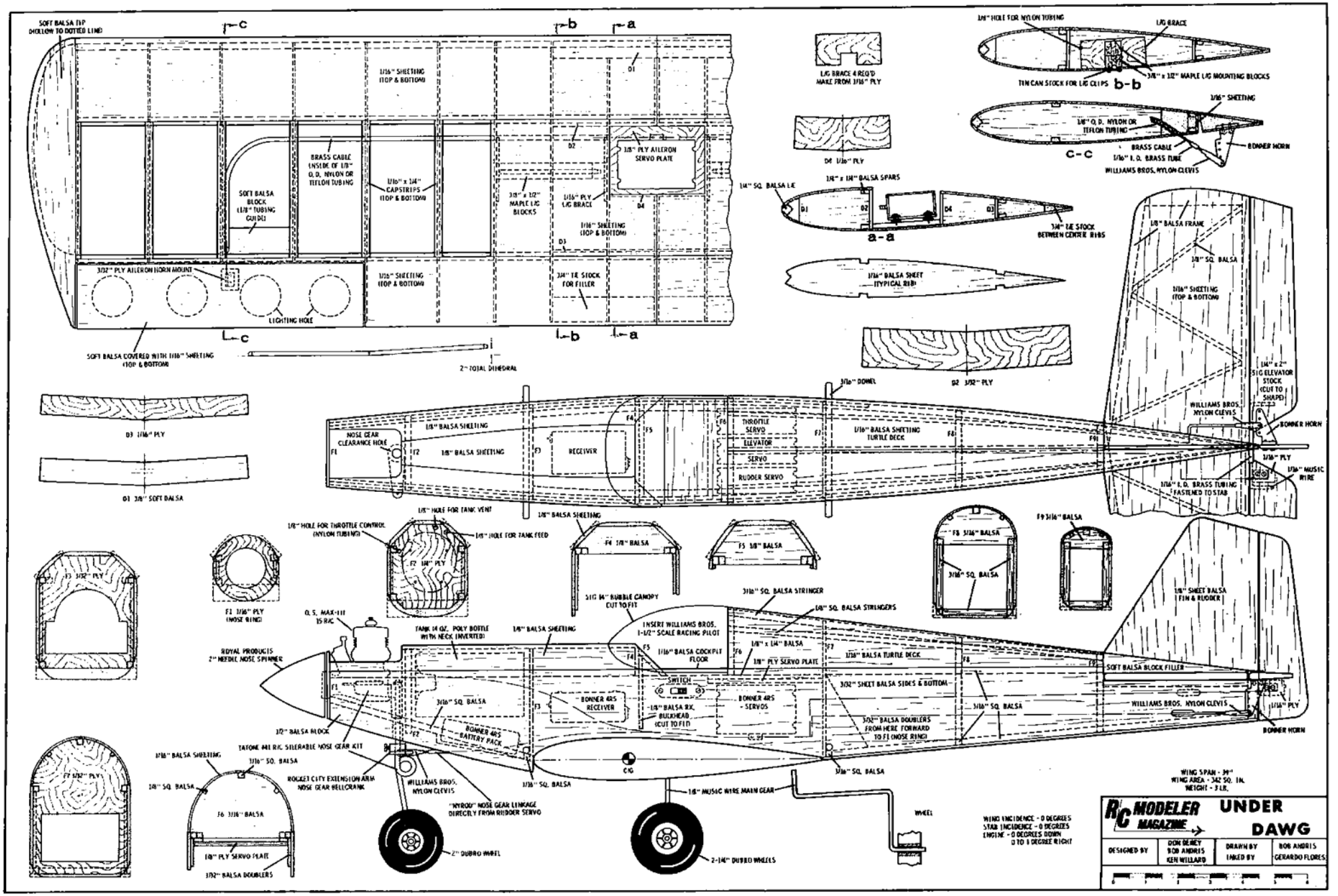
Fuselage:

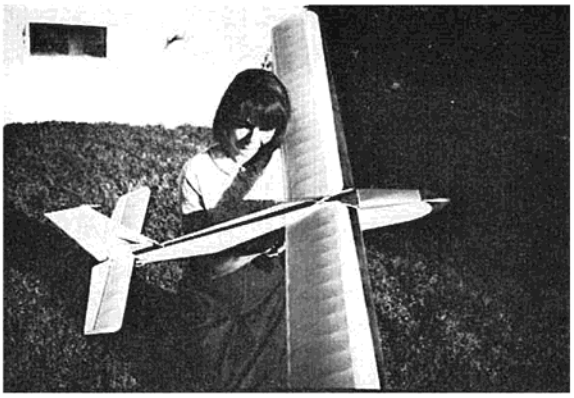
1) Cut sides from 3/32" sheet.
2) Add 3/16" x 3/16" longerons and uprights.
3) Add 3/32" sheet (grain vertical) doublers with epoxy or contact cement. Leave accurate slots for formers.
4) Add 3/16" sheet tail filler blocks to each side.
5) Add 3/16" x 3/16" square servo mount rails between F3 and F7.
6) Cut out 3/32" ply bulkheads F3 and F7. Cut F2 from 1/4" plywood.
7) Cut bulkheads F4 and F5 from 1/8" balsa, and F6, F8, and F9 from 3/16" balsa. Note direction of grain.
8) Check bulkheads F3 and F7 to make certain they are perfectly true and of identical width. Lay one fuselage side down flat on the work table and glue F3 and F7 in their respective slots between doublers. Check with draftsman's right angle to be certain they are perpendicular to fuselage side.
9) Join sides, making sure of equal bends at nose and tail. Check alignment, adding F2, F4, F5, F8, and F9.
10) Drill engine mount holes and fuel line holes in F2. Check fit.
11) Add F1 and 1/2" sheet bottom nose block. Drill for nose wheel and steering cable. Rough shape.
12) Drill motor mount for engine. Install on F2 with blind nuts. Check fit of F1. Remove engine from mount. Remove nose wheel leg.

(Continued on Page **24***)*



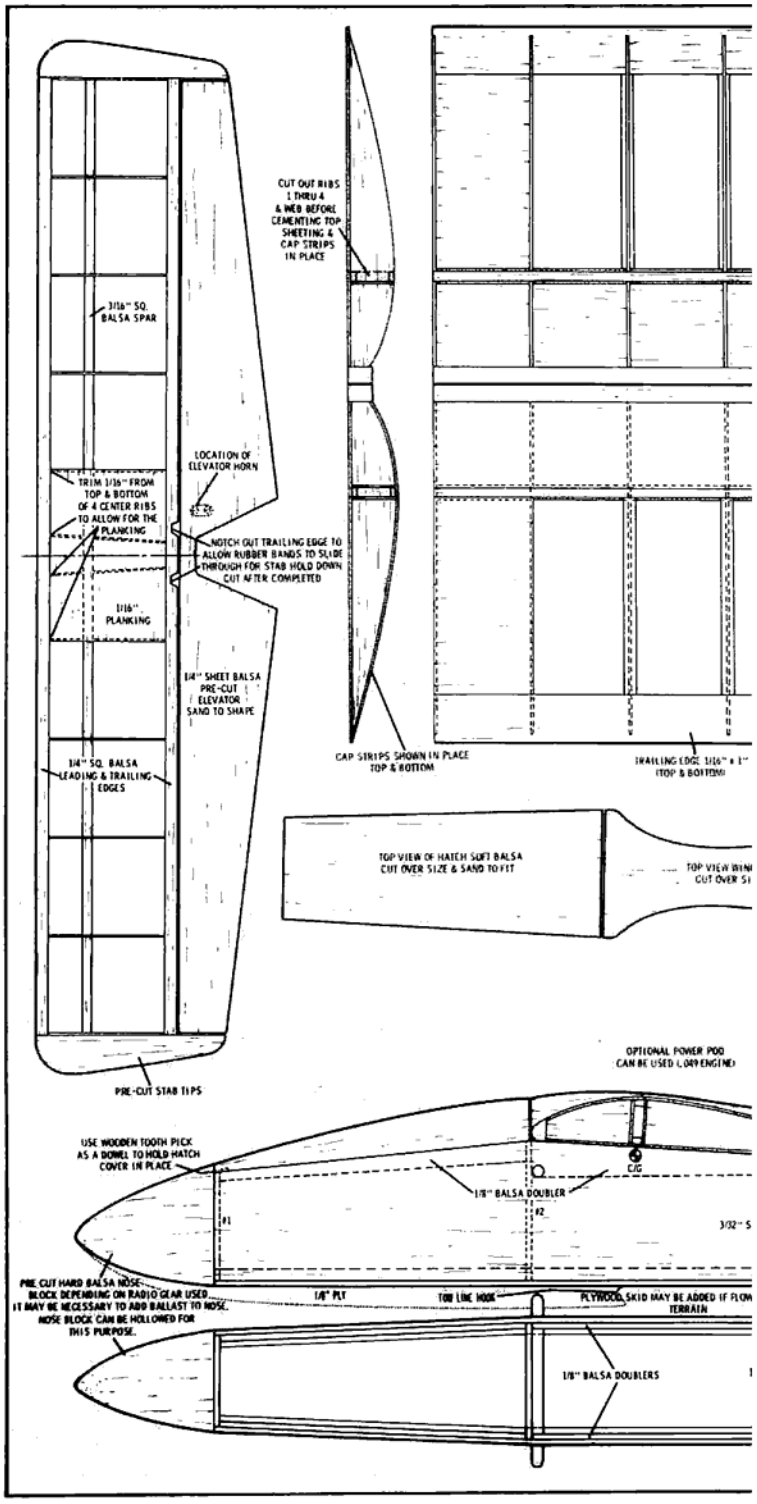



SOFT BALSA TIP (HOLLOW TO DOTTED LINE)
1/16" SHEETING (TOP & BOTTOM)
BRASS CABLE INSIDE OF 1/8" O.D. NYLON OR TEFLON TUBING
SOFT BALSA BLOCK (1/8" TUBING CUT IN)
1/16" x 1/4" CAPSTRIPS (TOP & BOTTOM)
3/8" x 1/2" MAPLE LG BLOCKS
1/16" PLY LG BRACE
1/8" PLY AILERON SERVO PLATE
1/16" SHEETING (TOP & BOTTOM)
3/4" T.E. STOCK FOR FILLER
3/32" PLY AILERON HORN MOUNT
LIGHTING HOLE
SOFT BALSA COVERED WITH 1/16" SHEETING (TOP & BOTTOM)
2° TOTAL DIHEDRAL
LG BRACE 4 REQ'D MAKE FROM 1/16" PLY
1/8" HOLE FOR NYLON TUBING
LG BRACE
TIN CAN STOCK FOR LG CLIPS
3/8" x 1/2" MAPLE LG MOUNTING BLOCKS
1/16" SHEETING
1/8" O.D. NYLON OR TEFLON TUBING
BRASS CABLE
1/16" I.D. BRASS TUBE
BONNER HORN
WILLIAMS BROS. NYLON CLEVIS
1/4" SQ. BALSA LE
1/8" x 1/4" BALSA SPARS
3/4" T.E. STOCK BETWEEN CENTRE RIBS
1/16" BALSA SHEET (TYPICAL RIB)
1/8" BALSA FRAME
1/8" SQ. BALSA
1/16" SHEETING (TOP & BOTTOM)
1/4" x 2" LG ELEVATOR STOCK (CUT TO SHAPE)
WILLIAMS BROS. NYLON CLEVIS
BONNER HORN
1/16" PLY
1/16" MUSIC WIRE
1/16" O.D. BRASS TUBING FASTENED TO STAB
3/16" DOWEL
1/8" BALSA SHEETING
NOSE GEAR CLEARANCE HOLE
1/8" BALSA SHEETING
RECEIVER
THROTTLE SERVO
ELEVATOR SERVO
RUDDER SERVO
1/16" BALSA SHEETING TURTLE DECK
1/8" HOLE FOR TANK VENT
1/8" HOLE FOR THROTTLE CONTROL (NYLON TUBING)
1/8" HOLE FOR TANK FEED
1/8" BALSA SHEETING
F4 1/8" BALSA
F5 1/8" BALSA
F8 3/16" BALSA
F9 3/16" BALSA
3/16" SQ. BALSA
F3 3/32" PLY
F2 1/8" PLY
F1 3/16" PLY (NOSE RING)
SIG 14" BUBBLE CANOPY CUT TO FIT
3/16" SQ. BALSA STRINGER
1/8" SQ. BALSA STRINGERS
1/8" SHEET BALSA FIN & RUDDER
O.S. MAX-III 15 R/C
TANK 14 OZ. POLY BOTTLE WITH NECK INVERTED
INSERT WILLIAMS BROS. 1-1/2" SCALE RACING PILOT
1/16" BALSA COCKPIT FLOOR
1/8" x 1/4" BALSA
1/8" PLY SERVO PLATE
1/16" BALSA TURTLE DECK
ROYAL PRODUCTS 2" NEEDLE NOSE SPINNER
3/16" SQ. BALSA
BONNER 4RS RECEIVER
BONNER 4RS BATTERY PACK
BONNER 4RS SERVOS
SWITCH
1/8" BALSA RX. BULKHEAD (CUT TO FIT)
3/32" SHEET BALSA SIDES & BOTTOM
3/32" BALSA DOUBLERS FROM HERE FORWARD TO F1 (NOSE RING)
SOFT BALSA BLOCK FILLER
WILLIAMS BROS. NYLON CLEVIS
1/16" PLY
BONNER HORN
1/2" BALSA BLOCK
TATONE MET R/C STEERABLE NOSE GEAR KIT
1/16" BALSA SHEETING
3/16" SQ. BALSA
3/8" SQ. BALSA
F6 3/16" BALSA
1/8" PLY SERVO PLATE
3/32" BALSA DOUBLERS
ROCKET CITY EXTENSION ARM NOSE GEAR BELLCRANK
WILLIAMS BROS. NYLON CLEVIS
"NYROD" NOSE GEAR LINKAGE DIRECTLY FROM RUDDER SERVO
2" DUBRO WHEEL
C.G.
1/8" MUSIC WIRE MAIN GEAR
WHEEL
2-1/4" DUBRO WHEELS
WING INCIDENCE - 0 DEGREES
STAB INCIDENCE - 0 DEGREES
ENGINE - 0 DEGREES DOWN
0 TO 1 DEGREE RIGHT
WING SPAN - 39"
WING AREA - 342 SQ. IN.
WEIGHT - 3 LB.
R/C MODELER MAGAZINE
UNDER DAWG
DESIGNED BY
DON DEWEY
BOB ANDRUS
KEN WILLARD
DRAWN BY
BOB ANDRUS
TRACED BY
GERARDO FLORES



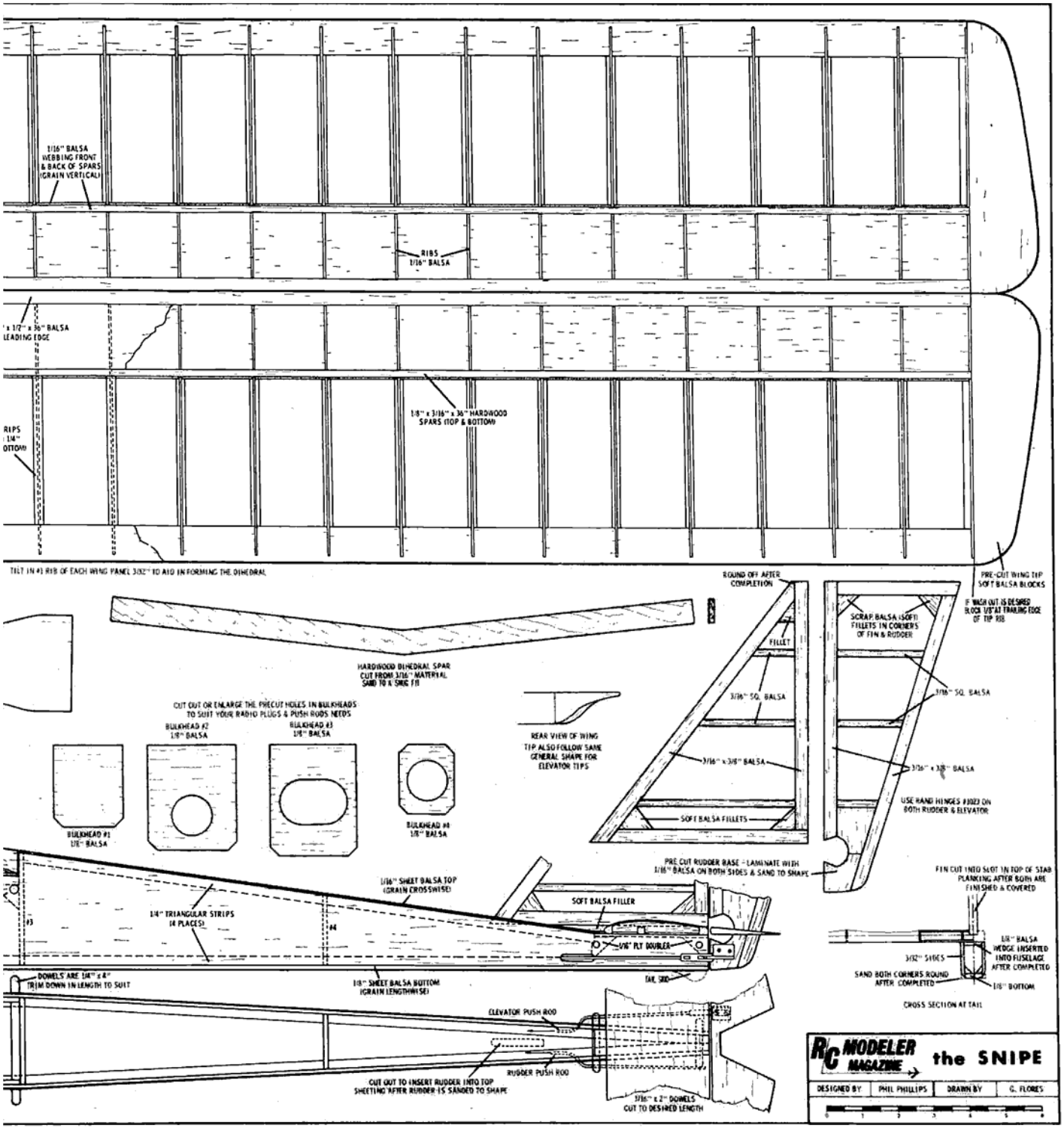
SNIPE

By Sgt. Phil Phillips, U.S.A.



Sgt. Phillips' six-foot glider is a natural for newcomers to slope soaring. Easy-to-build, features optional power pod.

THE Snipe is a simple, quick and easy glider to build. It is the direct result of a conversation between two glider nuts who thought it was time for a glider that could be bought, built and flown in less than a week. It was decided that this glider should be capable of flying the big gear as well as some of the smallest — it can, and has been flown using my Bonner 8 channel receiver and two big servos at an all-up weight of 2½ pounds. The glider has also been flown with my wife's Kraft reed set at a weight of 2¼ pounds. The Snipe also has flown using my Mustang 200 galloping ghost gear with two Bellamatic servos at a flying weight of two pounds. Since it is of relatively light construction it is not indestructible — in fact, there are only five pieces of hard wood in the entire kit — four spars and a dihedral brace. The first test ship weighed 18 ounces with four coats of clear dope and covered with silk span. I then placed the big gear in and the Snipe weighed a shade under 2½ pounds — and flew with no trouble at all. This was a calm day with little wind and no thermals and the plane did not gain too much altitude under these conditions. The next flight was on a moderately windy day with heavy gusts and the Snipe was off and running! It looped with ease and flew inverted for awhile, but this is **not** why it was designed. The Snipe is primarily a beginners R/C glider. The construction has been kept as simple as possible. The instructions are laid out for a step-by-step guide to help the beginner build his first R/C glider. The fuselage can be built in about 1½ hours, and set aside to dry while you build the wing. Both wing halves appear on the plans to make building move along as quickly as possible. All this can be completed in the first nights work. The following night the rudder and stabilizer can be built and the sanding of the fuselage and wings should be started. Cover the wings the third night, then sand the stabilizer and rudder. The fourth night I covered the rudder and elevator and finished sanding and doping the fuselage. The fifth night I made push-rods, installed the R/C gear and placed the fourth coat of dope on all surfaces. It flew on the sixth afternoon with four



coats of clear dope and the big gear!

If you are a beginner I feel that by following the step-by-step directions, you should have no trouble. If you are an experienced builder you will probably make your own changes, and build it to suit yourself. However, it might aid you in building the Snipe if you would read through the instructions just to see how it was supposed to be built. Then go ahead and have a ball changing things to suit yourself. The webbing in the wings serves two purposes, one, they form a dihedral box and two, they greatly add to the overall strength of the wing. I would **definitely** follow this part of the construction as I have seen the wing with and without this webbing and it does make a lot of difference in the overall strength.

By carefully pre-locating your R/C gear before you actually bolt it down, you should be able to balance the Snipe with no ballast needed. I place my R/C gear in loose, rubber band the wings on, put the rudder and elevator in place, then I know where to place my R/C gear. I had to put the Bellamatics in **front** of the #2 bulkhead to make it balance without any ballast. However, those big servos went up flush against the **back** of #2 bulkhead and it balanced out with no ballast needed. I am not going to attempt to tell **you** where to place your R/C gear, because we all seem to do things a little differently. The noseblock has been made 3 inches long so you can hollow out a place for any ballast if the need should arise.

You may also want to add a tail skid and undercarriage. Where I fly we don't need either. If you fly from sand, or hard ground, they could be easily added.

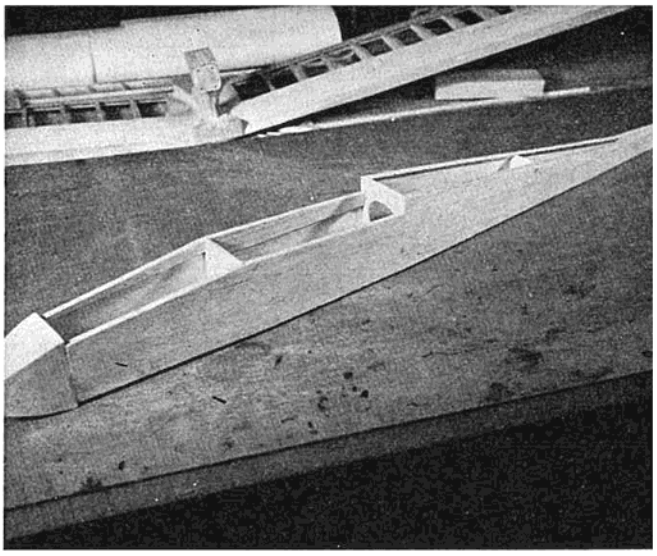
Hinges and control horns are shown on the plans, however, you can use any type you like. They are of no importance to the over-all flying performance of the Snipe.

FUSELAGE CONSTRUCTION

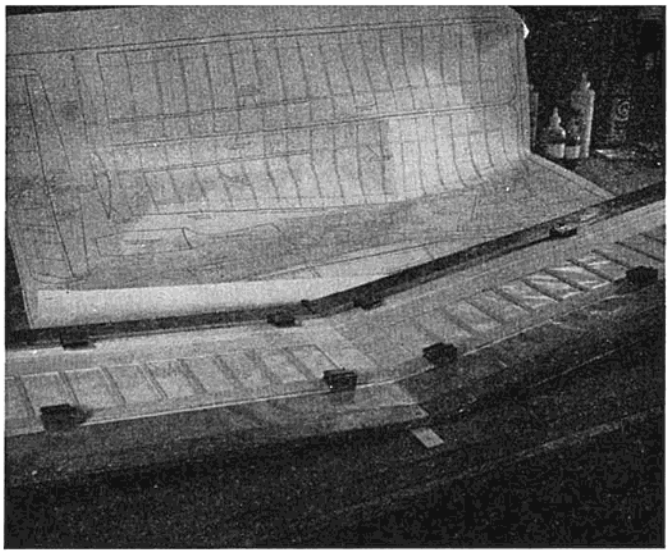
Step F-1: Cut a strip of ¼" triangular balsa 16¼" long.

Step F-2: Glue this piece to the top, back inside of the fuselage and pin in place. Leave ⅛" clearance where bulkhead #3 will be placed later.

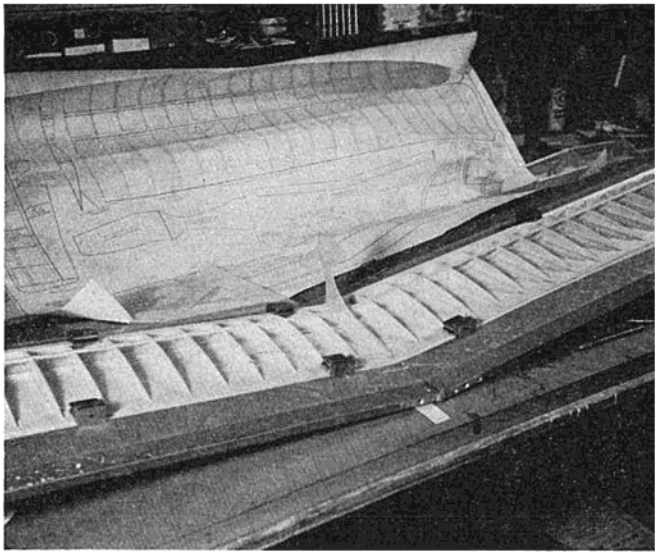
Step F-3: You will notice there is a 3 inch



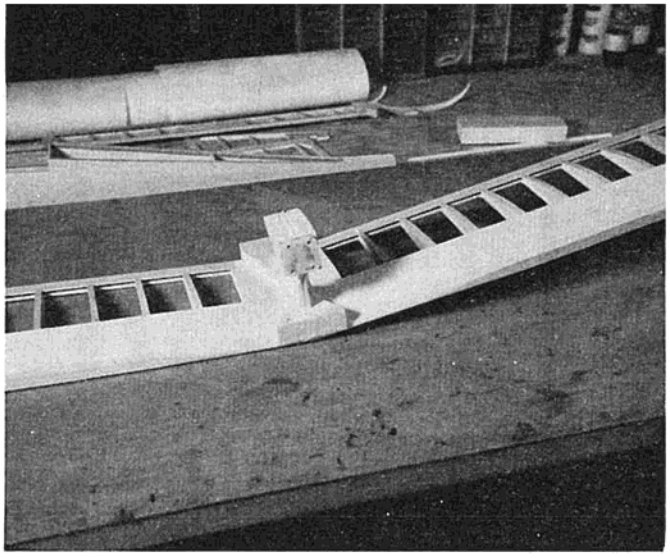
Basic fuselage structure, less top sheeting and canopy block



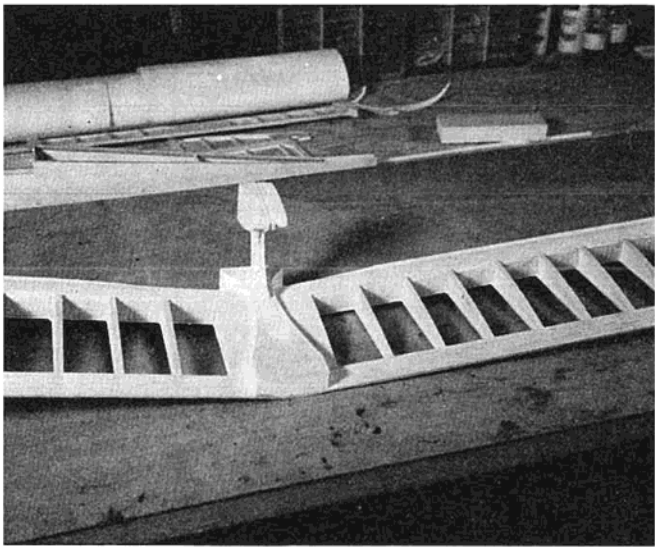
Lower wing sheeting and capstrips in place on Magna-Jig.



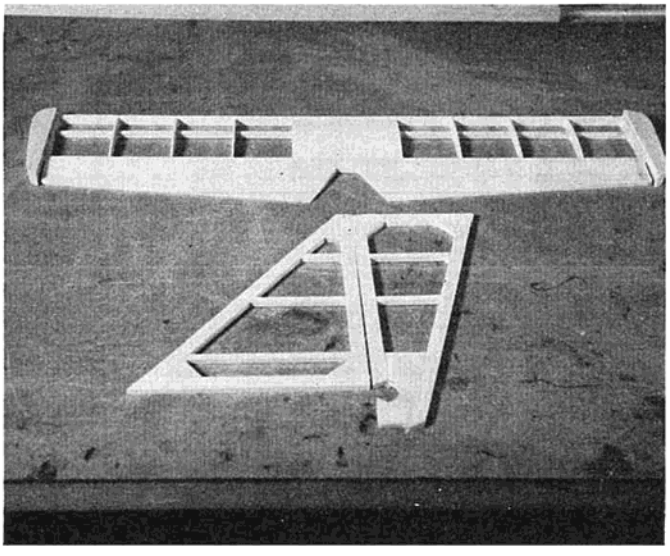
Ribs, spars, L.E. and power pod core.



Front view of finished wing, prior to sanding.



Rear view of wing showing pod and center wing block.



Basic empennage parts prior to final sanding. Sterling Coverite used on entire structure.

straight cut extending to the end of the fuselage. Do not put any triangular balsa along this edge.

Step F-4: Repeat this process for the other half of the fuselage. Let these halves dry while you are laying out the bottom of the fuselage.

Step F-5: Pin pre-shaped section firmly to a level work area. Be careful to place pins approximately 1 inch back from the front and rear of the fuselage or you may not be able to remove these pins later, especially at the rear of the fuselage

Step F-6: Cut one 19 inch strip of triangular balsa. Keep this piece handy as you will use it after the next step is completed.

Step F-7: When the fuselage sides are dry, place the right half of the fuselage on the table and slide firmly against the bottom half of the fuselage and pin in an upright position. Do not attempt to glue these halves together as this will interfere with sanding later.

Step F-8: Place glue down both sides of the 19 inch triangular brace you have cut, and press firmly down against the bottom and side, then pin in place.

Step F-9: Repeat this process for the left half of the fuselage. Use a straight edge to check the body halves and see that they remain vertical.

Step F-10: Glue #3 bulkhead in place, making sure it is flush with the upright cut on the fuselage sides (where the trailing edge of the wing will fit later) and pin in place.

Step F-11: Bend in the fuselage sides up to bulkhead #2 and pin in place.

Step F-12: Cut a 7½ inch triangular strip, glue and press down against bottom and sides, then pin in place.

Step F-13: Do this to both halves.

Step F-14: Bend in the two front sides against the bottom of the fuselage and pin in place.

Step F-15: Pin and glue #1 bulkhead in place.

Step F-16: Cut a 6½" triangular strip, glue and press down against the bottom and sides and pin firmly in position.

Step F-17: Using ⅛" scrap, measure, cut and glue doublers in place along top insides of the fuselage halves between bulkhead #1 and #2.

Step F-18: Use clothspins to hold these doublers in position.

Step F-19: Repeat this process along the top inside edge of fuselage halves between bulkheads #2 and #3.

Step F-20: Use clothespins to hold these in position.

Step F-21: Glue and pin nosepiece in position against bulkhead #1.

Step F-22: Glue and slide #4 bulkhead in place. The exact location of this bulkhead is not critical, simply slide it back until it fits snugly and leave it there. The holes drilled into #3, and #4 bulkheads are sufficient to clear most pushrods. If you have to enlarge them, go ahead, it won't hurt a thing. The hole in #2 bulkhead is to allow your servo wires to be plugged into your receiver.

Step F-23: Remove all pins holding down the triangular strips from #3 bulkhead back to the rear of the fuselage, do not remove pins that are holding down the bottom of the fuselage.

Step F-24: Lay 1/16" sheet strips crossways from bulkhead #3 down past bulkhead #4, stopping at the front of the elevator position. Be sure to place this wood grain crossways as this adds strength to the fuselage. This completes the fuselage construction at this time. Let dry thoroughly (preferably overnight) while you now proceed to the wing construction.

WING CONSTRUCTION

Decide now if you are going to build the wing in one piece or in two halves. The instructions in this booklet are for a two-piece wing. I suggest you have access to both sides of the workbench.

Step W-1: Pin both leading edges down firmly over the wing plans.

Step W-2: Place both bottom trailing edges down and pin in place.

Step W-3: Select one piece of 36" x 2" x 1/16" planking. Glue one edge and place firmly against lower back side of the leading edge. Press down and pin in place. Use enough pins to hold this piece down evenly for the entire length of the planking.

Step W-4: Cut and glue bottom strips in place starting with rib #3 going out the full length of the wing. Should the planking over-lap the hardwood spar, this is okay, simply cut the cap strips to fit.

Step W-5: Using 2" x 1/16" planking, cut sections and lay crossways between ribs #1 and #2, gluing and pinning in place.

Step W-6: Repeat this process for both wing halves.

Step W-7: Cut approximately half way through eight ribs on both sides from where the bottom of the top spar will go to the top of where the bottom spar will be placed. Later the spaces in these eight ribs will be completely cut out to form a tunnel for the dihedral brace.

Step W-8: Place glue on one side of a hardwood 36" x ⅛" 3/16" spar.

Step W-9: Locate the exact position of this spar by using the two end ribs and a center rib as guides.

Step W-10: Tilt in root rib approximately 3/32" to aid in forming the dihedral. This can be sanded to the exact fit later.

Step W-11: Glue and press down ribs and pin in place. Do not attempt to pin through the hardwood spar.

Step W-12: Start gluing every other rib in place in order to hold down and locate this bottom spar while the glue is still wet.

Step W-13: When step W-12 is completed glue and place in the top hardwood spar. Lightly glue this hardwood spar where it fits over ribs #1 through #4. This will enable you to easily remove the spaces when cutting out for the dihedral brace.

Step W-14: Repeat this process on the other half of the wing.

Step W-15: Let this dry for at least 30 minutes (preferably longer), then go to step W-16.

Step W-16: Carefully cut out the four spaces previously cut half way through on the first four ribs of each wing.

Step W-17: Cut and place webbing (this is balsa placed between ribs in a vertical position) between the spaces of the first five ribs on the front side only. Use 2" x 1/16" planking and make sure the grain runs vertically.

Step W-18: Place each piece between the ribs. Shove against the two hardwood spars and glue on the **outside only.** (You don't want to get glue in the wing tunnel or your dihedral brace may not slide in easily.)

Step W-19: Let this dry thoroughly, then test slide in the dihedral brace and check for a smooth fit, trimming and sanding the dihedral brace and the cutout spaces as needed. When you are satisfied the dihedral brace will slide in and out freely you are now ready to place the top planking in position.

Step W-20: At this time remove all pins from the bottom planking as you will be unable to get at these pins when the top planking is in place.

Step W-21: Glue each rib from the leading edge back to the hardwood spar, then glue full length down the top of the hardwood spar.

Step W-22: Glue one edge of a 36" x 2" x 1/16" piece of planking and place in position over ribs sliding forward firmly against the back of the leading edge. Pin thoroughly in position. Don't spare the pins, placing them at least 1 inch apart full length down the leading edge. Press this planking down onto the ribs and against the top hardwood spar.

Step W-23: Use clothespins, placing them close to the ribs, to hold this planking to the hardwood spar.

Step W-24: Taper one edge of the top trailing edge to a fine point by sanding full length down the entire 36" sheet.

Step W-25: Glue full length along the back trailing edge and approximately ½" from the end of each rib back to the rear of the trailing edge.

Step W-26: Place the trailing edge in position making sure the tapered end goes down and to the **rear.**

Step W-27: Pin through the trailing edge into the top of each rib or this trailing edge will curl up from the ribs.

Step W-28: Pin down securely the back edge of the top trailing edge out the full length of the wing.

Step W-29: When the top planking is completely dry, remove clothespins.

Step W-30: Cut four pieces of webbing to fit between the first five ribs. Do not glue them in at this time.

Step W-31: Insert the dihedral brace into the dihedral tunnel.

Step W-32: Glue in the webbing, remembering to glue from the outside only and pin these in place.

Step W-33: **Slowly** remove the dihedral brace. This completely encloses the dihedral tunnel.

Step W-34: If washout in the wing is desired, it should be put in at this time. To do this, shim up the trailing edge ⅛" at the end rib only. The webbing you are going to put in, when glued in place and completely dry, will lock this washout in to the wing.

Step W-35: Starting at rib #5, cut and

(Continued on Page **24***)*

UNDER DAWG

(Continued from Page 18)

13) Install tank and sheet nose top from F4 to F1 with 1/8" sheet.
14) Install stringers for turtle deck. Sheet with 1/16" balsa.
15) Shape and sand.
16) Construct stab and elevators.
17) Construct fin and rudder.
18) Glue fin to stab.
19) Install filler blocks to fair empennage into fuselage and glue assembly to fuselage, checking alignment and decalage carefully.
20) Install pushrods for trial fit before sheeting bottom rear of fuselage (if using Nyrods they must be installed before sheeting.)

Wing:

Note: The original prototype used a built up wing as described in these notes. The second prototype used a foam wing from Foamcrafts, P. O. Box 336, Campbell, Calif. 95008, with performed leading edge, aileron cutouts already made, etc. This is available from Foamcrafts, and if you use this type of wing, follow their construction methods. The following steps are for the built-up version only.

1) Cut 19 ribs from 1/16" balsa.
2) If using Jig, check rib spacing carefully, since the first four bays on each side are 1½" while the rest are 2¼".
3) If not using jig, block up the leading and trailing edges of ribs, with bottom spar in place, over plan.
4) Install leading edge (D1) and top spar; trailing edge sheeting; leading edge sheeting; and cap strips.
5) When dry, remove from plan, turn wing over, then install sheeting and cap stripping.
6) Repeat for other panel
7) Join panels with D1, D2, and D3, checking alignment and dihedral angle.
8) Cut out ailerons from very soft bala. Cut ailerons from very soft ron cores, then sheet both sides with 1/16" balsa.
9) Cut ribs and sheeting away from ailerons.
10) Install linkage and servo mount.
11) Carve tips from soft balsa and hollow out.
12) Cover and finish to suit. Note: This is a small aircraft with a small amount of wing area. Weight is critical, so try to hold finished weight to three pounds. Performance is astonishing if the proper wing loading, decalage, and trim arrangements are maintained.

There's an old saying — "Everybody likes an underdog."

I think you'll find it applies to this Under Dawg, too!

THE SNIPE

(Continued from page 23)

glue webbing, (again making sure the grain runs vertically) to the back side of the two hardwood spars between each rib out the full length of the wing. Glue these on the inside and press firmly against the hardwood spars — top and bottom. After they are in place, they can be held in position by placing a pin crossways through each rib.

Step W-36: Cut and glue and place on top cap strips starting with rib #3. Do this out the full length of the wing.

Step W-37: Using 2" x 1/16" planking, lay crossways between ribs #1 and #2, gluing and pinning in place. Let wings dry thoroughly, preferably overnight, while you now start on the elevator construction. Steps 38 and 39 should be completed after you have let the wings dry overnight.

Step W-38: Your wing tips can now be added after you have sanded off the edges. Simply locate, glue and pin them in place.

Step W-39: Cut and sand to the desired shape.

STABILIZER CONSTRUCTION

Step S-1: Trim 1/16" from the edges — top and bottom — of four ribs to allow for clearance of the planking that will cover top and bottom of the center four stabilizer ribs.

Step S-2: Pin leading edge and center spar in place.

Step S-3: Cut 1/16" sheet planking to fit between the leading edge and spar. Glue and pin in place.

Step S-4: Cut 1/16" sheet planking to fit between spar and trailing edge. (You will put trailing edge down later). Glue and pin in place.

Step S-5: Glue and place the center four ribs in place.

Step S-6: Glue the remaining ribs in place.

Step S-7: Place glue on the back of all ribs and the back edge of the bottom planking that goes from the spar back to the trailing edge.

Step S-8: Firmly slide the trailing edge against those ribs and bottom planking and pin in place.

Step S-9: Glue and pin both stabilizer tips in place.

Step S-10: Carefully remove pins in area between the center four ribs.

Step S-11: Double glue this area completely.

Step S-12: Pin and glue the top planking in place later. Let this dry while you now build the rudder.

RUDDER CONSTRUCTION

Step R-1: Locate the rudder base (the part with a cut-out section in it). Glue some 1/16" scrap balsa planking onto both sides of the rudder base, below the cut-out portion. Your rudder control horn will be bolted through this part later.

Step R-2: Use C-clamps or clothespins to hold these pieces together until they dry. They can be sanded later.

Step R-3: Build the front edge and to of the rudder, using the 3/8" x 3/16" balsa strip, glue and pin in place over plans.

Step R-4: Now build the front edge and top of the rudder, using the 3/8" x 3/16" balsa strip. Glue and place rudder base in position.

Step R-5: Glue the trailing edge of the rudder snugly against the rudder base and the top of the rudder frame.

Step R-6: Using scrap balsa cut and double glue in all fillets in both rudder and fin. (These help prevent warps.)

Step R-7: Cut and glue in the crossbraces, using the 3/16" square strip balsa. Place the braces over the plans. Pin them down, then slightly lift **up** from the plans so they will be half way between the 1/4" x 3/16" balsa already glued around the framework of the rudder and fin.

Step R-8: Let this section dry completely while you now start to sand the fuselage.

HATCH CONSTRUCTION

Step H-1: Sand the hatch cover to blend into the nose block.

Step H-2: Use a wooden toothpick to make a dowel and glue it to the center front, bottom of the hatch on the inside. Let this completely dry.

Step H-3: Test locate the hatch and see where the dowel hole will have to be located into the nose block.

Step H-4: Drill out a small hole for the dowel and you have a lock that will keep the front of the hatch in place.

Step H-5: Drill a small hole (just big enough for the antenna wire to pass through) approximately 1/4" from the back center of the hatch for your antenna to come up through and lead back to the fin. By placing a small rubber band over the antenna wire, pulling down over the hatch and hooking each end under the front wing dowels you have your hatch pulled snugly down in place.

In case of an unscheduled hard landing your wing will slide forward, your hatch will lift up and then you will have suffered only a minimum amount of structural damage.

FIN LOCATION

Step FL-1: Draw a line down the center of the stabilizer from front to rear.

Step FL-2: Locate the fin over this center line and draw a line down each side of the fin.

Step FL-3: Remove the fin and cut out the area between the two outside lines, so that the fin will slide down into this slot.

Step FL-4: Glue and pin the fin into this slot, check with a straight edge to keep the fin vertical and let dry.

Step FL-5: Check to see if the back of fin is flush with the back of the stabilizer.

Step FL-6: After this is dry, position the stabilizer and fin onto the area at the rear of the fuselage. Any space left in front of the stabilizer where you left off with the fuselage planking can now be filled in.

Step FL-7: You will notice that the front of the fin touches the top of the fuselage. Mark this spot and cut out a slot for the front of the fin to slide into. This guide hole will keep the fin straight and locked in place.

The rear of the fuselage, the rear of the stabilizer and the rear of the fin should all be flush. The space left under the fin and in front of the stabilizer should now be filled in with scrap balsa, and sanded to fit.

WING FILLET

Step WF-1: Cut this piece a little over size to allow you to sand to a close fit. Sand the back to fit first.

Step WF-2: Sand the front to fit up against the hatch.

(Continued on Page 25)

(Continued from Page 24)

Step WF-3: If you have cut the proper angle into the front edge of this fillet, you will notice that the bottom will touch the hatch before the tip will, due to the curved shape at this point. Sand slow and easy and this will make a smooth fit.

DOWELS

Step D-1: Locate where the dowels will go. Mark the spot and drill holes just big enough for the dowels to slide through. **Step D-2:** Do not glue them in place. In fact there is no need to glue them in at all. They can be held in place by the dope you will use to paint your glider. By not gluing those dowels in place, your finishing will be made easier when you sand the fuselage sides. If you feel you must glue them in, do so after you've completely finished your paint job.

POWER POD

A simple power pod for a .049 can be added by making a hardwood pylon and locating it between the two wing halves.

FINAL ADJUSTMENTS FOR THE BEGINNING R/C FLYER

1. Check to see that all flying surfaces are aligned and free of warps.

2. Check to see if there are any binding parts, such as a pushrod catching on a bulkhead. The pushrod exit slot should be just big enough for the rods to pass through and not touch when you give maximum left or right on the rudder or full up or down on the elevator. Also check to see that when you give left, that the rudder goes left. The same goes for the elevator. Check to see if the elevator goes up when you give up. Do all this checking while standing at the rear of the glider.

3. When you rubber band the tail surface and the wing onto the fuselage use only as many as you feel absolutely necessary.

4. Make sure your batteries are fully charged. This has cost a lot of misery in the past when people forget to charge them. I charge mine overnight and don't take them off charge until just before leaving for the flying field.

5. Make sure your antenna is pulled out all the way on your transmitter. Also make sure the antenna is stretched out as far as it will go on the glider.

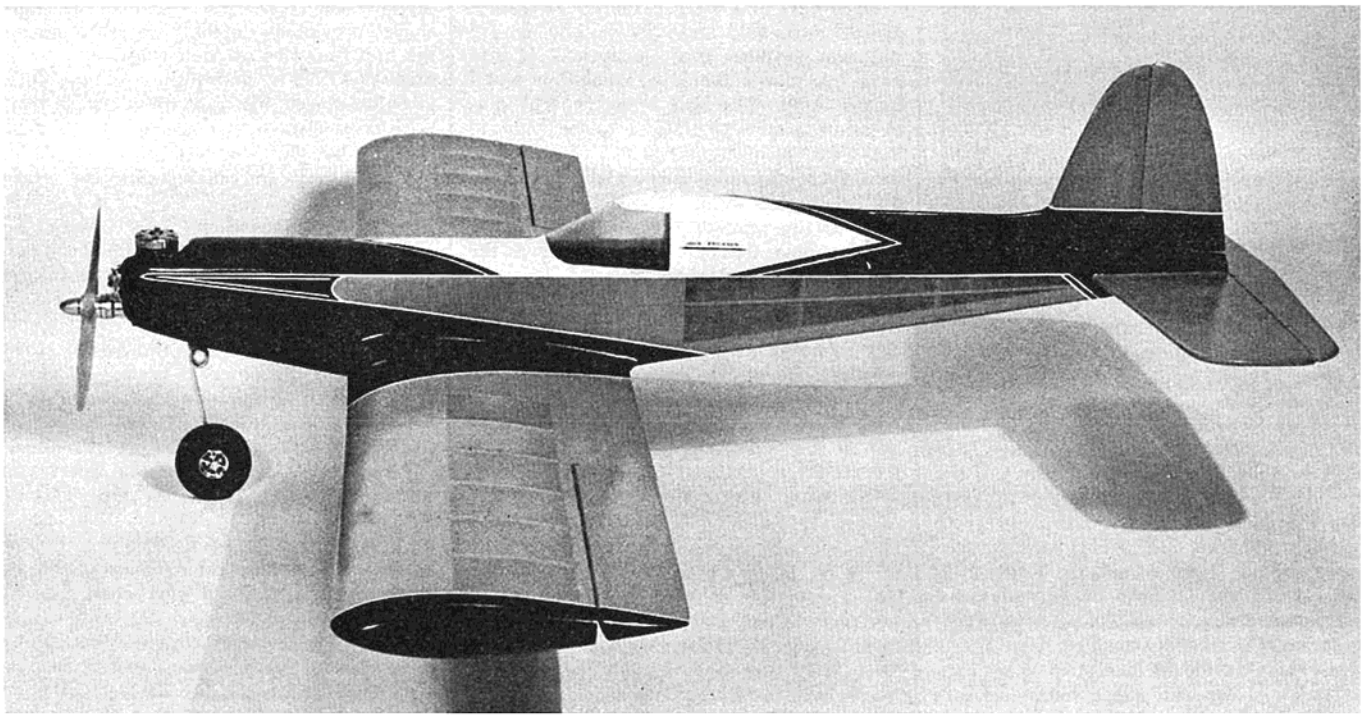
6. Turn the switches on in the glider, and the transmitter. A close friend of mine chased his glider quite a distance and found out he had forgotten to turn the switch on in the transmitter. I have had a number of **free flights** in Germany because of failure to turn on the switch in the glider. Check them both before you launch.

7. Pack the battery and your receiver in plenty of styrofoam and sponge rubber, to prevent damage if you should make a hard landing.

8. Balance the glider where the plans show for the first flight. The glider should balance with the nose just slightly pointing down. You may change the CG location on later flights to suit your type of flying. The CG can and often does change with the wind conditions.

9. Check the weather closely. If you are using a power pod to pull the glider up then you can fly on a calm day. If you use a tow-line, you'll need thermals or a little breeze. If you slope soar you'll need some wind or thermals. If there are birds circling around, get in with them. If the wind is too strong, and I'm primarily talking about your first few flights, don't chance it. Either wait for it to calm down or you will get in trouble.

10. If you're in doubt about any of the above conditions, don't fly. Don't let any one talk you into flying, if the conditions are not right.



PART II: CREATIVE R/C

MODIFYING THE KWIK-FLI II

Second in a series of articles on creative modification. Try these ideas by John Ericksen.

Equipment is new Micro-Avionics 6 channel. Engine is Enya 60. Guy holding the little green box is Ericksen.

WHEN planning to modify a perfectly good airplane kit it's logical to ask, "Why bother?" In the case of the Kwik-Fli, the answer is — it isn't much bother, and it'll look a heck-of-a-lot better. It may even fly a bit better.

Most important, however, is the urge to deviate a little from the run-of-the-mill and be a bit creative. Kraft's design flies as well or better than most (look at the contest record) and to tamper with a proven thing like this is probably folly. But then, if folly ever slowed this crazy sport down, we'd all have given up by now.

Besides, following instructions too close can be disastrous. I once built a Cherokee strictly according to plans and it cured me. I followed instructions to the letter, and just as I suspected, the thing crashed.

Admittedly, it had 217 perfect flights prior to the crash (a dead-stick landing into a fence), but somehow I knew when I was building it, the thing was doomed. If I had just followed my intuition and shortened the landing gear a bit it might have cleared that fence and still be flying today!

Come to think of it, it would still be in perfect shape. A short landing gear on a Cherokee would cause the prop to hit the ground making it impossible to start the engine, much less ever take off.

We designers refer to this as the "Chicken Theory" — everything that doesn't go up, doesn't have to come down."

The theory gets its name from the true inventors of the heavier-than-air flying machine. History lists Wilbur and Orville Wright as the inventors, but true aviation buffs will point out that the Wright brothers actually purchased their machine from the Sunday brothers who constructed and "flew" it many times at Chicken Hawk (a grassy field just South of Kitty Hawk).

None of the flights were ever verified, however, as the brothers always "flew" the machine during the week. They made

many attempts at flight on Sundays when creditable witnesses were available, but were always plagued with difficulties at these times.

On one such week-end, Ralph Sunday, elder brother of John, refused to take off when he discovered John had forgotten to charge the batteries. A week later, John forgot to bring Ralph's goggles to the field. On another day, Ralph fueled the engine with kerosene and another week it was too windy.

So it went.

The brothers carted the machine to Chicken Hawk each Sunday and polished it (it had a beautiful finish) while telling spectators how well it had flown (when no one was around) and why they were unable to test it that particular day.

Finally, the brothers tired of "flying," and sold the machine to Wilbur and Orville. The rest is history.

The Sunday brothers' contribution wasn't entirely lost to the world, however. They later worked with models for a time and passed the art on to their many children and grand-children who in turn can be found most any Sunday practicing all they learned from their ancestors.

But, back to the Kwik-Fli.

As originally designed, it's got everything going for it except looks and (like almost all overpowered multi ships I've seen) a tendency to fishtail at full throttle when going up-wind. (Sometimes called the Kwik-Fli Dance.)

We'll fix the first problem (looks) shortly. The second one (upwind fishtailing) isn't entirely eliminated, but is noticeably reduced.

I've heard much hog-wash about upwind fishtailing being caused by increased airspeed when the aircraft travels against the wind. This just isn't true. Any pilot with an airspeed indicator in his flying machine can demonstrate this very easily. The indicator will read the same going-up-wind as it does going down-wind.

Ground speed changes with the wind, of course, but we are flying in the air (well, most of the time), and the airplane is totally unable to tell whether it's going upwind or down-wind. It flies the same (through the air) either direction. We, as observers, are grounded, however, and see the airplane in relation to the ground.

What I'm driving at is that an airplane that fishtails upwind, also fishtails downwind. We just don't notice it.

For example:

A multi moves through the air at about 60 m.p.h. **airspeed** or 88 feet per second. Now, lets suppose it fishtails two-inches twice a second, or one two-inch deviation every 44 feet **through the air.** On a no-wind day, we don't see any fishtailing. (two inches off course in every 528 inches (44 feet) is a 1-264 ratio — hardly noticeable).

If you're still with me, lets add a 30 m.p.h. wind. The airplane's airspeed is still 60 m.p.h. **through the moving air** (ask your pilot friends), but going upwind the ground speed is cut to 30 m.p.h.

Now we have a two-inch deviation every 22 feet. Remember, the plane is still moving through the air at 60 m.p.h. therefore the deviation rate (timewise) remains the same. Distance-wise, however, deviation is doubled since it takes the plane twice as long to go from point A to point B and the fishtailing can be seen.

This is why we do axial rolls down-wind. Judges can't see the imperfections because of the stretching out (and smoothing out) effect.

The modifications I've made on Kraft's design do seem to cut down on the "dance." Probably because of the "cleaner" fuselage and wing fairings.

At any rate, the best method of getting around the "dance" is never fly up-wind. If you find this difficult, try announcing to the judges when you turn up-wind, "commencing Kwik-Fli Dance . . . now!"

When judges are a little confused by a maneuver, they often give an automatic 2½ points if you announce it with conviction and your helper yells, "Wow, wasn't that great?"

I get a lot of 2½ point scores. I do a lot of confusing maneuvers.

Thoroughly confused by now? You're showing good judgement and can probably understand the modifications easily by looking at the pictures. On the other hand, if you think you understand what I've been talking about, read on. I'll confuse you yet.

CONSTRUCTION

Jensen's kit comes with a well written manual, so what the heck, lets follow it — at least for awhile.

The book says begin with the wing, so we will. I'm a firm believer in their overlapping spar construction, so by all means, use it. After crashing one three times I can testify to its strength.

Only one change is necessary on the wing, but it is an important one. No provision is made on the plans for hinging the ailerons. Since they are built into the wing while still on the construction board, look out. The thing goes together so fast, you can have it finished before thinking about hinges. Modification here is simple.

Add a ¼ x ¼ x 1-inch balsa block inside each aileron at hinge locations. I use three on each aileron and since the wing is built upside down, they must be put in before top (in this case bottom) sheeting is applied.

No provision for hinges is needed in the wing itself. One of the spars handles the job nicely.

Since we have done away with all rubber bands on the modification, it's not a bad idea to completely finish the wing before beginning the fuselage. I Celastic the center section after sanding the framed up wing. Run it out far enough on each side to go past the fuse sides about one inch and you'll have an almost indestructible wing. The wing is very strong without it, but some additional beef is needed to handle the Camlocks at the rear of the wing and the two dowels at the leading edge.

After Celastic is dry, these can be installed. If you have a favorite wing fastener, by all means, use it. I simply drill two ¼ inch holes in the leading edge about one-inch on each side of wing center. Do the same with the front plywood plate in the wing servo cavity and install hardwood dowels. These go through the leading edge and back into the servo compartment where they should be cut off flush with the plywood plate. Extend them out from the leading edge about an inch (they can be shortened later).

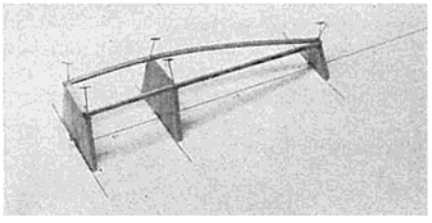
Holes for the camlocks can be drilled (about 5/8th inch in from the trailing edge) now or later. It's probably a good idea to go ahead and completely finish the wing now, so when you mould the wing fairings, they will fit exactly. Several coats of dope applied to the wing after the fairings are moulded can add enough extra thickness to make final wing seating difficult.

While you're waiting for all that wing dope to dry go ahead and begin the fuselage. Get started on the stab, as well. It takes about eight minutes to frame up the stab and no modifications are needed. Don't wait until the last minute, however, since it is a closed structure and should be pinned down on a board for as long as possible to give the sealed off glue a chance to dry.

Basic fuselage framing is an easy one-evening project and no deviation from plans is made prior to shaping that huge top block. One thing to watch for, however, is final alignment of the firewall. I've built three Jansen Kwik-Fli's, and on one of them the firewall had slight up-thrust.

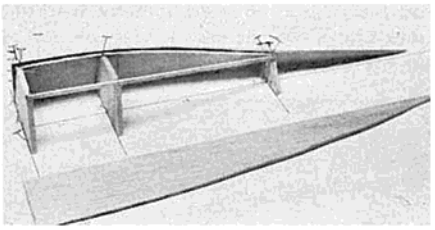
I heard of one other builder with the same problem, so at least check it before all that epoxy in the nose sets up. If you do foul it up, however, don't sweat it. A shim under the engine mount will fix it.

While the fuse is drying, you can build up the cabin. Begin by cutting out the three 3/16th inch thick bulkheads. Mark the center of each with a pencil so you can pin them down along a straight line to make sure it doesn't warp while you're framing it up.



Draw straight line on building board and pin bulkheads (centering them on line) at front, 3 inches and 9½ inches. First two bulkheads are identical. Glue ⅛th square stringers in place. Note that they end at top (not sides) of rear bulkhead.

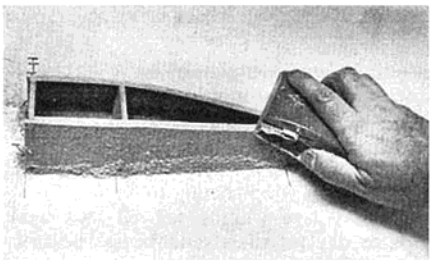
Add the two ⅛th square top stringers and then the rough-cut sides. Sides are made oversize, so don't worry too much



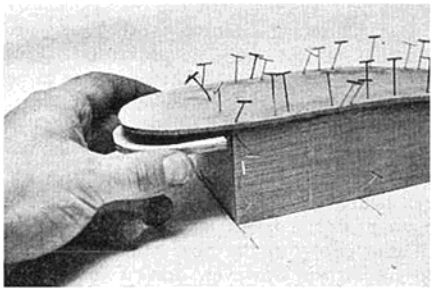
Glue on rough-cut sides. Don't bevel top or bottom now. We'll do it later the easy way.

about preliminary fit. When sides are dry, sand off the top with a sanding block to make a good fit with the top sheet.

This is also made over-size and sanded to shape after it is glued in place. Up to



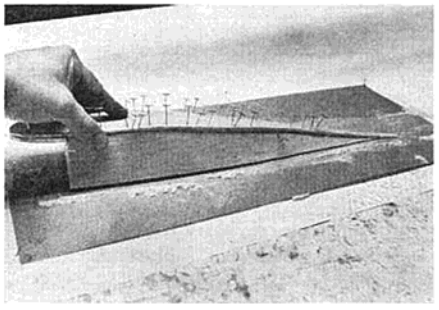
While still pinned to building board, flatten top of sides and stringers with sanding block. Be sure to remove inside pins now.



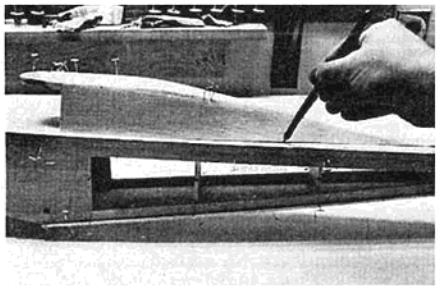
Glue and pin rough-cut top piece, then add 3/16" or 1/4" front doubler.

now, the entire turtle deck is still pinned to the building board. When it dries, remove it. Getting the pins out may be a problem since you've sheeted over some of them, but it can be done with a gentle touch. At least I warned you.

Once off the board, sand the cabin bottom flat by tacking a large sheet of sandpaper to the building board and working the turtle deck back and forth across it.

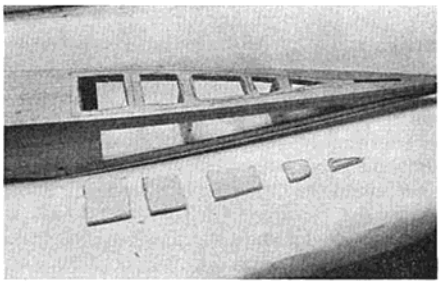


To flatten bottom of structure for good fit with fuse top block, remove from building board and sand bottom by working back-and-forth across large piece of pinned-down sand paper.

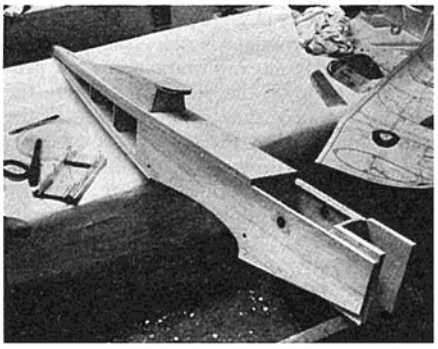


Position rough finished modification on framed-up fuse and mark side locations.

Now that the top deck modification is completed, set it in place on the fuse top block. Mark where edges will be and then cut holes in that part of the block that will be covered by the new top deck. Don't cut the block at any bulkhead locations as this would weaken the entire structure. If you like, save the pieces you've cut out of the top block and compare them with the weight of the new top deck. Although you've increased the bulk of the fuse, it will weigh less. Don't worry, it's still much stronger than needed.

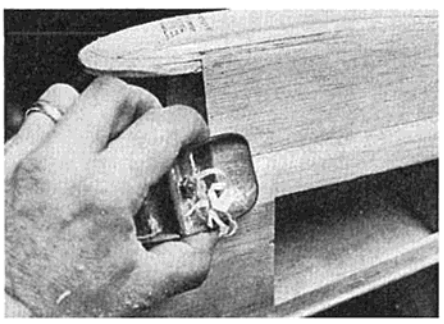


Mark bulkhead locations, then cut out all areas not covered by cabin structure or touched by bulkpads. Removing all this wood from tail section doesn't weaken it where it counts, and sure helps balance the airplane later.

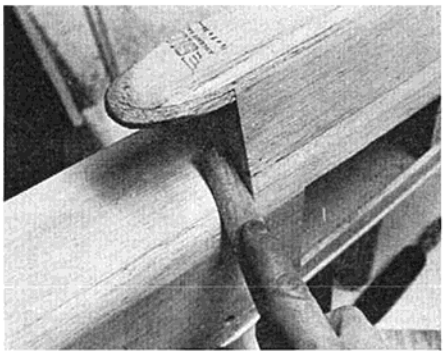


Glue on cabin structure. Don't give up now, it'll look better soon.

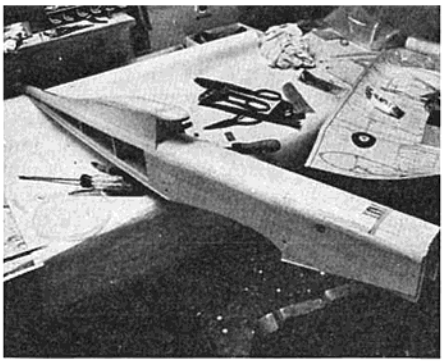
Glue the top deck in place and when dry, begin carving away. A razor plane is hard to beat here. Plane the rear section to conform to the sloping lines of the top deck and round the fuse top from the cockpit forward. Round off edges of the modified top deck back to former "B." From "B" on back, the deck is flat on top and 1/4 inch wide to accept the new dorsal fin.



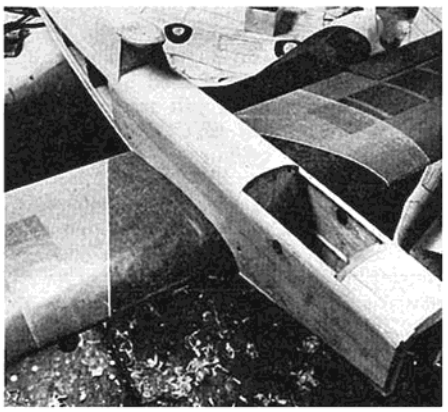
Razor-plane quickly shapes rear area.



Wood rasp or bastard (file) is good for shaping this area.



Beginning to look better? Note 1/8th inch piece of plywood inset into front center of hatch cover.



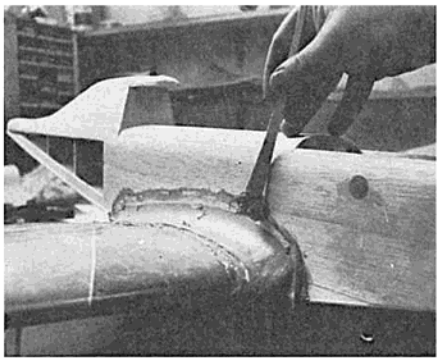
Install wing fasteners (not rubber bands) and mount finished wing to rough-finished fuselage. Be sure to cover wing with Saran Wrap or waxed paper before fitting in place.

Slight trimming of the dorsal supplied with the kit will make it fit the new top deck.

Wing fairings are next and are made entirely from Sig's fabulous new Epoxy-Lite. Tape wax paper or Saran wrap completely around wing center section and Camlock the wing in place.

Mix about four ounces of EpoxyLite and start globbing it on wing and bare fuse in the rough shape of the desired fairings. About this time you'll decide the sticky, gooey mess is impossible to handle. It is if you don't have a small rubber ball or some other circular object ready to do the basic forming for you. I use an old roll of plastic electrical tape. Begin at one end

Mix Sig Epoxolite according to instructions. Wear some old clothes.



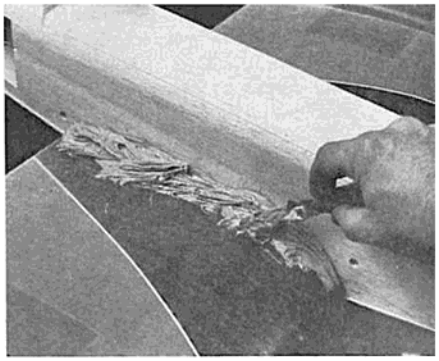
Scrape excess Epoxolite from fuse with scrap balsa. Final fillet forming is done with finger dipped in dope thinner.

of the fairing and pull the ball or tape roll along the wing and fuselage in one uninterrupted motion.

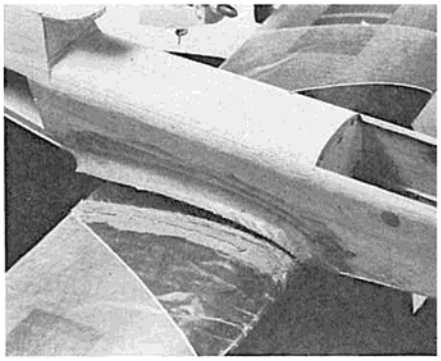
Press hard against the fuselage and wing as you form the fairing with the ball. Don't worry about the excess EpoxyLite that oozes up on the fuselage and out on the wax-papered wing. Just wipe it off before it sets (several hours).

when hard. Even though EpoxyLite is very light, it is amazingly tough and the less sanding you have to do the better.

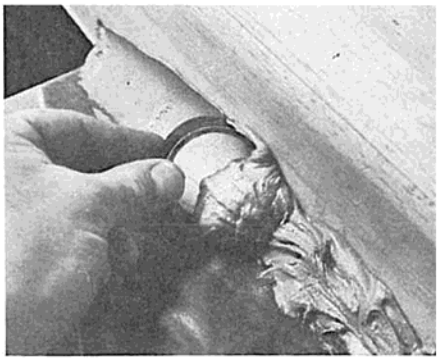
When you think you've got the fairings as close to final shape as is possible, let it set overnight. Next morning, remove the wing — it won't stick because of the wax paper.



Goop the goo in wing fillet area. Do one side at a time.



When Epoxolite dries (overnight), remove wing and presto — instant wing fillets. Well, almost instant.

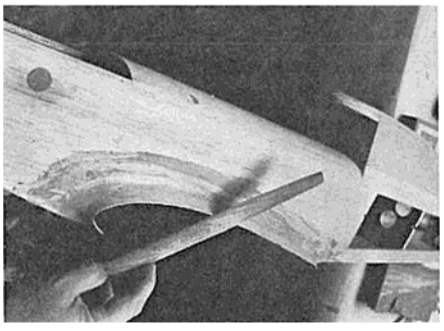


Close-up of shaping the gooey mess. Make basic fillet shape with round object. Old tape roll used here, but a rubber ball would work as well.

Shapes that can't be formed with the ball can be made with your finger if you first dip it in thinner or acetone.

EpoxyLite gets easier to work with the fingers as it begins to set up if you remember to keep the thinner handy. It's best to get the fairings as close to the desired shape and smoothness while forming, but if you goof, the stuff will sand to shape

All that remains now is to get rid of the paper thin outer edge. A couple minutes work with a wood rasp will finish up the edge in a nice straight line, and remove any goofs you made the night before.

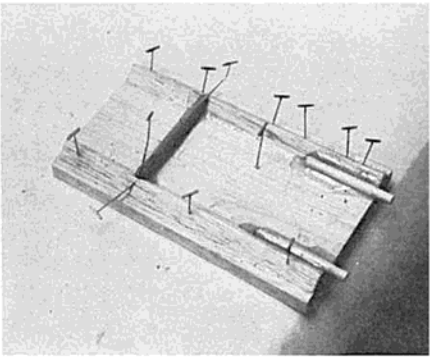


Ragged edges of dry fillet are quickly removed with rasp.

Incidentally, holes are already cut into the kit fuselage sides for wing dowels. If your fairings aren't large enough to cover them, be sure to fill them in with EpoxyLite while you're making the fairings.

Fin and stab can also be faired in with EpoxyLite if you like, but take it easy here. Tail-heavy bombs make awful holes in the runway.

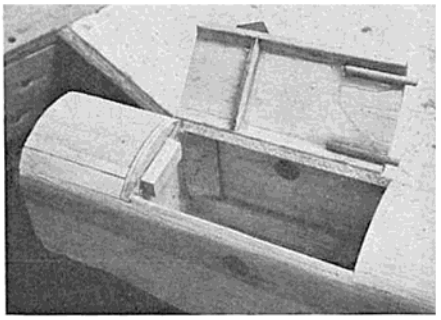
Plans call for the hatch to be rubber banded down. A better-looking (and just as easy) way is to dowel the rear of the cover (⅛th inch dowel is plenty) and secure the front with a 3-48 screw.



Underside of hatch cover shows ⅛ hardwood dowels epoxied in place at rear of hatch and addition of plywood crosspiece to keep cover from spreading if screwed down too tight.

To do this, epoxy a small hardwood block in the center of the firewall so that the top of the block is flush with the bottom of the hatch cover. Drill two holes at the rear of the tank compartment to accept in place, drill a hole through the hatch the hatch dowels. Then, with the hatch and on through the hardwood block beneath. Attach a blind-mounting nut and you're in business.

A 1/16" piece of plywood epoxied into the hatch cover where the screw enters will keep the screw head from damaging the cover.

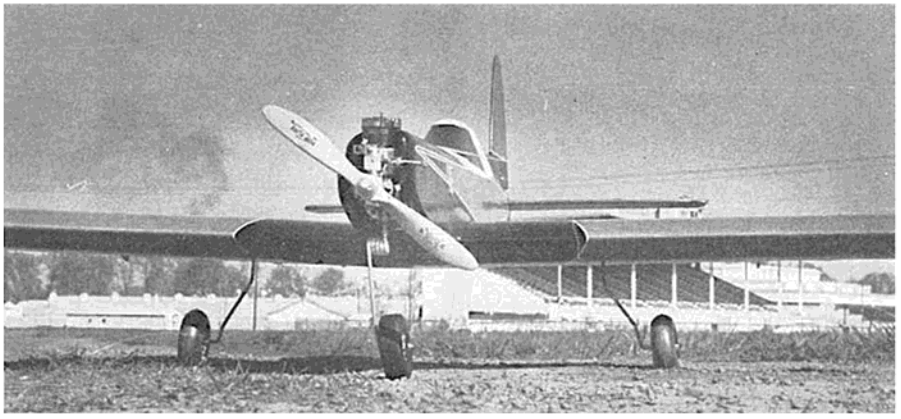


Hardwood block is epoxied to rear of firewall in tank compartment to accept blind mounting nut. Hatch is then held down by dowels at rear and blind-mounted screw in front.

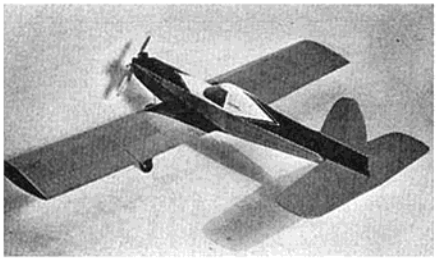
I mounted my Enya 60 upright in two of the planes and it works very well. If you choose this route, use a Tatone steerable mount, but remember to mount it as low as possible. Bottom of the mount should be flush with the bottom of the firewall. Otherwise, fuel draw will be screwed up and the engine will cut out in any high "G" maneuver.

The lower thrust line doesn't change per-

(Continued on Page 30)



Tatone steerable nose gear engine mount used here. Mounting engine much lower to get good fuel draw also lowers thrust line. Seems to make the ship groove even better than original.



Vertical stab area is reduced and rudder area increased on this version. Helps a great deal with wing-over and spins.

KWIK-FLI

(Continued from Page 29)

formance much (if any). I like to think it improves things. At any rate, the planes with the lower thrust line seem to groove like crazy. Also, engine starting is easier.

If you do it this way, though, don't forget to lengthen the nose gear so the prop will clear the ground. Also lengthen the main gear. If you don't relish bending your own, use a Taurus main gear.

FINISHING—Nothing new here except maybe a slick way to attach the windshield. Glue it down in the usual manner and then when it's completely dry, mask it off and apply EpoxyLite around the edges. Feather it out with your finger. Leave the masking tape on until you've finished painting and the result can be beautiful.

A maximum of two extra evenings are required to do all the modifications I've mentioned.

FLYING

Nothing too unusual here, either. The Kwik-Fli is a groovy, hot, contest design capable of every maneuver in the book and the modifications don't change handling much.

Although the airplane has good slow-speed characteristics, there is a limit. A very slight back-pressure on the stick when good ground speed is attained will produce those beautiful, positive "up and away" lift offs we all love. Immelmans on take-off are entirely possible, but let's wait for the second or third flight.

Instructions with the kit explain a rather unusual method of determining proper C.G. location. Basic theory is that the heavier the airplane, the further back the C.G. should be.

This works well as far as inverted flight is concerned. Since a heavier airplane requires more lift (higher angle of attack on the wing), a tail-heavy plane will fly nose-up right-side-up as well as up-side-down.

Here again, however, there are limits. Stalling speed is related to weight (heavy airplanes stall at higher speed) and a tail-heavy airplane tends to stall much easier than one with the C.G. located further forward.

I've found the C.G. locations indicated in the kit work very well (hands off inverted flight) as long as the airplane doesn't weigh more than seven pounds. Above that (my first one was well above that) and things get hairy if you move the C.G. further back to compensate.

The over weight bird would fly beautifully with the C.G. somewhere back by the trailing edge of the wing. This, of course, made it a little difficult to keep the nose gear down on take off, and made it nearly impossible to land. It would snap-roll on any landing approach under about 50 m.p.h. Also, it didn't like to come out of spins. On two occasions I performed beautiful 104 foot spins from 100 feet.

I've read many times that first test flights should be made on a nice, calm day. Pure bunk.

Pick the worst day possible. Hardly anybody will be around to watch. Take offs are a cinch in a high wind if you remember to aim into it. (You've got 30 m.p.h. airspeed before you even start the engine.) Landings in the wind are also easy. Just begin your final from 1,000 feet and bring 'er down helicopter style.

If you crash, get it aimed into the wind before it hits and things won't be damaged nearly as much.

Most important of all, however, is that if the plane is too far out of trim it'll crash on a calm day anyhow, so why not do it in terrible weather?

Then you've got an excuse. Something like, "If the damn wind would ever stop blowing around here, I'd show Weirick a few things."

Following the above instructions carefully, you may end up with a few undamaged parts. Take heart. Save them all and stand by. I'm working on a modification of the modification.

I plan to enlarge the cabin to accommodate a second wing. Instead of just another Biplane, however, mine will feature negative wing stagger.

Think of it! A trike gear, stagger wing bipe. I've even dreamed up a catchy name. "The Stagger-Bi."

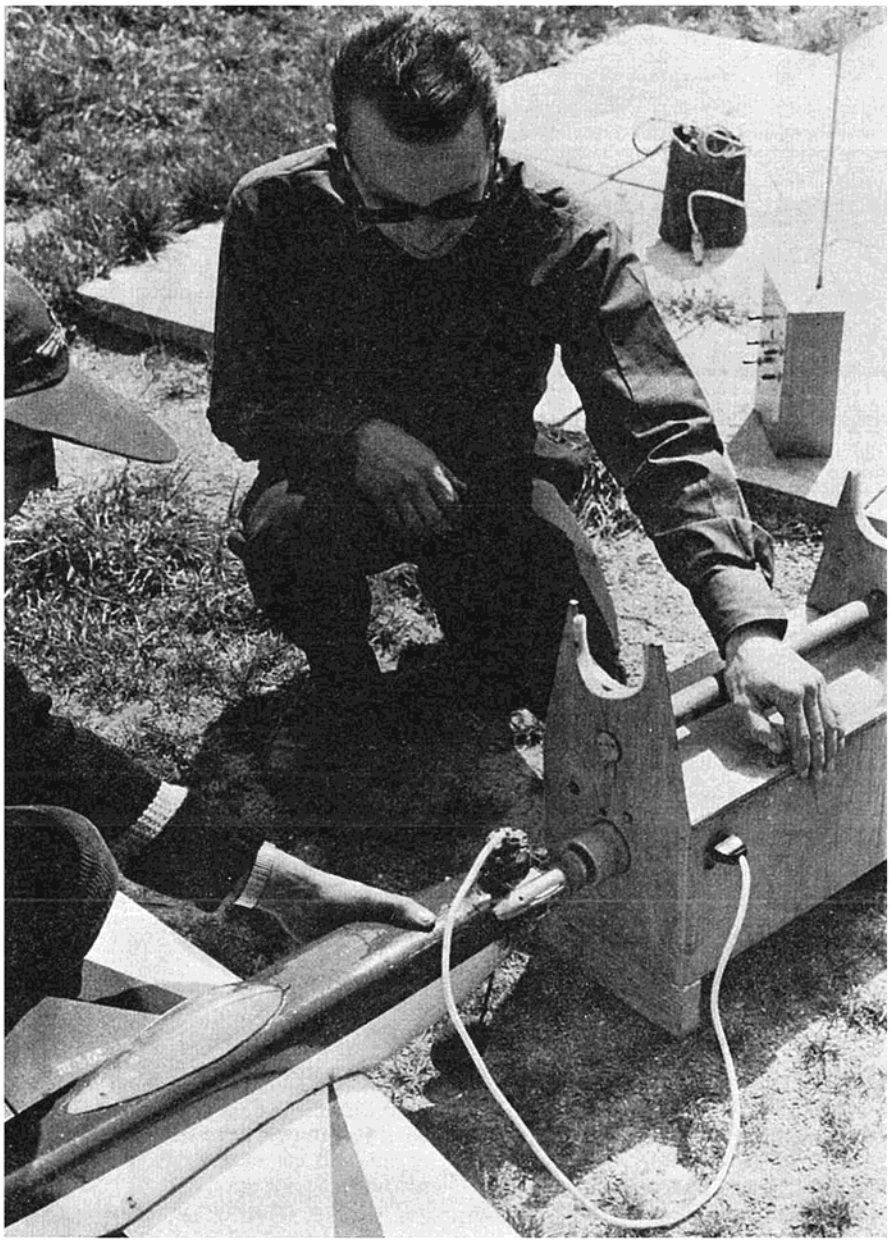
Eat your heart out Phil Kraft.

RC ENGINE STARTER

From Switzerland, an easy-to-build R/C engine starter in fully, or semi, automatic versions.

BY B. HUBER

Bruno Giezendanner and Gerd Huber starting the engine on Bruno's "Pelikan." Semi-automatic version with glow plug power from common battery. Starter mounted in a universal tool box.



WE built our first prototype of an electrical engine starter in the summer of 1964 and it has been in use since that time with very good success. The main reason for designing and building this fully automatic monster was to be able to fly alone, with no one to hold the model during the engine starting process. Of course it is possible to start the engine quite alone, but you always run the risk of getting bloody fingers in the whirling propeller. So we tried to make a starter which would kick on the engine by itself, thus enabling the pilot to hold the model without assistance.

The electrical engine starter has many advantages:

1. The engine starts instantly if everythink is o.k. No special "kick" is necessary.
2. The engine starts in a very short time, with little concern for the amount of fuel in the cylinder.
3. The engine starts whether it is hot or cold.
4. One starter is enough for a flying site with about 15 or 20 guys.

So we see, that the starter spares you a lot of time, many angry words, and (probably!?) some bloody fingers. Because the financial outlay is not large (the material for the starter costs very little), and because the amount of work is very moderate, we think that it would be to your advantage to build this gimmick, like some 100 guys here in Switzerland and in Germany have done.

Let's first discuss the principle of our fully automatic engine starter. The heart of the whole machine is a used electrical car-engine starter, which we can obtain from an old car. We use a 6 volt type for our mobile starter, where the batteries are in the same box. A 12 V model may be taken, if you have a small 12 V battery, or if you prefer to take the power from your car batteries by a cable.

This DC motor is screwed into a wooden box in a way that the axle is approximately on the same level as the spinner on the engine of your model. An aluminum cylinder (4) is fixed on the axle of the motor, and a rubber muffle (5) is pressed into a hole of this cylinder. On the back plate of the motor, a lever with a spring (3) is fixed in such a manner that it presses the axle over the bill (2) against the engine spinner.

If we press the model against the starter, the axle of the motor moves backwards and the lever pushes on the micro-switch (1) which closes the current path and makes the motor begin to turn. We see, that the starter can only move, if the engine is properly coupled. If the engine has started we pull the model back, the spring pushes the axle forward, and the contact is opened, which stops the starter immediately. Some modelers have built a semi-automatic starter, because they used a manual switch to energize the starter. In this case, the switching mechanism is omitted, which simplifies the whole problem.

We built two models of the fully automatic starters, one for 12 V, powered by the car battery, and another one for 6 V with a separate battery box and a 6 V car battery. If power is taken from the car, we must think about the votlage drop in the cables. Since the 12 V starter takes

about 20 A continuous, the cables must not be too long and must have a considerable copper surface. If you take a normal electrical cable, the motor will not even turn, while the cable, on the other hand, is getting hot. Because a car battery is heavy and its capacity is 5 times too big, we decided to install rechargeable nickel cadmiums with about 30 A/h in the starter box of our mobile starter. We use five elements (1.2 V each) which are relatively small and could be easily placed in the main box under the motor. (The power for the glow plug can also be taken from these batteries.) This box is heavy enough to not be pushed away when the model is pressed against it for starting. The capacity of the batteries is enough to start an engine over 100 times before being recharged.

Building the Engine Starter

Building the starter is very easy. You first must get a starter motor of a car (or better yet, one from a scooter, since the latter are a lot smaller and are still strong enough) for 6 or 12 V DC as desired. We first check the motor, to see if there is a built-in brake, and if it turns in the correct direction. The brake must be omitted and the axle must turn free (since it would take too much power in the other case and because it would prevent the starter from functioning correctly). Most starter motors turn in the correct direction. If not, it would be necessary to change the two main static windings, which is a 15 minute task for a good modeler.

Now drill a hole in the center of the backplate of the motor, so that we can put the ball bearing bill on the center bore of the axle. (See picture!) This bill should have a diameter of about ¼".

We now bend the lever and the two supports from a piece of flat steel and screw them to the motor. The spring and the switch may now be mounted. The spring is adjusted, so that 2 or 3 pounds pressure will push the axle back. Check to see if the axial distortion of the motor axle is long enough to switch properly. If not, the switch must be mounted at the most outward section of the lever.

The cylinder (4) is turned out of an aluminum block. The backward bore has a diameter, so that the cylinder must be pressed on the axle (but it may also be fixed with a worm screw). The larger bore is made so that the rubber muffle (5) must be pressed into it, without using a further fixing method.

The cables are now connected to the motor and the switch and batteries, and the whole thing screwed into a solid wooden box, as shown in the photographs. The switch we use is a Burgess-Microswitch Type K5, which switches a guaranteed maximum current of 25 A. We know, that the peak currents may reach 50 to 60 A in our cases, but this switch has proved to suit ideally for our purposes, because only one of about 50 switches have failed in 3 years.

The rubber muffle is another problem. We found a rubber muffle that is used to protect electrical connectors and cables, a piece that could be easily trimmed to our dimensions.

Use only solid spinners for your engines, such as Veco's aluminum spinners or the nylon types of Top Flite, because plastic

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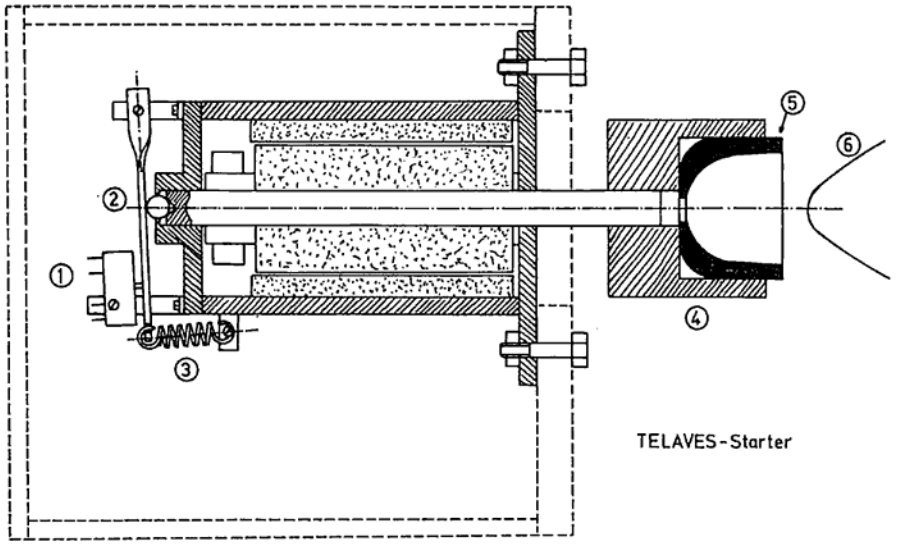
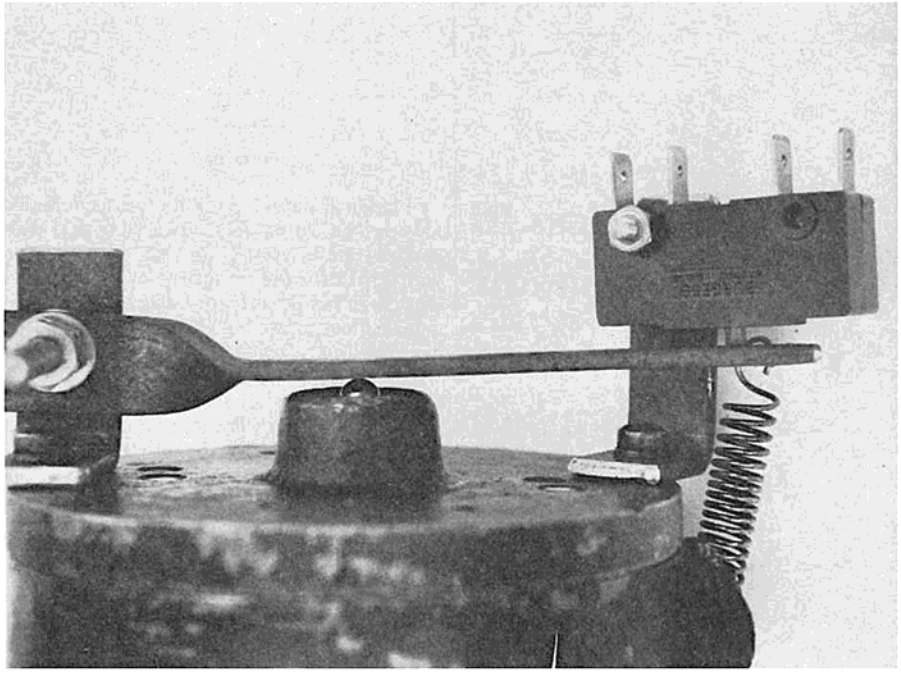
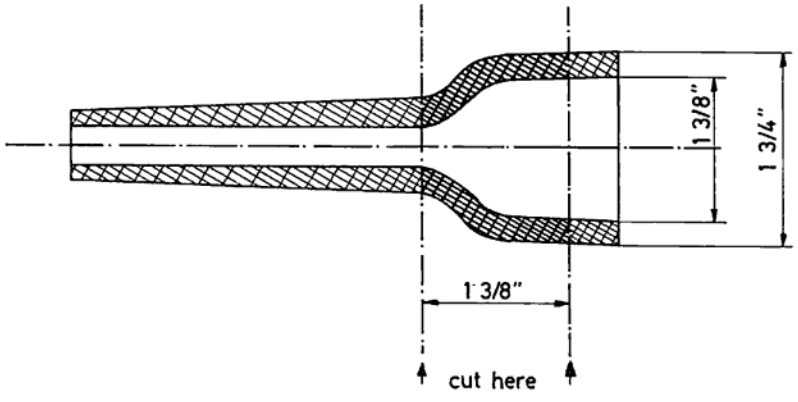


Fig. 1: Engine starter principle. (1) Burgess Microswitch Type K5; (2) Ball bearing bill for frictionless push transmission from the axle to the lever; (3) spring; (4) aluminum cylinder; (5) rubber muffle pressed into the cylinder; (6) spinner on R/C aircraft engine.



Above: Rear portion of the starter motor. Note ball bearing bill that lays in the centering hole of the axle and presses against the lever. Below: The rubber muffle is cut out of an electrical connector protective sleeve.



PRECISION PATTERN AIRCRAFT DESIGN

part X

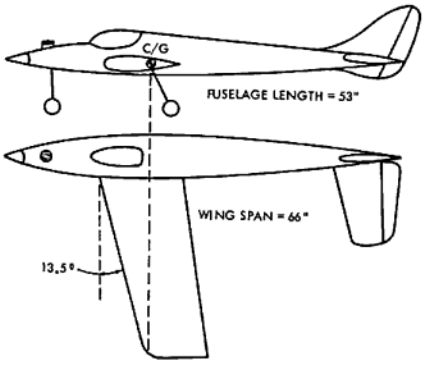
A study in Class III Aerodynamics by

BEN HERMAN
JACK CAPEHART

DESIGN CONFIGURATIONS

THIS month we'd like to present some of the various designs which we have been experimenting with, and give some of the reasons underlying the designs. First we'd like to present the "La Paloma" (French for dove) design and two later revisions which incorporated various modifications.

Basically, the one factor which sets this design apart from the current run of the mill Class III planes is the high degree of symmetry so that it is nearly the same aerodynamically, when upright or inverted. At this point, we must note that true symmetry is almost impossible due to structural and equipment installation considerations. It is possible that now, with the introduction of smaller radio gear, a higher degree of symmetry may be possible.



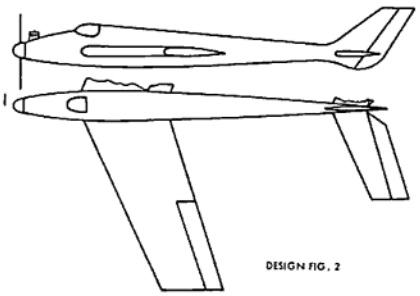
DESIGN FIG. 1

Design Figure 1 gives the profiles of this design (La Paloma I). The wing and stab airfoils were 65018 for the root section and 65012 for the tip section as used by Hal deBolt in his interceptor design. Each wing panel incorporated 13.5° sweepback with no dihedral. Incidentally, pictures of this design were presented in the early installments of this series, although subsequent to those photos more fin area was found to be necessary. You will note that the thrust, wing, and stab are zeroed out. Furthermore, the wing and stab are located as close to the thrust line as was possible and yet have ample installation room above the wing. Also, as much fin area below the thrust line as was possible was also incorporated, for reasons discussed earlier in this series. You may also note that the fin area is somewhat larger than is customary (although we note that large fins are becoming more common currently). As noted above, the original fin was somewhat smaller, but the area was increased to that shown in the drawings which gave much truer tracking through the looping maneuvers. There is, of course, a point of no return on fin size. If they get too large, weathervaning on the ground with a crosswind becomes a problem, and also spiral instability may result. However, the fin used on the La Paloma evidently had not reached this critical size as it presented none of the above problems. Also, the presence of the sub-fin and the relatively large amount of lateral fuselage area above the thrust line and in front of the CG help counteract left yawing tendencies due to prop wash effects. In fact, only 1° of right thrust was required in this design (we would have liked to have none). The design used strip ailerons, contrary to theory, for the sake of simplicity in construction. Although they were perfectly satisfactory, theoretically, conventional ailerons would be even better, particularly in the rolls, as per our previous discussions.

How about the flying characteristics? It is generally agreed by all who saw this design fly that the rolls were far superior to anything else we have seen. This superior rolling ability really caused the plane to shine in such maneuvers as the Immelman, Cuban eight, and rolling eight. As you all know, these maneuvers are relatively easy to perform from the pilot's point of view, most of the difficulties arising due to deficiencies of the aircraft. For example, there is no maneuver easier to perform than the Immelman turn, but if the plane wants to drop its nose and lose heading during the rollout on top, there is very little we can do about it. So far as we were able to determine, there were no observable defects in this maneuver with the "La Paloma." The Cuban eights and rolling eights were likewise superior due, again, to the unusual rolling ability of this design.

A very similar design, with the exception that the wing was located in the conventional position at the bottom of the fuselage, and possessing 15° total sweepback instead of the 27° used in the original was built by Bob Angus. We feel that, although Bob's plane was an excellent pattern aircraft in all respects, the roll performance was not quite up to the original La Paloma. Not that the rolls were bad, however, as those who had not seen the original (before it joined the "down elevator" club) thought that Bob's effort was the best rolling job they had ever seen, and we should point out, we have some good El Gringo's, Kwik-Fli's, etc., in town. We might add that Bob, one of Jerry Kleinberg's Class I Cavaliers (Bob will never live that down), recently took 3rd place at the TRCC 3rd Annual Cactus Festival in Class III novice with this design. This was Bob's first attempt at Class III competition (end of commercial).

As we have pointed out, the La Paloma incorporated a total of 27° sweepback. This is a point where the two authors of this series disagree. Ben feels that the 27° was completely adequate, while Jack feels that more sweepback would be highly desirable primarily because of the added stability and smaller moment of inertia about the roll axis. Ben feels that the 27° sweepback in the La Paloma was adequate and the rolls certainly left little to be desired. Additional sweep, he feels, due to the exceptionally long tail moment required for proper balance makes the design rather cumbersome (it's hard to get in your car trunk). Nevertheless, Jack's arguments persuaded another local flier, Walt Schultz, to try his ideas out. Walt went the whole route with a true 50° sweep, no dihedral, mid-wing design which



DESIGN FIG. 2

(Continued on Page 34)

(Continued from Page 33)

he called the Swift-wing. A picture of this design appeared in a recent issue of RCM. The design, in profile, is shown in Design Fig. 2, ⅛ scale.

This plane featured an original Walt Schultz "shoe sole" 16% symmetrical air foil, with an Enya 60 up front, and a Cletus Brow retractable gear. This design had similar flying characteristics to the La Paloma. The additional sweep seemed to keep the nose up better in a tightly banked turn but more important, it really outperformed the original in landings. Once this plane was lined up on final, you could go to sleep and forget about it. This plane (and all of our other swept-wing designs) exhibited absolutely no tip-stalling or snap rolling characteristics, but, mind you, we were always very careful to enter into the final with a banked turn rather than a flat turn. Flat turn them and you are on your own, as we have said before.

While on the subject of landing characteristics, we had some correspondence from Mr. H. McCrae who hails from Shrewsbury, England. Mac says that he has tried several designs with varying degrees of sweep, and confirms our statements about their landing characteristics. We have included a couple of photos of his designs. Thanks for the note and photos, Mac. Instead of answering your letter personally, we thought we'd acknowledge it in the column with your photos.

The finale to the La Paloma project has not yet been reached. We are currently drawing up plans for yet a third version which will incorporate most of the original features, except that it will have a 15% tapered wing, and will be considerably reduced in size. Three versions of this, with varying degrees of sweep will be built, and if der fuhrer likes it (that is, buys it) we'll try and present full size drawings.

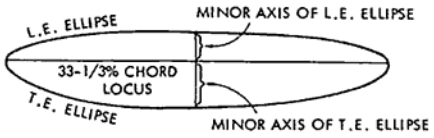
We have also been playing with more conventional designs (we're flying Lanier's while we build them, and we're planning a report on these in the near future). One of these, called El Sapito ("Little Toad" for you Gringo's out there), features conventional configuration with the exception of an airfoiled fuselage (both from the side and from the top), airfoiled tip plates, and a triple vertical fin. Madness you say? Maybe so, but here are the reasons: The airfoiled fuselage is an attempt to get "cheap" streamlining, while at the same time, will increase knife-edge performance. The airfoiled tip-plates likewise serve two purposes. The wing is somewhat shorter (58") in span than usual, the tip plates increasing its efficiency by effectively increasing the aspect ratio. The shorter wing is employed to reduce drag, weight, and roll damping, and it also fits better in the trunk of the average car. The other purpose of the airfoiled tip plates is again to provide precious lift for knife-edge flight. The triple rudder is being employed as a reducer of prop wash effects. It enables one to reduce the vertical area of the central fin, allowing us to have equal area above and below the thrust line as is also true of the tip fins. This symmetrical distribution of fin area should eliminate adverse prop wash effects on the vertical surface. The culmination of this report,

Left: Keskasey (Que'ce que c'est, French for "what is it") — Mac reports this model had 24° sweepback, gave fine knife-edge flight, stall turns without a wiggle, and hands-off tail slides. Model had sub-fin, hard to slow down in landings though. Right: No. 2 version of the Keskasey — even better than No. 1, no trouble with tip stalls, but too heavy to do a good top hat.

namely; the flight evaluation is as follows: We have not yet completed construction! It is shown in profile in design fig. 3.

One further factor that we are experimenting with is the elliptical wing planform. We are in the process of designing a plane, standard in most respects, with the exception of our elliptical wing. We are using a so-called ⅓-⅔ elliptical planform, a la

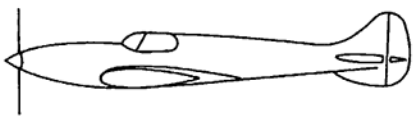
DESIGN FIG. 3



DESIGN FIG. 4

Spitfire. What this means is that the minor axis of the leading edge ellipse is ½ the minor axis of the trailing edge ellipse. This setup has the advantage of making the focus of the 33⅓% chord (the approximate center of pressure) a straight line, as shown in Design Fig. 4.

The planform view is shown in Fig. 5.



DESIGN FIG. 5

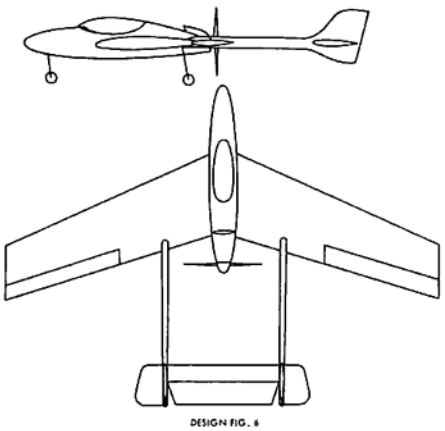
With a little imagination, you might almost stretch it into a semi-scale Spitfire, which really is our intent. Obviously, no human being (nothing is implied here) could ever build all of these designs, so we were happy to accept the offer of Joe Bradley, from Tulsa, Oklahoma to help in the development of the design and the building of the prototype. The design will incorporate all possible means to reduce drag, including retracting gear. The elliptical wing, of course, gives a great drag advantage and yet minimizes tip-stalling characteristics associated with some tapered wings.

Finally, to close this far out series, we'll present a real far out design, which we haven't built, nor even drawn up. However, if one of you modelers have more guts than we do, and would like to try it, we're all for it and would like to hear of the results. This design is a nameless wonder, so far. Basically, it is a mid-swept-wing pusher design. Don't flip yet. Let's think about this a moment. By using a pusher type engine coupled with a swept wing, it is possible to have the engine, as well as the radio equipment, very near the CG. Without going back to our formulas, what this accomplishes is to produce smaller moments of inertia about the pitch and yaw axes. The sweepback, of course, makes it possible to have the engine placement very near the CG, as well as providing a smaller moment of inertia about the roll axis. Smaller moments of inertia, of course, provide for more maneuverability with the same surface deflection. Therefore, theoretically, at least, less surface deflection (and therefore less drag) is required to give the same maneuverability as our current designs. However, the real advantage, we feel, would be for the proposed Class III pattern for 1968. Consider those square vertical eights, top hat, the eight point roll, and the half inside loop followed by a 1½ snap roll. All of these maneuvers require extremely rapid control response, and equally as rapid stopping after the surface is neutralized. The only way these can be accomplished, at all approaching the ideal, is with small moments of inertia, much smaller than our current designs. Another advantage of small moments of inertia are that stabilizing forces would be more effective. Thus, we can have our cake and eat it too. Here we have more maneuverability and more stability too. Finally, we may point out, in common with all pusher designs, the wing is operating in clean air. Design Fig. 6 shows a sketch.

(Continued on Page 35)

R/C AERODYNAMICS

(Continued from Page 34)



DESIGN FIG. 6

Admittedly this design is a bit wild, but it is a possibility. Obviously, there would be control surface linkage problems, but the new nylon-in-nylon pushrods would probably be practical here.

This brings us to the end of this series on aerodynamics. We're sorry we haven't answered all of the mail we have received, but we're working on it. If you haven't yet received an answer, don't despair; we'll either answer it in the near future by personal reply, or through the medium of our forthcoming series. Evidently Don doesn't read his own magazine and therefore has invited us to continue writing on subjects pertaining to Class III, or is it Class C flying. In this series, we hope to discuss the new pattern and the possible changes in current designs, or new designs that may be required. We will also report on our observations on some of the new breed of ARF planes, as well as any new design approaches. Along this latter line, we'd like to hear from any interested readers on your design and/or flying ideas. If you have any new approaches, for example, on performing any of the pattern maneuvers, please let us know. We'd also be interested to hear of any suggestions you may have concerning topics you would like to see covered in this series. This new series will be titled "C" Views, and as the name implies, will be primarily restricted to the new Class C category.

Hampi Senn has started his engine. Semi-automatic version uses switch on top of box to start the unit.

R/C STARTER

(Continued from Page 32)

spinners will be destroyed in a short time by this starting method. There are a lot of possibilities for installing the starter, either in a separate box together with the fuel pump, or in a "deluxe" tool box.

Starting Technique

The model is simply pressed against the starter, after the glow plug has been connected to its power source. The fuel is thrown into the engine by simply choking the air-intake with your fingertip. If the engine has too much fuel, big drops of it will be thrown out of the exhaust. If the needle valve setting is correct, the engine will start after the surplus fuel is discharged from the cylinder. This starting method is ideally suited for engines with mufflers.

We hope that your experiences with the fully automatic engine starter will be as good as ours.

NMPRA demo at Texas National Air Races. L to R: Ray Downs; Susan Logan, Miss Texas 1966; Jerry Nelson; Granger Williams.

NATIONAL MINIATURE PYLON RACING ASSOCIATION

N.M.P.R.A.

613 DONNER • LAS VEGAS, NEVADA 89107

THE National Air Races blew into Texas for the first time, and before the three-day event was over, we were treated to a mid-air disintegration of a midget racer, a Tornado watch, a hail storm, a sky diver with a broken leg, and some tremendous racing and flying.

The site for the races was Luck Field, just south of Fort Worth, and as the name implies, it took a lot of luck and some very skillful piloting to keep the Races as accident-free as they were. Luck Field is a small airport with one very narrow runway. Grass on either side of the runway was scraped off to give the pilots a takeoff way for six racers simultaneously. To say that takeoffs were a bit nerve-wracking is an understatement! Before the races were over they had stretched out to two weeks due to a rain washed-out final day, but nonetheless, it was a thrilling time for those of us who had never watched the racers fly.

All of the big names in Air sport were there, along with some pretty big names in the model world. The Air Race sponsors arranged to have a group of NMPRA pilots brought in from California to put on a demonstration R/C race, and the crowd loved it! Cliff Weirick, Jerry Nelson, Granger Williams, Gil Horstman, Joe Bridi, and Ray Downs made the trip from Los Angeles to Fort Worth for the show and Cliff did the piloting in a rented Aero Commander. Watching them unload six guys, seven Goodyear racers, and assorted bags, baggage, fuel, batteries and such was quite a show in itself!

For the flying demonstrations on the postponed days the Fort Worth Thunderbirds took over and flew aerobatic demonstrations, with Gale Helms, Edd Alexander, Ed Rankin, Helmer Johnson, Dan Carey, and Chuck Cunningham doing the flying while Bob Lutker handled the microphone.

Heart-stopping display of aerobatics were flown by Hal Krier in his Chipmunk, and Charlie Hillard in his Krier Kraft. During the show Cliff Weirick conferred at great length with Hal Krier on the merits of Cliff's little Chipmunk as related to Hal's big one. It was too bad that luggage space prevented Cliff from bringing the small one along.

The biggest thrill of the race had to be watching Bill Falck and his Rivets take the lead away from Steve Wittman and his Bonzo with half a lap to go to come home a winner in the feature race.

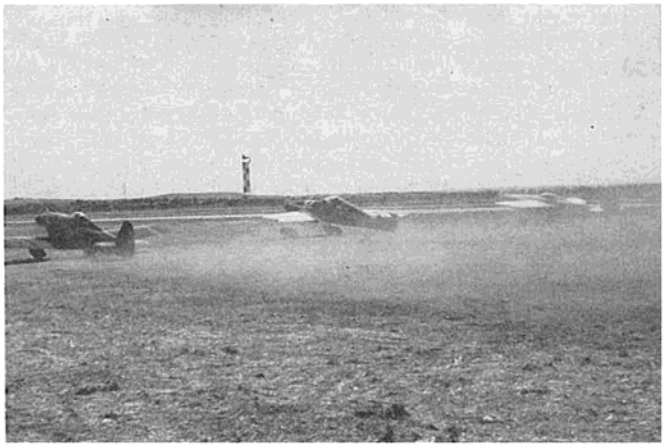
Two days before the races started one of the pilots was qualifying his racer at six thousand feet, and had just gone into a vertical dive to show performance at a 6G pull out. Suddenly the wings started to flutter and then off came one wing. He scrambled out of the craft as it went spinning through the air, yanked his chute and came down safely to earth only to be caught in the thirty mph surface wind and dragged about a mile. The ship was just a few small pieces when it was found. Two weeks later the pilot was back in the air flying a sport biplane in the finals for this class. The clincher is that this pilot, "Lucky" Jones, was one of the two pilots that survived the mid-air collision at the Washington, D. C., Air Races last year!

It was a great experience for racing fans and gave a large number of people an exposure to the excitement of R/C flying as well as that offered by the full-scale machines.

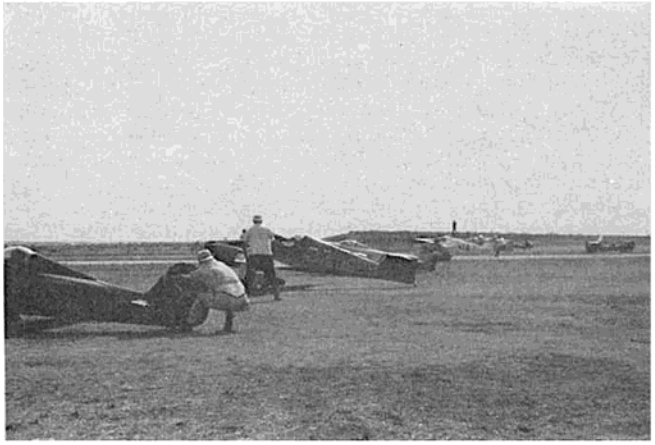
♦ ♦ ♦

Jerry Nelson, Chairman of the R/C Contest Board, sent out the proposal that NMPRA's 1967 rules be accepted as official, with the stipulation that the NMPRA come up with means of controlling maximum speed before they would go into effect. Ed Shipe asked Jerry to submit a counter proposal that the rules would be accepted as official for 1968 with the

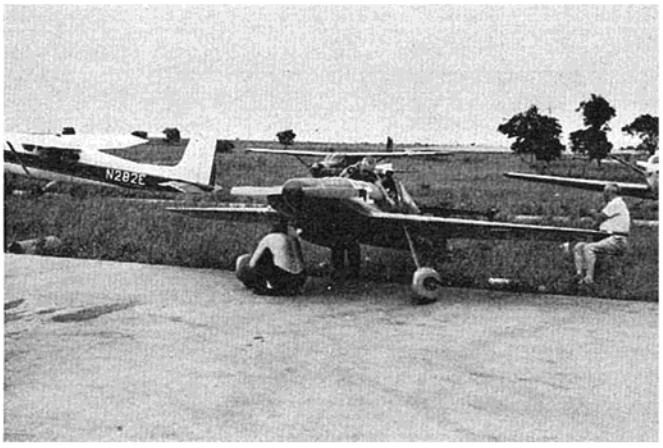
Formula I racers waiting for the starters flag in the Championship heat.



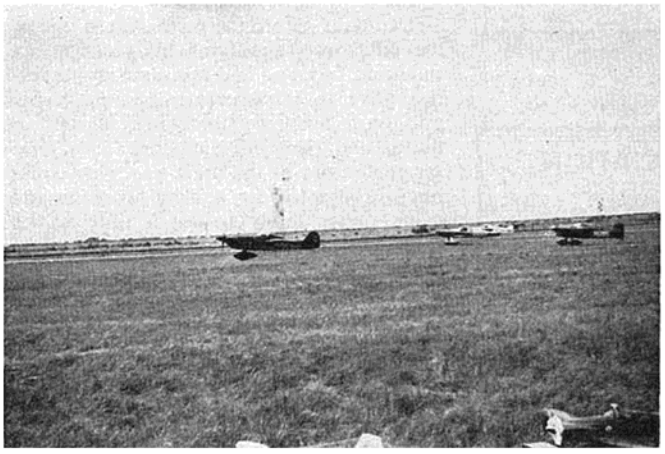
They're off! Denight Special, Rivets, and Shoestring in foreground.



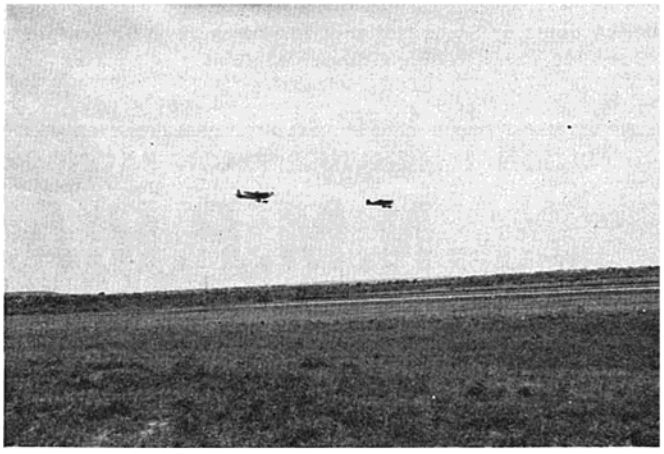
Top level discussions! L to R: Gil Horstman; Cliff Weirick; crewman for Hal Krier; Johnny Clemmons; Hal Krier.



Rivets getting tender loving care at edge of strip.



Denight Special leads the pack into the air. NMPRA racers in foreground.



Shoestring and Denight Special neck and neck. Note altitude!

understanding that the organization would work out an answer to the situation in time for proper action of the Contest Board for 1969 rule changes. The counter proposal was submitted to the Board for action. According to the AMA monthly mailing #10, November 1967, the 1967 NMPRA pylon racing rules are official for AMA in 1968 (450 square inch class). The 600 square inch class, which was provisional for 1967, has been dropped completely for 1968.

●

On the contest scene, Bill Anderson of Houston, Texas won first place at the Western U. S. Championship Contest, held on August 5-6 at Salt Lake City, Utah, and left that city nearly $600 richer! Total prizes in that contest were over $1,000. Contest coordinators are already at work in planning the 1968 Western U. S. Championships, and if the jackpot of prizes and the spectator crowd they drew in 1967 are any indication of a turning point in Goodyear racing, it is safe to say that the coming event will be one of the largest of its kind in the world.

In the New England Championships, held at Orange, Massachusetts on August 12-13, Hal deBolt topped the entries with his deBolt Mustang. Jerry Wagner was 2nd with a Denight Special, edging out A. Sattler and his Shoestring from Nelson plans.

At Tulsa, Oklahoma, eleven entries vied for prizes on August 13th, with Dale Nutter and a 450 square inch Jenny taking first honors. A team entry of Gant-Atkinson eased into the second slot with a Mustang Special. Third place went to McCoy with a deBolt.

In Decatur, Alabama, Nick Neville topped a field of eight entries, flying his K&B powered Miller Special to a first place win. Hal deBolt was second with his Special, while Ron Chidgey took the third position with another deBolt Special. Times for the first three places were 1:50, 1:50.5, and 2:00 respectively. This is a real active group with a rapid buildup of interest in Goodyear.

The West Coast Championships, held at Madera, California on September 2-4 saw the Goodyear event being flown on Monday with an overcast and a slight breeze keeping the temperature down. The planes were judged for appearance points when entered and qualification flights were made by those with new planes and contestants who hadn't flown the event before. There were 15 entries and five rounds of three plane heats were flown. The winners of each heat were timed for the purpose of breaking ties. The finals results saw Nat's Champion Joe Foster and his Rivets in first place with 15 heat points and a best heat time of 1:15.8. Joe Bridi was second with his Mustang and 15 points and a BHT of 2:08.0. In third position was Bob Snyder, a newcomer to the Goodyear circle, flying a Mustang. Bob racked up 13 heat points and a BHT of 2:44.0. It's interesting to note that this was Snyder's first race, finishing every heat and grabbing a final third place.

The 1967 Contest scene is over, and the NMPRA is looking forward to an outstanding season in 1968. By all indications, Goodyear pylon will be the biggest event of the year, with memberships and contest entries hitting an all time high. We urge you to join the NMPRA now, then actively participate in the exciting races slated for the coming contest season. This is the most exciting event in R/C, and **you** are needed to help it grow and gain in momentum. Plan now to fly Goodyear during '68. And don't forget to send your photos, race results, and hints and kinks to the new Goodyear section of RCM.

By P. G. F. Chinn

On its way to winning the Ripmax Trophy at SMAE's annual All-Scale meet, Norman Butcher's highly successful Fokker D-VII.

SIX SHOW STOPPERS FROM BRITAIN

Highlights of top British R/C scale designs.

1967 was an outstanding year for British scale R/C models.

MOST SUCCESSFUL was Norman Butcher's Fokker D-VII which took three firsts, a second and a third in scale contests through the season thanks, largely, to some very consistent flying. As with Lou Proctor's win at the U. S. Nats, Butcher's success was achieved with reed gear against strong proportional representation. The 8½ pound model had the same O.S. 12-channel reed gear that Norman has been using for the past three years and employed an O.S. combination servo pack operating the control surfaces through scale control horns and cables instead of the usual push-rods. The engine was O.S. too, a rear intake Max-H 60, and was inclined to the right to enable the O.S. muffler to be fully enclosed.

MOST IMPRESSIVE, Dennis Bryant's massive Fieseler Storch weighed nearly 11 pounds but became airborne remarkably quickly due to the huge area of its 93 in. wing. This model was a most intricate and finely executed piece of work, powered by an inverted O.S. Max-H 60, with muffler, under a hinged fiberglass cowl. With such large window areas around the cabin, orthodox construction was virtually ruled out in the interests of authenticity and Bryant therefore took the unusual step of following full-scale practice by building up the fuselage cabin area from steel tubes. F&M 12-channel reed gear was used to provide all the basic controls plus working flaps. This model took second place at the SMAE All-Scale Multi contest and was third in the Nationals.

MOST PERFECT from the point of view of sheer craftsmanship and strict adherence to scale was Dennis Thumpston's Bristol M.1C Monoplane of World War I vintage. Size alone distinguished this one-sixth scale model from the real thing. Construction, as far as possible, followed that of the original, with scale rib and stringer spacing, authentic rigging and control cables, true scale wire spoked wheels, plus numerous small details, such as a scale fuel filler cap and ammunition belt for the cowl mounted machine-gun, all most beautifully carried out. Because of the Bristol's short nose, all radio gear had to be mounted as far forward as possible, but few would have guessed that the very realistic looking pilot actually concealed a couple of servos under his neatly tailored leather flying jacket. The Bristol took 4th place at the Nationals, after more than a year of flying which included 2nd place in the same event last year. Power was supplied by a fully cowled Merco 49 (even the connector to the glowplug was concealed under a suitably located hatch) and R/C equipment was Grundig tuned-filter with Bellamatic servos.

MOST UNLUCKY was Dave Platt's very realistic U. S. Navy Douglas SBD-5 Dauntless which was twice rebuilt after bad crashes early in the season, managed to win the Bath Festival Rally scale event

(Continued on Page **39***)*

Nice line in body-English by Butcher as his D-VII deadsticks at the end of an otherwise excellent flight.

Dave Platt checks controls of Douglas SBD-5, just prior to model's last flight. Seconds later it splattered on tarmac.

Charles' Comanche, a 2000 hour project, featured retract gear, flaps, flying tail and a mass of interior and exterior detail.

BRITISH SHOW STOPPERS

(Continued from Page 38)

but was finally written off at the SMAE All-Scale meet in July when it rolled onto its back and plowed-in shortly after take-off. A most ambitious project, it feautred working flaps, retractable gear and bomb release, operated by Logictrol-7 propo. Finish was a most faithful reproduction of that of a typical SBD-5 service aircraft of the Pacific theater in the 1944-5 period. The model was built to a scale of 1½ in. to the foot and Platt had gone to considerable pains to ensure its scale accuracy. The power plant was again an O.S. Max-H 60, a motor that has been widely favored by scale multi flyers during the past year.

MOST DETAILED model of the year was Mick Charles' one-sixth replica of the Piper Comanche in which Sheila Scott made her solo world record flight in 1966. Working from the actual full-size aircraft, Charles duplicated **every** detail of the cabin interior, even to maps, tape-recorder and a box of kleenex. No servos cluttered the cabin: these were enclosed in the internal long-range tank. Externally the model was finished in authentic Piper gold and white trim and with reproductions of all the innumerable slogans and signatures that the full-size machine had collected on its world flight. Naturally, the landing gear was retractable and was especially designed and constructed for this model. All controls etc. were also true scale, including flaps and working stabilizer. Radio gear was British R.C.S. Digifive proportional and the power plant, an inverted O.S. Max-H 60 with special muffler and scale type exhausts, was fully enclosed under a hinged metal cowl. This latter proved to be the undoing of the model in the Nats when it did just that — i.e. came undone — so that Charles had to terminate his flight prematurely for fifth place.

MOST HAIR-RAISING was Arthur Lalley's twin-engined Bristol Beaufighter, resplendent in D-Day RAF markings, but quite a handful in take-offs and landings. Originally intended for SMAE contests (11 pounds maximum weight and .61 cu. in. maximum total engine displacement allowed) it came out at 12½ pounds and was, in consequence, underpowered on two .29's. Lalley therefore obtained a special clearance from the Air Registration Board, fitted two Merco 61's and flew it officially as a "full size airplane", placing first in the non-SMAE sanctioned Scale Fly-in at Old Warden, home of the Shuttleworth Aircraft Museum. The model featured a retractable landing gear, looked marvelous both on the ground and in the air and used Kraft KP-6B equipment.

This is not a model under British ruling. Arthur Lalley's hefty Bristol Beaufighter, now powered with two Merco 61's, required permission to fly from Air Registration Board.

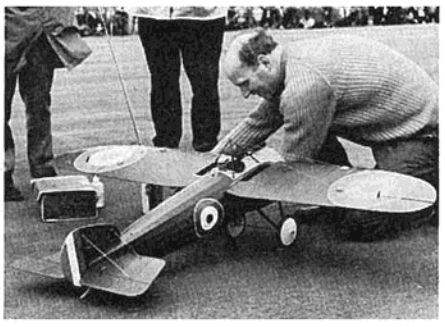
Second in the Ripmax Trophy event, Dennis Bryant with his big and beautiful Fieseler Storch.

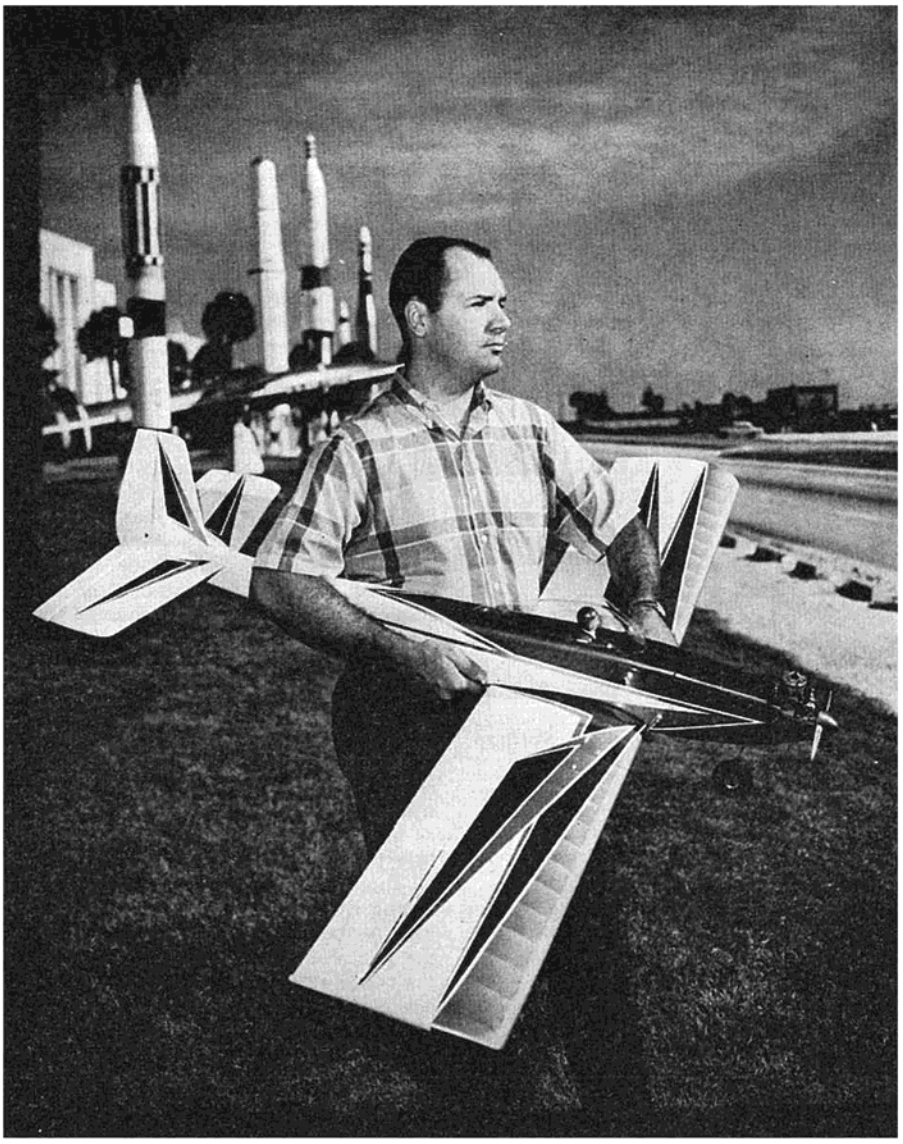
Note leading edge slats and lowered flaps of Bryant's Storch, just about to break ground.

Authentic steel tube construction for cabin section of fuselage is featured by Bryant's Storch.

Mick Charles starts the O.S. 60 in his highly detailed model of Sheila Scott's record-breaking Piper Comanche.

Superb WWI Bristol M.1C Monoplane is readied by builder Dennis Thumpston at British Nationals. A model virtually impossible to fault.





Dick Russ with his magnificently finished Skylark. Follow his step-by-step method for successful Acrylic lacquer finishes.

BY RICHARD T. RUSS

Painting with Acrylic Lacquer

Here's how to put those beautiful acrylic colors on your next ship.

ONE of the most impressive things about any model is the final finish. There are several mediums which may be used for the finish, such as pigmented dope, enamel or acrylic lacquers. For the finish on my low wing Sr. Falcon I selected Dupont "Lucite" acrylic lacquer which gave me a choice of any number of colors. Lacquer is not only easy to work with, but is very forgiving of human error.

There is really no secret in achieving a beautiful finish if it is approached in the proper manner. As in any finish, the final product will be no better than the initial preparations.

Let's assume you have your model covered with a minimum of four coats of dope. Sand the entire model with 320 grit wet-or-dry sandpaper, keeping it good and wet to prevent buildup. Brush or spray two coats of thinned lacquer primer, allowing at least 30 minutes drying between coats. Wet sand entire model with 320 grit or dry sandpaper until finish is (glass) smooth. You are now ready for the application of the first color. Using a lint free rag, wipe entire model with "Dupont Prep-sol" to remove any body oil or contamination. Wipe entire model with a "tack" rag (any auto paint supply has these), to remove dust or lint. For best results your spray equipment should be able to flow air 1.5 to 2 SCFM at 30-35 PSIG.

Due to the hardness of acrylic lacquers, cracking and chipping has sometimes been experienced. This condition may be retarded by the addition of two tablespoons of castor oil per pint of acrylic lacquer. This is mixed by dissolving the oil in lacquer thinner, then adding the oil-thinner mix to the lacquer. Thin your lacquer as called out on the label and be sure to strain through a paint strainer or cheese cloth.

Now, holding the spray gun 8-12 inches away from the model, apply a light first coat just wetting surface.

Note: For newcomers in spraying. Start your spray before reaching surface to be sprayed and continue on past before stopping spray. This will prevent an excess build-up and reduce the possibility of runs.

After the first coat has dried enough to form a fog or haze, proceed with the next application, only this time apply a heavier coat by moving gun at a slower rate. (Always try to keep the gun perpendicular to the surface.) All succeeding coats may be applied as long as enough time is allowed for a haze or fog to form over each application. You can build up as many coats as you wish but I have found four coats to be adequate. After allowing at least 4 hours for drying, thoroughly wet sand entire model with 600 grit wet-or-dry sandpaper. The model is now ready for masking the trim. After the trim masking is complete, it is important that the tape be sealed. Sealing is the application of clear lacquer which prevents the trim color from bleeding under the tape and causing the edges to be fuzzy. Sealing the tape may be accomplished by either brushing or spraying, the latter being the most desirable. Only one good coat is required to accomplish a good seal.

Now the trim color may be applied using the same procedure as for the base. Any number of trim colors may be added as long as an adequate drying time is allowed between applications. Do not remove the masking tape immediately after spraying as this can be disastrous. Allow the trim paint to dry overnight or at least eight hours before removing tape. After trim has thoroughly dried, slowly remove tape, pulling evenly back over itself so as to not lift any

(Continued on Page **44***)*

SHOP & FIELD

DON DEWEY
Editor

KATHLEEN ACTON
Assistant Editor

FUNDAMENTALS OF R/C ● PRODUCT REPORTS ● HINTS AND KINKS

THE PROFESSOR: PART III

FLYING

By Chuck Cunningham

R/C appeals to many persons for various reasons. Some like to build, some like to tinker, and some live only to fly. It is a strange phenomenon that as a builder's flying improves he likes to build less and less, and fly more and more. This month, in the last of the Professor series, we are going to delve into the flying end of the game.

If you have built the Professor, or if you have completed any other ship, the flying is still the same. In the first installment of the Professor group we talked about "dry flying", or practicing with your transmitter until you could command your fingers to do what you wanted without looking at the box. Learning to feel your way around the transmitter case is just like skipping from one typewriter key to the next without peeking while you're learning to type. Of course, this is more of a problem with reed sets then it is with proportional since, with the latter you keep your fingers glued to the stick, while you must hunt around on the reed rig. But don't forget, on the propo rig, you've got to find the trim levers, too! The idea is to become thoroughly familiar with the feel of the box before you go out to fly.

I have known some pilots that have been able to land their own ship after only a couple of flights while others have had as many as a hundred instruction flights before attempting their first landings. Usually this has something to do with the amount of work the beginning flier has put into his ship. The more work, the less anxious he is to land it himself.

At this point, let me put in a plug once again for good old sloppy ships with lousy finishes! I don't mean a warped, misaligned ship, but one with less than perfect finishing details. That first ship should be something on which to learn. In other words, something to teach you to fly without worrying about scratching the finish. You're going to bang up the first one, and if you don't believe it, then stop right now and go back to golf. By all means, build the first one to be expendable.

The first thing to do to insure success in flying is to double check all of the gear installation, and electrical connections. Check the operation of the radio gear with the engine running, and at several speed ranges between full high and low. Go over all of your servos and make sure that they are firmly attached to the aircraft structure. Don't have them too tight, but be sure that they will not work loose due to vibration. It's also a good idea to check out the fuel tank and the engine operation at home. You may save a wasted trip to the flying field if you have a tight bend in the fuel line, or a faulty throttle pushrod. While you're at it, be sure that the nose wheel turns the aircraft in the same direction as the rudder. Check to see that the aileron bellcrank, or cranks, are well safetied. Make sure that the battery pack cannot rotate within the fuselage, if it can this may gradually put tension on the battery connector until it parts company with the receiver. Another point to watch is to be sure that you have enough rubber bands holding the wing in place. On a large ship such as the Professor you should have eight to ten large rubber bands on either side of the wing to hold it down.

Pick a nice day for test flying and for your first flights. A day with a slight breeze is better than one with no wind at all, or one on which the wind is a problem. If you have someone to help you, then let him check out your new aircraft, take it off, put it a safe distance up in the sky, then gradually turn over the flying to you. If you don't have any expert help then we hope that all of the following ideas will get you over some of the rough spots.

When you are ready to fly, start your engine and adjust the needle valve until the engine is just beginning to break into a two cycle running condition. You can tell this point since the sound of the engine changes from a garbled roar to a whine. Don't lean down the needle valve past this point as a setting that is too lean may burn up your engine on just one flight. Position your aircraft so that it is pointing directly into the wind, and stand yourself about five feet behind the tail of your ship and off just a bit to one side. Have a helper hold the aircraft to keep it from rolling down the runway. Have a positive understanding with your helper that he (or she if you have talked your wife into breathing vast quantities of engine exhaust) will not let go of your ship until you have given the signal. All too often the helper thinks that you are ready and lets go. Sure 'nuff, you're not, and panicsville sets in. A good signal is a curt and positive nod of your head. You usually can't hear a shouted okay, so a nod will do.

Before you nod your head for release, run up the engine to full throttle, (make sure that your helper has a firm grip on it before you do this), and once again check over all of the controls. Run through up and down elevator, right and left rudder, high to low throttle and left and right aileron. Remember, to make an aircraft turn to the left the aileron on the right wing must go down, while the recerse is true for a right turn. If everything checks out satisfactorily nod your head for your helper to let go. Make sure that he doesn't give it a friendly shove, but simply lifts his hand off of the fuselage in a clean lift, allowing the ship to head down the runway without any other help.

As the ship roars off down the runway let it build up speed. With a trike gear, and with the nose sitting just a little bit positive, (that is the nose is a bit higher than the tail), the ship should begin to lift off of the ground by itself. If it needs a bit of help, gently ease back the stick, JUST A LITTLE! Never, never give a sharp jerk to the stick, and never move it from the neutral position to the limit of the control position until you know what you are doing! Just ease back on the stick and watch the aircraft. If you don't ease back enough it may settle back to the ground again. Watch that ship!

Let it climb straight ahead until it has gained several hundred feet of good old air between itself and the ground. If your field is small and you cannot gain this much altitude before making a turn, then turn and come back toward yourself, but keep the nose up and climb. With most of today's aircraft, and with the Professor, you can fly nicely at about half throttle. This is a much safer setting on which to learn and I suggest that you resist the temptation to fly flat out and go on about your business at half throttle.

Now that you are in the air it's time to try out some of the things that you have been practicing with your transmitter. Generally, you should fly in large lazy circles or rectangles at a high altitude learning to make right and left hand turns. These turns are a coordinated movement between the aileron and the elevator. To make a turn to the right, you bank the ship very slightly to the right with ailerons, then bring the stick back to neutral and then pull a little up elevator. This should keep the nose up and yet bring the ship around in a gentle, wide right turn. Do the same thing to the left.

Try and keep a straight heading. Keep the ship flying on a straight line. When the nose drifts from one side to the other bring it back on heading again. If, in one of your turns, the nose drops too much, then give a little opposite aileron to level the wings again and pull in a little elevator to bring the nose up once more.

Do not make the mistake of believing that up elevator will always give you an

up-aircraft flying position. It isn't so! Many, many beginners have failed to heed this warning and have ended up with a basket of sticks to cart home to show the little woman. Look at it this way; when the ship is flying on the level, the elevator makes the nose go either up or down. But, when you rotate the aircraft to a banked position, the elevator becomes a rudder, and if the ship is in a hard left bank, then up elevator will only serve to tighten up this bank even more until a chunk of sod comes up and greets your ship. If you get too far over in a bank, give it a little opposite aileron to level the wings again, then feed in the elevator to bring up the nose.

The hardest thing to learn when beginning to fly is to take yourself out of the cockpit and to put yourself on the ground, trying to control the bird way up in the sky. Men with full scale flying experience catch on to easing the controls right from the first, but have a hard time getting out of the cockpit. You have to think ahead of the aircraft just a bit and understand just what it is going to do before it does it.

When the aircraft is flying toward you, which is right, and which is left? If you picture this condition in your mind's eye you will see that it is a puzzle. Of course you can figure it out, but how much time have you got to think about it when that bird is heading your way? Discard all thoughts of left and right. Simply look at the aircraft coming at you head on. When one wing drops down, move the stick in the SAME direction. This will lift the low wing up and restore equilibrium to the aircraft. If you reason it out, you will see that if the ship is coming toward you, and drops its right wing, then you, looking head on at the aircraft will see the wing on your left side go down. When you move the control stick to the left, you will be compensating for the right wing drop by lifting this wing and lowering the left.

Always keep in mind that when the ship is heading toward you move the stick in the direction of the LOW wing to keep it from turning away.

The most important part of your first few flights simply has to be the landings. If you have lasted through this much of a flight then it would be a shame not to get it down again in one piece.

There are several different landing techniques. They generally depend upon the type of ship that you are flying and the type of field from which you are flying. Many pilots make something of a controlled crash serve as a landing while others strive to set the ship down with very little change in attitude of the aircraft. A landing can be made from a high altitude with the last hundred feet or so a rapid descent, or it can be a low, dragged in type landing with a gradual descent all the way down. To set up for a landing, come over the runway, heading into the wind and go about a hundred feet up wind, make a left turn and fly about two hundred feet, then make another left turn and fly down wind at about half throttle until you are several hundred feet down wind of the landing strip. Make another left turn and fly to a point just down wind of the strip, make another left turn and head toward the end of the landing strip. This is a left hand traffic pattern. A right hand pattern is just the reverse of the above. Now that the ship is heading toward the end of the strip gradually ease back on the throttle until you are flying at a reasonably slow rate. As the ship begins to sink you can ease back on the stick until the nose begins to come up and the ship starts to look like a duck settling down for a landing. Keep backing off on the throttle, until the aircraft comes to the end of the strip, then chop all of the remaining power. Let the aircraft settle to the runway, still with the nose held just a little high. With a stable ship like the Professor this can be accomplished very easily. With a ship with a higher wing loading you cannot pull the nose up as much, and you must land at a much higher speed. For low wing aircraft and those with a high wing loading the landing technique is somewhat different. The traffic pattern is the same, but as the ship nears the end of the landing strip coming back into the wind, chop all power and then let it slide into the field, holding the nose up at just the last minute.

Good landings take a lot of practice. When you are more at home with your ship you should practice touch and go flying as much as possible. Pick out a spot on the landing field and try and touch down as near to this as possible each time. The more you work at landings the happier you will be with your flying.

A lightly loaded, flat bottom winged ship will land at a much slower speed than will a hot ship, or a half-way ship like the Professor. Remember, you cannot slow the ship down too much as it will stall and snap roll into the ground. If you are learning to fly on one of the ready built aircraft remember that they are pretty small and that they have a high wing loading. If slowed down too much you may be inviting trouble.

Once you have the hang of flying you will want to practice doing various types of maneuvers. The easiest to do is the loop. All you have to do is to have enough altitude and then haul back on the stick and watch her go around. Of course once you have mastered this you will want to make big loops, trying to stack them on top of each other, and not using all of the elevator throw. To make a full roll, or a series of horizontal rolls you must learn to coordinate the aileron deflection with the elevator, both up and down. Enter the roll with the nose up just slightly. Hold full right aileron (most right handed fliers like to roll to the right, but practice both ways) and as the ship rotates on to her back push in just a little down elevator to bring the nose up. As the roll continues release the down elevator, and then as the ship comes to the right side up position again pull in

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1968 R/C PATTERN RULES

22.13 CLASS A PATTERN:

The maneuvers are as follows:

1. Unassisted R.O.G.
2. Straight Flight Out
3. Procedure Turn
4. Straight Flight Back
5. Figure Eight
6. Traffic Pattern Approach
7. Landing Perfection
8. Spot Landing

Maximum possible score is 80 points

22.14 CLASS B PATTERN:

The maneuvers are as follows:

1. Proto Takeoff*
2. Straight Flight Out
3. Procedure Turn
4. Straight Flight Back
5. Touch and Go
6. Three Rolls
7. Three Loops
8. Immelman Turn
9. Traffic Pattern Approach
10. Landing Perfection*
11. Spot Landing

Maximum possible score is 110 points

(*) Model must perform proto taxi before takeoff and taxi back to hangar and stop after landing. If, in either case, the model fails to accomplish taxi requirements, the associated maneuver will be given zero points.

22.15 CLASS C PATTERN (NOVICE AND EXPERT)

The maneuvers are as follows:

1. Proto Takeoff (see Class B)
2. Straight Flight Out
3. Procedure Turn
4. Straight Flight Back
5. Touch and Go
6. Three Rolls
7. Three Loops
8. Immelman Turn

Ten (10) of the maneuvers 9 through 23 shall be selected by the Contest Director just prior to the start of the day's flying. They shall be chosen in a random manner and in full view of the contestants (such as pulling from a hat). The maneuvers shall be flown in the order listed, except for those not chosen. In a contest of more than one day duration, a new list of maneuvers should be selected at the beginning of each day's flying.

9. Eight Point Roll
10. Knife Edge Flight (Three seconds duration)
11. Reverse Spin
12. FAI Top Hat
13. FAI Rolling Circle
14. FAI Double Stall Turn
15. FAI Horizontal Eight
16. Three Outside Loops
17. Loop With 1½ Half Snap
18. Cuban Eight
19. Inverted Three Turn Spin
20. Slow Roll (Five seconds duration)
21. Tail Slide
22. Reverse Cuban Eight
23. Square Vertical Eight (Entry in middle)

The remaining maneuvers are mandatory and are as follows:

24. Traffic Pattern Approach
25. Landing Perfection (see Class B)
26. Spot Landing

Maximum possible score is 210 points.

Rex Taylor, left, of Fliteglas Laminates, with RCM Editor Don Dewey and plywood "Flite Box." Fliteglas' "Flite Box" is resting atop G&K's "Flight Box" which is standing on RCM's hill. (Whew!)

RCM PRODUCT REPORT:

FLITE BOX & PAGAN MK II

Fliteglas Laminates' Class III aircraft come under RCM's Shop & Field scrutiny.

THIS month, RCM's Shop & Field department conducted flight tests on two aircraft produced by Fliteglas Laminates, P.O. Box 915, Felton, California, manufacturers of complete RC kits as well as fiberglass RC fuselages and accessories.

The first of the test items was the Pagan MK II, a combination fiberglass fuselage and foam wing kit from Fliteglas. Featuring a molded fiberglass fuselage of exceptional quality and durability with a minimum of weight, the kit also includes a foam wing and stabilizer, formed wing leading edges, and all landing gear hardware. The wing section is a contest proven progressive airfoil.

The model provided for testing was constructed from a stock kit by Ken Empson, and finished in a combination of MonoKote and Hobbypoxy paint. The finishing job, complete with British roundels and squadrons markings, was excellent and it was literally impossible to determine that it had a silver MonoKote wing and a Hobbypoxy silver painted fuselage — the match was identical. Squadron striping on the wing was an overlay of Hobbypoxy paint applied directly to the silver MonoKote. Engine used was a Merco .61 with a homemade "Kavan" type carburetor that produced one of the lowest and most reliable idles we have yet seen.

The Pagan MK II is a fast aircraft, but completely responsive and highly maneuverable. It is definitely a contest aircraft, and is capable of all of the current pattern plus the new "free-style" maneuvers. This aircraft, both from a kit standpoint as well as from its flying characteristics, is extremely difficult to fault. The fiberglass work on the fuselage is exceptional, and includes such items as inlaid balsa strips in the fin in order to eliminate the problem of hinging directly to the fiberglass shell. A choice is given the customer of radical mount. right or left, or upright beam mount. These bearers, as well as the main bulkhead, are factory installed, thus eliminating a tedious chore common to many fiberglass fuselages. Overall weight of the fuselage was some nine ounces less than one of the commercially available fiberglass "Candy" fuselages produced by another manufacturer. The material used in the fuselage, although not quite as appealing to the eye as those using a colored gel coat, produces a strong, light and flexible fuselage that can take more than its share of abuse. Workmanship was excellent. The foam wing was completely true and lightweight.

All in all, the Pagan MK II, priced at $49.50, is an excellent aircraft for the serious competitor, or for the sport flier who wants a contest caliber aircraft. This aircraft has been tested, and is approved and recommended by RCM.

The second flight test concerned Fliteglas Laminates' newest, and somewhat unusual (!) offering — the Flite Box. This aircraft is a 64" span, 785 sq. in. area aircraft designed for .45 to .60 engines, and featuring an **all plywood fuselage.** In fact, this is an aircraft that is designed to **look like a box!** Starting with the basic kit, the fuselage sides, top, bottom, and all formers, are made of ⅛" plywood, with instructions for gluing **and nailing** each part to the other. The nails, by the way, are supposed to be left exposed for effect! The fin, rudder, stab, and elevators, are sheet balsa. Before building, the modeler has his choice of constructing a low wing or shoulder wing — the fuselage is simply turned upside down for a shoulder wing configuration, and the empennage is put on the opposite side! Instead of a canopy, a **handle** is provided in the buyers choice of oriental modern, early American, Danish modern, etc., providing a replacement for the usual canopy as well as a convenient method of carrying the model! Although dowels are provided for the wing hold downs, it is suggested that drawer pulls (to match the handle) be used!

The wing is a thick sectioned symmetrical airfoil set at 0 degrees. Complete covering material as well as foam wing contact cement is provided in the kit. Our particular flight test ship had a balsa covered foam wing, while the second unit we built utilized an experimental .010 fiberglass sheet skin.

Our first reaction, upon learning of this "somewhat unique" aircraft, was "you've gotta' be kidding!" Fliteglas assured us they were not, and our subsequent flight tests proved their point. The flight test aircraft was completely unpainted with all wood grain showing, and sporting Early American appointments. The engine used was a Supertigre .60 and K&B 100 fuel. The flight tests, themselves, proved that the Flite Box was a most unique aircraft — and in our opinion — the first low wing, .60 size Class III trainer on the market. It was extremely easy to handle with outstanding low speed characteristics. The plane could be slowed down to virtually a standstill without any tendency to stall. Although it flew somewhat slower at full bore, it handled much like any contest aircraft, but in such a manner as to give the newcomer to low winged .60 aircraft a feeling of complete confidence, even on the first flights. This is not a contest aircraft, nor was it intended for this purpose, and vertical maneuvers were definitely not of contest caliber due to the inherent "boxy" design and attendant drag. But the combination of truly outstanding sport and training flight characteristics with its unsurpassed ruggedness make it an aircraft we are proud to recommend.

Our second prototype was constructed in somewhat of a different manner. Just to see what could be accomplished, we

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Rex Taylor and Ken Empson with Flite Box and Pagan MKII.

SHOP & FIELD

(Continued from Page 43)

rounded off the plywood corners, sanded it down, added a paint job with Special Products Limited new SPL 990 in orange, white, and silver (which, by the way, dried in 10-15 minutes and adhered to the fiberglass wing sheeting like glue), added a 14" DuBro canopy, and an Enya .60 with Kavan carburetor. The versatility of the basic design was proven out as the boxy look was eliminated, and we succeeded in making it look just like any other multi — much to the consternation of Rex Taylor at Fliteglas!

The radio used in the first prototype was a Kraft KP-5 proportional system, and the one used in the second was an Orbit 4-channel digital. Both aircraft weighed 6½ pounds, ready-to-fly.

This is one aircraft we are proud to recommend for its speed in assembly, its complete versatility, its rugged durability, and its excellence of flight characteristics for the newcomer to this type of aircraft or for the Sunday flier. Price is $32.95, complete.

Before closing out the day of test flying, we saw a sneak preview of Fliteglas Laminates new P-51. Fully scale, the kit includes one of the finest fiberglass fuselages we have seen, complete with dummy engine exhausts, authentic scale molded P-51 spinner, sliding molded canopy, full cockpit interior, foam wing and stab, operating flaps, and operating retractable landing gear — all of which are included in the kit. We had entertained our reservations about the $89 price tag until we saw the finished aircraft as well as the kit! This is one ship that will certainly turn up in the winners circle in 1968, since it is fully scale as well as being fully aerobatic — a trend started by Cliff Weirick flying the Stafford Chipmunk in 1967. The wingspan of the P-51 is 61⅝" with an area of 687 sq. in. Length is 50¾" with an all up weight of 7¼ pounds. Seven channels are required for operating all functions for a fully scale entry.

With an unusual policy of "complete satisfaction or your money refunded," (unusual in our industry), Fliteglas Laminates has an excellent offering of kits for virtually every flier, from the beginner through the expert contest flier, and the scale buff. RCM does not hesitate to recommend each of their three kits for your consideration as equaling, or exceeding, the manufacturer's advertising claims for them.

We were quite impressed.

PROFESSOR: III

(Continued from Page 42)

a little up elevator to bring the nose up. If you are making continuous rolls, keep the stick hard over and feed in the elevator as the ship rolls to that position.

When you are comfortable with the loop and the roll then you can go on to practicing the aerobatic type stunts shown in the AMA rule book.

Flying the pattern isn't easy, and it takes a lot of practice, but you may want to pick out some of the maneuvers in order to become a proficient flier.

All in all, flying is not hard, but it does take concentration. You must keep your eyes on your ship at all times, and you should always fly with easy movements. Most beginners tend to over-control all of the time, so practice with the transmitter before going out to fly. Once there, don't be afraid to ask for help. It's a tough job to learn to fly by yourself, so if possible, get as much help as you can.

ACRYLIC LACQUER

(Continued from Page 40)

base color. After all the tape has been removed, wet sand the trimmed area lightly using 600 grit wet-or-dry sandpaper to break the glaze and polish the edges where the tape was. If during your spraying operation, you acquired a run or two, don't worry about it; simply sand it out with the 600.

Now comes the final finish which may be accomplished in two different ways. You may stop where you are and polish the finish or you can do as I do, and apply one coat of clear, (heavy) and then polish. Both methods give the same end result, but the latter leaves just a little more durable finish. In any case, use white rubbing compound, and thoroughly rub finish until compound dries from rubbing. Remove rubbing compound using a soft cloth. Now, apply a generous amount of good auto cleaner/paste wax to entire model. Now comes the polishing; use a soft cloth and rub for all your worth until the desired shine is achieved.

No matter what method you choose for the final finish, I'm sure you will be as pleased as I have been, and will have a model that will stand out in any group.

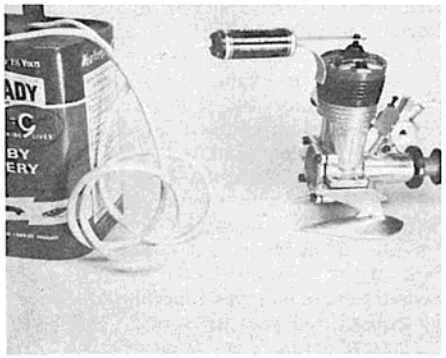
SHOP & FIELD

PRODUCT NEWS

Sturdi-Built Model Mfg., Route 2, Box 218, Meridian, Idaho 83642, has released their 'Cadet' R/C Trainer. Priced at $34.95, this kit includes formed plastic fuselage, pre-cut formers and hardwood motor mounts, foam wings (plastic or balsa covered), molded wing tips and wheel pants, formed landing gear and nose gear, balsa stab and rudder, Designed for a .29 to .35 engine, the Cadet spans 56" and weighs 4 pounds. Builders option of conventional or tricycle gear.

Aerotronics, 109 Chatham Lane, Oak Ridge, Tenn. 37830, is producing a new accessory item called 'Engine-Loks.' This is an entirely new fastener that permits mounting an engine to the engine mounting plate securely. The motor may be mounted and removed easily with no need to have access beneath the mounting plate for nuts, lockwashers, etc. Engine-Loks positively secures the engine against vibration and will hold firmly under the most severe vibration, according to the manufacturer. These Loks are molded of tough Delrin, providing a permanent, fuel-proof fastener. Available in two sizes, the first is designed for ⅛" thick mounting plates and .10 to .50 mills. The second size is for 3/16" mounting plates and engines from .50 up. All mounting hardware is included in the package price of 89c.

Tatone Products, 4719 Mission Street, San Francisco, Calif. 94112, has moved into new and larger quarters due to their expanding line and increased demand for their hobby supplies. The first of many new items to appear from under the new roof is a new type of glo-plug connector, itemized as the 'Hang-On.' This connector is made especially for all dry or wet cell batteries. As the photo shows, you merely connect it to your starting battery, then hang the connector on the glo-plug. When the engine starts, simply lift it off. No alligator clips to tangle, disconnect, or short out. The



'Hang-On' will fit all sizes of engines from ½A to large .60's. The connector is adjusted to fit the size of engine by bending the lower metal contact strap. The weight of the connector and battery wire assures positive contact with the engine without the necessity for holding it in place. Complete with wire and battery terminals for $1.49 each. Tested, approved, and recommended by RCM.

Midwest Products Co., 400 South Indiana St., Hobart, Indiana 46342, announces that two new racers by Owen Kampen are now at your hobby dealers. Designed for the new Midwest-RCM Racing class, the 'Hoosier Hotshot' and Steve Wittman's 'Bonzo' are appropriately called 'fun type' airplanes. Originally published as construction articles in RCM, they are intended to provide more fun and less work in racing with less expensive and more stable flying models. Both kits feature molded foam wings with a 44" span, making them a gentle flier for the novice. Cut the span to 38" and you have a tiger by the tail! Although primarily intended for Galloping Ghost systems, they have been flown by the manufacturer with a variety of radio equipment from Testor Corporation's 'Simpulse 1' to the Bonner 4RS digital system. Recommended engines range from .049 to .10. Each kit contains foam wing and stab, formed landing gear, clean die cutting, and easy to read plans. Wing area for the training version is 264 sq. in.'s., while the racing version is 228 sq. in.'s., Price per kit, $9.95.

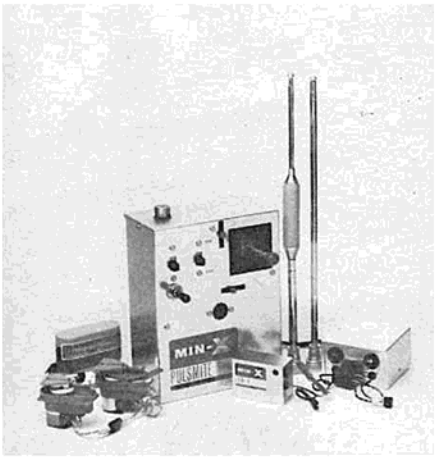
Antique Aero Products, P.O. Box 8571, La Crescenta, Calif. 91014, is a new model company specializing in scale RC aircraft. Soon to be released is their 42" scale Fokker DR1 Triplane which appeared in RCM's 'Challenge of R/C Scale.' The kit features hand cut ribs and formers. Also included is a formed, unbreakable 6½" cowl and 4½" vintage type wheels. Designed for GG or proportional, the Fokker can be powered with engines in the .15 to .29 range. Price will be under $20. The second kit is a 48" scale G17S Staggerwing Beechcraft for .29 to .45 and proportional gear. Featuring hand cut and sanded wing ribs and fuselage formers, formed cowl, and loads of plastic parts, and precise drawings. To be priced under $25 with optional retracting gear available for an additional $12.

Lazott Plastic Corporation, Gleasondale Industrial Park, Route 62, Stow, Massachusetts 01775, will soon release their conceited (XXX it thinks it can do anything) ready-to-fly biplane. This is a 52" span biplane desgned for .45 to .60 engines. Designed with the same rugged construction as their 'Solo,' the new biplane has the increased appeal of a Class III biplane. All hinged surfaces will be butt hinged for smooth chatter-free operation. Steerable tail wheel will be included. Control rod exits are formed as fairings. True butt-hinged conventional (not strip) ailerons. Engine can be mounted inside cowling. Price and date of release to be announced.

Top Flite Models, Inc., of Chicago, Illinois, announced that the "Kwik-Fli Mark III," designed and flown by Phil Kraft to win the 1967 World's R/C Championship at Corsica as well as the 1967 R/C Nationals, will be made available in kit form. Sid Axelrod, Top Flite Vice President, announced that the new kit has been scheduled for release in the spring of 1968 and will include more features and parts than any kit ever produced by Top Flite.

Nemo Hobby Distributors, 4720-22 Peck Road, El Monte, Calif. 91732, has announced that they now have in stock the designer approved kit of the R/C glider "Snipe" by Phil Phillips, which appears in this issue of RCM. Priced at $19.95, this kit is highly prefabricated with an excellent selection of balsa wood used in the fabrication of the parts. Tested, approved, and recommended by RCM.

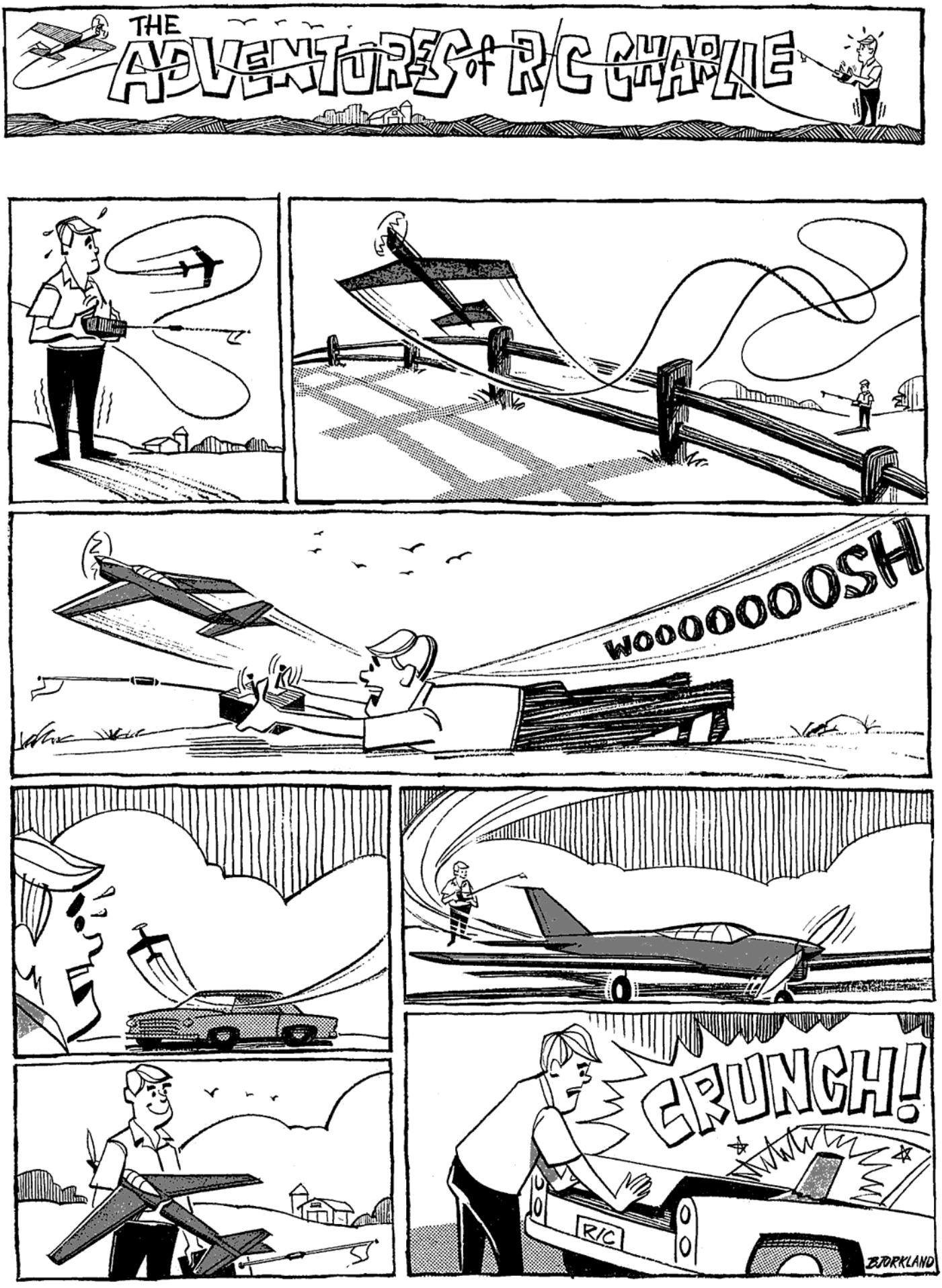
Min-X Radio, Inc., 8714 Grand River, Detroit, Michigan, has released their new DR-S system, which is the same famous Pulsmite transmitter that has been modified to make it dual rate. The DR-S system is compatible with the GG-1R, Rand GG Pack and Rand Dual Pack, and may also be used with any other pulse system requiring the same rates and widths supplied by the transmitter. Price is $179.90. Min-X is also in the proto testing stage of their new IC-4 Digital System which will be in the 12-14 ounce weight range and which will retail for $350, approximately. This is an all new system with the logic in the transmitter, receiver, and servos designed around integrated circuits to make it more reliable, easier and less expensive to service.



Citizen-Ship Radio Corporation, 810 E. 64th St., Indianapolis, Indiana 46220, is currently producing their new Model NPT Dual Range Pulse Transmitter which is shipped adjusted to operate the Rand GG Pack. Two features of this transmitter include a built-in internal switch to change the pulse rate to a faster pulse for use with actuators such as the Rand Dual Pak;, while the second is a nickel cadmium battery charger built into the transmitter and wired to plug into Rand battery packs. Price is $69.95. Citizen-Ship is also offering their Model SSH receiver for $34.95 with a new filter capacitor to allow high pulse rates without neutral shift of the width channel. The SSH is shipped with plug attached for operation with Rand Paks. Available as a complete system with Transmitter, receiver, and Rand Pak at your local dealer, or available separately.

Model Aeronautical Press Ltd., 13/35 Bridge Street, Hemel Hempstead, Herts, England, has just published their Aero Modelers Annual 1967-68. Priced at ten shillings & sixpence, this 128 page hardcover book is a review of the year's aeromodelling throughout the world in theory and in practice; together with useful data, and authoritative articles, produced by the Aeromodeller staff and their contributors. This is an excellent addition to any modeler's library.

R/C Modeler Magazine, P.O. Box 487, Sierra Madre, Calif. 91024, is once again offering their magazine binders. Priced at $3.50 each, or three for $10, each white vinyl, gold stamped binder holds an entire year's collection of R/C Modeler magazines. Supply is definitely limited, and inasmuch as the stock was quickly depleted in 1966, you are urged to order early.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