APRIL 1969 75¢

R/C MODELER MAGAZINE

THE WORLD'S LEADING PUBLICATION FOR THE RADIO CONTROL SPORTS ENTHUSIAST

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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Editing by Hlsat.

Thanks Elijah from Greece.

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COVER: Charline Burnsed of Daytona Beach, Florida with a Lanier Industries P-51 finished off with Finishing Touch WWII decals and MonoKote, Veco 61 and Orbit 6-12 proportional. Ektachrome by Chuck Borel. **FRONTSPIECE**: Dick Aggers' Grumman Widgeon photographed by Bill Coons at the Brimfield Hydro Meet.

VIEWPOINT

BY DON DEWEY

The entire staff of R/C Modeler Magazine would like to thank the several thousand readers who took the time to complete the Reader Interest Survey which appeared in the February issue of RCM. These forms are invaluable to us so that we may determine exactly what YOU want to see in RCM. Several people are, at the time of this writing, working full time, each and every day, tabulating percentile figures on every question that appeared on that survey. When completed, this information will guide the editorial policies of this publication in the months to come, and the statistics will be provided to the members of the R/C industry as a guide towards how they may better serve your wants and needs.

Since this column is actually being written during the last week in January, the total results of the Survey have not been completed, since the returns are still coming in at the rate of approximately three hundred per day. Still, definite trends have been established, and we have been able to effect some changes in RCM even in this issue. Some are minor, and may not even be apparent to you, while others represent "more of one thing" and "a little less of something else." Still further additions and/or changes will take place in the next few issues to come. As mentioned, these changes will be based on the interest percentile figures of the total survey results. The hardest job of any publisher or editor is in trying to please ALL of his readers. We know that this is an impossibility, but we will always continue trying to do EXACTLY that.

In that vein, we have several very exciting things planned for future issues – features that we have been able to obtain as a result of this Survey.

Production has always been one of our major problems. In the past years, we have been too small to be handled by the larger printers who could offer versatile services as publication specialists, and too large for the smaller printer who could not offer such services. As a result, we were always finding ourselves in the predicament of being at the mercy of someone else's production difficulties. This, fortunately, has been solved. Starting with last month's issue, our publication is now being printed by McCall's Corporation in their Mid-Atlantic Division in Glendale, Maryland. We are quite honored to be printed in the same facilities as some of the nation's largest general circulation magazines. One of the major benefits is the fact that the publication is sent to the Post Office in Washington, D.C. on the same schedule each month, and all copies of RCM – subscribers, hobby shops, and newsstand – arrive at the post office simultaneously. Beyond that point, we have no control, but at least we know that they are delivered to the Post Office at the same time each month. Hopefully, this will put your copy of RCM on a more regular schedule of arrival.

One last note on the Survey: Although we won't go into specific details as to the results until the compilation is completed, there is one area where the tabulation leaves no doubt as to your preference. And that is as to your favorite cover. Approximately ninety percent of all survey sheets received to date have picked the January, 1969 cover, featuring Miss Sherri Schruhl, our girl from Las Vegas! And to all those who asked – "no, we won't give out her address!"

To be honest, one percent of the replies stated that they didn't believe that girls belonged on the cover (or inside) of a model magazine, adding comments to the effect that "there were enough scantily-clad girls walking the streets."

I would like to go on record as saying that there will NEVER be enough scantily-clad girls walking the streets . . .

–

We hope you will like this issue. It's a rather special one, insofar as we've tried to put together a package of time and money saving ideas as well as some new construction techniques. We also welcome Bernie Murphy and 'Kits & Pieces' back from a leave of absence caused by the pressure of Bernie's full-time employment. We've chained him to the wall back there in Maryland.

We've also got a picture of Chuck Cunningham in a trash can. That's gotta' be a first! (Or a very large trash can.)

Next month, some very outstanding features. And 'Viewpoint,' or "Editor's Memo" as it was previously called, will have an all-new format. After we extracted our "wide-in-the-saddle" Texan, we relegated editorials and politics to the trash can.

I know you believe you understood what you think I said but I am not sure you realize that what you read is not what I meant.

Rest in peace.

TRY THESE MONEY-SAVING IDEAS

BY PAUL OSTERMAN

If we were to be completely honest with ourselves (and our wives) and tally up the actual cost of our hobby, we'd probably shudder at the amount of money we spend each month. Here are a few money-saving tips you might find useful on your next project:

If you like to build wings in one piece, don't like to splice the spars, and want to save money at the same time, here's a way. Your local lumber yard has redwood fencing slats that measure 3/8" x 2", rough finish. These can be ripped and surfaced on a table saw using a hollow ground blade, to 1/4" x 1/4", or whatever size you need. The slats sell for about 20 cents each and will produce six good six foot long spars for less than 4 cents each. They are just slightly heavier than balsa, but the spars comprise only a small percentage of the weight of the completed wing, so the increase is hardly noticeable. By the way, when ripping redwood on the table saw, always cut WITH the grain to avoid chipping the edges.

If you use NyRod for your control linkages, you probably have thrown away a number of short, left-over pieces. Don't! They can be spliced very effectively with a 2-56 screw. Screw the 2-56 into one end of the inner portion of the NyRod, snip off the head of the screw with a pair of dikes (or cut off with an X-Acto razor saw), and screw this portion on to another leftover piece of NyRod until the two pieces butt together. Lightly sand the joint until it slides easily in the outer NyRod. For splicing the larger outer rods, use a piece of 3/16" O.D. nylon tubing, available from hardware stores or pet shops. The latter carry this size tubing for aquariums. The outer rod splice will be a force fit and stays together nicely. Using this splicing method will usually give you an extra throttle NyRod linkage that you would have otherwise thrown away.

One of Ford Motor Company's "better ideas for RC'ers" is the air pump filter on those cars equipped with anti-smog systems. The filter (AutoLite) is a foam rubber sleeve that is just the right size in which to insert your receiver or battery pack for protection from vibration. They are available from all new car dealers.

Here's a pre-finishing trick that may be of help to you on your next ship. Instead of slopping on the filler and sanding forever and ever, thin Hobby Poxy Stuff to spraying consistency with lacquer thinner and lightly coat the entire plane. Either the little Badger, or regular size spray gun will handle it well. This gives an excellent primer-filler coat when sanded with 400 paper, used wet. Once you start to spray, however, keep going. This stuff dries so fast that if you stop to blow your nose, the gun will plug up!

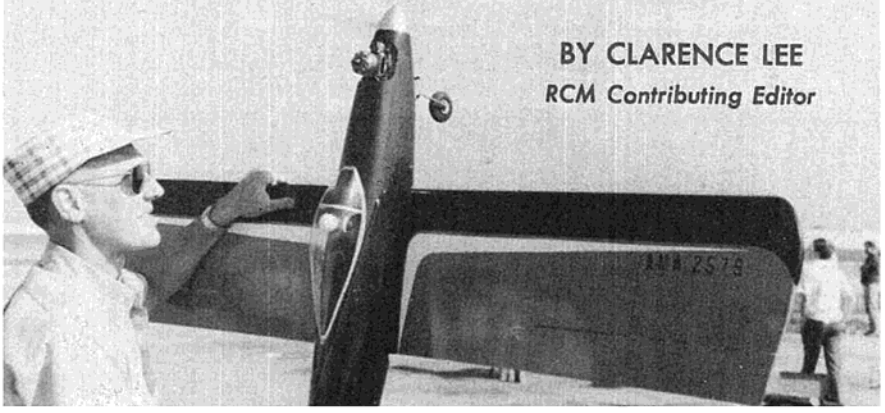
Since you were at the automobile dealer's a few minutes ago, you might try the plastic back window material used on convertible auto's for your next windshield or cabin side windows. You can buy a chunk of this stuff for next to nothing from your local auto upholstery and trim shop. It is about 1/32" thick, but extremely flexible so that it will not sustain permanent dents, and will never crack or break. The material can be easily cut with scissors or X-Acto knife and glued in place with contact cement. Another method of gluing in place is to drill tiny holes around the outer edge of the window and use epoxy so that it "oozes" through the tiny holes.

While you're traipsing around the auto stores, walk down the street to the auto accessory shop and buy a package of those racing stripes used on hot rods and sports cars. These can be trimmed to suit and applied to models as well. They are "everything-proof," including hot fuel, and once in place, won't come off. If you use them, be sure to get it lined up right the first time as you don't get a second chance with these!

That's about it for a few money saving ideas – hey! There's a piece of NyRod you dropped on the floor! Use it as an antenna base or mast. Just glue it in place and feed the antenna wire through. It will bend over nicely when you land inverted, then pop right back up!

ENGINE CLINIC

BY CLARENCE LEE
RCM Contributing Editor



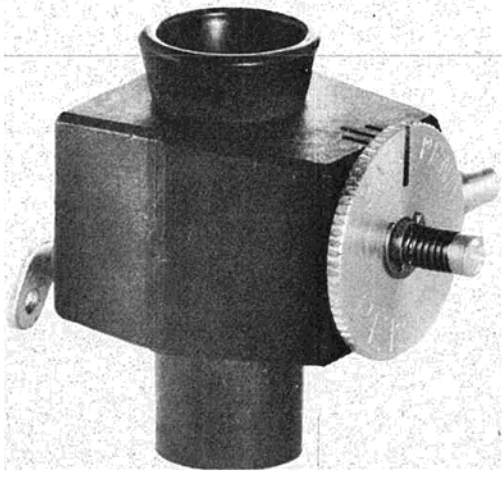
Clarence Lee tests the new Perry carburetor. The engine will maintain its idle holding the ship straight up. . . . .

Last month I mentioned a new carburetor that is under development by old time R/Cer John Perry. I doubt if many of you have ever heard of John as he is a Sunday fun flier and doesn't make the contest circuits. I first met John about 1950 when he was flying a full house Miss Tiny on single channel. (The old free flight boys will remember the Miss Tiny.) John had a clockwork escapement long before any of the commercial compound escapements were available. He was flying with up and down elevator, left and right rudder, and high and low throttle. Of course it required one blip for right, two for left, three for up, etc. You had to have a pretty educated thumb and some real quick thinking ability in the old head. There was a dumb kid hanging around the field then also with his own single channel radio named Doug Spreng. Doug had one of the few radios that worked reliably. (Reliable in those days was two flights in a row without a fly-away!)

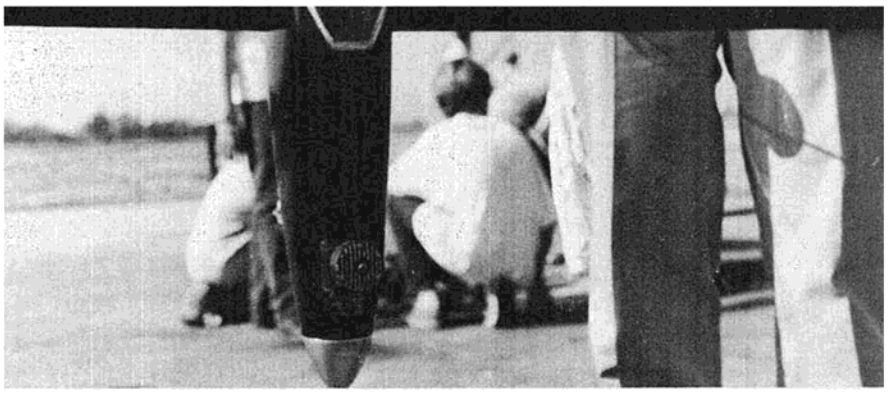
Since last month I have had the opportunity to use one of John's carburetors, as he gave me one of the prototypes for testing. Because this column is being prepared three months ahead of publication date, the carburetor should already be on the market by the time you read this, or will be very shortly.

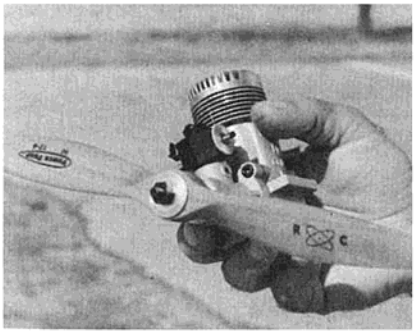
I am very impressed with the performance of the carburetor and feel that it has many features that make it stand out over all the others. This includes the Veco which I was responsible for.

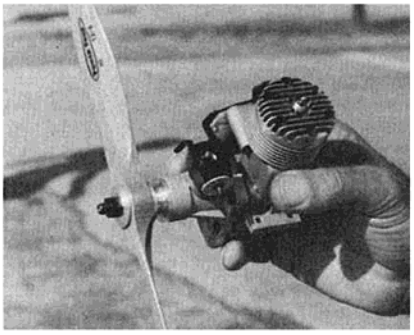
Take a look at the photos and you will see yours truly performing a little test with my Candy that few other carburetors can match. The engine will maintain its idle holding the ship straight up or down on either a full or NEARLY EMPTY tank. It will do this without changing idle rpm enough to matter. This also means your idle speed doesn't increase three or four hundred rpm towards the end of the tank and cause you to blow a spot landing because the ship wouldn't stop flying. Now, I can hear some of you saying, "my old Fox .59 would do THAT." Right, it would, but unfortunately very few people ever bothered to read the instruction pamphlet that came with the engine and knew how to adjust it so that it would. Having a low, intermediate, etc., it was not the easiest thing to adjust. This is the big feature of the Perry carburetor - the ease of adjusting the idle. Take a look at the close-up of the carburetor and you will see a disc on the side of the body. This disc adjusts the idle mixture. It only moves about a quarter of an inch and you can go from rich to lean within this range. The adjustment is sensitive, so you only move it a tiny bit each time. The disc has a mark on it and the body has three dots. This gives you visual reference as to how much you move the disc. If you find it necessary to take the carburetor apart for cleaning, these marks let you put it back together again exactly as it was without changing the idle setting. Setting up the idle is a simple matter of moving the disc slowly in one direction until the engine dies. It doesn't matter whether it is lean or rich. Note the position and simply restart the engine. Move the disc in the opposite direction until the engine again dies. Now set the disc in the middle of



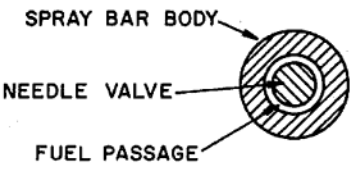
. . . or straight down on either a full or near empty tank without changing idle rpm. At left, a close-up of the Perry carburetor.







CROSS SECTION OF CONVENTIONAL SPRAY BAR AND NEEDLE VALVE



these two positions and that is ALL there is to it. This disc only adjusts the idle mixture. There is a screw on the top of the body for raising or lowering the idle speed. Once the mixture is set, the raising or lowering of the idle speed does not change the mixture setting.

You will also notice in the close-up an Allen screw sticking out of the side of the carburetor. This is the high speed adjustment. Production models will have a small wheel that can be turned with the fingers. This adjustment is not a needle valve in the true sense. The Perry carburetor regulates the fuel mixture by opening and closing a slot rather than using a regular needle and seat. This makes the carburetor less susceptible to dirt or foreign matter. With a conventional needle valve and seat you have a round ring opening (through which the fuel flows) that only measures about two thousandths of an inch (.002"). This is smaller than a human hair. With the Perry carburetor the opening is a rectangular hole and, for the same area, considerably larger. See the drawing which will help to clarify this.

The fuel is further regulated as the carburetor barrel rotates. The spray bar contains the fuel passage and is, in turn, pressed into the barrel. This unit slips inside of a tube that has a curved slot running 90 degrees to the fuel passage. Rotation of the barrel increases or decreases the size of the fuel passage.

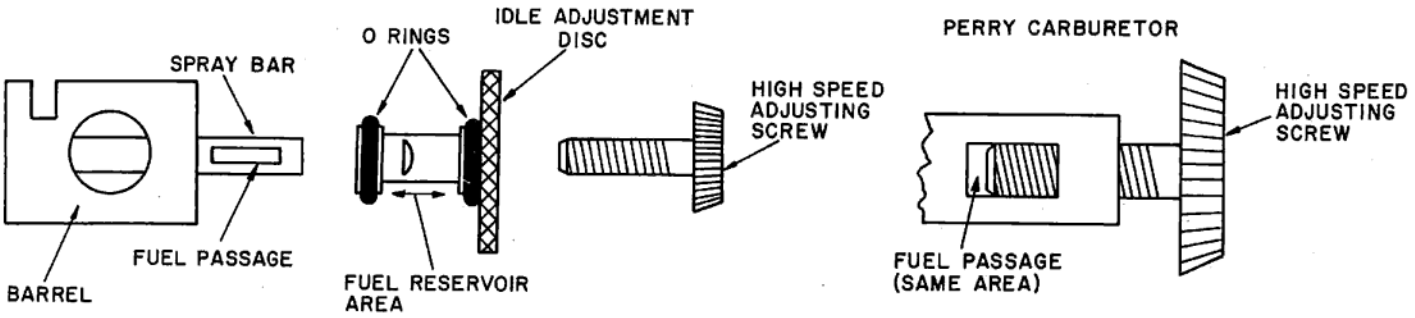
The shape of the curved slot is very critical and took considerable experimentation on John's part. Many different cutters had to be made before the final shape was decided upon. An ordinary tapered slot would not work because the fuel demand varies at different openings of the barrel, the fuel demand being non-linear. The curve is necessary to keep the fuel-air ratio constant throughout the throttle range. From idle to high speed there are no lean or rich spots. This method of metering the fuel makes the throttle action extremely linear in response.

The carburetor has another feature which I am surprised someone has not come up with before now - and that is a small fuel reservoir in the body of the carburetor itself. The space between the two "O" rings becomes the fuel reservoir when slipped into the carburetor housing. At idle, you can pull the fuel line, wait several seconds, put it back on, and the engine will keep right on idling. This means if your pick-up tube ever flips out of the fuel during some violent maneuver while idling, the engine will not die because of the air bubble. How many times have you made a landing with the tank nearly empty and hit the brakes to stop quickly only to have the engine die? This was caused by the fuel surging to the front of the tank and the pick-up tube drawing air. The fuel reservoir eliminates this from happening.

A stainless steel cylindrical filter fits between the "O" rings, and fuel, from the fuel line, must pass through this to get into the fuel reservoir. Being of cylindrical shape it has a considerable amount of area – four or five times as much as is found in conventional line or tank filters. This, in my estimation, is a big feature in itself. How many times have you lost an engine because of a minute speck of foreign matter in the fuel line or spray bar? Because of the large filtering area a considerable amount of foreign matter can be trapped by the filter and still not affect the performance of the engine. To clean the filter you only have to remove the high speed adjusting screw and pull the idle adjusting disc from the carburetor housing. The three reference dots on the body allow you to replace the idle disc in its original position without changing the idle mixture setting.

Okay, how about the top end? This will depend upon the individual make of engine. Top end is dependent mainly upon the area of the venturi opening as far as carburetion is concerned. If you increase the venturi area you will also increase the rpm at the top end. However, if you go TOO large the engine will not have good fuel draw and you will have problems with the engine leaning out at the end of the tank, etc. Some of the engines are running smaller venturis than they really need to – notably the Enya, Webra, and some Super Tigres, depending on which carburetor of the month your

(continued on page **10***)*



ENGINE CLINIC

(continued from page 9)

engine features. The Perry carburetor for these engines will have a slightly larger venturi area and you should notice a small increase in top rpm. The carburetor for the Veco will have approximately the same area so you will not notice too much change.

I have not run any economy checks as yet, other than knowing that I am getting approximately the same amount of flying time as I did with the Kavan and Veco carburetors. I usually run some stop watch tests and had intended to do so the last time out. However, right after the photos were taken, the fickle finger of fate pointed my way and I bent my Candy. This brought an end to my testing for a couple of weeks. Fortunately, the ship was not too badly damaged. However the crash could have been avoided.

Several weeks ago some clown decided to step over my ship, rather than go around, and wrapped his foot in my antenna. Even though the end of the antenna was held to the fin with a rubber band it stripped some of the insulation off of the wire where it comes out of the fuselage. This past week I decided to replace the antenna. I had always thought that it was the length that was critical and used a piece of wire that had a few more strands than that which came on the receiver. I noticed my ground range was down considerably, but still was sufficient – so I THOUGHT anyhow. I fly on 53.025 and took off with a flier already flying on 52.950. We had flown together before with no problems. This time he got to me – like down elevator! So the moral of this sad story is – If you ever change your antenna, have the receiver retuned.

I have the airplane about back together and will be running some economy checks in the near future. We'll let you know the results and any other info that comes up about the Perry Carburetor that might be of interest.

–

Now it is time for the "One of those things that bug me" department. Out there in R/C land there are some otherwise nice guys that suffer from a very bad fault. They are "needle valve tweakers!" Every time they start an engine they open the needle valve up a turn or two and then proceed to lean the engine in until it peaks out. Usually they will keep going past peak until the engine starts to sag off lean – (scratching up the piston and sleeve in the process) – then come back rich and start the procedure all over again. After doing this several times they FINALLY decide on a setting. Then they take off and are usually either too rich or too lean. They land and start the action all over again. I can always recognize a "needle valve tweakers" engine when I get one back for repair because all of the knurling will be worn off of the needle valve where it runs against the ratchet. All of this adjusting before each flight is ABSOLUTELY UNNECESSARY. Weather conditions will make it necessary to change the needle valve setting occasionally – however, you seldom need to move the needle more than ONE OF TWO CLICKS OF THE RATCHET AT THE MOST. Temperature will have less effect than the himidity. On a humid day you will have to open the needle a click or two, and on a dry day can close it down a click or two. The next time you go out to the field to fly, try making the first flight without even touching the needle valve. You will probably be surprised to find out that it won't need any adjusting – PROVIDING, of course, that it was set properly the last time you flew the airplane. If it is a little rich or lean, land and make an adjustment - but no more than ONE or TWO clicks at a time.

If your needle valve is of the round wheel type, such as the Veco, Enya, etc., file a mark on it. Then, if you ever have to turn it more than two clicks one way or the other from the correct setting, there is something wrong - dirt in the fuel line, a hole in the pick up tube, etc. Anytime you have to back the needle valve out a half turn or more from its normal setting you can be sure there is dirt, foreign matter, or a leak in the fuel system somewhere. Take a look at some of the fellows that never seem to have trouble setting their needle valves - they have the correct setting flight after flight, and you will see that they don't fiddle around with the needle setting every flight. In fact, they will probably tell you they haven't touched it in weeks. I do as much flying as the next guy, and probably MORE that a lot of you. Anytime that I have to change my needle setting more than a click or two one way or the other, I start looking for the trouble. If you start off flying early in the morning when the air is cool and damp, you will have to turn the needle in a click or two as the day warms up and dries out. But do just that – A CLICK OR TWO. Let's knock off the "tweaking" back and forth bit.

Q. I have always noticed that my engine never seems to have as much power on a damp humid day as it does when the weather is dry. My car always runs better on a rainy day. If my car runs better, why doesn't my model engine?

Paul Rosenthal
Chicago, Ill.

A. First of all, if you notice a definite improvement in the running of your car on a rainy day, the chances are pretty good that you are either using a gasoline that has lower octane requirements than your car needs, or the timing is too advanced. Water vapor in the air cools the fuel mixture. If your motor is detonating because of cheap gas or the timing too advanced, you will notice an improvement in the performance on a rainy day. If the timing is set correctly for the gasoline that you are using, you will notice very little difference in the performance. Also, some of this "running better" is psychological. The dampness quiets some of the squeaks and body noises that you are not actually aware of and you just THINK the car is running better.

Model engines are a little different story. Glow plug engines are actually semi-diesels. The spark is not controlled as it is in your car. Combustion pressure coupled with the heat from the glow plug causes the mixture to ignite. Moisture in the air causes the mixture to ignite prematurely – the same thing as having the timing set too advanced in your car. This pre-ignition

causes the engine to lose power and run much hotter. Humidity actually has more of an effect on the performance of a glow engine than the temperature. Your engine will actually run hotter on a 75 degree humid day than it will on a 85 degree dry one. Hot humid weather is the worst possible condition under which your engine can run. You should always be sure and run the engine on the rich side under these conditions. One lean run can do far more damage than the same setting on a cool dry day.

As long as we are talking about temperature and humidity, I would like to point out that the barometric pressure also has an affect on all internal combustion engines. On the intake stroke a low pressure is created in the crankcase of a two cycle engine. The fuel-air mixture is then driven in by outside air pressure – NOT sucked in. The higher the barometric pressure the denser the charge in the cylinder. This is the purpose of super-chargers on automobile and aircraft engines. You will actually notice a small increase in performance on days when the barometric pressure is high.

Q. I have a Super Tigre .56 that has always been very easy to start. The top end has always been good, but the idle has not been as reliable as I would like. I have installed a Kavan carburetor. This made a big difference in the idle, but the engine is now very difficult to start at times. What would cause this?

Dean Simpson
Austin, Texas

A. I'm pretty sure I know the answer to Dean's problem – I've come across this myself quite a few times the past several months.

The Kavan carburetor has the airbleed hole drilled right at the top of the venturi. At wide open throttle the airbleed has just barely closed. In fact, I have had several carburetors where the airbleed hole was still partially open at full throttle. If your linkage is set so that you do not quite get full throttle, this will also allow the airbleed to remain partially open. When you choke the engine to start, you only pull air instead of the fuel. There are two solutions to the problem. Prime the carburetor with your fuel bulb, or modify the carburetor. Modifying the carburetor is probably the best bet as fuel bulbs have pretty well been replaced with electric pumps, pressure type fillers, etc. However you should carry a small squeeze bottle such as Tatone's just for priming the exhaust on cold days.

To modify the carburetor you remove the barrel and file the slot that the idle speed screw rides in slightly deeper. This will let the carburetor travel slightly past full throttle and close the airbleed hole.

Also be sure and set your linkage so that at full throttle you do not stall the servo. If you do, you increase the current drain and will find that one side of your battery pack runs down far ahead of the other. If you fly six or seven flights and don't charge your batteries every time you go to the field, you may find one side of your pack dead and wonder why. Stalling the throttle servo the whole time you are flying might be the cause.

Q. My Veco .61 has always had an exceptional idle. You simply couldn't kill the engine. I now have eight or nine gallons of fuel through the engine and it has started to die if I close the throttle too quickly – especially with a full tank of fuel. I am using the same airplane and have not changed fuel. I have tried new glow plugs with no improvement. What has gone wrong?

Ralph Carnes
Springfield, Mo.

A. I would be willing to bet the problem is a simple matter of varnish build-up in the exhaust. The exhaust baffle clearance has been set at .005". Over a period of time, varnish and carbon build-up will close this clearance down. With the baffle too tight the engine can not bypass internally and will die. Remove and clean the baffle and the inside of the exhaust stack with fairly coarse steel wool after every six or seven gallons of fuel. Be sure none of the steel wool gets into the engine. You can cheat and drill a No. 50 hole in the baffle, but do not do this on a new engine. The hole plus the pre-set clearnace will be too much and the engine will not accelerate as it should.

Q. I recently entered an Open pylon contest and used a hotter fuel than I normally run in my Webra .60. (Supersonic 1000) The engine really screamed for the first six laps and then went sick. Since then it is hard to start, has lost power, and will not idle. Could the hot fuel have damaged the engine?

Bob Thompson
North Hollywood, Calif.

A. Quite a few fellows have run into this problem lately. It's a natural tendency to lean the engine out just a little bit more than normal at a pylon race and hope for a little extra speed. Usually the engine overheats and sags off, which is most likely what happened in this case. The fuel itself was not the cause – running the engine lean, dirt in the fuel, or even a hole in the fuel line would more likely be the cause. However, a lean run while using a hot fuel, will cause the temperature to raise much higher than it would with a mild fuel. Actually Supersonic 1000 is not that hot. It contains 25% nitro methane. This is pretty warm by sport flying standards, but a really hot fuel contains from 40% nitro all the way up to 80%.

There is a good possibility that you scored your piston, sleeve, or ring. Maybe all three. If you are lucky, it may only be a loose head. This occurs quite frequently on a lean run even while sport flying. Any time you have a lean run, check the head screws. You are going to be surprised to find how often they will need a little tightening. If the engine still acts sick after tightening the head screws, there is most likely internal damage and you should return the engine to MRC for repair.

While on the head tightening subject – this is something that should be checked after every race with your Goodyear racers. Hot fuels and lean runs cause the parts to expand quite a bit more than they would under normal conditions. This actually stretches the screws so that when the engine cools the head will be loose. Some of you guys have gone to Allen head screws to stop the problem. So what happens when everything expands and the screws can't stretch? You guessed it, Dad – the head, case, or something else has to GIVE. Usually you end up with a bent head that leaks worse than ever!

That's it for this month, gang. Next month the whole article will be devoted to fuels. I had prepared it for this month but decided to set it aside in order to cover the Perry carburetor.

Scratch Building

BY CHUCK CUNNINGHAM

"Someday I'm gonna' build a really **BIG** *bipe!"*

For the past several months we have been delving into the design of various types of R/C aircraft. If you have kept up with the series you know that we have investigated the design of a full house pattern aircraft, trainer types, galloping ghost models, and biplanes. They each had some characteristics that were similar, and many that were diverse. All during this series; and many previous articles, we made the assumption that you wanted to design your own craft, both for the fun of it, and for an escape from the dependency upon others to design a model that just suited your taste. This month, we're going to open up a subject that is a companion to the others, and yet one, that from all I have heard from friends, needs to be explored. The subject is SCRATCH BUILDING.

Many modelers, new to the ranks of the sport, are completely dependent upon kits to supply their construction projects, and even some who have been building for years have this same dependency. As one of my closest friends, who falls in the latter category, expresses it, "If something doesn't tell me to glue stick A to stick B then I just can't do it!" Others forge blithely ahead and glue everything in sight into one big mass and have a ball. Why, then, is it a problem to start out on your own without the aid of a kit, or even magazine plans? Perhaps it's a fear of not getting a complete, good looking aircraft, and perhaps it's just the need for a basic grounding in "how-to-do-it." If you really need a reason for considering scratch buiding then here is the very best of all: MONEY!

As balsa prices leap upward and the cost of labor to assemble kits follow the same line, it becomes even more and more important to the serious builder/flier to "make his own." This certainly is not meant to be a panning of kits, since most of the best aircraft to be found at the field ARE from kits, but if you build any quantity of aircraft per year, the cost of doing it ALL from kits simply becomes staggering. Of course, using material of a lower cost than balsa will also help hold the prices down. We have discussed this before, and later on in this article, I'll pass along some information received from some of our readers during the past few months.

If you are designing your own aircraft and building from scratch for the first time, then a good idea is to develop the construction details based upon the last successful kit that you put together. Some kits are very complex, while others are even more simplified than the average magazine design. For example, if you are building a slab-sided stunt aircraft, your problems are really very few in number. Draw out your design full size on a piece of brown wrapping paper, or on a sheet of tracing paper. The important thing is to work on a good flat surface. A nominal investment in drawing triangles and a French curve or two will serve you a lifetime. A good T-square is a help if you are working on a drawing board, but if you're working on the kitchen table, then a good long straight edge can do the job. The aircraft that you build from your design will be only as straight and true as your drawings, so take some care with them. Make sure that you have drawn the wing and tail settings to the exact angle that you desire with reference to the thrust line.

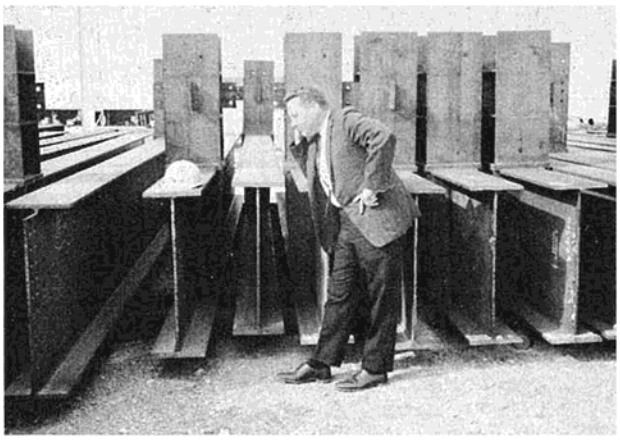
Start your drawing by marking the center line of the fuselage on your paper. Next, locate the wing and horizontal stab in the position that you want along this line. Then develop the fuselage side view to look like you want it to look. Don't draw in the preliminary lines too heavily since you may want to come back and change them later. Just sketch them in lightly. Draw a top view of your dream ship directly above the side view. Refer to plans in this issue to see just what the designers did when drawing their aircraft. Mark out the locations of the prime bulkheads such as the firewall, and main braces at the joint between the wing and the fuselage. Extend these lines up to the top view, and if you're building a square, box-type fuselage, you won't have to draw out the bulkheads, but simply pick the dimensions from the plans as you build. Draw in the wing airfoil on its chord marking line. Add doublers to the drawing. Again, look at magazine plans to see what type of doublers and braces are commonly used. Don't be afraid to make your creation strong. With the fuselage drawn you can then draw the horizontal stab from a top view, then the wing. The structure of each is up to your personal preference, again, based upon the kit that you enjoyed the most. Some kits do not really beef up the center section of the wing enough, so don't skimp on that location. Remember, the weight that you add in structure can be made up in leaving off a little bit of finish.

Now, that you have the plans drawn, take a good look at them to see if everything really looks "right." Take the plans off of the table and put them on the floor. Then step up on the seat of a chair and take a good look at

them from as far away as you can get. You'll be surprised just how many errors you can pick up by getting AWAY from the drawing and really taking a GOOD look at it. (A case of not being able to see the forest for the trees.)

If you're satisfied with the design, then the next step is to get on to the building. A kit simplifies the next item by providing all of the necessary wood. You won't have a box to dig around in to dredge up the necessary part, so make an approximate list of the materials that you will need. Go to the friendly hobby dealer and load up on the balsa, plywood, sheets, strips, tubing, wire, glue, mastic, adhesive, hardware and so on that you are going to need. If you've been building models for some time then you probably will have a good supply of odds and ends, but if you haven't, then try to plan ahead for your needs. It's far better to buy a little bit too much than to run out at nine-thirty on e night with a good couple of building hours ahead of you! If you're building an all-balsa aircraft the cost of lugging the wood away from the hobby shop will still amount to a pretty good piece of change, but if you've been trying to cut the cost of modeling by using foam and cardboard, then you will find that the material costs will really be quite low. If you want to hold down the purchases so that they won't make too much of a dent in the family budget all at once, buy the needed wood for the fuselage one week, the wing the next, and the covering and dope/paint the next

Start construction of your aircraft by laying out the fuselage sides along the side view of the fuselage and marking the outline of the body upon it. Then cut both sides at the same time to these dimensions. Use a ball point pen to do the marking, and don't press too hard. The best way to be sure that you make one right and one left side is to mark "Inside" on each of the sides. Add in all of the doublers, stringers, etc., to each side and set them off in a safe, flat place to dry. As you longtime readers know, I like to use 1/32" plywood as doublers in balsa fuselages. The strength is much greater than a balsa doubler. Use a good grade of contact adhesive to stick the doubler to the side. Cut out all of the bulkheads. Cut out the firewall, and if you are using a Tatone engine mount, mark its location and drill the mounting holes. Install the blind nuts, and if you're using a trike gear, install the nose wheel mounting blocks to the firewall. It's much easier to do all of this before the firewall is glued into the body structure. After all of the bulkheads are chopped out assemble them to the sides. This is the time to take great care to be sure that everything lines up. You can build a fuselage jig to do this, or do like I do and work to a center line drawn on my building board. If you take a little care here it will pay off in a true flying aircraft.



"How about **THESE** *wing spars?"*

With the fuselage structure completed you can turn to construction of the vertical and horizontal stabilizers. These can be either of built-up structure, solid sheet balsa, or foam core with some type of covering. If you are not going to use dope for the finishing material then these parts may be built of sheet balsa quite easily. Since dope has such great warping tendencies it's a good idea to use a built-up structure to resist the warping as much as possible.

Wings are the last item on our list. Some builders like to construct these first, I generally build them last, but to each his own. If you haven't learned how to cut your own foam wings you're missing out on a very simple way of constructing the most time consuming part of your model. Many words have been written on how to build foam wings, the best of all being presented in RC Limited. For those of you who may have missed this article and are interested in foam wings, by all means order a copy of this magazine from RCM. It's well worth $1.50 just for this one article, alone. A source of foam is one of the major problems, but consult the yellow pages of your phone nine-thirty on a night with a good couple of building hours ahead of you! If you're building an all-balsa aircraft the cost of lugging

Each one has his own tricks of the trade for cutting foam wings, and here are some of the ones that I have developed over the past four years of building foam wings. The template is most important. If you build it from balsa then you run the risk of cutting into the template with the hot wire. For all around good results I have found that 1/8" plywood works the best. Cut out the templates with a jig saw, (the Dremel Jig Saw can't be beat), a little over-sized, clamp the two templates together, (if it's a constant chord wing), and sand to the final contour. Sand the edges with 400 wet-or-dry to make sure that there are NO snags to hook the wire. Mark one template to be used as the root, and the other to be used as the tip. Mark divisions on each template to serve as guides for speed control by each member of the cutting team. Mark out the foam block very carefully to be sure that the chord lines on each end of the block are exactly parallel. Pin the template to each end and get ready to cut. The voltage that you use depends upon the weight of wire that you are using, the length of the wire, and the density of the material. For best cutting results be sure and use a voltage setting that just allows the wire to cut without dragging, and not high enough to melt the material. If you use too high a heat you will have a finished surface that looks much like the surface of the moon – all covered with pits and craters! When cutting, start at the trailing edge and come toward the leading edge. When rounding the leading edge curve go very slowly, and at the center of the leading edge radius, STOP just a second to be sure that the wire at the center has caught up with the ends. If you go around the leading edge too rapidly you will have a sway in the leading

edge and the radius will not be the same at the center as at the tips.

When you have completed the cut, remove the core from the remainder of the block and examine it. If it looks good then slide it back into the block, place the block on a flat surface and weight it down with a couple of books to prevent warping while the core cools. The next step is VERY important, whether you are building your own foam core, or are working on a commercial core. You MUST sand the core as smooth as you can get it. Some commercial cores are very rough, as well as some of your earlier home built attempts. By sanding them you will gain a good smooth bonding surface with the wing skin, thus developing the maximum strength of the entire structure. If you do not, you just might have a folded wing, no matter what type of skin that you use. After you have sanded the core be sure and VACUUM the entire core surface to remove all loose sanding dust. If you do not, then, again, you will not get a good bond, with the same rough results.

Install the landing gear blocks, dihedral brace slots, and aileron bellcranks prior to covering. When you are ready to cover, use the material of your choice, the adhesive of your choice, and a lot of care. If you are Scotch, like me, (ancestors, not drink!) use cardboard for a good, simple and above all inexpensive covering. If you're a die-hard, then use balsa for covering. But DON'T skimp on the adhesive. If you are using the spray type (3M77) be sure that you have all surfaces well covered. If using a brush-on cement, again, be sure that all surfaces are covered and that the adhesive is well set up prior to joining the covering to the core.

When joining the wing halves be very careful that you do not build in a twist to the wings. Join them with epoxy glue and a plywood dihedral brace. Use round toothpicks to hold everything in place while the epoxy dries. When this is set up, wrap a band of 4" or 6" wide fiberglass tape around the center section and bond this to the wing tip blocks, then sand and finish to your own specifications. When working with foam wings it's a good idea not to use dope on the skin unless you have sealed the balsa skins with Hobby Poxy clear or similar material. If you use cardboard, then use enamel paints and you will get a beautifully smooth finish. Take care in selecting the enamel to be sure that it IS fuel proof. If it is NOT use Aero Gloss fuel proofer for the final coat.

On the subject of foam wings, and foam wing covering, I've received two letters in the past few months that I'll pass along to you. The first is from Don Williams in Houston, Texas. Don has done a lot of experimenting with R/C jet aircraft, and along the way, discovered another type of foam, a rigid polyurethane foam. It is much lighter than balsa, and just a bit heavier than the expanded bead polystyrene foam generally used in foam wing cores. It can be cut with a hot wire, carved with a knife, sanded, and generally worked just like balsa or polystyrene foam. Don tells me that you can use almost any adhesive on it and it will not attack the foam. Don has used dope, fiberglass resin, white glue, ambroid glue, titebond glue, epoxy glue, epoxy paint, and rubber based contact cement with no problem. (Rubber base contact cement will eat up polystyrene foam). Don uses the foam for wings, fuselage sides and top blocks, wing tips, fillets and almost any place that you would use balsa. He has also used this material to form a mold for fiberglass parts as it works so easily. Don tells me that he purchases the material from Miles Laboratory in Houston, but believes that the material is available from other sources. He mailed me a chunk of the foam and I have been experimenting with it, and it is a great material. Give it a try.

Another letter, from Chuck Wenzel in El Paso, Texas, concerns some experimenting with covering materials. Chuck has run weight chcecks on them to see just what each weighs. He uses shell reloading scales to check the weights so they should be more accurate than the normal bathroom scale. Here are the results of his tests: Plain silk, (no dope) weight of sample section; 2.5 grains. Weight of silk sample with dope finish, (and not a super finish at that); 16.5 grains. Heavy template paper; weight 21 grains, with dope finish; 35 grains, (with spray enamel finish; about 25 grains. Ed.) Heavy template paper plus vinyl covering 37 grains, heavy tag board, 84 grains, and thin fiberglass sheet as supplied by Fliteglas kits at 72 grains. Chuck has gone even farther computing the cost of these coverings. Dope and silk for one wing he didn't compute, but it is in the range of three bucks per wing. Tag board is $1.60, plus dope or enamel, heavy template paper ten cents for a wing, plus vinyl covering at $1.67.

Cunningham measures a potential wing jig!

Now, the vinyl covering that Chuck has used is Contact Vinyl purchased from the hardware store. Chuck puts it on the paper first before covering the foam wing core and has found that it makes a great fuel proof finish.

Experiments like these are really what makes this hobby progress. I hope that you will pass along any experiments that you may have tried so that we can spread the results around.

That's about it for this month, so I would like to take just a moment to apologize for not answering many of the letters during the past year. I still have a stack and plan to work through them this winter and spring. Last year was rather a tough one in our house, we had three deaths in the family, plus two serious operations, and I was pretty hard put to keep up with this monthly column, so I let the answering go by the board. Now, I hope that things have settled down a bit and I can dust off those letters and peck out a few answers.

Good luck with your scratch building and let's have some pictures of the finished results.

DON PRENTICE'S *MAGNIFICENT* DEHAVILLAND BIPLANE

TIGER MOTH

During the years of World War II, the DeHavilland Aircraft Company, and other companies, under contract to them, built more than 8,000 Tiger Moth training planes. The back-bone of the RCAF Commonwealth Air Training Plan designed to train air crews, used this aircraft as its elementary pilot trainer. To accommodate the harsh Canadian winters, the open cockpits of the aircraft were enclosed in a large greenhouse, the two center panels, of which , slid on rails to a position behind the rear cockpit.

This aircraft is still flying around the world and many present airline pilots, return to their original love of the open cockpit and singing wires by relaxing in these machines.

The model presented here is not entirely scale as compromises have been made to ensure flyability for a relative novice. A Clark Y airfoil has been employed to ensure a slow landing speed. The model, as a result of this airfoil, and large wing area, can be flown safely inside a football field. Its high sink rate on landing coupled with its response to throttle on take-off and high rate of climb make touch and go's a cinch in a small area.

The model relies on the interplane struts, landing and flying wires for the strength required for flight. Do not omit these details without strengthening the wing spars. The procedure used to hook-up the struts and wires is the result of 3 major design changes. The aircraft can be assembled on the field in a minimum time and without the use of turnbuckles. The engine, although space is available to invert it, has been left in the upright position, a compromise to ensure flyability without fuss. It is difficult to invert a biplane for engine starting without damaging the upper wing.

The major problem in the construction of a biplane is the installation of the upper wing and cabane struts. This design, with no outward slope to the struts, and with a center section fuel tank, permits the provision of a platform in this area on which the upper wing is installed.

This is not a beginners construction article. Only the specific points associated with the construction will be discussed. It is assumed that anyone selecting this model will be well aware of the normal construction techniques through previous experience.

FUSELAGE

The bulkhead 'key' assembly technique is employed to ensure easy assembly. The 1/8" ply doubler extends above 3/32" side panels in the area where the cabane struts are attached. Drill the holes for the struts and insert 2-56 anchor nuts on the inside for cabane struts. Ensure these holes are accurately located. The 1/4" plywood undercarriage mounts sit on the underside of the fuselage sides and doublers. Install 4-40 blind nuts to accommodate the gear. A 1/8" plywood insert is added to the bottom of the fuselage behind the rear wing to accommodate floats at a later date. The lower wing is held in position by 1/4" dowels at the front and Dzus fasteners at the rear. Build the lower wing prior to completing the assembly of the fuselage. It is easier to install the fasteners while looking down from the top inside the fuselage than attempting to do it after completing the model. Ensure that an oil drain is installed in the sump under the engine. Make sure this area is sealed so that oil will not leak into the fuselage. A fibreglass re-enforcing patch under the nose section will protect this area should a nose-over occur.

WING

No plywood is employed in the wings except for the ribs carrying the interplane struts. The plan shows the wings with no sheet covering except in the lower wing center section. Should the builder be concerned with warping, use the full rib section, omit the false ribs, and sheet the leading and trailing edges with 1/16 sheet, and cap strip the ribs between the sheet. This procedure will not provide the detail one likes to see in a biplane, but will discourage warping. The wing tips are laminated with 5 pieces of 1/32" x 1/4" balsa. Make a 1/4" plywood form as shown and, after soaking the pieces in hot water, coat with white glue and press the sticks into the form. Hold them in place with pins. Incidentally, attach the form to a piece of soft wood to accommodate the pins but be sure to place Saran Wrap between the form, board and sticks so that they

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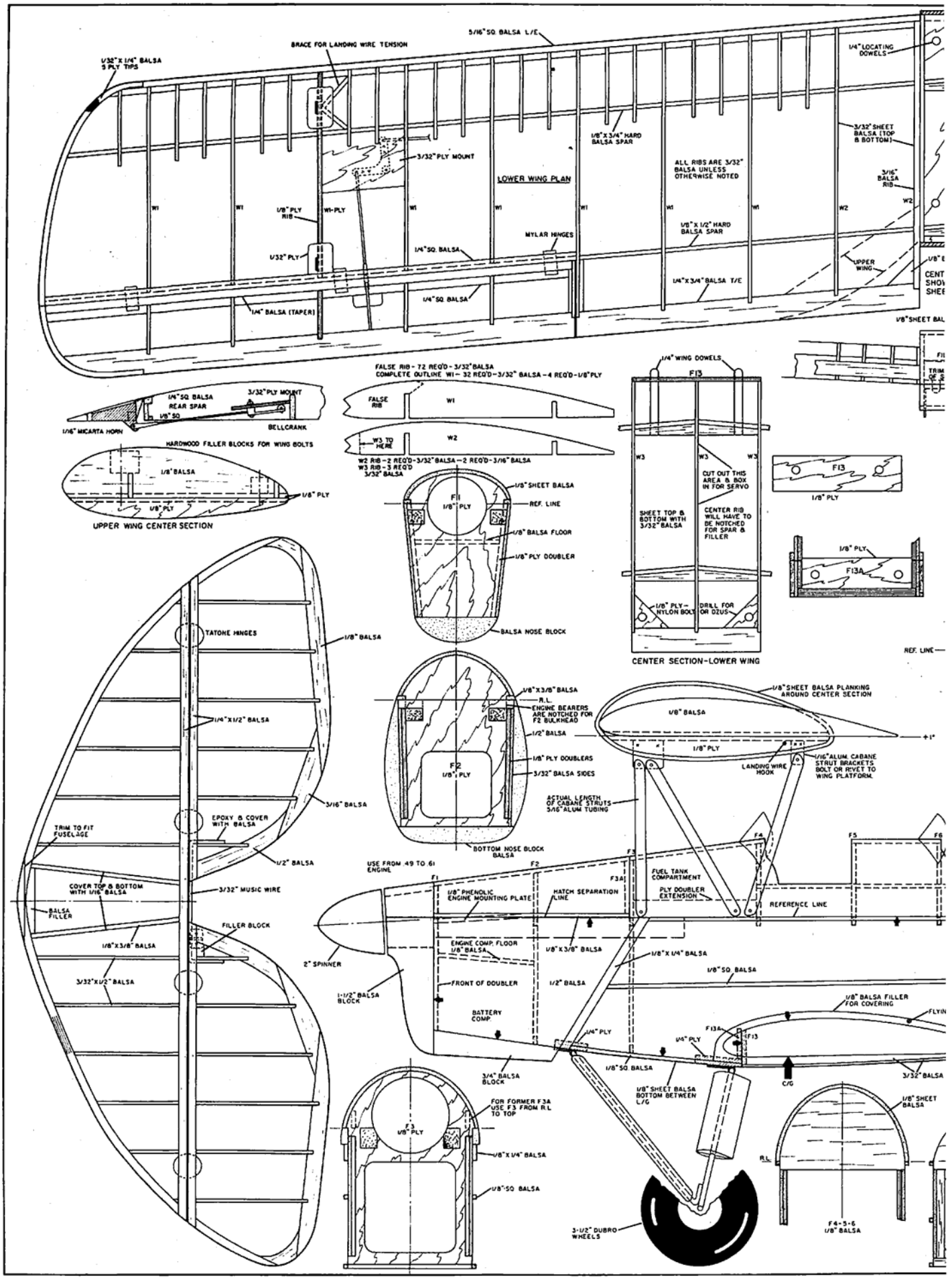
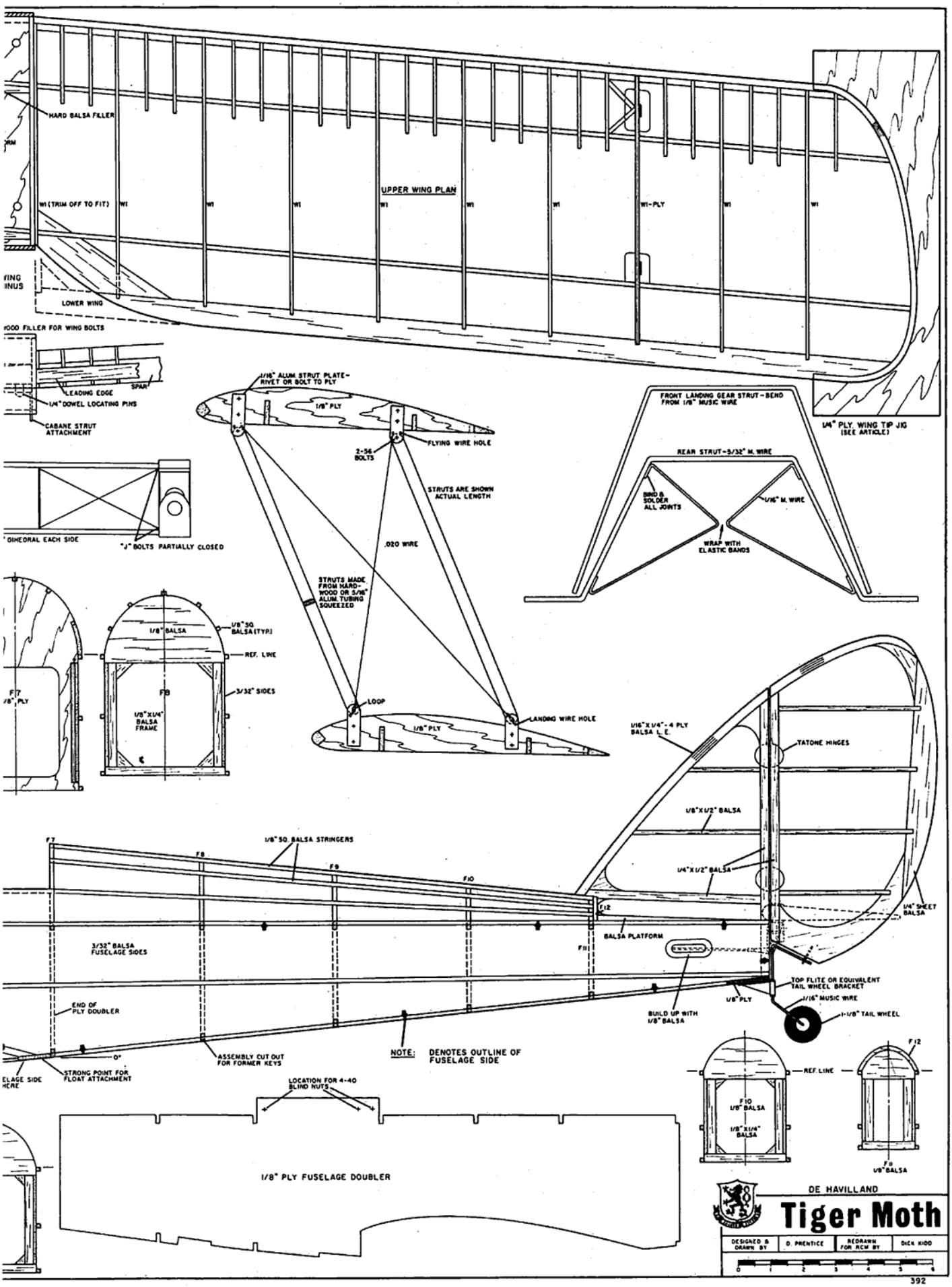

LOWER WING PLAN
1/32" X 1/4" BALSA 3 PLY TIPS
BRACE FOR LANDING WIRE TENSION
5/16" SQ. BALSA L/E
1/4" LOCATING DOWELS
1/8" X 3/4" HARD BALSA SPAR
3/32" SHEET BALSA (TOP & BOTTOM)
3/32" PLY MOUNT
ALL RIBS ARE 3/32" BALSA UNLESS OTHERWISE NOTED
3/16" BALSA RIB
1/8" PLY RIB
W1-PLY
MYLAR HINGES
1/8" X 1/2" HARD BALSA SPAR
1/4" SQ. BALSA
1/32" PLY
UPPER WING
1/4" X 3/4" BALSA T/E
1/4" BALSA (TAPER)
1/8" SHEET BAL
1/4" SQ. BALSA REAR SPAR
3/32" PLY MOUNT
1/8" SQ
1/16" MICARTA HORN
BELLCRANK
FALSE RIB - 72 REQ'D - 3/32" BALSA
COMPLETE OUTLINE W1 - 32 REQ'D - 3/32" BALSA - 4 REQ'D - 1/8" PLY
FALSE RIB
W1
W3 TO HERE
W2
W2 RIB - 2 REQ'D - 3/32" BALSA - 2 REQ'D - 3/16" BALSA
W3 RIB - 3 REQ'D 3/32" BALSA
HARDWOOD FILLER BLOCKS FOR WING BOLTS
1/8" BALSA
1/8" PLY
UPPER WING CENTER SECTION
1/4" WING DOWELS
F13
W3
CUT OUT THIS AREA & BOX IN FOR SERVO
SHEET TOP & BOTTOM WITH 3/32" BALSA
CENTER RIB WILL HAVE TO BE NOTCHED FOR SPAR & FILLER
1/8" PLY - NYLON BOLT
DRILL FOR DZUS
CENTER SECTION-LOWER WING
F13
1/8" PLY
F13A
1/8" PLY
F1
1/8" PLY
1/8" SHEET BALSA
REF. LINE
1/8" BALSA FLOOR
1/8" PLY DOUBLER
BALSA NOSE BLOCK
REF. LINE
TATONE HINGES
1/8" BALSA
1/4" X 1/2" BALSA
3/16" BALSA
EPOXY & COVER WITH BALSA
TRIM TO FIT FUSELAGE
1/2" BALSA
COVER TOP & BOTTOM WITH 1/16" BALSA
3/32" MUSIC WIRE
BALSA FILLER
FILLER BLOCK
1/8" X 3/8" BALSA
3/32" X 1/2" BALSA
1/8" X 3/8" BALSA
R.L.
ENGINE BEARERS ARE NOTCHED FOR F2 BULKHEAD
1/2" BALSA
F2
1/8" PLY
1/8" PLY DOUBLERS
3/32" BALSA SIDES
BOTTOM NOSE BLOCK BALSA
1/8" SHEET BALSA PLANKING AROUND CENTER SECTION
1/8" BALSA
1/8" PLY
LANDING WIRE HOOK
1/16" ALUM. CABANE STRUT BRACKETS BOLT OR RIVET TO WING PLATFORM.
ACTUAL LENGTH OF CABANE STRUTS 3/16" ALUM TUBING
USE FROM .49 TO .61 ENGINE
F1
F2
F3
F3A
F4
F5
F6
1/8" PHENOLIC ENGINE MOUNTING PLATE
HATCH SEPARATION LINE
FUEL TANK COMPARTMENT
PLY DOUBLER EXTENSION
REFERENCE LINE
2" SPINNER
1-1/2" BALSA BLOCK
ENGINE COMP. FLOOR 1/8" BALSA
1/8" X 3/8" BALSA
1/8" X 1/4" BALSA
1/8" SQ. BALSA
FRONT OF DOUBLER
1/2" BALSA
BATTERY COMP.
1/8" BALSA FILLER FOR COVERING
1/4" PLY
F13A
F13
1/8" SQ. BALSA
3/32" BALSA
3/4" BALSA BLOCK
C/G
1/8" SHEET BALSA BOTTOM BETWEEN L/G
FOR FORMER F3A USE F3 FROM R.L. TO TOP
F3
1/8" PLY
1/8" X 1/4" BALSA
1/8" SQ. BALSA
3-1/2" DUBRO WHEELS
1/8" SHEET BALSA
R.L.
F4-5-6
1/8" BALSA



FULL SIZE PLANS AVAILABLE — SEE PAGE 70

(continued from page 17)

may be rewound after drying. Build one wing tip each night for 4 nights. The ailerons in the lower wing panels are built-in during construction and are cut out after sanding. The plywood ribs are not installed until the wing is removed from the board. Prior to installing the plywood ribs manufacture the strut attachments out of 1/16" aluminum and rivet or bolt to the ribs. These must be accurate to ensure wing alignment after assembly. Each wing panel is built separately and joined later using balsa gussets, etc. The upper half of the fuel tank is permanently attached and forms the joint for the upper wing panels.

Cabane Struts

The plan shows the struts actual size. Manufacture the struts out of 3/8" x 3/16" hardwood or use 5/16" aluminum tubing squeezed to an oval shape.

Should aluminum be used, cut the struts to approximate length, squeeze to shape, and fill the ends with an epoxy filler to ensure the sides cannot be squeezed in further by the mounting bolts. The lower half of the fuel tank sides are constructed and the cabane strut attachments are installed. Be accurate. Assemble the cabane struts and lower half of fuel tank to the fuselage. Level the fuselage on the workbench and check for a 1° incidence angle on the upper flat surface of the tank assembly. If it is not close to 1° your measurements are out, so start adjusting by filing elongated slots in one end of the struts until the situation is corrected. Later fill in the elongated hole with epoxy and redrill. 2-56 bolts have been found adequate to hold the assembly together.

Tail Plane

The leading edge of the fin and the stabilizer are laminated in a manner similar to the wing tips. The large surfaces will warp readily so take more than adequate precautions.

Rigging

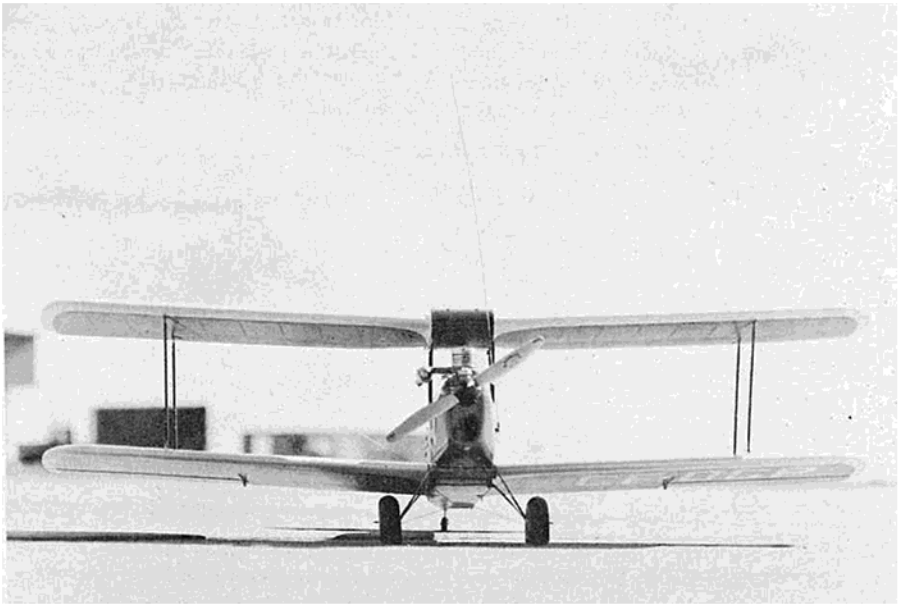
Since the landing and flying wires are required, correct rigging of this ship is mandatory. Incorrect wire length will warp the wings. The following is suggested. Install the lower wing, and without the undercarriage installed, support the model on a flat surface with 1" blocks along both sides of the fuselage so that the lower wing area near the fuselage is supporting the assembly. Prop up the tail to ensure the flat surface of the wing is fully supported, place additional blocks under the wing tips. Weight the wing to ensure it does not move. Using .020 wire, attach one end to the wire hole in the front strut fitting, extend the wire to the hook at the lower tank section and return it "V" fashion to the rear strut fitting and attach permanently. Ensure the wire has no slack nor should it be excessively tight. Repeat the process for the other wing. Now attach the upper wing and wing struts. If the struts are of the correct length, the upper wing will also be rigged automatically. Attach the "V" rigging to the hook at the fuselage and rigging is now complete.

Assembly of Model

At the field, install the lower wing, hook up the landing wires by warping the wing upward. Install the upper wing, with struts attached (never necessary to remove them). Splay the struts outward, bend the wing down and attach the flying wires. Attach the struts and presto, the landing and flying wires are tight. The struts are attached to their metal plates with 2-56 bolts. Tapping a thread in the fitting will eliminate the need for nuts.

Flying

Be prepared for a crowd around the model. It always attracts attention. On take-off, take care of torque with lots of right rudder and on landing watch the nose over. Should you be unable to overcome the nose over, shorten the front struts on the landing gear. Be careful though, should you make them too short, take-offs will be more difficult. The model flies inverted with tail low just like the real ship and although it will NOT do the complete FAI pattern, more eyes will be on your ship than on the other fellow who is doing the pattern in a flawless manner!



RCM's Technical Art Editor, Dick Kidd, displays unusual appearance of the Goose. MonoKote covered, Enya .29, Micro Avionics proportional system. Ektachrome by Don Dewey.

THE GOOSE

AN UNUSUAL, COMPACT, ONE-PIECE, SWEPT-FORWARD "THING" FOR A CHANGE OF PACE. BY BRENT REUSCH.

The first flight of the 'Thing' (as it was then called) took place on a chilly 10 degree December day. Garry, my eleven year old son, hand-launched it on its maiden flight. The 'Thing' pulled straight out of his hand and

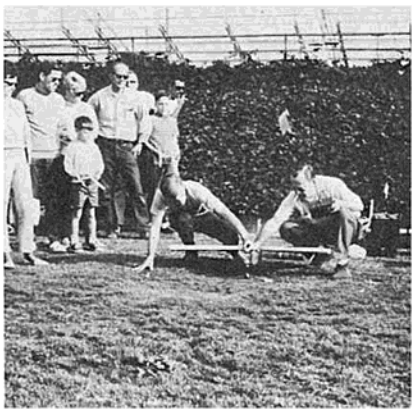
The first flight of the 'Thing' (as it was then called) took place on a chilly 10 degree December day. Garry, my eleven year old son, hand-launched it on its maiden flight. The 'Thing' pulled straight out of his hand and continued to climb at a fairly steep angle. When I finally lifted my dropped jaw long enough to get 'with it' on the controls, the ship responded in a normal manner. After some very minor trim changes on the pitch and roll levers, a cautious loop and a few low passes were attempted and the 'Thing' was brought into a normal landing on the snow covered field. Further attempts to fly the model on that day proved fruitless. Not because of the model, but simply because neither Garry or I could get up a launching head of steam on the slippery, icy road we were using for an airfield!

A week later, this "swept-forward job" went into its second flight, with anonymity, but landed with a name. Bob Mathews, my flying partner, who launched the model on its second flight, was so struck by the fact that it looked like a goose in flight, that we called it the "Goose."

The first flights of the Goose were made without a landing gear and it would sustain a fantastic climb angle with an S.T. 23. With the tricycle gear added, the climb and speed have been reduced, but it is still greater than a conventional model of the same size and power, as there are no tail surfaces and less fuselage to cause drag.

I am glad to say that the Goose is NOT the result of many and varied test models to find the right configuration for good flight and stability. The airplane you see in the pictures is the first one ever built and no need for modifications has been found necessary so far. This design configuration has been in my mind for almost 25 years, ever since it was tried as a fuel-carrying glider to tow behind bombers in the Second World War.

The advent of proportional radio, with its instant trim feature and my subsequent two years of experience on this type of radio gave me the confidence to try something different. As it turns out, the airplane is as easy to fly as any good multi ship and will give few problems to anyone with some proportional time.



Dick Kidd adjusts the needle valve on the Enya .29, as small crowd gathers to watch unusual craft.

The Goose at rest. First flight on RCM prototype near-disastrous due to improper incidence, requiring excessive up-elevon trim.

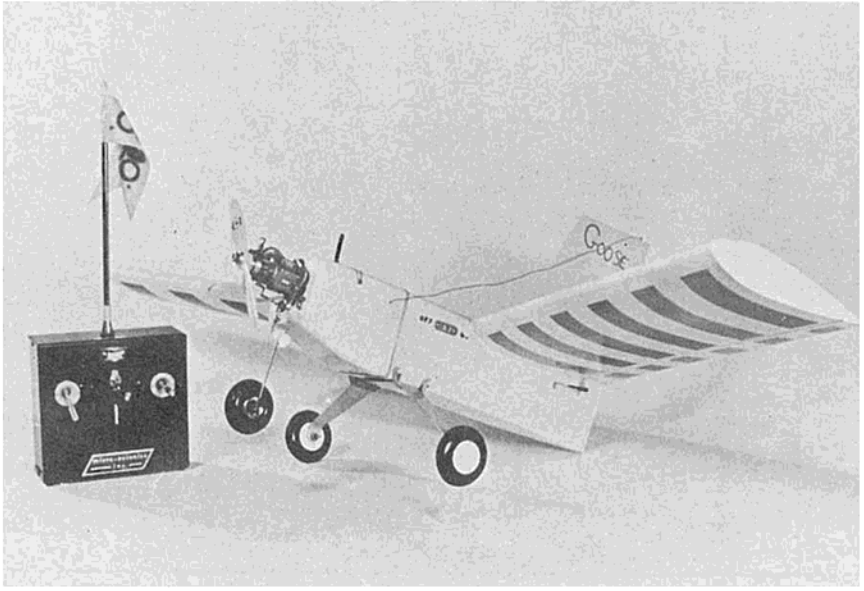
Elevon type of control is used and is recommended, but the elevators and the ailerons could be separated similar to those used on the Hustler Delta. A suggested elevator and aileron division is shown on the plans, but this has not been tested, so you are strictly on your own. The elevon set-up works well, as only two pushrods are required from the aileron servo – these provide both roll and pitch control. The aileron servo is moved back and forth on a sliding plate by the elevator servo, the latter being fastened firmly to the fuselage in the usual manner. Micro Avionics servos are shown on the plans, but Bonner and Kraft servos could be adapted by using an "Aileron-Rand" on the aileron servo.

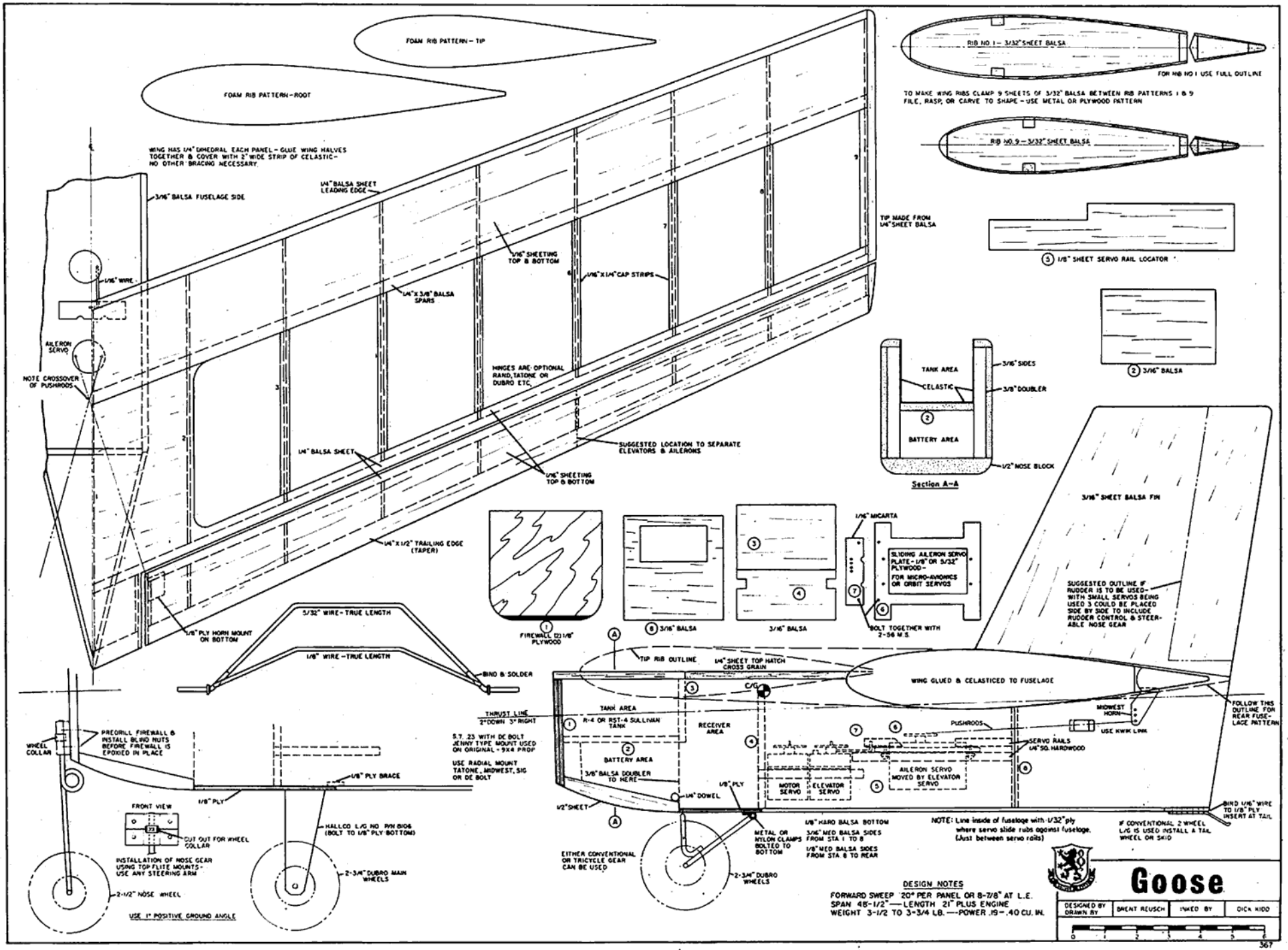
Construction is conventional, so no special building instructions will be given. One note however: The inside of the fuselage wherye the "aileron-servo plate" slides back and forth, should be lined with 1/32" plywood. This keeps the sliding plywood plate from eating into the balsa sides and jamming the elevator action.

The original was built with foam wings and weighs 3¾ pounds. AST 23 proved to be plenty of power and any .19 to .40 motor would be more than adequate.

One added feature – this is a compact, one-piece model that fits inside even a compact car with room to spare.

The author's latest prototype utilized foam wing, S.T. 23, trike gear, and Micro Avionics proportional system. Rudder can be utilized if small digital servos are used.





FULL SIZE PLANS AVAILABLE – SEE PAGE 70

DETAILING THE

STERLING PT-17

BY DOUG HOBBS **PHOTOS BY BILL NORMENT**

When I saw the ad for Sterling's PT-17 kit, the decision was instantaneous – this was one that I HAD to build. These photographs represent thirteen-and-one-half months of real enjoyment, and at this writing the PT is STILL unfinished. There are some of the scale details to add and all of the equipment has to be installed.

This kit is DEFINITELY NOT for the beginner or less experienced builder. For the old-timers and the more experienced builders, it is a real challenge. A lot of time and patience is required to build the PT, so don't expect it to go together like some of the pre-fabs or partly pre-fab. This is one kit that you will have to BUILD from the first piece of the fuselage to the last piece of the rigging. If you do decide to build it, remember one thing, HASTE MAKES WASTE; then settle back and give it all you have. The beautiful model that evolves from that box of balsa and plywood will be your reward.

One of the major items that I have had other builders comment on is the planking of the fuselage with the 1/8" x 3/8" balsa strips. This is one procedure that does require some know-how, if not experience. Some of the pieces are curved so much that they will break if you try to apply them dry. I find that an easy way is to form them wet and let them dry before trimming to size and applying. Make a form from a 3/4" x 1½" x 8" balsa block, giving it a little more curve than is required. Cut six or eight pieces of the 1/8" x 3/8" balsa strips a little longer than required, and soak them in hot water for about ten minutes. Bend these pieces, (stacked one on top of the other), around this form, and hold them in place with masking tape until thoroughly dry. I found it better to start off by gluing one straight piece in the center of each side, top and bottom, and then work out on each side of these four pieces. To keep everything true, glue one piece on the right side, then glue one piece in the same station on the left side. Repeat this procedure at the top and bottom. Each piece will have to be fitted to its own location by tapering to the nose end properly and by beveling the edges to fit the adjoining pieces, this is where some of that time and patience comes in, and it is the difference between a good job and a fair job.

The top deck of the fuselage around the cockpits can be treated somewhat the same as the nose. Soak the sheet balsa in hot water, trim the sheets to fit, and hold them in place with masking tape until thoroughly dry. Remove the moulded sheets, trim to a good fit if necessary, and then glue them to the fuselage. Use masking tape to hold the sheets in place until the glue is dry.

In the general construction, it is impossible to be too careful. In the fuselage, be sure to put in one stringer on one side, then put in another stringer in the same station on the opposite side. Check your alignment after each and every installation. Try to pick two stringers of about the same density for opposite stations. Keep all stringers straight from front to rear, even if it means re-notching the bulkheads. Remember that the stringers show up in the final finish and that they are supposed to be STRAIGHT.

Construction of the wing and tail surfaces will be routine to most builders. One word of caution though, a wing can be no better than the surface on which it is constructed. Be sure that your work surface is flat and straight; that is, NO bumps, NO dips and NO twists. Be sure to use the correct sizes of blocks, as called for on the plan, to block up these structures during their construction. Use fine sandpaper on a block for shaping and finishing; the longer the block the better the job.

I used yellow silk on the wings and tail surfaces, and dark blue silk on the fuselage to hold down the number of coats of colored dope required to cover up. Sig's "Supercoat" dope was used throughout, clear, cub yellow, and dark blue (which I lightened slightly with white). All trim and insignia is painted on with red, white, blue, black and silver. The rivet detail is simulated with 1/2" straight pins pushed in tight with a spot of clear cement over the head to hold them in place.

A very realistic dash panel can be obtained by transferring the circle layouts of the pattern on the plan to a piece of 1/16" plywood. Cut the holes in the plywood a little small, then trim and sand to match over the dash pattern supplied. Sand with fine sandpaper and then dope with first clear, and then black dope, on one surface only. Glue a piece of clear plastic to the unfinished side. Glue the printed dash panel with the face next to the plastic, so that each instrument shows through its respective hole in the plywood. Glue the completed dash panels to their respective bulkhead. Box-in the inside of the cockpits with 1/16" sheet balsa to hide the stringers. Straight pin heads show up nicely for knobs on the dash.

I found an elastic cord that really fills the bill for the rigging since the size and color show up very well. This item was found in the sewing supplies section of a department store. The brand name is "Stay Lastic" cord elastic No. 150/H2D, manufactured by the Continental Elastic Corp. of New Bedford, Mass. Still another dressmaker's item was used for the wing walks. Cut two pieces of NYLON NET to size and spot glue very sparingly around the edges with cement; mask off with masking tape and apply two or three coats of clear dope and then two or three coats of black dope. This makes a good looking walk and is very easy to keep clean.

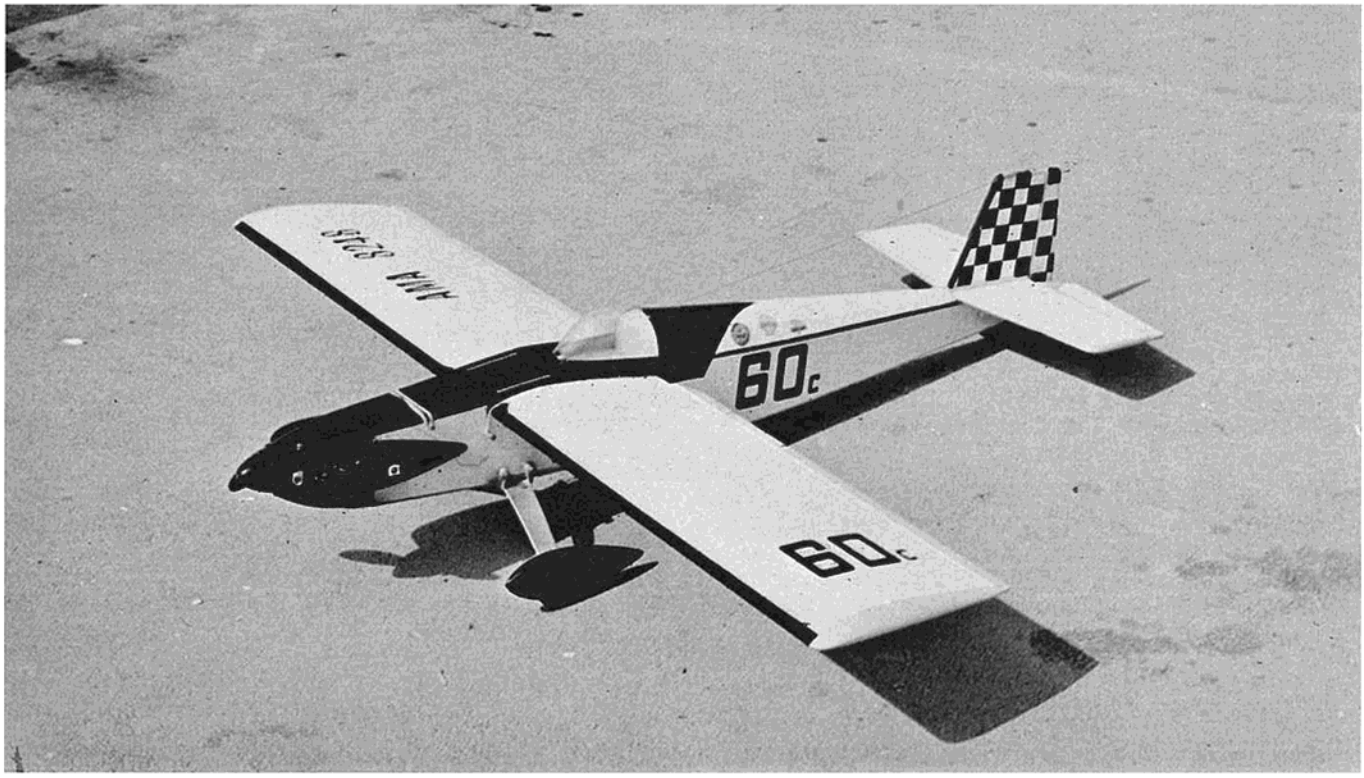
The scale engine shown is made up from the new Williams Bros. two inch scale Pratt and Whitney cylinder kits. The Pratt and Whitney 450 engine has been used on some of the restored PT's and on some that were converted to crop dusters.

This ship took second place in the "Best Finish" awards at the 1968 Iris Festival R/C Invitational sponsored by the Sumter Model Airplane Club and the South Carolina Radio Aircraft Modelers, held at Sumter, S.C.

If your thoughts are leaning toward this kit and you think you have what it takes, then get with it. She is a real beauty and an eye catcher anywhere you take her.

POWER PROP
1216

BOLLING FIELD
U.S. ARMY PT-17
AIR CORPS SERIAL NO.



PINATA

RCM introduces "Stressed Skin" construction, an all new building technique. Except for the firewall, landing gear support, nose block, cowl cheeks, and necessary balsa supports, this 600 sq. in. Formula II Racer is built entirely from corrugated cardboard for a cost of 30¢!

When plastic R/C models started to come into being, I can remember hearing remarks like, "too heavy," "never fly," "cost too much," etc. Well, they came, and are still here, and more popular than ever. The one point in their favor that keeps them popular is the speed with which a modeler can assemble the plane. They are, however, expensive.

This article introduces a new construction material, which is very INEXPENSIVE, as well as a new construction technique. The material is called, "stressed skin" or, in non-technical language, you will hear it called "corrugated board."

Competition Models, home of the "Starduster" the hottest "free flight" model in the country, (what's free flight?) is pioneering this new material and construction technique for R/C models. I can hear the critics now; "What does a free flight outfit know about designing, building and flying R/C models?" I guess I can't blame you for being skeptical, so read on and judge for yourself. To an old model builder this new material and building technique will not have the appeal of balsa, but it is less expensive and very easy with which to work. There is, however, enough balsa used with the "stressed skin" to keep that old model builder in touch with it. One of my friends commented, after viewing my "stressed skin" ship, "Look at this guy, he has a shop chuck full of balsa and he builds an airplane out of corrugated board!"

The day I developed the idea to try the corrugated board on a model, I hurriedly built a wing out of some regular corrugated box material, since we had received some furniture shipped in it from North Carolina. The wing looked so good I thought I might as well investigate the board to see if better sizes and weights were available. As you can guess I found that there is all types and sizes of corrugated board.

In evaluating the sample wing I decided not to investigate any board over 1/8" thick. At first, my main concern was to try and get the board as thin as possible. Flat cardboard was

BY RAY VANDEWALKER

considered but it was found that a regular framework construction was necessary. In fact the flat cardboard had to be treated as a balsa skin. Something should be set straight here. Corrugated board is NOT cardboard. Cardboard is merely a thick piece of paper. Corrugated board is a board constructed with a corrugated paper center with a paper face sheet glued on each side. The investigation of the corrugated board resulted in selecting only two sizes with which to experiment. These two sizes are called "E" flute, which is about 1/16" thick and "B" flute, the board also comes in a number of strengths ranging from 125 lbs./sq. in. to 600 lbs./sq. in.

The "E" flute, being only 1/16" thick, I thought, would be the best bet, but to date it has been disappointing. To begin with, it is a special size and it is not readily available. The particular grade of "E" flute that I used turned out to be slightly heavier than the "B" flute. With weight being one of the prime factors in the completed model I chose to build the first model with the "B" flute board, having a strength of 200 lbs./sq. in. At the same time that I was trying to settle on which board to use, I was experimenting with the board, itself, to see how it could be properly worked. I found one characteristic of the board to be that it has more stiffness across the corrugations than it has parallel with them. Note the wing construction in figure 7 – the flutes run WITH the chord. The board, therefore is stiffer spanwise than it is chordwise.

You will note that all of the flying surfaces have the flutes running fore and aft while the fuselage has them running up and down and across the ship. Note the large arrows on the plan denoting the direction of the flutes. Another interesting fact is that what you build INTO your surfaces in the way of a warp CANNOT be taken out by steaming, doping, etc. There is no twisting the surface once it is complete. So a word of caution: Whatever you use as a building surface, MAKE SURE IT IS FLAT AND STRAIGHT.

On examining the plans and the construction figures you can see that the construction technique is quite simple, and that a model can be built very quickly and inexpensively. The construction figures are provided to show the step-by-step build-up and to familiarize you with the simplicity of this technique of construction. Regular model airplane cement was used throughout except for the top wing skin and the turtle back. Contact cement was used for these units.

FUSELAGE

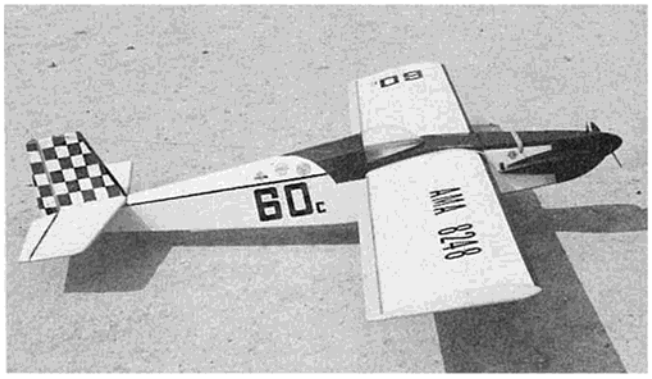
Cut two corrugated skin sides to the shape shown by the heavy outlines on the plans. If you are using a corrugated board with one white side make sure you have two opposite sides. Next, cement the stiffeners in place on each skin and then join the sides. Epoxy the 1/4" ply firewall and the landing gear support in place. Add the 3/32" sheet balsa doublers and then the 1/4" diameter dowels for the landing gear and wing. Add the 1/4" sheet balsa forward of the 1/4 ply landing gear support. Add the 1/8" x 1/4" balsa closeouts for the wing craddle and the fuel tank hatch area. Add the 3/32" bulkhead for the forward end of the turtle back. Cut the turtle back to size as shown by the flat pattern on the plans. Score and shape it as shown in figure 8. Cement the turtle back in place using contact cement. (Note: In fitting the turtle back the edges can be sanded much like balsa.)

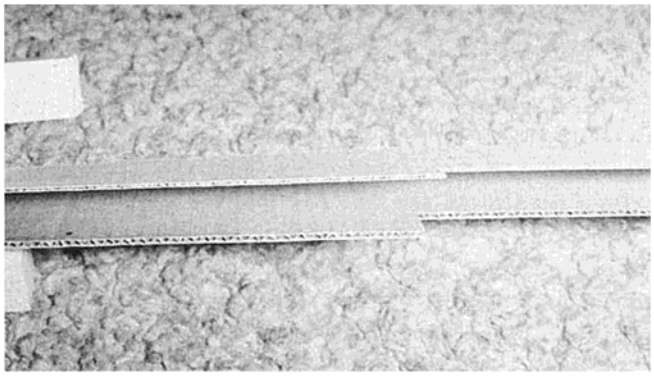
Now add the aft turtle back bulkhead and cut the bottom skin to size. Note that it is cut to allow for the 1/8" sq. balsa fill in on the corners in order to close out the flutes of the corrugated skin. After the bottom skin is cemented in place, add the 1/8" sq. balsa corner closeouts. Add the 1/16" ply face sheets to the firewall and the turtle back bulkheads. Now add the 1/4" sheet balsa fuel tank hatch. Cement 3/16" square balsa to the inside of the hatch to key it in place. Add the 1/8" x 5/8" balsa support at the tail. The "Pinata" was designed to the 600 sq. in. formula II racer rules so a .40 cubic inch engine is used. The photos show a K & B .40 cu. in. front rotor engine radially mounted. The nose block is built up from 1/2" thick balsa blocks with a 1/16" ply face sheet in front. The nose block is designed to be removable so blind nuts are epoxied into the back. (See photo.) In the photo of the engine, note that the screws through the firewall are used to hold the nose block in place.

The right hand cowl cheek is epoxied to the nose block. In order to be able to remove the nose block the left hand cowl cheek is removable and is held in place by one screw.

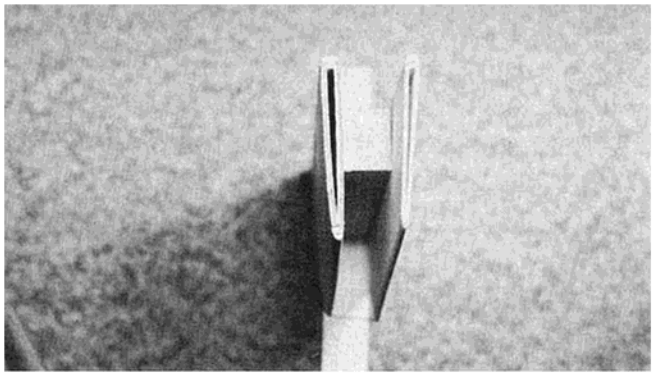
TAIL SURFACE

The tail surfaces require very little explanation as the construction figures 1, 2, 3, and 4 are quite detailed. Cut the skin surfaces to the sizes shown by the heavy outlines on the plans. Using the step-by-step instructions on the

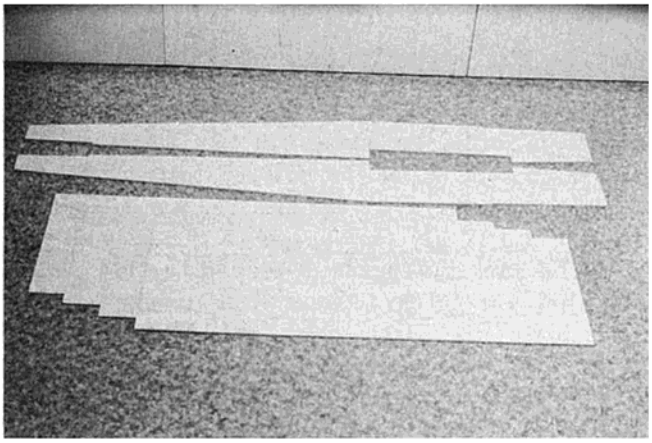




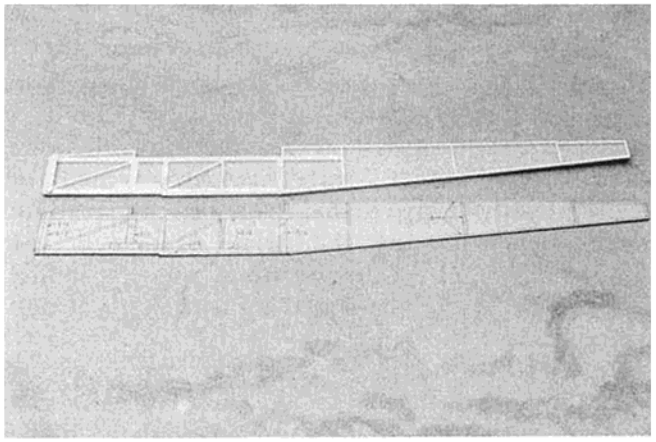
"E" flute (top), and "B" flute (bottom). "E" flute heavier!



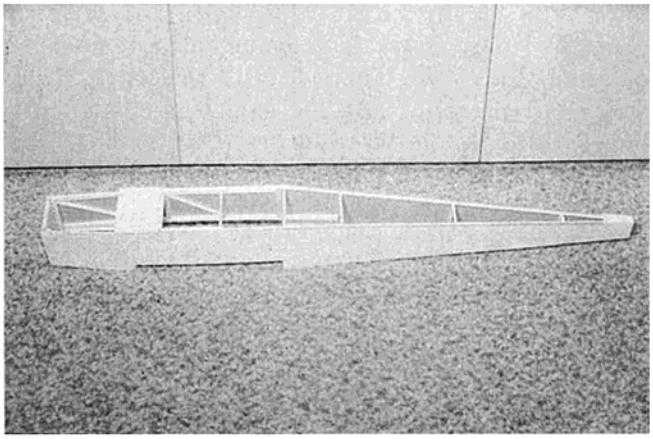
Tips of two stabs using "B" flute (left) and "E" flute (right).



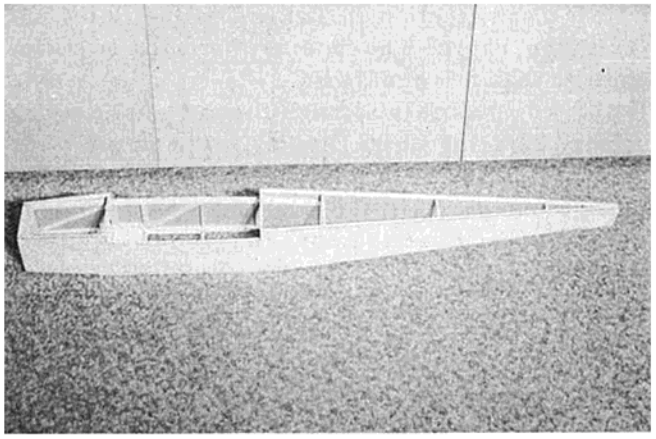
Fuselage sides and wing skins cut out, ready for construction.



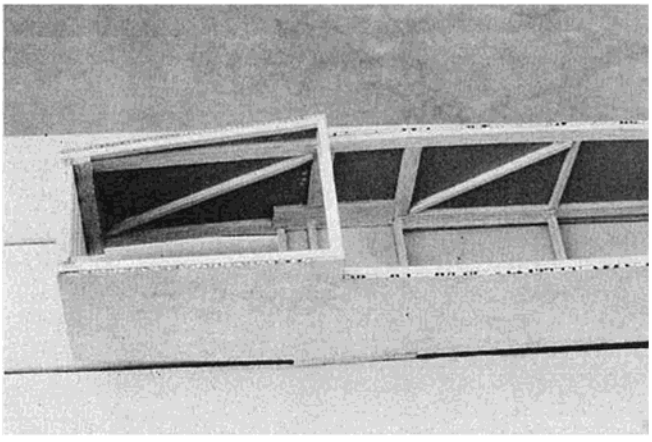
Vertical and horizontal longerons glued in place.



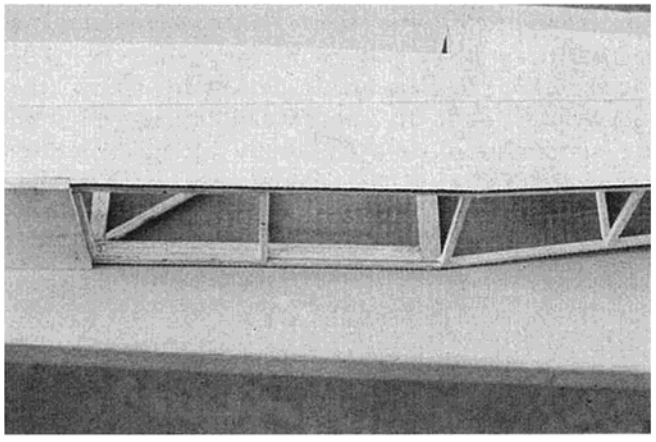
Bottom view of fuselage with sides joined together.



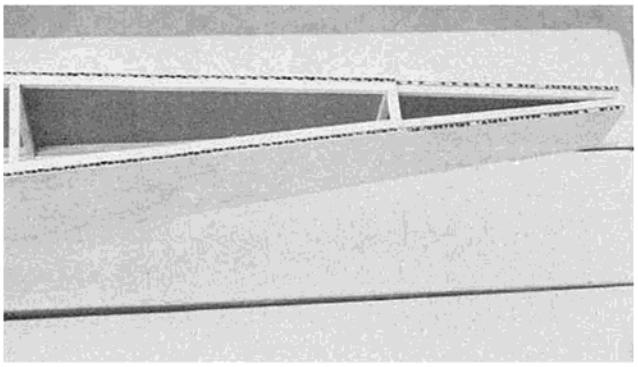
Top view of Pinata fuselage.



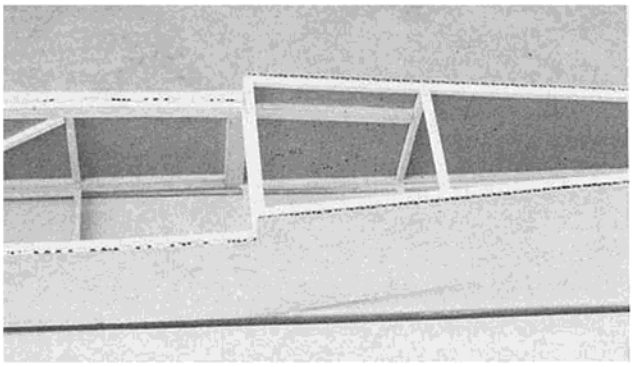
Close-up of fuselage top showing corrugation ends.



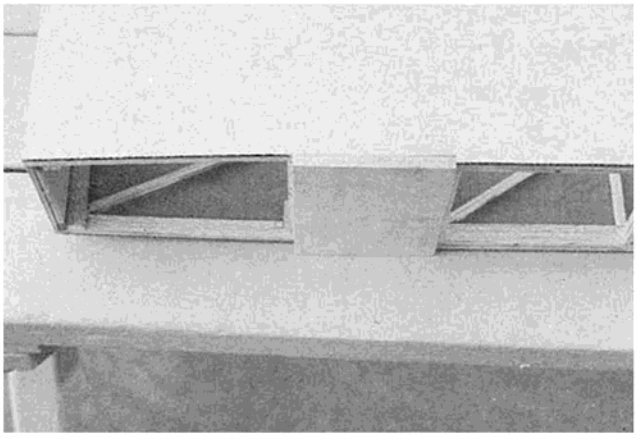
Close-up of fuselage bottom aft of L.G. block.



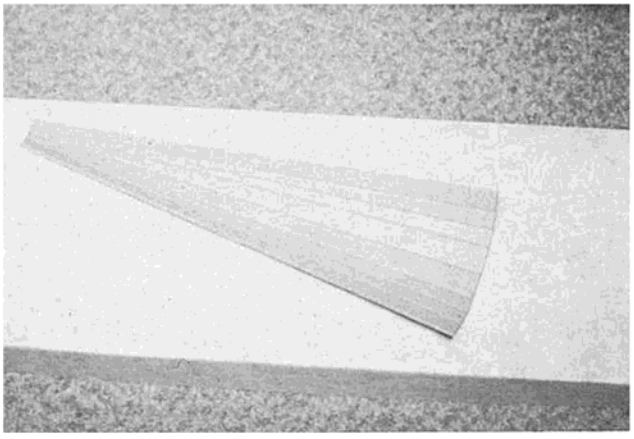
Top view of fuselage at stab position.



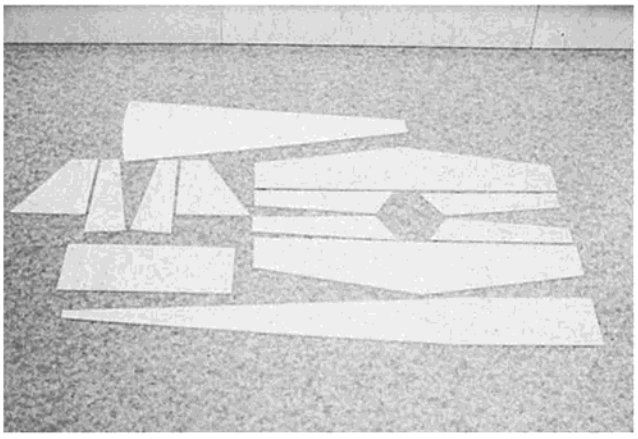
Top view of fuselage at wing location.



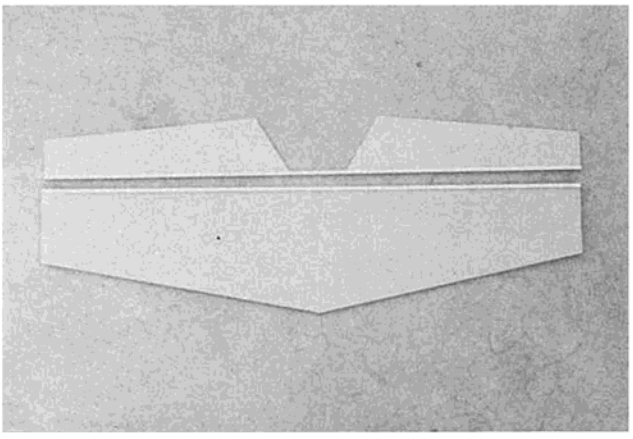
Close-up of bottom of fuselage at L.G. location.



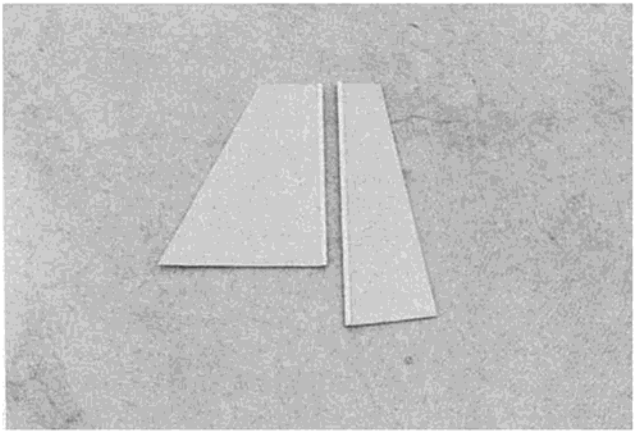
Turtle deck scored and pre-formed, ready for installation.



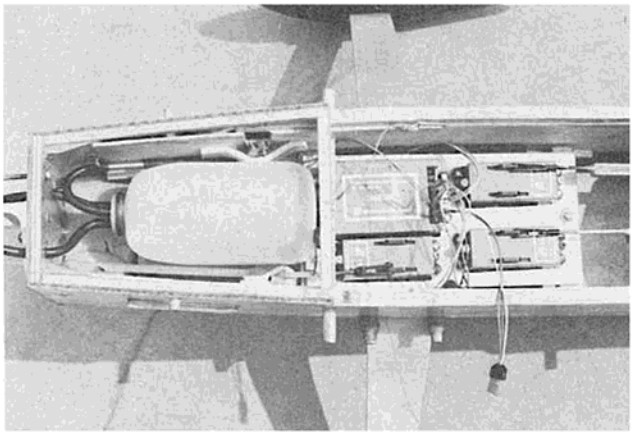
Tail, top and bottom fuselage skins ready for installation.



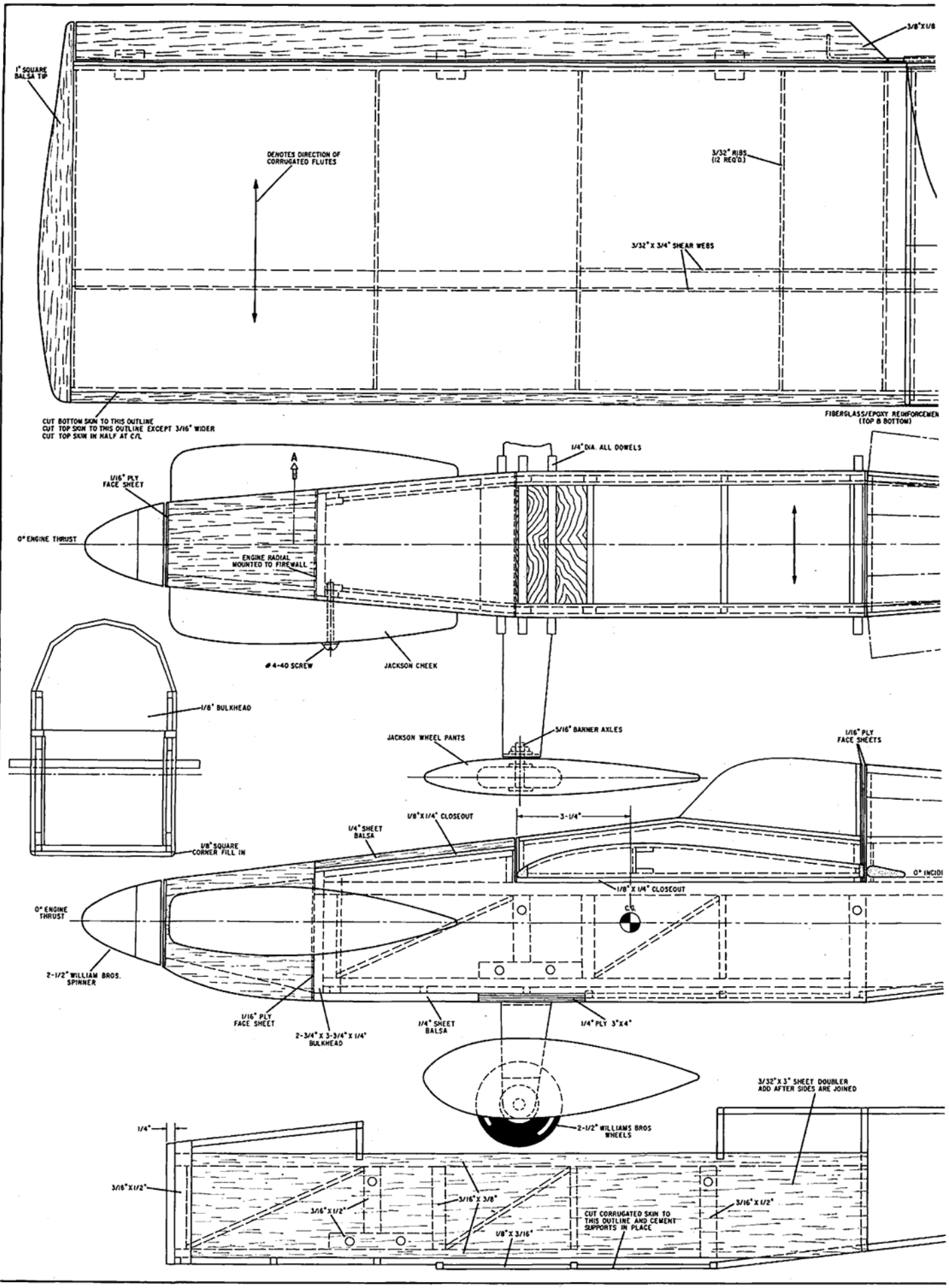
Horizontal stabilizer with wood bracing.

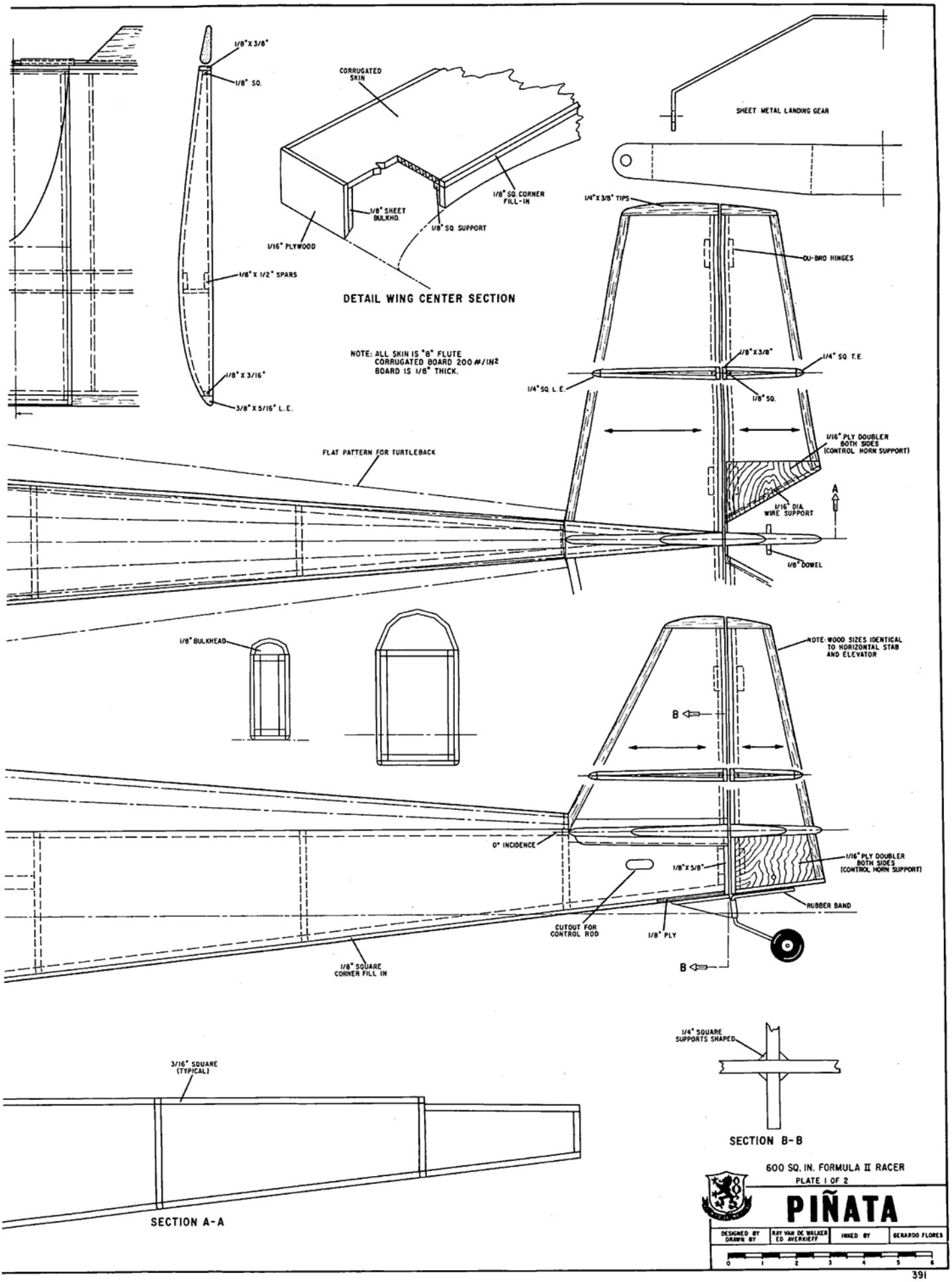


Vertical stabilizer and rudder.

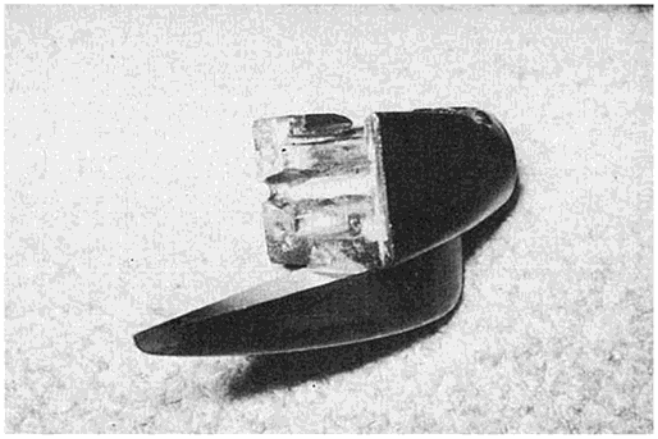


View of tank compartment and radio installation.

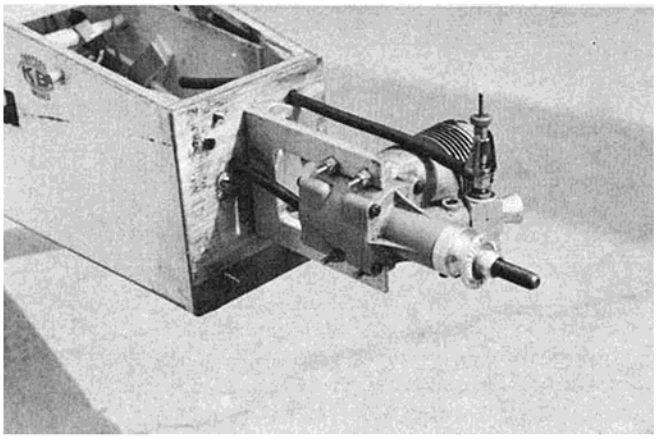

1" SQUARE BALSA TIP
3/8"X1/8
DENOTES DIRECTION OF CORRUGATED FLUTES
3/32" RIBS (12 REQ'D.)
3/32" X 3/4" SHEAR WEBS
CUT BOTTOM SKIN TO THIS OUTLINE
CUT TOP SKIN TO THIS OUTLINE EXCEPT 3/16" WIDER
CUT TOP SKIN IN HALF AT C/L
FIBERGLASS/EPOXY REINFORCEMEN
(TOP & BOTTOM)
1/4" DIA. ALL DOWELS
1/16" PLY FACE SHEET
0° ENGINE THRUST
ENGINE RADIAL MOUNTED TO FIREWALL
#4-40 SCREW
JACKSON CHEEK
1/8" BULKHEAD
JACKSON WHEEL PANTS
5/16" BANNER AXLES
1/16" PLY FACE SHEETS
1/8"X1/4" CLOSEOUT
3-1/4"
1/4" SHEET BALSA
1/8" SQUARE CORNER FILL IN
1/8" X 1/4" CLOSEOUT
0° ENGINE THRUST
C.G.
2-1/2" WILLIAM BROS. SPINNER
1/16" PLY FACE SHEET
2-3/4" X 3-3/4" X 1/4" BULKHEAD
1/4" SHEET BALSA
1/4" PLY 3"X4"
3/32" X 3" SHEET DOUBLER ADD AFTER SIDES ARE JOINED
2-1/2" WILLIAMS BROS WHEELS
1/4"
3/8"X1/2"
3/16"X 3/8"
3/16"X1/2"
1/8"X 3/16"
CUT CORRUGATED SKIN TO THIS OUTLINE AND CEMENT SUPPORTS IN PLACE
3/16"X 1/2"



FULL SIZE PLANS AVAILABLE – SEE PAGE 70



Nose block with right cowl cheek in place.



Motor compartment with cowl and cheeks removed.

construction figures build the surfaces as noted. When building the horizontal surfaces build the stabilizer first, then build the elevator. When the tail surfaces are complete they may be cemented to the fuselage. Be sure to add the triangle supports. (See section B-B on the plans.)

Wing:

If there is a difficult part to build on this airplane with this construction method, I guess it could be the wing. Cut the skins to the sizes noted by the heavy outlines on the plans. Note that the top skin is wider than the bottom. Using the step-by-step instructions on construction figures 5, 6 and 7, build the wing as noted. Remember, make sure that your workbench is FLAT. If you end up with a twist in your wing it will be because you BUILT it there. (The wing will NOT warp.) Score the top skin on the inside as shown in figure 6. Pre-bend it until it maintains a slight curve as shown in figure 7. After the lower skin and the upper skin have been doped on the inside, cement the upper skin in place using contact cement. Add the tip blocks and sand the balsa parts to shape. Add the ailerons as shown on the plans.

Wing Saddle and Canopy:

To add the wing saddle, the wing should be set in place on the fuselage. Cement the front and rear balsa bulkheads in place, leaving room for the 1/16" ply face sheets. Add the two sides and the 1/8" sq. supports. The corrugated skin and 1/8" sq. corner fill-in can now be added. Cement the canopy in place and then the 1/16" ply face sheets.

Finish:

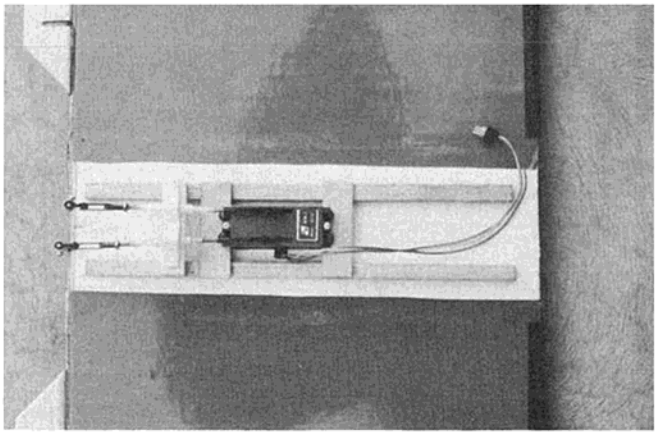
The natural finish on the corrugated skin makes it very well suited to take any of the finishes used on model airplanes. It will also take finishes that are not normally used on models such as enamel and varnish. The model in the photos is finished with clear butyrate dope and trimmed with black butyrate dope except for the bottom of the wing. To check out MonoKote to see how it would work in this application, I covered the lower surface of the wing with red super MonoKote. It works fine! The checkers on the tail are regular MonoKote. The white portions of the plane are the natural color of the corrugated skin. As with any model, to prevent oil from soaking into the skin or plywood firewall, make sure that the area around the firewall is well finished.

Radio Gear Installation:

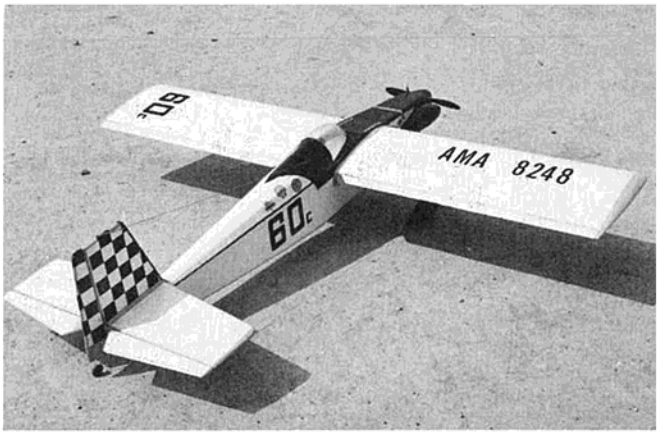
A typical installation is shown in the photos. The rudder and elevator use the conventional balsa pushrods to transmit control. On the throttle control NyRod is used. The three servos and receiver are mounted in a piece of 1/8" plywood cut out to accept them with No. 4-40 blind nuts being used so that the individual components may be removed if necessary. I see now that you can buy a mounting plate that is similar to this. This type of installation also makes it easy to transfer the equipment as a unit from one ship to another. The wing servo installation is a typical pushrod type for strip ailerons. NyRod is used between the servo and the control arms. Servo mounting tape is used to hold the NyRod in place. The battery rests under the fuel tank and is installed on two strips of double sided mounting tape.

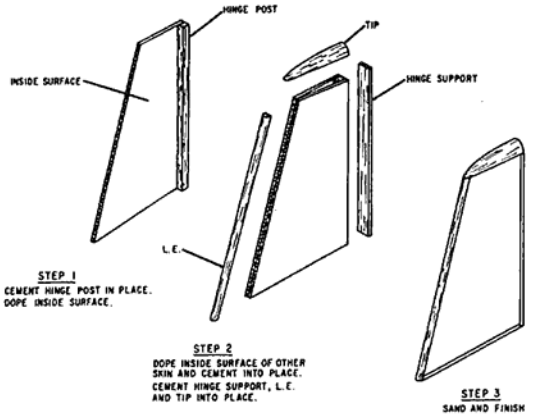
(continued on page **40***)*

Aileron servo compartment with E.K. servo.

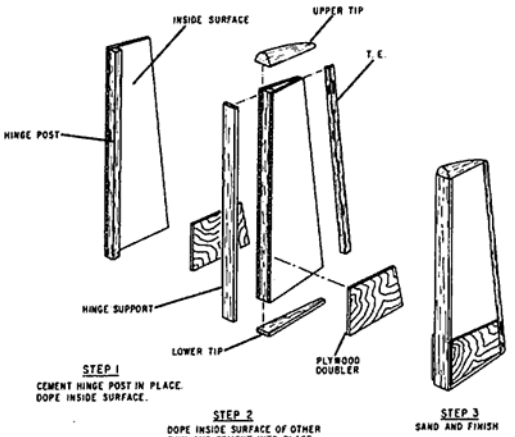


The completed Pinata, ready for racing.

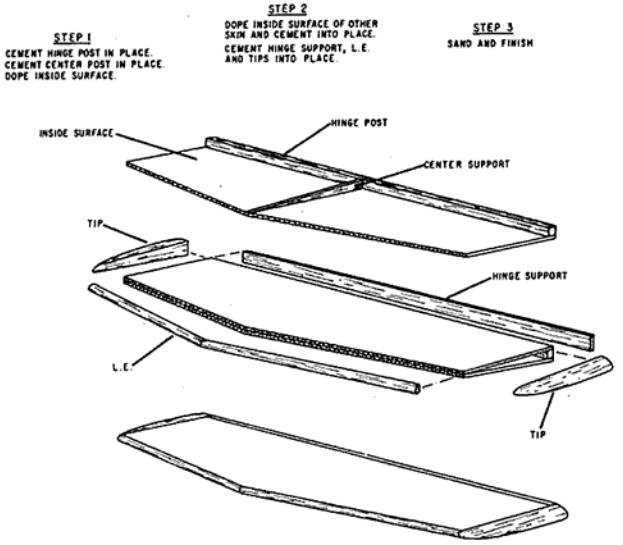




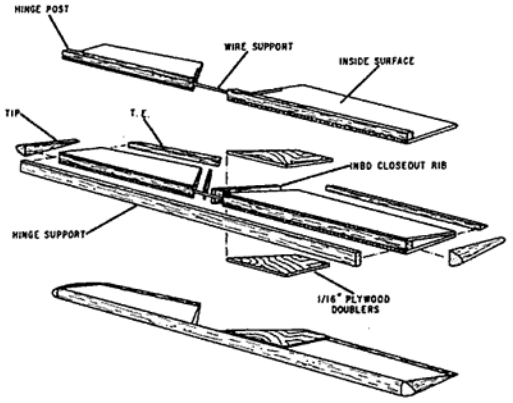
VERTICAL STABILIZER CONSTRUCTION
FIGURE 1



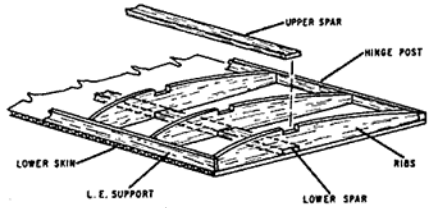
RUDDER CONSTRUCTION
FIGURE 2



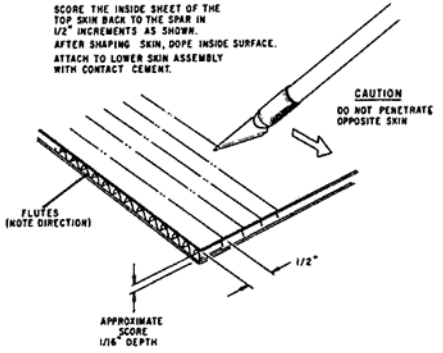
HORIZONTAL STABILIZER CONSTRUCTION
FIGURE 3



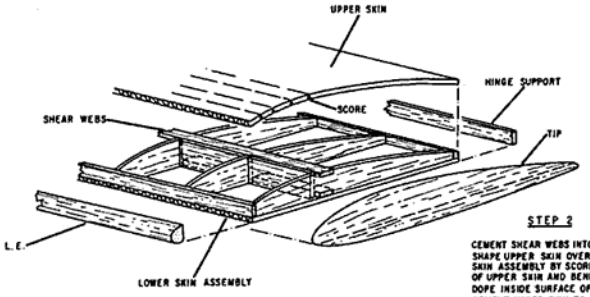
ELEVATOR CONSTRUCTION
FIGURE 4



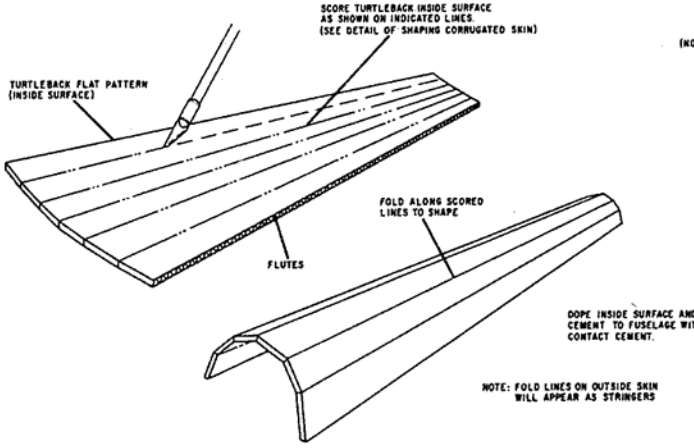
WING CONSTRUCTION-LOWER SKIN ASSEMBLY
FIGURE 5



SHAPING CORRUGATED SKIN
FIGURE 6



WING CONSTRUCTION - FINAL ASSEMBLY
FIGURE 7



TURTLEBACK CONSTRUCTION
FIGURE 8

600 SQ.IN. FORMULA II RACER

PLATE 2 OF 2

PIÑATA

DESIGNED BY	RAY VAN DE WALKER
DRAWN BY	ED AVERKIEFF
INKED BY	GERARDO FLORES

0 1 2 3 4 5 6

RCM FLIGHT TRAINING COURSE

CARDBOARD COVERING FOR FOAM WINGS

A STEP-BY-STEP TECHNIQUE FOR PROPERLY UTILIZING THE ADVANTAGES OF CARDBOARD AS A SKIN FOR FOAM WINGS.

BY J. ALEXANDER

The final construction step in the RCM Flight Training Course will be the presentation of the RCM X-Pert, a .35 to .40 powered low wing design that will perform the entire aerobatic program. In keeping with the objectives of the FTC, this thoroughly tested design utilizes the same 15% symmetrical airfoil foam wing as was used on the RCM Advanced Trainer, as well as the same stabilizer and fin. Again, in keeping with our design criteria, standard commercial components are used throughout, and the construction techniques are geared to maximum strength combined with all possible economy. As an example, the foam wing for the RCM X-Pert is now in stock at Warner Industries at a most reasonable price. Cardboard covering is also recommended in order to further reduce the overall cost of the aircraft. Cardboard, as a foam wing covering, was first presented to RCM readers by Chuck Cunningham, and if used properly, is an excellent covering material. In order that you may learn to use it properly, this month's installment of the Flight Training Course is presenting a step-by-step method of covering foam cores with cardboard, expertly authored by frequent RCM contributor, J. Alexander. In order that you may follow this procedure on your RCM X-Pert, we are presenting the wing drawing with this issue, and suggest that you order your foam core and follow the step-by-step construction. When the full construction article for the X-Pert is presented next month, you'll be that much ahead of the game.

A subject frequently mentioned in construction articles is the cardboard covered foam wing. Unfortunately, reader results have sometimes been less than perfect. In such cases, the idea, along with a botched-up mess, usually ended in the trash can. But the concept merits serious consideration by every RC'er using foam wings.

Cardboard, in this application, offers a number of advantages over balsa sheet or hardwood veneers. Foremost of these is economy. Available everywhere, from pennies to four or more dollars per sheet, the potential savings becomes readily apparent.

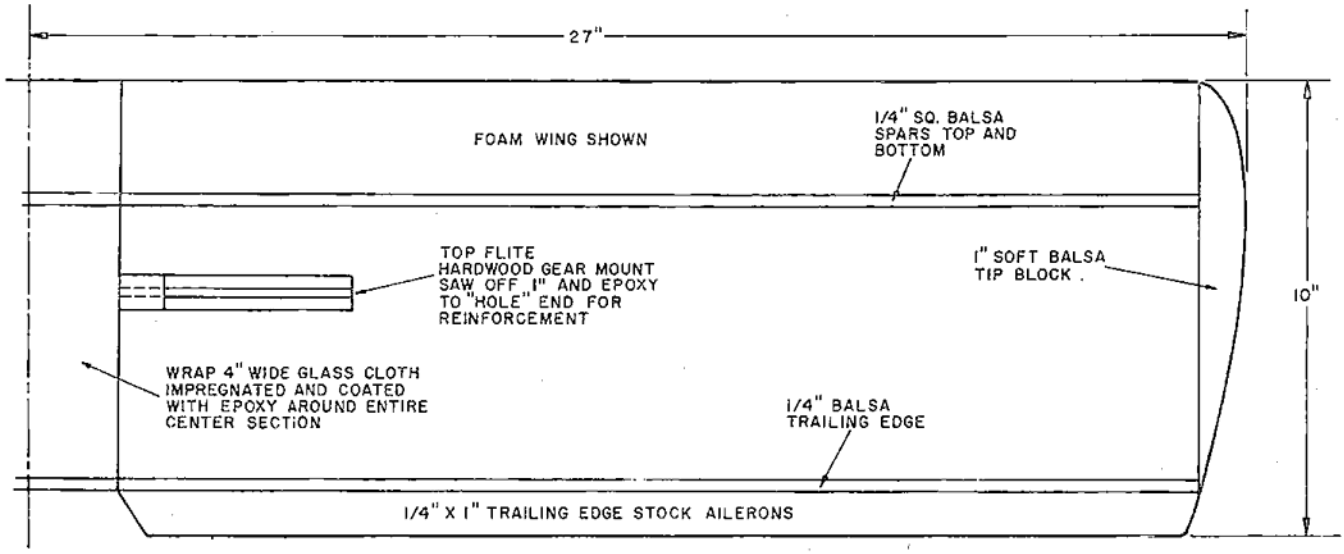
Because it IS a one piece seam-free covering, the filling, sanding, and multi-coated finishes used on other materials are eliminated. It offers a firm, ding-resistant surface and, depending on material used, the finished wing weighs about the same, or less, than a comparable balsa-covered unit.

But, as with any material, there are techniques peculiar to it and requirements to be met. Failure to observe some rather simple rules will likely result in grief.

First is the cardboard itself. Marketed in myriad types, under many trade names, the RC'er should have no trouble finding a suitable material. Cardboards similar to that used in file folders or matchbook and menu covers are good as are sign and art types. Thicknesses approximating that of playing, or business, cards are most suitable and should have a fairly hard surface. Avoid the very porous types (such as blotters) as weight will suffer because of dope or paint absorption. Such places as stationery or art stores usually stock acceptable material or know of others who do.

Because of the rigidity of cardboards, a good, strong contact cement that will not damage foam is mandatory. Some cements, suitable for balsa, which is more soft and pliable, do not work well with cardboard. A good way to check the cement is to put cardboard on scrap foam, or an old panel, and let it lay around for a

Foam wing layout plan for RCM X-Pert. Use 1/2" dihedral under each tip.



week or so then try to peel the cardboard off. Some brands may require a double coating for adequate adhesion.

Cardboards have a grain. This grain must parallel the wing leading edge to prevent wrinkles. Not knowing of, or failing to check grain, follows poor or improperly applied cement as the leading cause of poor cardboard covering jobs.

A short digression at this point will illustrate how the grain problem must be kept in mind from the very first. Unfortunately for us, many cardboard sheets are factory-cut with the grain running parallel to the short side. For example, a sheet measuring 24" x 35" would be ideal for a wing panel 32" long if the grain runs the long, or 35" direction. If it runs the 24" direction, or cross-wise, we will surely have a wrinkled leading edge if we use it. This situation has caused a number of RC'ers, (the writer included) to have an inventory, or cardboard supply, suited to 20" wingspan planes! Or, if you go in for archery, it makes good target material!

A couple of more points before getting down to business. The sharp-eyed reader will notice two things in the photos. First, the foam core is grooved. The grooves were caused by a too-hot wire while adjusting a new foam cutter, and for the purposes of this article, a scrap panel was OK. The second is that too large a piece was cut from the sheet for grain checking. This was done to illustrate an error commonly made by those going the operation for the first time. Of course the reader will NOT make this goof. (And no smart-aleck editorial comments, please!)

Ah, well!

As a preliminary to covering, it is a good idea to attach balsa wing tips and trailing edge strips. Titebond glue is recommended for strips and contact cement for tips. Cardboard has been used for 45 degree wing tips, but balsa does a better sealing job. All joints must be tightly sealed since thinner, or solvent, contacting foam can be DISASTROUS. When the glue has dried, trim and sand the balsa as required. The strips of masking tape, visible in the photos, were used to hold the trailing edge strip in place while the glue set.

Cut a piece from one corner of the sheet and mark it so it can be returned to its original position. Fold this piece so it approximates the core leading edge contour. If in doubt, keep folding until it is nearly flat, or a crease develops. Fold in both directions. When a wrinkle(s) appears you are bending CROSS-GRAIN. Return the piece to its position on the sheet, noting the grain direction.

With a yardstick draw a line across the middle of the sheet in the direction of the grain. Mark the center line of the core leading edge at both tip and root so that the marks are visible when the core is resting on its leading edge.

The next step depends on wing design. If the core is a straight constant-chord type the following paragraph need not apply. For the more complex wing, such as that illustrated in the photos, which has a full-symmetrical root, semi-symmetrical tip, and is tapered with a three degree washout, this additional step is recommended.

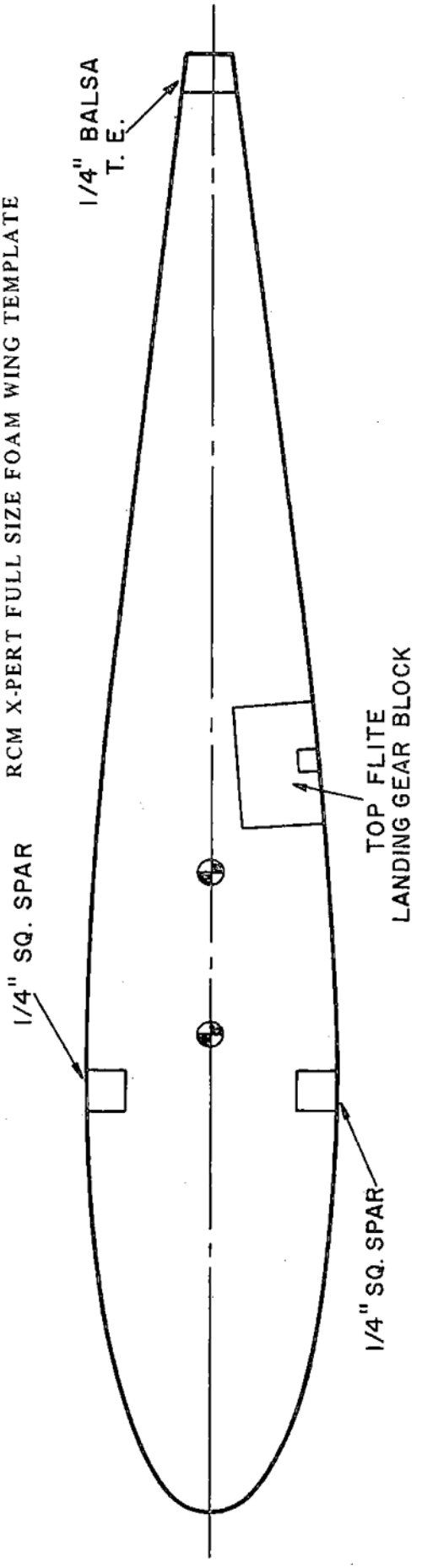
Rest the leading edge of the core on the sheet so its center marks are aligned with the grain direction line on the sheet. Now lay the core first one way, then the other, drawing lines around it. These are guide lines, so they must be accurate. Be sure the core does not slip out of alignment or the cardboard grain will not parallel the leading edge when the covering operation is started. Allowing ample overhang, trim away all excess sheet.

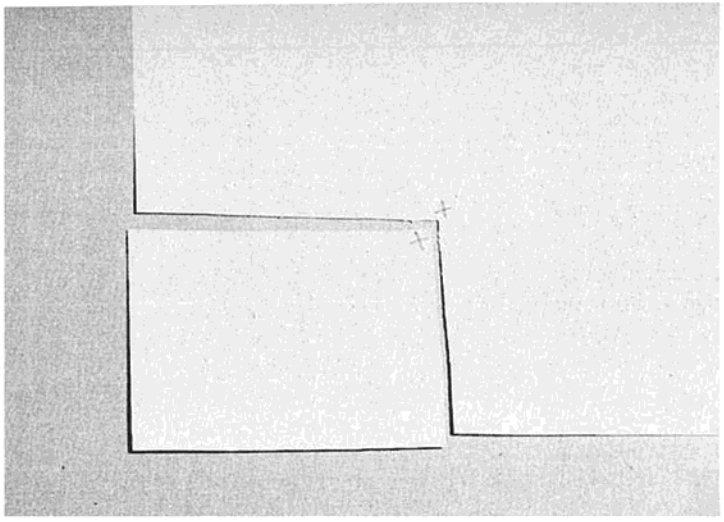
Run your sandpaper lightly over the core to break any glaze. Now scuff that side of the cardboard which is to contact the foam. This will improve adhesion.

Coat one half of the core and the corresponding cardboard area with contact cement to a point just around the leading edge. Allow the cement to dry for the specified time stated on the can. Failure to do this, especially with cardboard, may result in poor adhesion or possibly foam damage. As stated earlier, some cements may require a double coating.

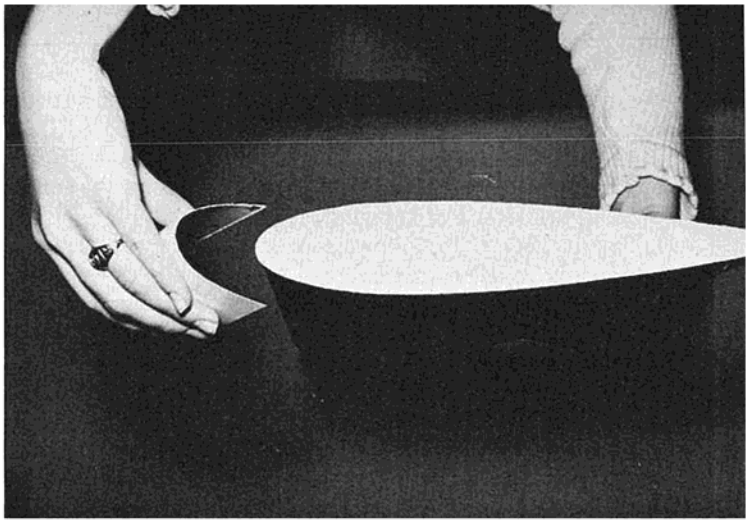
Following evaporation, procedure is again governed by wing design. With the constant-chord barn door type, covering is begun at the leading edge and back to one trailing edge. The core is then turned over, cement applied, and the other side done in like manner. For more difficult designs, such as the one illustrated, the operation starts at one trailing edge and continues on around the core to the other. Aside from the starting points, covering is similar for all wings and reference to the photos should clarify remaining steps.

With the core leading edge upright, match the trailing edge with its proper

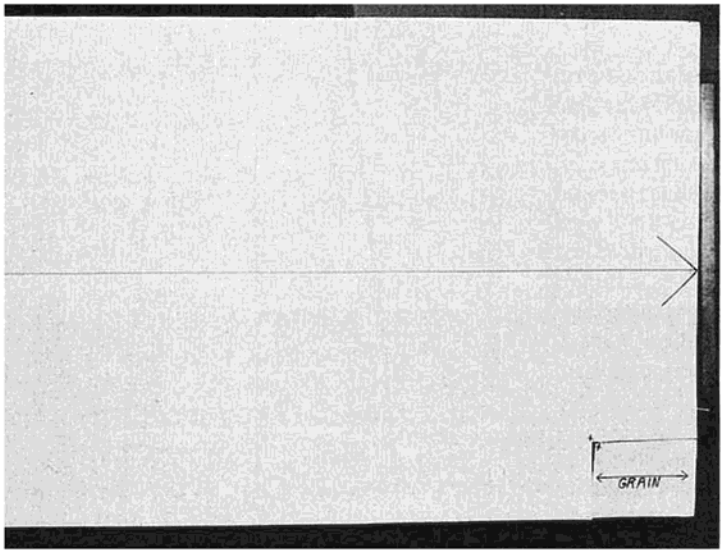




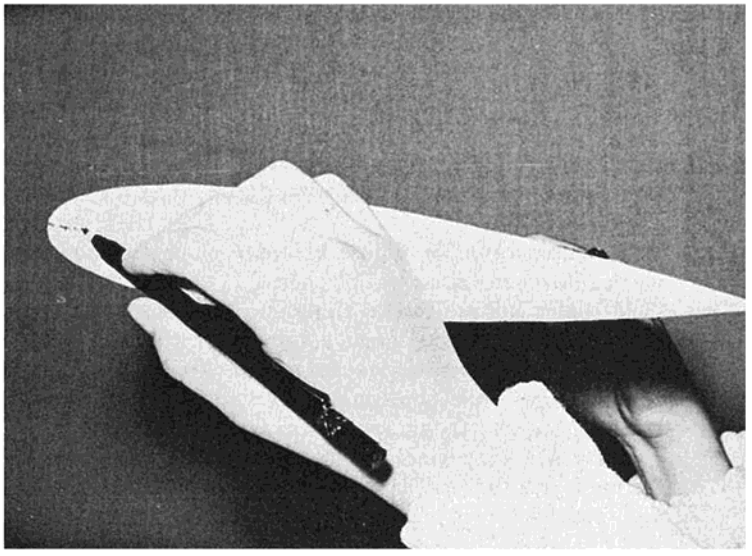
Piece cut from corner of cardboard sheet to check grain direction. Note "X" marks used to return piece to original position.



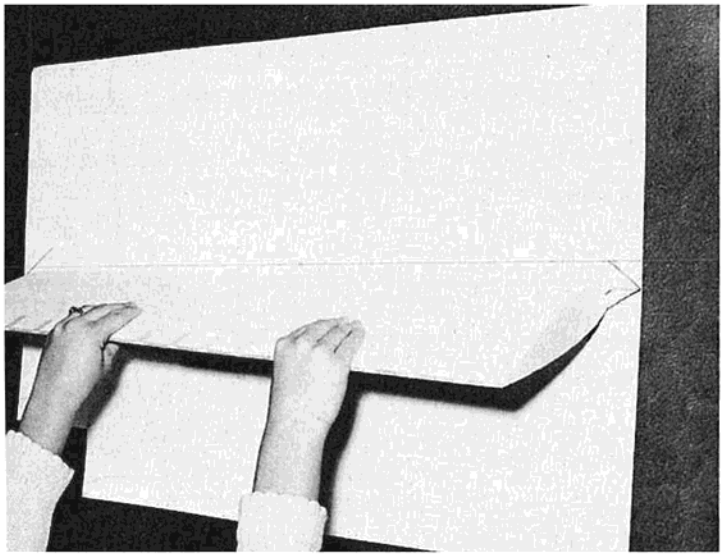
Folding piece cut from cardboard sheet to check grain direction.



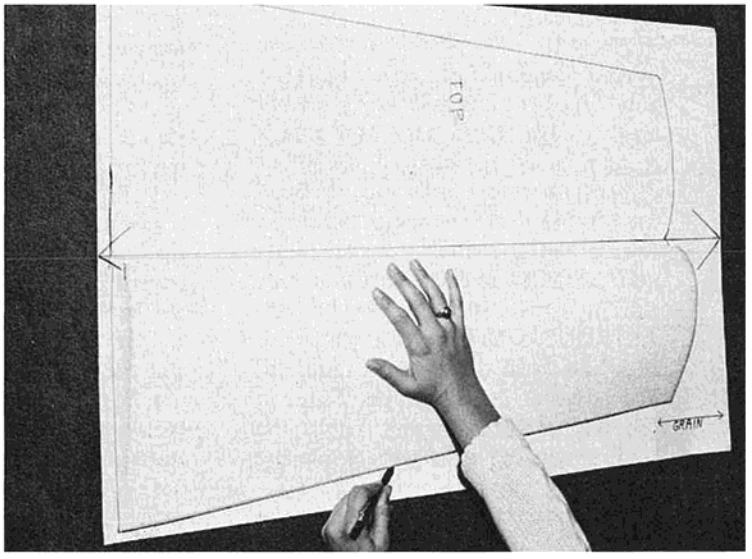
Piece returned to cardboard sheet and grain direction indicated.



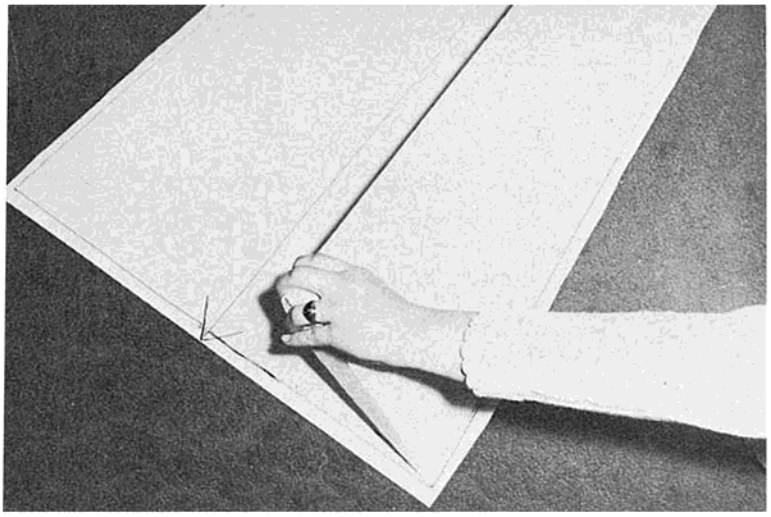
Marking foam core center line on root. A similar mark will be drawn on tip. These marks used for alignment purposes.



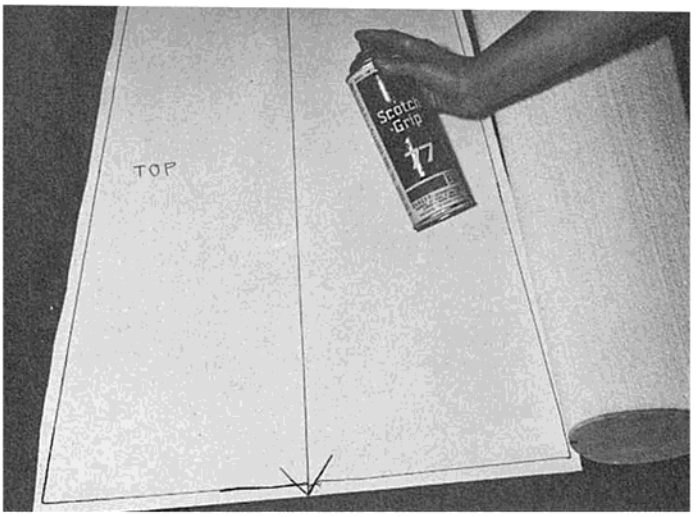
Matching core center lines with grain direction/center line on cardboard sheet. Note strips of masking tape used to hold trailing edge strip in position until glue sets.



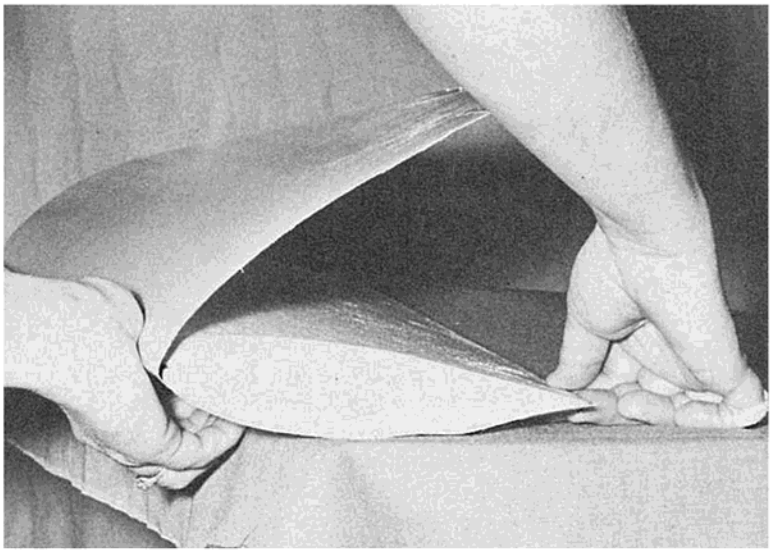
Drawing core outline/guide-lines on the cardboard sheet.



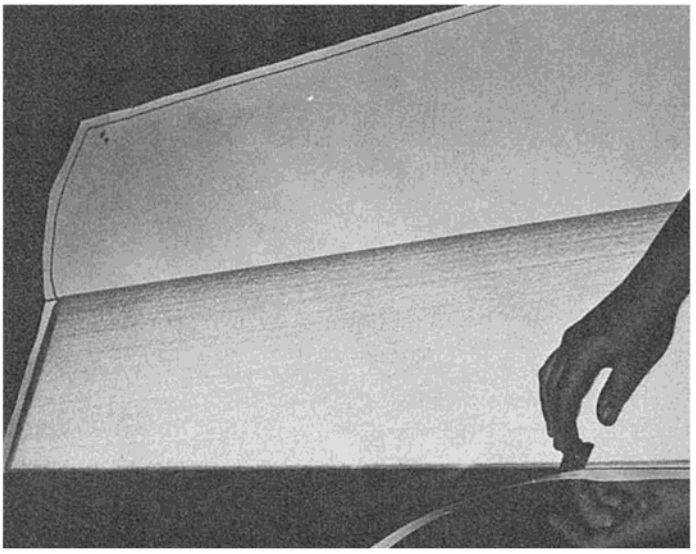
Spraying contact cement on sheet and core to cover first side.



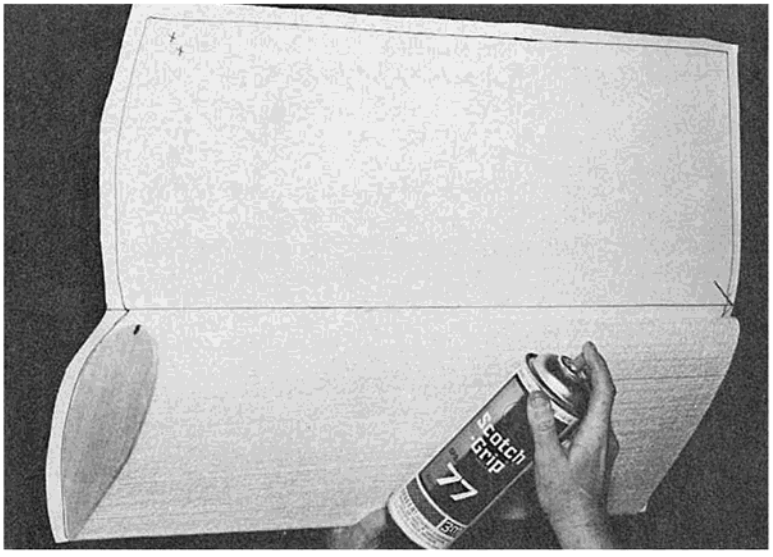
Matching core trailing edge with guide lines on cardboard sheet to begin covering operation. As core is rocked forward, sheet is picked up.



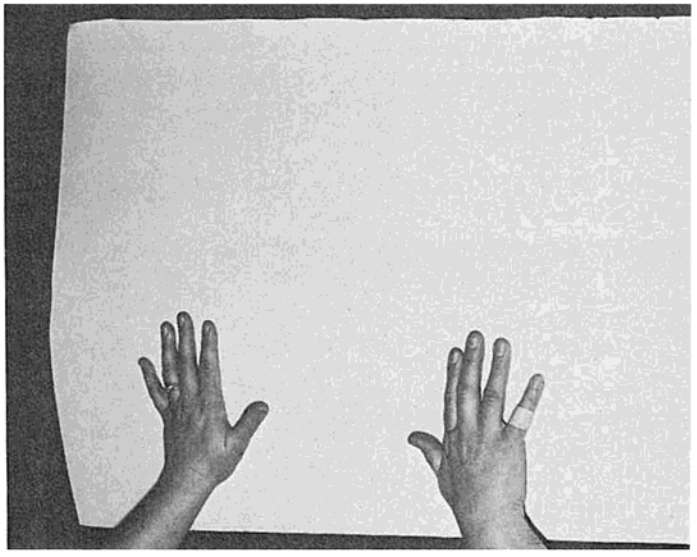
Trimming cardboard sheet flush with the core trailing edge. With cardboard, sharp tools are necessary for best results.



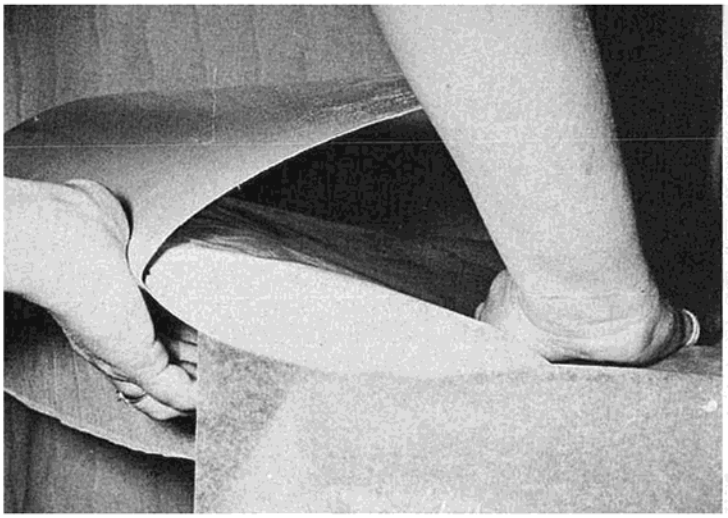
Working cardboard around core leading edge.



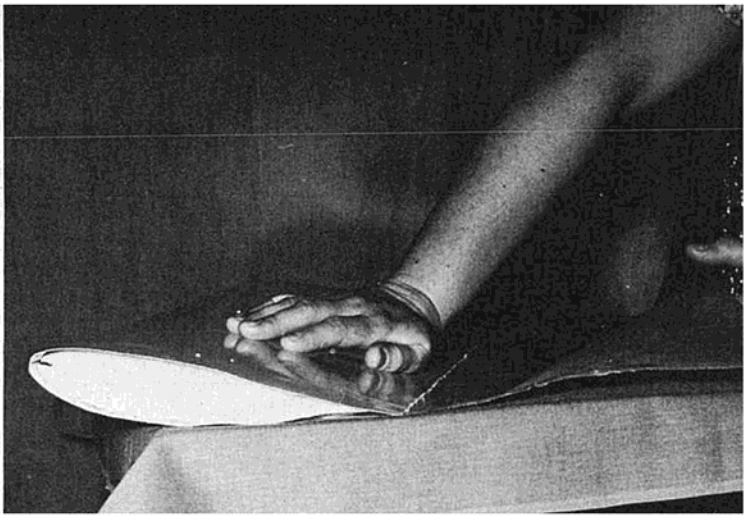
Pressing sheet firmly to core on first side. This assures proper adhesion and avoids gaps between sheeting and foam.



Applying contact cement for second side. Note cardboard has been pulled back from the leading edge. This is done to make certain of sufficient and proper adhesion. Use care not to tear chunks of foam from core.



Working cardboard around leading edge from bottom as second side covering is begun. Note use of wax paper to prevent premature contact.



Pulling wax paper from under cardboard as second side covering is completed. The cardboard used here is plastic coated and extremely glossy on one side.

guide-line previously drawn on the sheet. Holding the core with one hand, slowly lean it forward. As the cemented surfaces meet, press firmly on the core with the other hand for proper adhesion. Continue laying the core forward until flat, then slightly more until the cardboard just begins to start around the leading edge. STOP AT THIS POINT. We do NOT want to cover the leading edge yet.

Slide the half covered core back so that the trailing edge hangs over the table. With a SHARP X-Acto or razor blade, trim the excess cardboard flush with the trailing edge strip.

Now turn the core so its leading edge hangs over the table. With one hand holding the core flat, work the cardboard around the leading edge from the bottom by running the heel of the other hand back and forth, spanwise. Turn the core over, covered side up, and run both hands over the cardboard to assure complete adhesion.

Turn the core over again and apply cement as before, being particularly sure the area at the leading edge is properly coated.

After evaporation, move the core so its leading edge extends a short distance from the working surface. Lay a piece of wax paper over the cemented foam to a point about 1/2" short of the leading edge, then, with one hand resting on it, hold the core flat. The waxed paper keeps cement off of the hand and prevents premature cardboard-foam contact. Work the cardboard over the leading edge with the heel of the hand, as before, until the covering adheres smoothly with no gaps or air pockets. Now, shift one hand to the wax paper and begin slowly pulling it out toward the trailing edge until the core is completely covered. Now trim away excess cardboard.

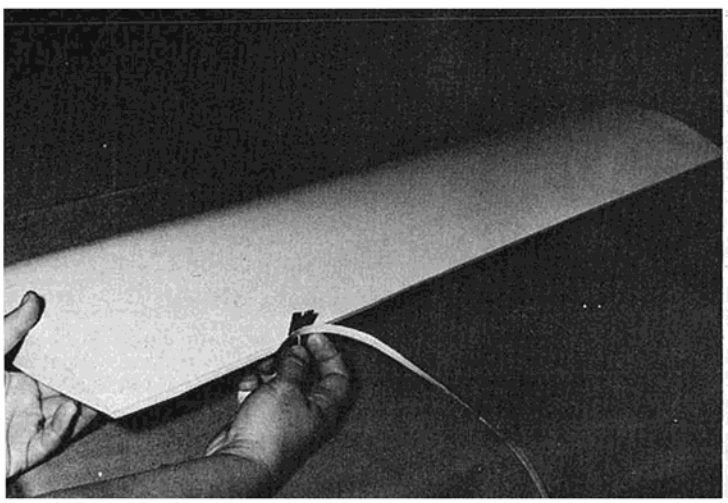
White or epoxy glue is sometimes used to insure adhesion of covering to the wing tips and trailing edge strips. This is dependent on individual preferences and contact cement used. If you're dubious as to the ability of your contact cement to hold at these points, go ahead and use the extra insurance.

As with all construction methods, there are variations in wing covering. Most notable is the practice of completely coating both core and sheeting with cement then covering in one continuous operation. Though admirably suited for balsa and considerably faster than that illustrated here, it is recommended only for those with prior covering experience – especially with cardboard. Premature contact presents problems here, and the new foam craftsman is advised to avoid this procedure.

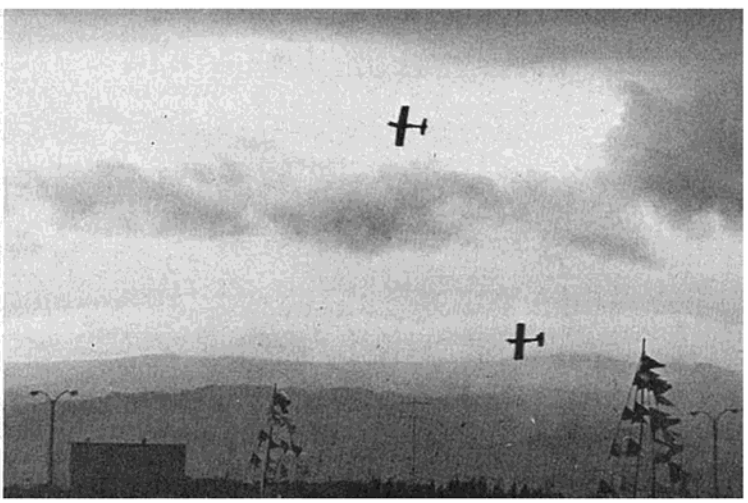
When both panels have been covered and any other operations completed the wing halves are ready for joining. This is usually done with epoxy glue or resin and glass tape. After curing, the wing is quickly finished with one or two light coats of dope or paint.

(continued on page **40***)*

Final trimming of covered panel. Fine sandpaper is used after trimming for glass smooth edges.



Two Goodyear racers — one features an economically built, easily finished, cardboard covered foam wing.



FOAM WING COVERING

(continued from page 39)

And that completes the cardboard covered wing. The methods detailed here have been used successfully by numerous RC'ers in cardboard covering – and particularly newcomers – should have no trouble by following the procedures described.

So for your next foam wing, TRY CARDBOARD. It's every bit as good as balsa, better in many respects.

Best of all – it's a whole lot cheaper!

RCM X-Pert Wing:

Three types of wingtips were used on the RCM X-Pert with total spans of 52" and 54": 1) Cut off straight tips, no blocks, 2) 1" rounded block tips, 3) "Citron-type" spade tips. Since there was no discernible difference in performance, we used the 1" rounded tip blocks with a wingspan of 54". The soft balsa does absorb shock when a tip gets a little low on a landing. (This is called a 3 point landing – one wheel, one wingtip, and one prop blade!) All seven of the X-Pert's built so far have used foam wings. There is very little advantage to the "built-up" balsa type except for a very slight savings in weight.

The foam wing is easy to cut if you have your own equipment for it. If not, RCM has arranged with Warner Industries, Inc., 259 Hosack St., Columbus, Ohio 43207 to have these available at a reasonable price by the time this article appears in print.

Several methods of covering the foam wing are available to you – the cardboard method described, joined balsa skins, or plywood veneer available from Autocon Corporation, 250 Orchard Rd., E. Patchogue, L. I., N.Y. Each of these covering methods have been used with complete success on one or more of the prototypes. If you use one of the thinner grades of cardboard, cut 1/4" slots the full length of the panel cores for the 1/4" square balsa spars top and bottom. Fit these spars in rather tightly using Titebond glue. White glue will sometimes form a "puddle" somewhere in the foam, and, in turn, this will become trapped moisture after the wing skins are applied. Epoxy, while being the strongest glue for the purpose, is difficult to remove if it is spilled, or bubbles up on the foam panel. Titebond has proved excellent for the purpose. If you are using balsa or plywood, or one of the heavier cardboards for the wing skins, the 1/4" spars are optional, as we have experienced no problems with wing panel fatigue or breakage when these spars were omitted.

Add the 1/4" square balsa trailing edge to each foam core, again using Titebond. When this has dried, sand the trailing edges carefully to match the airfoil of the wing. Sand the foam cores lightly and remove all dust with a vacuum or blower prior to covering.

After the wing panels are covered, epoxy the two wing halves together maintaining the proper dihedral. No dihedral brace is necessary. After the epoxy has dried, wrap the entire center section of the wing with a 4" wide piece of glass cloth and coat with epoxy glue. DO NOT USE RESIN! Polyester resin and epoxies are not compatible, and in many cases, the epoxy glue used on the fibreglass cloth will not dry in the very center of the wing joint where it comes in contact with the dried epoxy used to join the wing panels together.

Cut the balsa tip blocks to shape and glue in place. Next month, the complete RCM X-Pert will be presented.

PINATA

(continued from page 33)

Flying:

The model is not extrmely fast due to the 600 sq. inches of area with constant thickness airfoil, and the .40 cu. inch engine. It should make a good trainer for pylon racing, on take-off with full power it is necessary to hold a little right rudder to compensate for torque. In the air the Pinata responds faster to the controls than a pattern type model so beware! The landing speed is a bit faster than a pattern ship so make sure that you touch down on the first third of the field. Any flier that can get an R/C up and down (in one piece) by himself should not have any trouble flying the Pinata. The test model in the photos weighed 5½ lbs. complete.

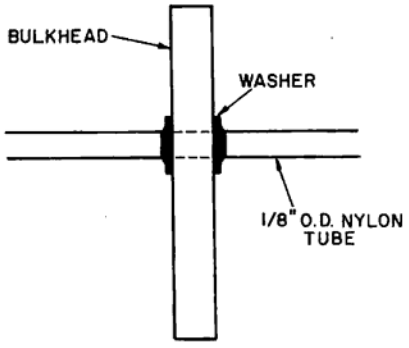
The model in this article deals with the easiest type of a wing to construct, i.e. a flat bottom airfoil, constant chord, constant thickness wing. My experiments have shown that symmetrical sections and tapers are also possible with this construction technique. The idea of "stressed skin construction" is SIMPLE and it WORKS! I'm sure there will be other approaches to its use.

I can just see the wheels turning now!

FOR WHAT IT'S WORTH

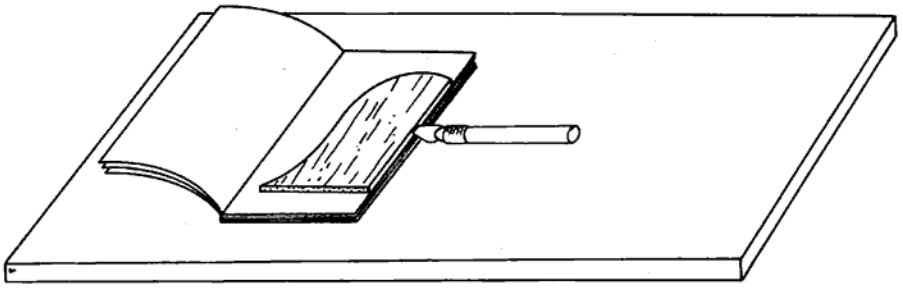
This column is designed to accomplish two objectives – to save you time and money in your RC activities. You are urged to share your ideas with RCM's readers, since the hint or kink you take for granted as being in common usage may be a completely unique idea to another RC'er. Submit as many suggestions as you like – a subscription to RCM will be awarded for the first idea we publish from an individual reader, with a five dollar payment for each additional idea published after the first. Submissions to this department cannot be acknowledged or returned. No payment will be made for items reprinted from club or association newsletters although source credit will be given.

The first idea comes from E. W. Trombly of Lomita, California, who suggests that 1/8" O.D. nylon tube can be securely fastened to bulkheads by using a No. 740 axle retainer (slot car) from Dynamic Models. By using one on each side of the bulkhead, the crimp in these washers hold the nylon tube firmly in place.



How many times have you used a straight edge to cut a sheet of balsa, only to have the metal, or plastic, straight edge slip, ruining your work? One way to circumvent this problem, according to Dick Franco of Fremont, California, is to rubber cement a few pieces of medium grade sandpaper on the bottom side of your straight edge.

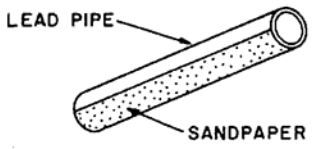
Slitting balsa with your knife to install hinges in fins, rudders, stabs, and elevators, can be done more accurately and prevent coming through the sides of the stock if you lay a magazine on a flat surface, open it up to approximately the height where you will want to slit the balsa. Lay your stock on the magazine and your knife on the



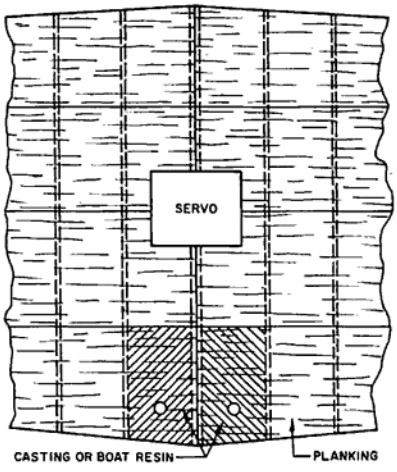
flat surface with the blade parallel to the stock. Now, by turning a page at a time, you can get micro adjustments of about .016 of an inch until your stock is centered perfectly. By making short sliding strokes with your knife, you will get a perfectly centered slit for your hinge. A wafer thin piece of balsa can also be removed this way, a necessity with the thicker hinges such as DuBro, by just flipping a page or two which will allow for the thickness of the hinge and make a neater installation. Submitted by Gerald Wilson of Warren, Michigan.

Laird Stanton, Beeville, Texas, has come up with an excellent method for the application of Super MonoKote to either open, or sheeted balsa structures. First tack the MonoKote snugly around the edges with an iron according to standard instructions. Then, slowly go over the entire surface with a photographic reflector floodlamp using 1/2" to 1/4" clearance between the rim of the flood and the MonoKoted surface. As well as giving even shrinkage, this method solves three other problems normally encountered in this type of covering (1) it doesn't cause scratches on the MonoKote, as usually happens with an iron, (2) it cannot press the covering material into the grain of unfinished sheeting or spars, and (3) it does not cause any bubbling between the MonoKote and fully sheeted areas. Laird has been using a 150 watt indoor type reflector flood bulb mounted in a spring clip socket which gives a four inch effective width on each pass, and is currently looking for a 250-300 watt reflector flood or infrared heat bulb to speed up the process by increasing the effective width and allowing a greater clearance from the material. The reflector floods are available for less than five dollars at any camera store.

The best construction job on a wing can often be ruined by gouging the leading and trailing edge sheeting, tearing capstrips, etc., during sanding. For a smooth, continuously even sanding job on that next wing structure, cement your sandpaper to a length of lead pipe about threee feet long. According to Mike Jones of Greensboro, N.C., this will provide an even surfacing of the structure sans nicks and gouges.

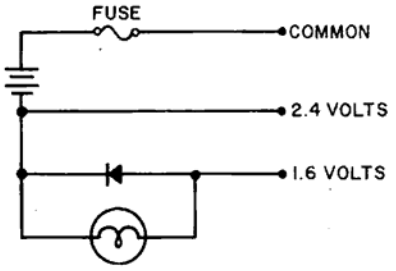


Here's a quick, strong, and easy way to prepare your wing for accepting nylon mounting bolts, suggested by Jim Schneider of Palmdale, California. After the trailing edge planking is installed on the top and bottom of the wing, stand the wing upright on the trailing edge. Fill the spaces between the trailing edge sheeting to the first rib on each side of the center with casting resin or polyester boat resin. When dry, drill holes for your wing bolts. This method not only greatly



strengthens this area of the wing, but you can cinch down tight on the bolts without crushing the wing structure.

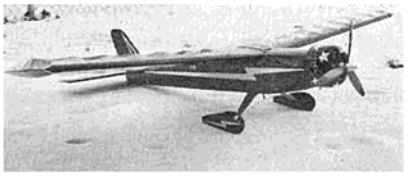
Gerald Reinhard of Beloit, Wisconsin, points out that Clarence Lee recommended against the use of the 1.2 volt nickel cadmium battery for starting engines, giving low voltage after a few starts as the reason (Engine Clinic, p. 10, 2/69). Since this can be overcome, Gerald submitted the following schematic. The 2.4 volt portion is a direct connection, while the 1.6 volt lead is the result of the 0.8 volt drop across the diode. The voltage across the diode lights the No. 43 bulb (dimly) automatically showing a complete plug circuit. The fuse protects the battery in case the leads are shorted for an undue period. Normal clip contact by banding together will not cause a burn out. The 1/4" heat sink will provide a safety margin when used to fire two plugs simultaneously and when properly shaped it can provide an assembly base. This simple unit features rechargeability, dual voltage output, automatic plug check on low voltage, and delayed short period protection for the battery. There are eight of these presently being used by the Tri-City RC'ers, the original prototypes using the 4 AH surplus cells, and having been used continuously for over two years. The latest versions use 1.2 AH "C" cells. The one drawback? "Who borrowed my battery?"



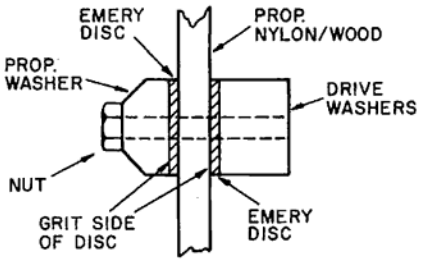
FUSE 10-15 amp slo-blow
CELLS 2-1.2 volt nickel cadmium
DIODE 1N3491
BULB No. 43
HEAT SINK ¼" aluminum (about 1 x 1½" min)

Most coffee cans today come with a plastic cover for use after the can is opened. These covers make an excellent dish for mixing epoxy or fibre glass resin. They have a slight lip on them so that dripping never occurs. To clean the cover up after use all you have to do is let the epoxy harden and then flex the plastic in several places and – snap, crackle, pop! All the left over epoxy is gone and you have another clean dish for the next batch! Submitted by Norm Montes of Daly City, California.

What can $8.70 buy you? When is a deBolt Jenny not a Jenny? Hal deBolt says that people constantly tell him that the ever-popular Dmeco 'Jenny' flies fine but looks like a pig! The photo shows the "Jenny plus 10," eligible for the new Formula Class II rules, and great for plain sport flying. The 'formula' is one stock Jenny kit, one Hartman 5" fibreglass cowl ($4.50), and one Dmeco CL-4 canopy ($1.25). Thus, for $8.70 (call it ten bucks with tax!) you have a jazzed up Jenny. The model in the photo is covered with Silron, sprayed with AeroGloss dope, finished off with clear HobbyPoxy, and sports an Orbit 4-8 IC radio. All up weight with the ST .40 engine is 4½ pounds.

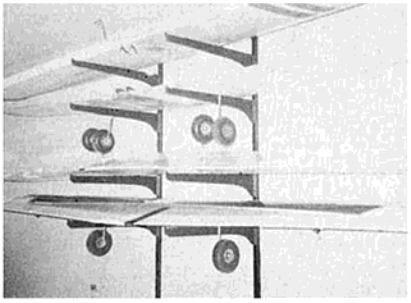


H. R. Braunlich, Poughkeepsie, N.Y., suggests the following method to prevent the loss of prop, nut, and washers on RC engines – cut two discs from emery cloth that are the same size as your prop washer. Install one behind the prop washer and another in front of the drive washer. To date, no propellers have been lost while using these simple emery paper discs.



The 'Carrier Wave,' published by the McDonnell RC Club, recommends that all nylon props should be stress-relieved before installing on big RC engines such as the .56-80's to preclude the possibility of slinging the prop apart. This is easily accomplished by boiling the prop in water for about thirty minutes. Coloring your nylon props is an easy job and can be accomplished at the same time the stress relieving is being done. The trick, however, is in using the proper amount of Rit Dye to do the job. From experience, it looks like one quarter of a package of Rit Dye to a quart of water is satisfactory for coloring. It is not necessary to use a pan large enough to immerse the entire propeller, however it is desirable. If the complete prop cannot be submerged in one operation, adjust the water level so that one half of the propeller gets dyed, then the other, rotating evenly. The dye process is permanent and fuel-proof. Any color shade can be produced by just varying the strength of the solution or the amount of boiling time. Coloring more propellers at one time lowers the cost of the dying operation.

Hung up on finding a method to store your planes in the shop? Max Blose of Hamilton, Texas purchases shelf standards and shelf brackets at the hardware store or lumber yard. These adjustable units, designed for adjustable bookshelves in the home, provide an excellent storage rack for fuselages and wings. To avoid scratching your aircraft, run a coat of Dow Silicone Rubber on the top of each bracket.

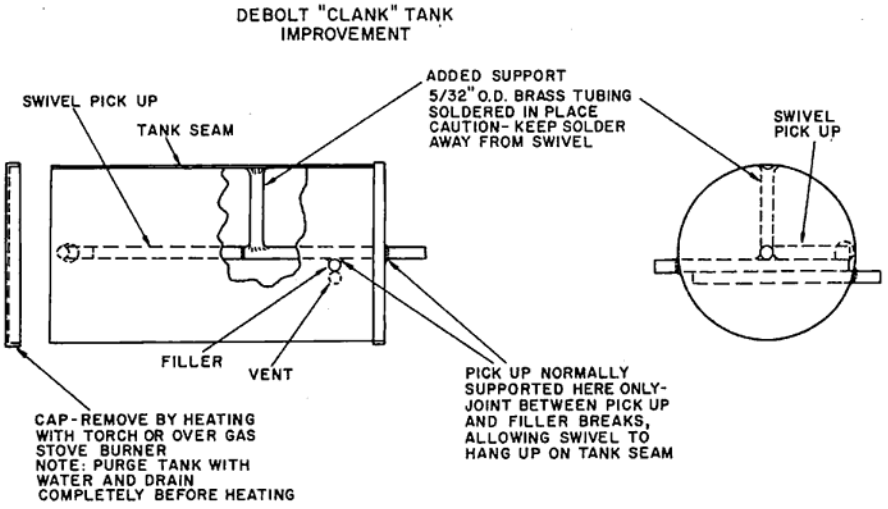


Do you dread carving that plug for a fibreglass cowl, fuselage, etc? A surefire "painless" way is to use construction grade two inch thick blue styrofoam. Cut two sides, spot contact in three or four places so they can be easily reached with a thin blade when sanding is finished. Join, and draw the top view. Sand to shape in the square. This material sands easily with little or no flaking. Do not bear down too hard when you first start. Use a medium wood rasp to bring the material to the desired shape. Then, round off all corners and sand to final shape. When the sanding is complete, separate the halves and cover with two heavy coats of Titebond glue, allowing 24 hours drying time between applications. Also, coat the backside of plugs about 1" wide near the edges which

will stop erosion from primer, etc. Do not sand after the glue application, but approximately ten to fifteen minutes after each coat of glue has been applied you can wet your fingertips slightly and smooth the high ridges of glue. Next, apply a heavy coat of acrylic auto body primer to the styrofoam plug. When dry, wet sand very lightly with No. 600 wet or dry. Again, you will find it sands easily, so go easy on the pressure. Apply a second coat of primer and let dry thoroughly. Wet sand to polished finish. (A third coat of primer may be needed.) You can now spray with acrylic paint and mount to a suitable base, preparatory to molding the female mould. Follow the standard moulding procedure from here, such as releases, wax, etc. One word of caution: Make sure the styrofoam is well sealed with Titebond, otherwise the solvents in the primer will attack the foam. These spots can be repaired by cleaning out and recoating with Titebond. Idea used by Jerry Mickley of Moorhead, Minnesota.

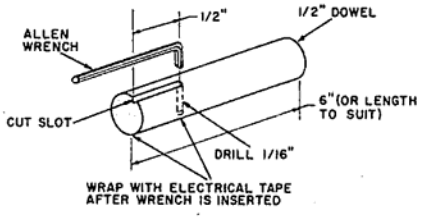
Since RCM has been giving away its decals, we've noticed a great number have been applied improperly. The "sticking power" of any decal is only as good as its initial application. Here's the proper way to apply any decal: Soak the decal unit it slides easily on its backing sheet. Next, slide one end until it extends a slight distance beyond the backing sheet. Now, hold this end down in place on the surface to which it is to be applied, then lower the decal into final position by sliding the backing sheet away from the decal. When it is in place, smooth it down and remove all trapped water bubbles by using a small piece of blotter material, such as a scrap of desk blotter. The latter will insure a good, smooth bond, Be sure to thoroughly rub all edges with the piece of blotter. Idea by Bill O'Brien, RCM Staff.

According to Rod Taylor, Van Nuys, California, the deBolt "clank" tank, being metal, is superior to plastic bottle tanks, since they have much less tendency to split or pop a plug with the resultant deluge of "glue-eating" fuel. The deBolt tank has a long, swiveling pick-up line which is cantilevered from a solder joint to the filler/vent tubes. This solder joint breaks, causing the swivel to hang up on the tank seam. The problem is readily solved by the following pro-

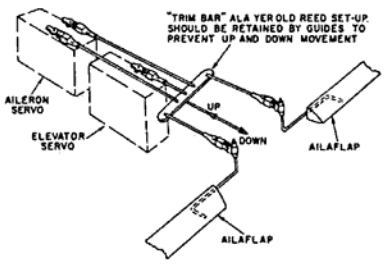


cedure: (1) purge tank completely with water, (2) drain all water from tank, (3) remove aft cover using butane torch or by holding end of tank in flame of gas stove (camp stoves work fine), (4) re-solder joint between pick up tube and filler/vent line, using pencil tip iron, (5) cut 1/8" or 5/32" O.D. tube support to lqngth for slight force fit between tank seam and pick-up tube, (6) clean oil from inside tank wall and pick-up tube, (7) tin ends of support tube, (8) solder support tube in place, (9) resolder end cap, (10) leak check by closing filler and vent line with fingers. Submerge tank in water and blow through pick-up line. Any bubbles indicate leaks. Rod has flown a tank with this modification for several months with no further problems.

They said it couldn't be done! L. S. Symasek of Florida wanted to install the steering arm on the nose gear in his Lanier Apache with the Allen-type set screws instead of the conventional slot-head screws. In order to reach into the nose (where his ham sized hands wouldn't fit), he made a handle for the Allen wrench per the drawing. It only took a minute to make and saved hours of swearing! This handle also gives much more positive control and grip than do conventional pliers.

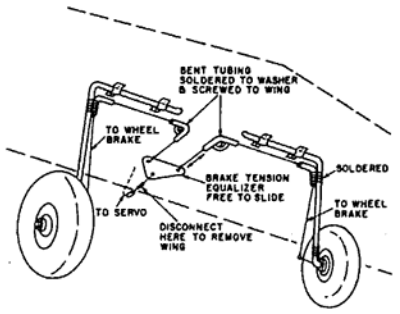


Aldon Annis, Streator, Illinois, submits a method of converting any existing full-span aileron wing to "flaperons" or "ailaflaps." The sketch



is self-explanatory, and up-elevator will give down-flap, etc. The connecting bar is a "trim bar" ala the old reed set-up. This bar should be retained by side rail guides to prevent unwanted up and down movement.

A sketch by M. H. Dailey of Edmonds, Washington shows his method of installing mechanical brakes. He uses a small nylon bell-crank to equalize braking on both right and left wheels. By using the tubing assembled to the wing you get full mechanical advantage to each wheel. This method has been used for over a year, and provides better braking action than a single nose wheel brake without the disadvantage of brakes pulling unequally to the right or left.



Help the American Cancer Society's programs of research, service and education. The life you save may be your own.

KITS & PIECES

BERNIE MURPHY

RCM'S Shop Editor Looks at the *G&K 'COBIA,* and the *MRC-FUTABA F-69* Radio Control System.

Remember us?

We're back at the old stand in the cold Maryland weather after an absence of several issues. I'd like to blame this on Fearless Leader, but, in reality, it was due to the "nine-to-five" bit being misinterpreted by my employer as meaning "nine-one-day-to-five-the-next!"

Anyway, we're back in the routine, now, and have some excellent material to throw your way in the coming months. Hints and kinks on kit building, kit reviews of some of our industry's latest offerings, building shortcuts, and the like. This month, we'll start off with the latest flying creation from G & K.

The G & K Microbia is a 44" span, 320 square inch area, low wing trainer and sport RC aircraft that introduces several unique concepts in kit aircraft.

Following on the heels of the firm's successful high-performance .60 powered 'Cobia,' the smaller version of this aircraft is intended as a trainer and Sunday fun ship for three or four small to medium size proportional servos. One of the 'unique' concepts we mentioned was that the manufacturer claimed in their advertising flier that this aircraft could be built in two evenings on the card table in front of the TV set and would be ready to fly, and this, in fact, turned out to be true! As we have all experienced, the so-called "almost-ready-to-fly's" often take about as long to put into flying condition as a highly prefabricated kit aircraft.

The 'Microbia' is a kit aircraft, but the engineering and design of the construction techniques, enables the RC'er to literally assemble the aircraft in his lap. The complete kit includes a foam wing with covering material, all parts pre-cut, landing gear assembly, elevator and aileron controls, steerable nose gear, main gear, all hinges, and a complete step-by-step photo instruction manual.

The kit is simplicity, itself. The fuselage consists of two fuselage sides, two doublers, motor mount bearers, bulkhead, and top and bottomsheet. These all fitted completely accurately, and actually allowed the ship to be assembled off the table! The top and bottom sheets, which are inset, only go a portion of the way back toward the tail, and the two sides, which include the entire vertical fin, are actually laminated together at the rear, the latter another unique engineering idea. This same idea, however, although greatly decreasing the amount of time required in construction, does present a problem in arriving at the proper C.G. The tail, being quite light, introduced a nose-heavy condition in both of our test models, even though our servos were located as far aft in the equipment compartment as possible. We strongly suggest that you use epoxy glue for laminating the two sides together at the rear of the fuselage, both from a strength factor, and from the standpoint of adding some weight to the empennage.

The foam wing provided with the kit was accurately cut, with the dihedral being pre-set by the one piece formed dihedral/landing gear hardwood spar. The dihedral provided by this member is excellent for all-around sport flying, although excessive for high performance maneuvers. For this reason, we obtained a second kit from G & K with a flat (no-dihedral) wing. This second prototype was a definite step up from the previous model in the performance category!

We did not particularly care for the covering material provided with the kit for covering the foam wing, an adhesive backed material similar to that used on the Lanier ARF aircraft. Our reasons for this statement are simply that it is somewhat difficult to apply without wrinkling, and does not offer very much "ding" resistance. It does, however, apply quite rapidly. An alternate method would be to cover the wings with Solarfilm, since very little heat is required for this material, allowing it to be applied directly over foam wings. Although it would create an increase in overall weight, balsa or cardboard sheeting could be used as an alternative. If you use Solarfilm, the fuselage can also be covered with this material, eliminating any need for painting or doping.

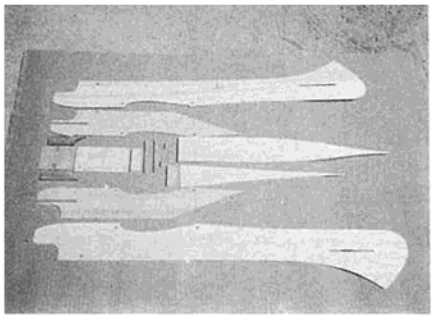
The Microbia is intended to be flown with any good .15 to .23, with a Kavan equipped O.S. Max .19 being the optimum. If you use only three servos of your proportional system, do not hook up the rudder, since the ship is designed for aileron flying. The balance point of the aircraft should be 25% back from the leading edge of the wing.

Priced at $16.95, we have found the 'Microbia,' as produced by G & K Manufacturing, Inc., P.O. Box 27, Marina, California 93933, to equal or exceed the specifications claimed for it by the manufacturer. It is a well-engineered kit that is highly prefabricated, and does actually go together faster than a great many of the ARF aircraft. In the flying category, it performs admirably, and will provide the sport flier with a great many hours of flying pleasure. The kit is well worth the price, and has been tested, and is approved and recommended by RCM.

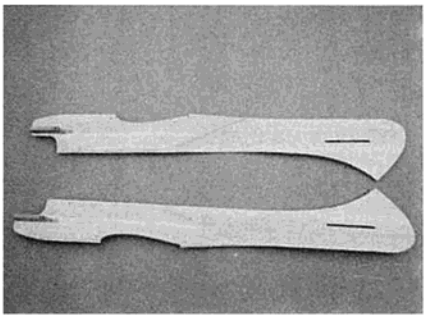
In this day and age of exotic digital proportional systems, it might seem strange that we would be presenting a product report on a non-proportional single channel system. Yet, there is method in our madness.

The MRC-Futaba F-69 Radio Control System is a non-proportional single channel system that incorporates several interesting features. The transmitter is an extremely compact unit that measures 6" x 4" x 1½", and features an "automated rudder and engine control." Simply speaking, the rudder is operated by a control stick that moves right or left, automatically keying the rudder servo to the right or left, eliminating the "one-right, two-left" button pushing sequence of older single channel systems. The engine control button similarly operates the throttle servo. The automatic keying can be bypassed by a switch which permits either manual or automatic keying sequence. Eight inexpensive pencell batteries

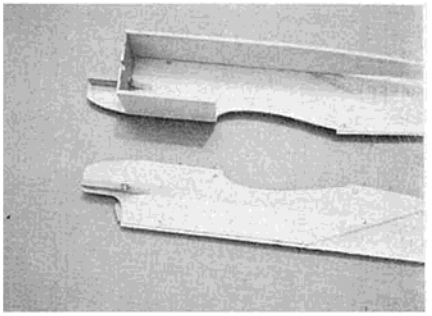
(continued on page 46)



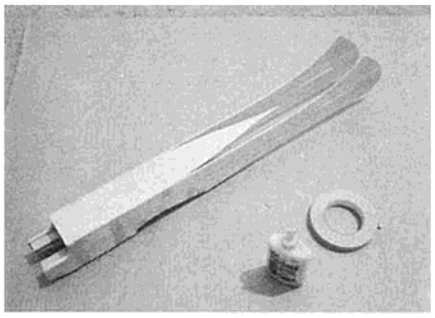
For easy assembly use pins and masking tape or scotch tape.



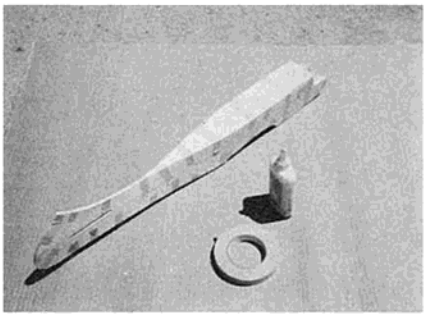
Cement doublers to fuselage sides and cement motor mounts in place. Align carefully.



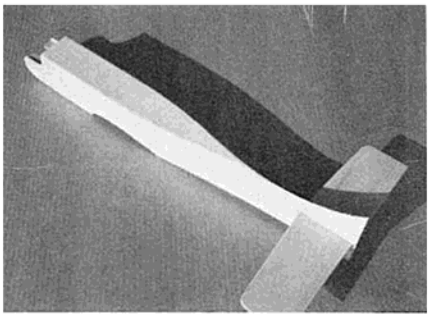
Cement top, bottom front and firewall in place. Hold in place with tape on outside.



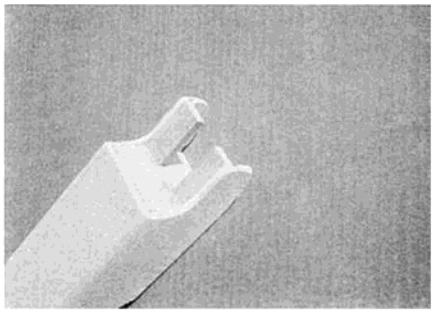
Cement and tape other side in place. Spread cement over all of rudder area and remainder of top sides. Pull together and tape in place. Re-cement all inside areas.



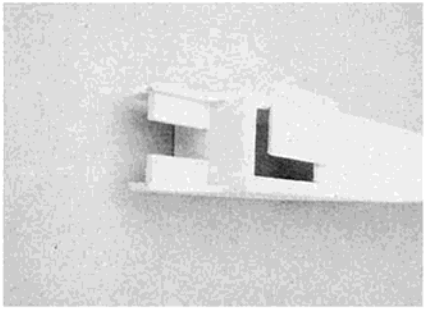
Install bottom rear and cement in place. Install front and rear wing saddle reinforcements in place.



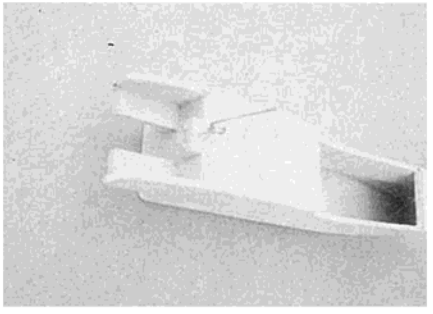
If you are using four servos, cut off rudder for later hinging, otherwise leave it on. Be sure that cement is thoroughly dry before removing rudder. Check alignment of fuselage while cement is still wet.



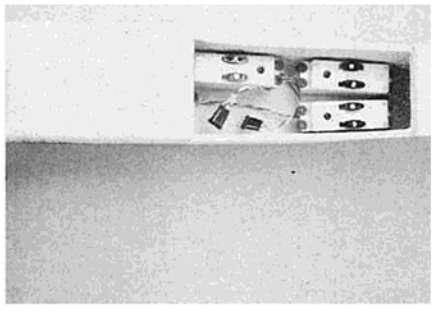
Round off corners and sand smooth. Fit wing dowels in place but don't install until after covering fuselage if you are using MonoKote.



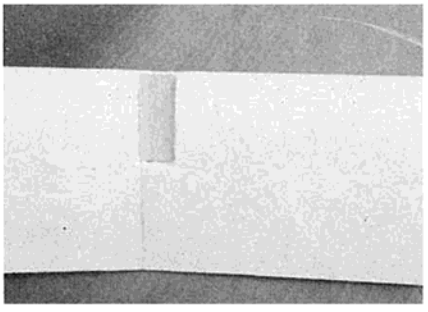
Cut hatch block 2¼ x 3¼ for easy access to fuel tank and battery, etc. Under-cut as shown about 30° with razor blade so that hatch will not fall through opening.



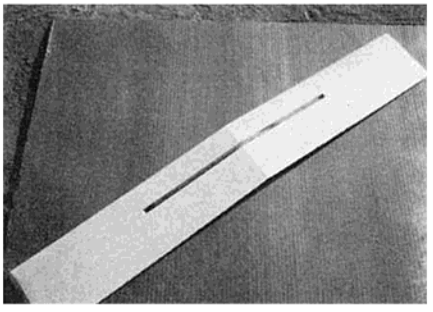
Install nose gear block as shown. If you do not plan to have steerable nose gear, make a 90° bend in top part of gear and fasten directly to firewall.



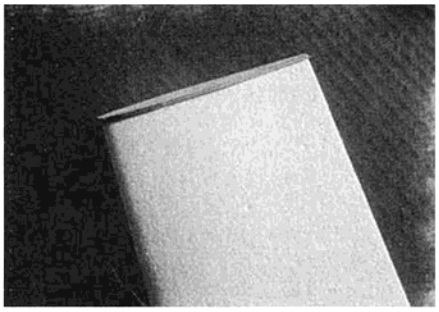
After painting fuselage (or MonoKote) mount servos with servo mounting tape to sides of fuselage as shown. Keep servos to the rear as much as possible.



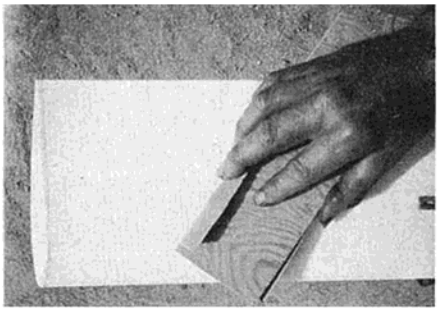
Cut out foam on wing on top right side as shown for servo mount made from 1/16" sheet balsa epoxied in place. Use a sharp paring knife to cut foam.



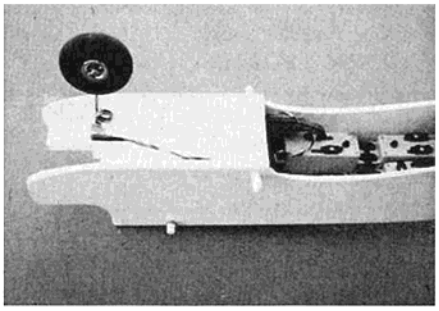
Install dihedral and landing gear spar with epoxy. Install 1/8" x 1/4" top spars in place with epoxy.



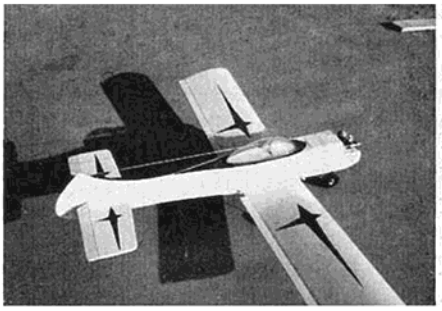
Install 1/8" tip blocks in place.



When dry sand entire assembly so that there are no imperfections before covering. Vacuum off all dust before covering. Apply covering, making lap joint near trailing edge on bottom of wing.



Wing servo must be on opposite side of front servo in fuselage so there will be room for it when you mount wing on fuselage. Balance point (C.G.) should be 25% back from leading edge of wing.



Use a good .15 to .23 engine with throttle control. If you are using only 3 servos, do not hook up rudder. Plane is designed for aileron flying.

KITS & PIECES

(continued from page **44***)*

provide the transmitter power supply.

The receiver is of the superhet (selective) variety, and measures 2 1/8" x 1 5/8" x 1". The system, as provided, is completely prewired, tested, and guaranteed. The airborne radio system requires three pencell and one 9 volt transistor radio type battery. Total airborne weight is eleven ounces.

The rudder servo/circuit board is one complete unit and is mounted in the aircraft fuselage using four small wood screws. The engine control servo is mounted separately in the fuselage. The test aircraft used for the flight tests on the MRC-Futaba F-69 was the CG Junior Falcon. Although considered somewhat heavy for this size aircraft (.049), the aircraft and radio system performed to perfection at all times. We were amazed at the complete reliability of the system as well as the outstanding ground and air range. Our only criticism of the entire system is the plastic battery holder used in the airborne system. This proved to be somewhat less than durable and was replaced with a standard three pencell metal battery holder.

All in all, this is an excellent system, economically priced, for the junior modeler, and for the newcomer to RC who wants to "get his feet wet" without a heavy investment. It would also be more than satisfactory for use in gliders with rudder only control. Beyond the points mentioned in the review, we could not fault the system, and do not hesitate to recommend it to you. The F-69 is manufactured by the Futaba Co. in Japan, and distributed through hobby dealers in the United States by the MRC-Enya Company of Brooklyn, New York.

Look for us next month, and in the meantime.... we'll se YOU at the field.

AMERICAN CANCER SOCIETY

219 East 42nd St., N.Y. 10017

KEN WILLARD

The Fourth Annual Model Airplane Trade Show, presented by the Garden Grove Radio Control Club, was held at the Orange County Fairgrounds on January 11 and 12th. As usual, your Chief Sunday Flier had to attend this smorgasbord of R/C goodies, and as usual, came away drooling at all the great new items which are in store for you in the coming months – and marveling at some of the excellent displays of craftsmanship.

Altogether, there were fifty-one exhibitors – manufacturers, dealers, distributors, and magazines were all represented. Attendance was good, but perhaps not as large as expected on Sunday, and maybe for two reasons. The Super Bowl game was one – and the other was due to a scheduling situation wherein a dog show was being held at the fairgrounds at the same time as the model show, and this resulted in a packed parking lot. Many modelers didn't know about the dog show, assumed that the air show must be packed to the gills, and just drove away, figuring they wouldn't be able to get near the exhibits.

At the dinner which the Garden Grove Club put on Saturday night for the show participants there was good food, good spirits, good fellowship, and a good talk by Phil Kraft, who pointed out that we still have a long way to go to make the general public more aware of the hobby and sport of R/C building and flying, so that more of them can participate in this exciting and enjoyable pursuit during the forthcoming years when shorter work weeks and more leisure time are commonplace. The first question put to Phil during the question and answer period came from Cliff Weirick, who plaintively inquired "What 'shorter' work week, boss?" After order was restored, Phil answered "Executive privilege," and went on to the next question.

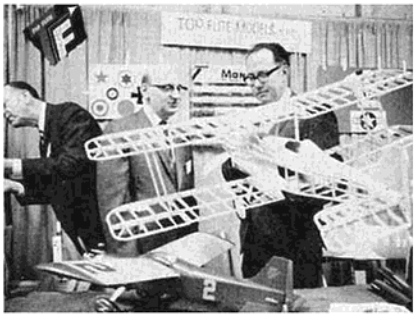
Following the old saying that "one picture is worth a thousand words," here are some of the highlights of the MATS. You'll excuse me if I dwell on some of the items a little more than the others. It just happens that they were the ones that seemed to be most appealing to Sunday fliers.

The Garden Grove R/C Club's welcoming committee of John Thacker, Emma Barton, Lyle Keipinger, and Dale Cook.

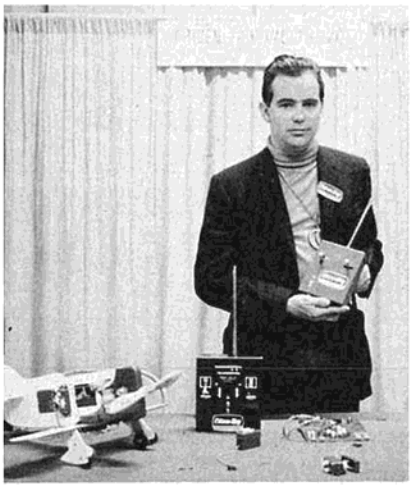
Fred Angel tells Don Dewey all about the Blue Max Series and his new Citabria, Playboy, and a new sport parasol job. Patricia Crews, of RCM, lends an ear also.

Jerry Nelson and Mrs. Nelson were busy explaining his Simprop radio gear and his fiberglass gliders.

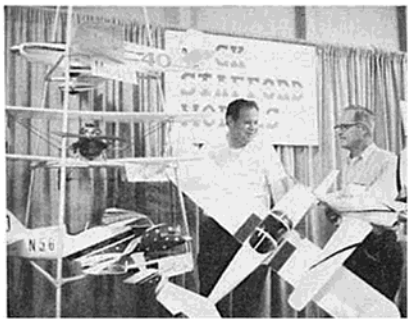
Sid Axelrod of Top Flite shows Phil Kraft some of the features of Top Flite's new SE-5 scale kit. It's a real beauty – scale buffs will love it.



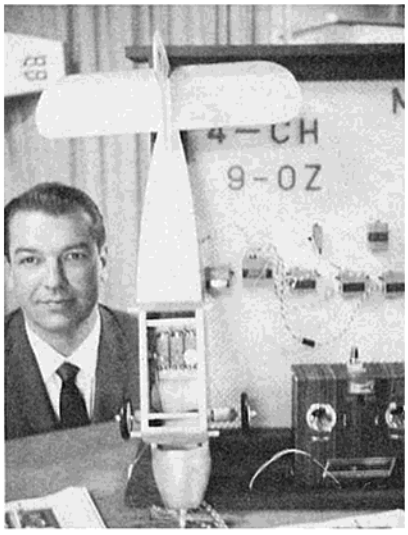
Bill Welker, of CitizenShip Radio Corp., shows off the prototype of their new two channel propo rig for boats, or gliders, or rudder only (with motor control). Airborne weight is 11 oz. – heavier than some others, true, but not as expensive, either. Should have a ready market in the fields it is intended to serve. We'll have a product report on it later on.



Jack Stafford cons Ed Shipe, NMPRA prez, into looking over Jack's new Ercoupe. Ed clings to his Mustang, while to the left you can see Jack's Midget, Sperry Messenger, and a striking new model of the Knight Twister that they are testing. Jack says it'll outrun most pylon racers even though it has some 760 sq. in. of wing area! It's a real beauty.



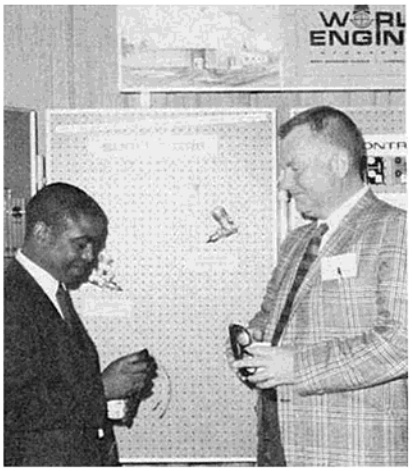
Now this is something that really turned me on! Chuck Waas, of Micro Avionics, proudly shows off their new 9 oz. full house propo. The servos weigh about 1¼ oz. each, have 3½ pounds thrust. Note the antenna, fully collapsed within the transmitter case. This setup will sell at a competitive price (around $400.00) with other propo units now available, even though it is 33% to 40% lighter. Note the installation of three servos in the 1/2A Bellanca scale job, which has a Cox medallion with engine control installed. Chuck assured me that by the time you read this, these new units will have been shipped to Micro Avionics dealers – so if you can't get one, either your dealer didn't get his order in fast enough, or–well, write Chuck. Just don't blame me. I'm as anxious as you are to see these lightweight units showing up around the fields. After all, I've been harping for smaller units for a long time. Now that Micro Avionics has one at 9 oz., anybody want to try for 6?



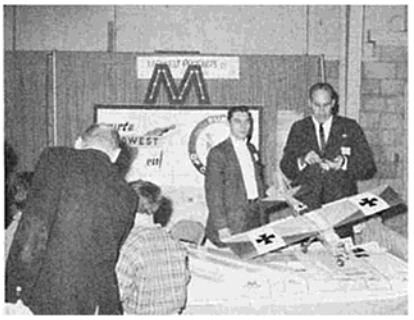
Bill Hall, of Hallco, displays the new mountings for his single and dual actuator ghost systems. For the modeler who can't quite crack the price barrier of the digital proportional rigs, galloping ghost still provides an excellent control system, even though it does have some limitations. Bill's dual actuator system comes ready to install, thus eliminating the need for the inexperienced modeler to do a wiring job. Both systems are compact and rugged. If you have to budget under $150.00, and want proportional control rather than full throw servo or escapement action, galloping ghost is the answer.

The flight demonstration area was a busy place all day long, and the crowds were always big. Regularly scheduled demonstrations of new models were put on by various manufacturers, and they went all out to put on a show.

Jimmy Grier, R/C's answer to TV's Flip Wilson, amuses Johnny Maloney of World Engines with a few sage observations on Johnny's new M.A.N. servos.



Jim Davis and Frank Garcher desperately try to interest someone in "Das Liddle Stik." Ugh! It's so ugly it's beautiful!



The model display, although relatively modest due to lack of space, was very impressive due to the excellence of the workmanship on the planes.

Dewey Broberg proudly shows his Aerocommander and the Du-Bro line of accessories.

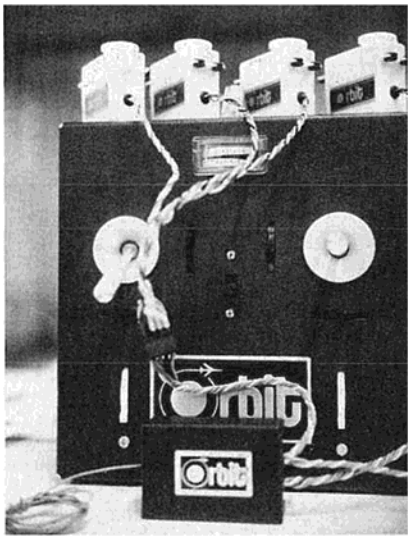
The PCS and Kraft-Hayes booth was always crowded. Did manage to get a shot of Bud Freeman and Cliff Weirick trying to agree on an answer to a question. The new single stick version of the Gold Medal series attracted a lot of attention. Maybe not as much as Cliff's gorgeous missus, Charlene – which figures, natcherly.

World Engines has come up with what looks like another winner – three servos and a receiver all pack-

aged in one unit, with a lead to a fourth servo if desired. Weight is less than separate servos plus receiver, and installation is a cinch.

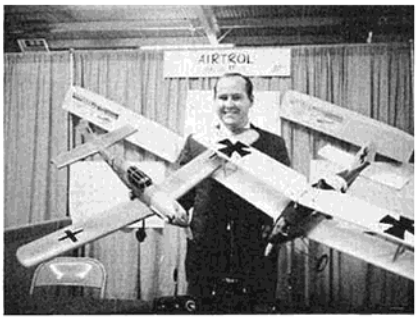
The K & K of K & K Industries – Ken Griggs Jr. and Ken Griggs Sr. – were quick to point out the features of their newest model, the Formula 2 version of their famous Rivets pylon racer. The big Rivets should do as well in its class as the Formula I version – and that's doing all right.

Orbit once again showed their ultra small proportional set – the one they displayed in prototype form last year. But there's a big difference. They've worked out all the bugs, and in doing so have come up with some improvements and changes in circuitry which makes it possible for them to market it in the competitive $400.00 price range. The photo shows the transmitter, receiver, and four servos. A 225 ma. battery pack will be used, making the airborne weight 9 ounces – and they're working on an even smaller version of the receiver which will reduce the weight further! Looks like a photo finish between Micro Avionics and Orbit for the distinction of lightest digital propo in 1969. Love that competition!



While Don Dewey circulated, the faithful RCM staff – Jean O'Brien, Kathleen and Pat – socialized with the spectators. Sally Dewey, sporting Tatone's latest medallion, laughs at one of Ken Griggs' witticisms. He's only half in the picture there at the right – maybe it was a half-witticism?

Tom Johnson, of Airtrol, says they're going all out with their new line of semi-scale, almost-ready-to-fly models. They're also coming out with a digital proportional set, augmenting their present line of radio equipment.



And here's the E and K of Logictrol – Bob Elliott and Jerry Krause. Bob took me to task for overlooking his 12 ounce gear in 1968 when I was predicting what might come by 1972. He was right, too. So all I could say was "Sorry about that, Bob. No question about it – you were right up there with Kraft. So-o-o, now that Micro Avionics is showing a 9 ounce rig, would you care to try for 6?" I had to leave there in a hurry.

Marilyn and Paul Reno and Phil Phillips, of Phillips Custom Models showed their Snipe and Foam Glide I slope and thermal soarers. All foam construction except in some strategic

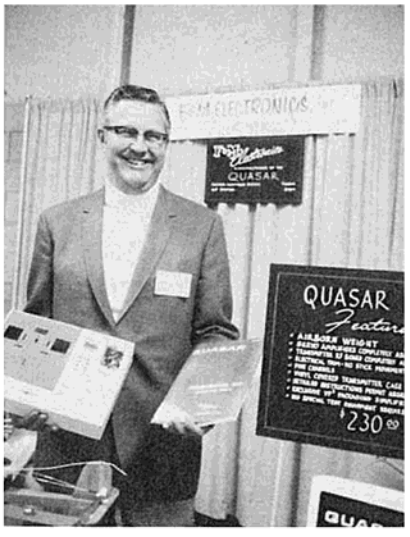
(continued on page **50***)*

stress points, they go together very fast.

As usual, the dean of the kit makers and one of the world's greatest modelers, Carl Goldberg, was on hand to talk modeling and show his latest line of goodies.

Ron Murray and Bob Maritz were there for Royal Products. Lots of items on display, as you can see. Main item, center stage, was their retractable gear.

Smiling Duke Fox had his line of engines – the biggest one weighs almost as much as some of my whole models do.



(continued from page 49)

Dick Thompson now heads up F & M Electronics. For the guy who wants to make his own, the F & M Quasar kit is hard to beat. The instruction books are just about as complete as you can get.

Chuck Fuller of G & K Mfg. points out the salient features of their fiberglass fuselage for the Stagger-wing Beech model they are marketing. The wings and tail are balsa, and the whole model is very attractive.

Hal Schatz represented MRC Enya and Webra. The Webra .09 Diesel with throttle control looked very good.

And here's another interesting new material of models. Sal Taibi, free flight's gift to R/C, with his partner, Ray Van De Walker, have developed a new "stressed skin" material, similar to corrugated cardboard. It's about 1/8" thick, weighs less than medium hard 1/8" sheet balsa, and is very strong. It can be bent around single curves by scoring lines carefully. The "Paper Tiger" hanging above Sal's head is constructed almost entirely with this new material.

Guess where the Williams boys are. Look closely and you can see their ears. Their scale accessories were a big hit.

Bill Cannon, big gun of Cannon Electronics, shows a scale model of his own full scale Comanche, with his Mini-5 system installed. You can get Cannon's propo rig in kit form, partially built up, or ready to install, depending on your ambition and/or your budget.

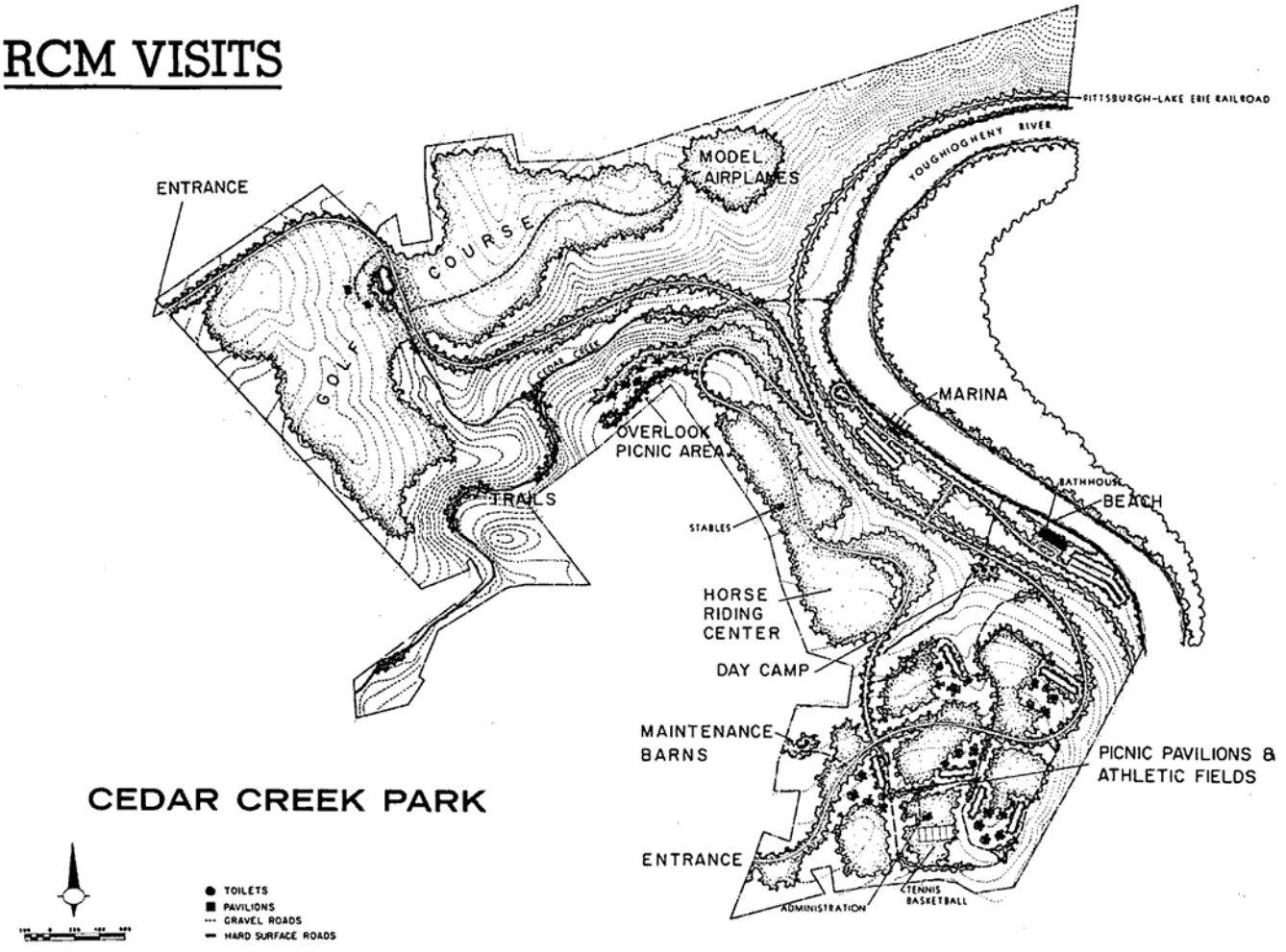
Sorry I missed some of the displays when taking photos. The light wasn't always satisfactory. Saw the two Dales – Kirn and Willoughby, and will have to smoke a peace pipe with John Tatone. And there were others, but space limitations have to prevail.

It was a good show. Hope to see you all there next year. Now to test some of the products.

"Darn it!" exploded Walt. "I'd like to build my dream ship this week, but I just don't want to spend the **whole** week up to the elbows in balsa! I could build an ARF tonight, but that won't give me the unique plane I want. Whaddya say, hairy hound? Got an exciting new construction technique I can use?"

I could only shake my muzzle and crawl away under the bench, because I had just been pondering the same situation. You know, outside of foam wings and a little fiberglass, we still do not have any 'home workshop' construction methods that the twin-pusher builders of the '20's didn't have. Let your mind wander into the world of the future for a minute; picture some of the techniques we'd have if we had kept pace with the aerospace industry:

1. An inexpensive self-foaming material which can be easily carved to shape for a male master. The same material can then be poured around this master to make a female mold.
2. A liquid plastic which can be painted into that female mold (or sloshed into it). This plastic sets in 30 minutes, forming a tough skin. Different thicknesses are built up with multiple applications.
3. Ready-made sheets of a rigid plastic, which is foamy and easily cut with a model knife; this is easily fabricated for bulkheads and ribs.
4. A bonding glue for these plastics which gives adhesion in 10 seconds, cures to a 100% joint in 24 hours.
5. A tough thermoplastic compatible with the previous plastics, but which becomes rubbery and totally pliable at 250° to allow dropping over molds for complex shapes. Once heated and formed, it remains rigid at temperatures less than its melting point.
6. A viscous spray liquid which can be easily tinted to any color. When applied, one coat forms a pliable fuel-proof skin.



THE MON-VALLEY R/C CLUB

WESTMORELAND COUNTY PARK COMMISSION SETS NATIONAL PRECEDENT AS PENNSYLVANIA R/C CLUB BECOMES FIRST IN NATION TO OBTAIN FLYING SITE UNDER FEDERAL "PROJECT 70."

BY KEITH ACKMAN **PHOTOS BY LEE HIXENBAUGH**

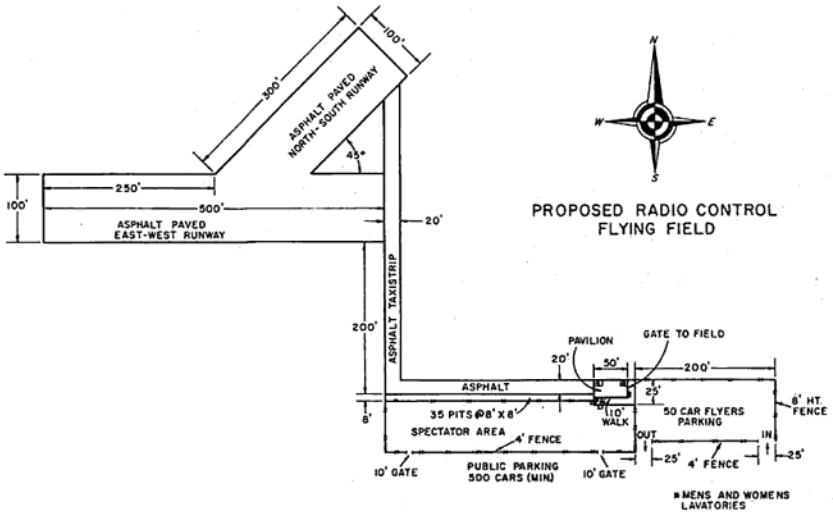
This article is written in behalf of the thousands of radio control modelers who may be experiencing the problems of locating a suitable flying site. If this problem confronts your club, read on, and discover how the MON-VALLEY RADIO CONTROL CLUB conquered this problem and, through its efforts, may well have "paved the way" for future developments on flying site locations.

Before uncovering the solution to this somewhat archaic problem, a brief club history is interjected so the reader may visualize the inception and growth of an organization from its modest beginning to the present form.

In the late '40's' control line flying captured the interests of local modelers throughout the valley. Through the dedication and efforts of Sam and Jack Poole, Michael Nogy, Francis Maguire, Wilfred Taylor, Steve Miller, and William Pocky, a club was born. Throughout the years, interest and enthusiasm for model flying remained at a peak, but many flying sites were lost due to noise or housing developments; however, these dedicated men flew wherever, and whenever, an opportunity was present.

In 1951, when radio control came into existence, there emerged a new problem of locating flying areas which required a rather different type of site than did its predecessor, control line. During the ensuing years, flying sites were discovered, but were lost shortly thereafter due primarily to land and housing developments.

One autumn Sunday, Mike Nogy informed the club president, Francis Barch, that he had located a beautiful field which was very flat, contained about six acres, and was free of obstacles. Upon making an inquiry the club discovered the property to be part of Westmoreland County's Cedar Creek Park in Rostraver Township, Pennsylvania. In October, 1967, Francis Barch, Henry Holesapple, and Nichael Nogy



requested a meeting with the Park Commission. Permission was granted and a meeting was arranged by County Assessor Andrew Kritsky with Recreation Commission members Al Shrump, W. E. Noel, Arthur Wilson, Mike Sivak, Francis Murrman, and John Laudadio. During this meeting, the club's representatives explained their activities and discussed the role they would assume should the club be granted permission to use the field. Since no member on the Commission had any knowledge of radio control flying, they suggested that a demonstration be staged so that they could better understand the club's activities, and November 20, that 1967 was established as Demonstration Day.

The Mon-Valley club members were somewhat apprehensive of flying in November due to the severity and uncertainty of weather conditions at that time of the year, but their fears were unfounded as the day dawned sunny and beautiful. The Recreation Commission, composed of Kriksky, Sivak, Murrman, Laudadio, and Shrump were on hand to witness the demonstration. These men were not only interested but also highly impressed as they experienced the majesty of radio control flying for the first time.

As a result, the club members were invited to attend the January 10th Commissioners' meeting to further discuss the possibility of using the property. During this meeting Keith Ackman, club secretary, and Francis Barch, president, presented and explained flying rules and safety precautions to be observed by all flyers. Their efforts bore fruition at this meeting since the club was authorized to use the land. Needless to say, the A.M.A. insurance program, complete, revised club by-laws, and adequate flying safety rules, placed them in a somewhat favorable position.

It is appropriate to consider the dynamic leadership of the Westmoreland County Recreation Commission before continuing with this story. In 1964, Rostraver Township acquired land for a park. Mr. Andrew Kritsky was responsible for negotiating with the township and local land owners for acquisition of property. This County Park Program is included under Federal "project 70" and the park itself is titled Cedar Creek.

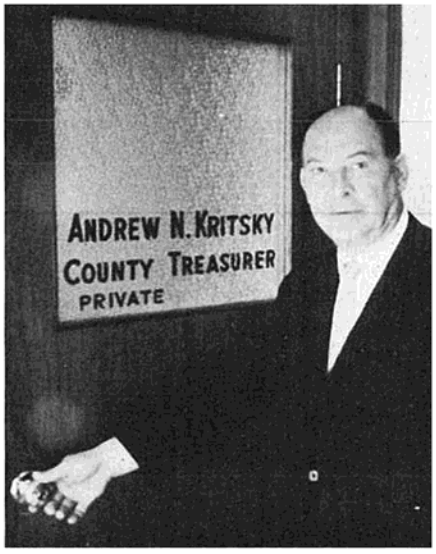
Of paramount importance is the fact that the Mon-Valley Radio Control Club has not only been authorized to use the land, but has also been included in federal "project 70" as a recognized recreational activity. The word "recognized" is very important to us as it should be to radio control enthusiasts everywhere since it placed model aviation in its PROPER perspective.

In a recent interview with Mr. Kriksky, it was determined that the future club flying site will include an asphalt runway, an enclosed pavillion, a parking area, and many other facilities. Mr. Kriksky quoted the cost of this project to be approximately $60,000 which will include a road to the field as part of the total cost.

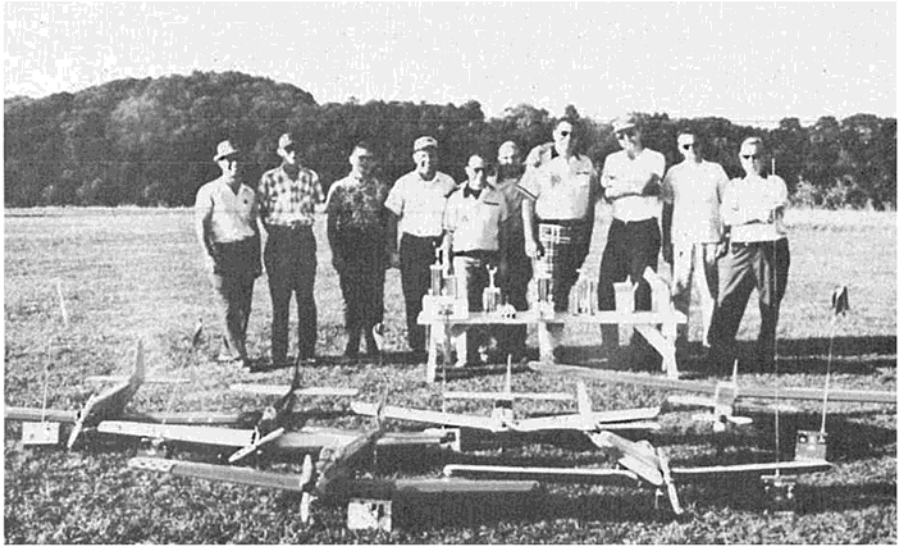
As a summation, the Mon-Valley Radio Control Club is the FIRST club in the United States to be considered under "Project 70." Each member of the club, as well as radio control enthusiasts everywhere are deeply indebted to the leadership and foresight of the WESTMORELAND COUNTY PARK

(continued on page 53)

Mr. Andrew Kritsky, Westmoreland County Treasurer, whose efforts made Mon-Valley flying site possible.



Mon-Valley R/C members, Joe Parrinello, Bill Pocky, Frank Parrinello, Sam Pope, Keith Ackman, Howard Williams, Henry Holesapple, Francis Barch, Ted Lengyel, and Fred Collins.



MON-VALLEY R/C CLUB

(continued from page 52)

COMMISSION. A very special "thanks" to Mr. Andrew Kriksky, who has given radio control model aviation the prominence it well deserves as a recognized recreational activity and sport.

The Mon-Valley R. C. Club hopes their story will encourage other flyers to seek assistance from their community leaders in an effort to enhance the value of model aviation.

TOP OUT

BY JERRY KLEINBURG

Finishing touches. Rubber-powered Lancer goes together, a major project for young hands and minds. Adult encouragement essential, but in a knowledgable way. Frank and Mike - partners in modeling adventures.

It's amazing how kids will stick with something once they put their minds to it. There's nothing wrong with their span of attention either when the interest on hand is one that grips either youthful desires or imagination. And this includes building model airplanes the hard way – that is, by the 'old-fashioned' framework and tissue method.

I've just watched my two sons wrestle, for the better part of a week, to turn out a 24" span Lancer rubber-powered model that's kitted by Guillow, a name that's been associated with kitting models for youngsters a heck of a long time. The boys never let up, and although the result was as disreputable a looking model you'd ever want to see, still it was THEIR creation and they were happy with it as well as being properly proud. I'm sure in their eyes the knobby, warped and tissue wrinkled patchy job was the best model airplane EVER – and I didn't tell them differently. This Lancer was a sort of milestone in craftsmanship for the boys, and in these days when a good deal of concern is heard over "lost skills and hobbies", I think that something involving a larger issue was demonstrated in this particular achievement.

Modeling, where my own sons are involved, is not directly encouraged. Call it "reverse psychology" if you wish, but I've always believed that direct positive influence by me would be to over-pressure the little guys (they're 10 and 12, and NOT so little. . .) which would bring on the wrong atmosphere regarding models in the long run. This is a well known problem and one that commonly occurs where businessmen and professionals try to over-force their vocational interests upon their male offspring. In any case, modeling was left to the boys to decide upon and try out. Actually, the deck was stacked. Besides the normal curiosity, it's pretty hard not to be swayed where the biggest male influence in their lives is pretty well taken up with a hobby that has "all those neat motors an' things." And so they scrounged up their own materials, found working space, used a hunk of 1 x 6 pine for a building board to turn out plastics, gliders, AMA Cubs, and now, the Lancer which came as a birthday present. Not only are the materials all bootstrapped, but they're learning the construction art all on their own. This is the part that's perhaps the roughest on the "old man." Let's face it, results

without help are pretty scratchy. . . In fact, they're outright primitive! And it wouldn't take much to smooth out their creations. A bit of help with the tissue covering, or a steady hand in the placing of all those tiny decals on the plastic shelf models, or a smooth touch or two with the paint brush – any of these would easily improve results 100 or 200%. But we strive for full independence although it's difficult to say exactly how much of a hands-off policy is best in this or any other situation. However, so far progress is ALL theirs and I don't want to spoil the independence of their effort and have them lose the magic spark of interest.

That's it. I think this fairly well shows that kids can – and may – do well for themselves where they are allowed to function largely in their own environment, especially from an age and skill standpoint. The job for us adults is to provide inspiration by honest example and to otherwise encourage independent action – but gently, gently. And if we're careful enough, by golly, they'll do fairly well – not because we tell them, but because they 'FIND' modeling for themselves! This means that whatever adult influence is employed it must be free of an attitude reflecting superiority, condescension, or coercion. This isn't easy since it's natural to re-live youthful years through the experience of children. But to be fair to the kids, and to reap a high order of happiness and satisfaction – as well as to encourage Juniors, we have to learn and practice restraint, yes, even in modeling!

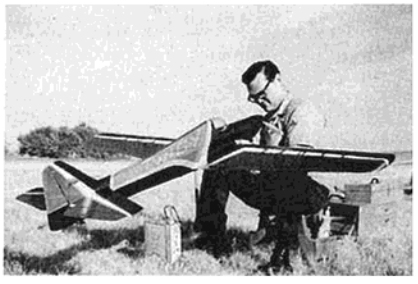
Around the Country

OHIO. Moonlighting, among the Cleveland Radio Controlaires, takes on another meaning. Recently, the 50 member, 12 year old club held its annual contest and featured – along with such fun events as Donut Drop, ETA, Speed Dash, and Limbo – an event called the "Moonliter." Frank Vidmar, VP of the group, tells us about this new wrinkle in contest RCing:

"The event which really took the cake was our night flying affair. What started out as a joke, turned out to be a real exciting event. Someone suggested that we give a trophy to the flyer who made the last flight of the day - rather, the night! We started at 9 PM and went until 11 PM daylight saving time. About a half dozen flyers joined in the challenge and the spectators urged the daredevils on. There was no moon, but the still air and quiet did help in flying. The fliers of planes without lights finally had to concede to those having lights. Although it sure was an eerie feeling to fly by lights on the planes, this event proved it can be done! Winner was Bob Penko, while the runner-up was Frank Daniels. We plan to hold another such event next year but with some restrictions because it appears with lights on the plane and a little orientation practice, the contest could last all night! Our contest this time finally came to a halt because Frank couldn't get his engine started. The real joke of the event came when Ed Rozic attempted to fly with a lantern tied to his plane! (What some guys won't do to try and win!) To add extra spark to the evening, Col. Bill Beach gave a flight demonstration of a real Bell turbine-powered helicopter owned by the Meyers Snow Plow Co. here in Cleveland. In order to make this a family affair, we had a weiner roast, also. It really is great how the women and kids can make a contest sparkle."

TEXAS. Contest travels last year included a trip to Dallas and the

Twigy, by Don Downing of Contest Products, gets loving attention and grooming for 2nd place win in Dallas Southwestern meet. Super Tiger 61, Logictrol in original bird.

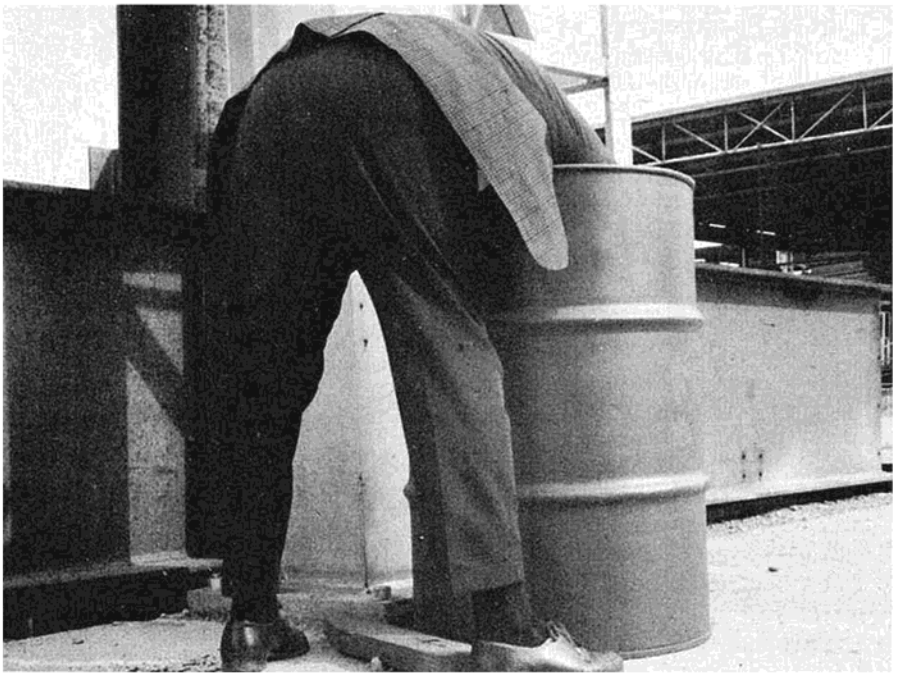


annual Southwesterns where Bill Aaker, Dick Straw, and Carl Summers and the rest of the Dallas RC Club hosted RCers to a well run and relaxed pattern meet. Dan Carey, Don Downing, and Gary Pannel dominated Expert pattern, while Sam Fly (uh, huh. . .), Dave Webb, and A.F. Capt. Jim Bonar took care of Novice hardware. In B, Norm Barnes topped the field which included Dale Smith, Dwayne Brown, and retired AFer Lew Kenison who took a day away from his Austin, Texas hobby shop to try a bit of RC competition. Sentimental favorite was little Tommy Dodgen of Winnsboro, Texas who flew an original design and used an Orbit 3+1. The talented 13 year old flier again showed that young age is no barrier to proficient RC flying as he scored well against competition in the B pattern event.

Tommy Dodgen of Winsboro, Tex. scored well in B pattern at Dallas meet. Talented 13 year old flier proves youth no barrier in RC.

It's a short hop from Dallas to Ft. Worth where the Thunderbirds staged their 1st Annual Fall Pylon Racing Meet. Bob Lutker, the major motivating force behind development of pylon racing in the southwest, was an energetic CD who saw that the meet ran flawlessly with a pace that gave everyone plenty of flying. For a summary we turn you over to Bob Lutker!

"All systems were 'go' in this first of a series of RC racing meets, and my fellow Thunderbirds came through with flying colors. As CD, my job couldn't have been easier with the terrific cooperation and efforts of all the meet officials. Utter perfection prevailed throughout the contest. Ideal Texas weather, the finest gathering flyers I've seen anywhere around the country, good attendance, large crowds, good publicity, the finest modeling facility in the southwest.



MEET

CHUCK CUNNINGHAM

RCM Associate Editor

He leaves no stone unturned looking for new R/C materials!

What's an **R/C MODELER MAGAZINE** Editor doing in a trash can?

He's looking for discarded scraps of industrial material that might have a practical application for **YOUR** next model!

And he's well qualified for his job. A graduate Industrial Engineer from the University of Texas, Chuck is Purchasing Agent and Corporate Executive with Thornton Steel Industries, Inc. He **KNOWS** how to buy wisely, and how to find new applications for even the most common materials. For example, he introduced the use of cardboard as a covering material for foam wings, and the use of a one-piece plywood fuselage, as well as many other time and money saving techniques. Don't miss Cunningham On R/C in the May issue of R/C MODELER – the world's most widely read, quoted, and imitated model aviation publication with a staff that takes **YOU** to wherever the action is happening!

THE MAY ISSUE ON SALE APRIL 10th

and really the most pleasant fellowship enjoyed anywhere. This has just gotta sound like we're bragging, and it's because we are! We're pleased and proud that RC racing has advanced in this part of the country to attract 24 of the Southwest's most skillful pilots.

Competition was keen and the flying no less than spectacular. Two full days of nothing but pylon racing - the greatest sport in model aviation! Flying quality was unsurpassed. We were honored by attendance of AMA President Cliff Weirick who ended up taking top honors in Formula I, but only after being given a hard chase by the Southwest's top flyers. Except for Cliff holding a firm lead throughout the meet, the other places were up for grabs all the way. It was a flyers' meet, with 10 full rounds in Formula I where some impressive statistics resulted from this largest Pylon Racing meet ever held in this part of the country - even topping the Tahlequah, Oklahoma meet which was an extension of the 1968 Nationals. Those 10 rounds stacked up to a full 57 heats with a top time of 2:00 flat being turned in by Cliff Weirick, followed by Dr. Bob Pearce at 2:03.8, Bill Anderson's 2:06.4, and Ben Beerbower at 2:12. It was no snap, Cliff had to work for that 1st place award. And prizes were BIG in Formula I: $100, $50, $25, $15, $10 - and a nice trophy to boot! Formula II saw Chuck Cunningham of Ft. Worth, young 16 year old John Jennings of Dallas, and Maurice Woods of Oklahoma City winning in that order. All flew planes using K&B RR engines in 4 heats, with Chuck clocking the best heat time of 2:26.3 with his brand new original 600 class racer, John with his Shoestring posting 3:05.8, and Maurice pushing a very pretty Air Cobra to

Dr. Bob Pearce focuses on far pylon as he pushed T-tail Rivets to 2nd place win at outstanding Ft. Worth contest. Dan Carey, called.

2:40.5. Open Pylon went to Jim Bonar, Charley Powell and Dr. Bob Barrett. So, our dreams have come true, and Ft. Worth is now PYLON RACING headquarters in the southwest part of the U.S. with this having been the largest racing meet yet held in this part of the country. I want to invite all RC pilots to come race with us in Ft. Worth during our 1969 contest season when meets will be held on March 22-23, June 14-15, and October 18-19. So, y'all come!"

MASSACHUSETTS. An exciting RC event during 1968 was the speed trial get-together at Westover AFB sponsored by the Hampshire Co. RCers. Bob Barkowski, club president, reports several 185 mph times were posted by club members and that Maynard Hill clocked a one-way 198.8 run in an attempt to set a new world mark. The 198.8 time is equal to the world record set in Germany during 1968. Fran Mitchel's high stab delta type speedster, was the most popular ship at the meet with 3 entries. The Rossi powered racers reached 185 mph and Fran is optimistic about bettering this time at later trials when he'll have added time to improve on his selection of props and fuels; he didn't have sufficient time this go-round. Charlie Olsen had a K&B powered mite that showed its potential by folding a wing on climb-out! He'll be trying again with the others next June when another speed trial is being planned by the Hampshire Co. club. There's a good chance the U.S. will capture the world speed crown then and results of the next meet will be interesting to see. Mark this one for a MUST in 1969!

NEW JERSEY. Did you notice that meets seemed bigger during 1968? If you hadn't thought about this, consider the Central Jersey RC Club's Eastern States Championships held at Sky Manor Airport on October 6th. Lee Shulman, the CD, reported that 98 contestants entered and flew. It drew fliers from Massachusetts to Georgia and 4 flight lines were used to handle the large turnout. Class A pattern saw 19 entries, Class B had 27, Novice 15, and Expert 13. Scale had 24 planes signed up. Prizes were plentiful also with trophies being awarded to 5th place and all contestants sharing the more than $1000 in merchandise. To the CJRCC, it was an embarrassment of riches, and they're wondering how to handle next year's affair which promises to be even

Meroke RC Club Annual winners. Lee Shulman, with hardware and kits, won pattern. John Gravini, under the broad-brim straw, was 1st in Scale. Bob Geyer was CD.

bigger! We feel Lee Shulman will come up with a real good answer, despite all those contests he's planning to attend in 1969.

And speaking of Lee Shulman, here's how he helped two fliers to smile when they think of the planes they lost in 1968: At the Johnsville, Pa. meet Lee won 2 trophies, a 2nd in Formula I and a 1st in Open Pylon. In the Open Pylon event, Ernie Weiss and Dick Sarpolus of the Monmouth Model Club each planted an airplane in the deck during preliminary heats. Lee sympathized, had two trophies in his hands, and decided that Ernie and Dick could have one as a consolation award. The problem was to share one trophy between two fliers, so they sawed it in two! Now when they see their "half-trophy" they have to laugh. *"And we think of Lee Shulman who's an avid modeler, a good competitor, and a good friend,"* says Dick Sarpolus, who sent details.

Ernie Weiss and Dick Sarpolus, of the Monmouth MAC, "share" a consolation trophy from Johnville, Pa. Open Pylon event. Trophy was sawed in two! Lee Shulman idea.

RC ABROAD

ITALY. Earlier we wrote of Paolo Zoppolato after reading of his modeling difficulties in Nino Campana's GLITCH newsletter. Paolo had been disqualified from flying in Italy because he had criticized administrative policy controlling Italian modeling. He recently wrote thanking for the support. Here's his comment:

"I would like to thank you and RCM for the publicity of my troubles. Someone will learn something from this experience which will lead to better democratic procedures. I hope so, maybe not. However, in this case I like to remember one of the verses of the "Divine Comedy" by the poet Dante Alighieri:

"Non ti curar di lor, ma guarda e . passa."

I'll translate:

"Don't care about them, just look at them and go on."

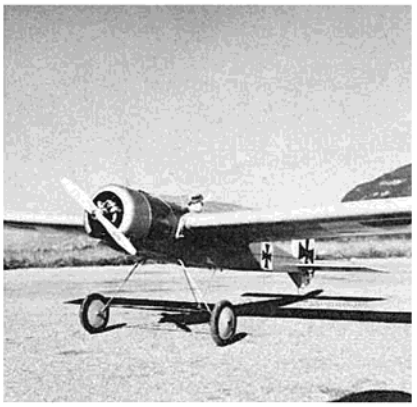
Nothing will change in my mind since I love the truth.

Yours truly,
Paolo Zoppolato"

We're glad to hear from you Paolo, and also to read that your reinstatement has been made.

Also from Italy, a letter from Leopoldo Pergher with the latest about competition:

"We have our difficulties, for example our FAI selections won't be held until April in 1969. At first it was set for October, but then it was changed.

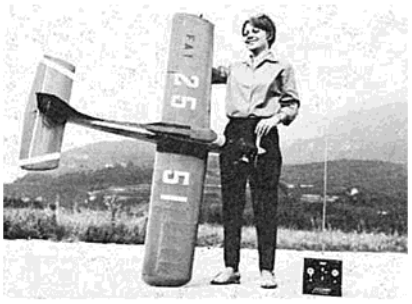


Paolo Zoppolato's "Arcidiavolo." Powered by a ST 56, Grundig propo. "Stable, slow, and realistic in flight."

Because of these difficulties, earlier in 1968 we decided to organize the Lombardo-Veneto Championship to provide a contest exercise, so to speak. During 1968 this championship included 8 trials for conventional RC planes and two for seaplanes and was a true success. Next year two other regions in central Italy will organize similar championships and we believe this will improve the Italian RC contest structure. This year the weather is colder; just in time for the building

season! At present I'm building 3 copies of my "Fononi." Two are for me and the third for a friend who bought the balsa. This is my latest design; 58" span, 6 lbs., a tapered wing using NACA 64012 at the root to 64018 at the tips, and a very slim fuselage ala the Nobler of U/C fame. This gives good tracking for loops. It's necessary to store the servos one over the other but for field accessibility there's a hatch on the top of the fuselage also. There's even one on the side for access to the fuel tank! Look for pictures of this one later. Incidentally, I cannot be unhappy with my contest year in 1968: I won three

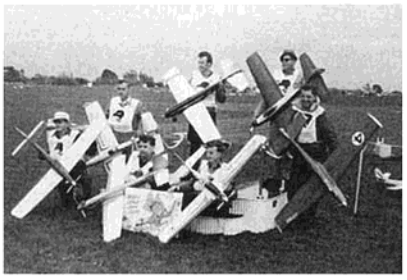
M-31 Andromeda, by Leopoldo Pergher, and mechanic (Isabella). ST 60, 6 lbs., Micro Avionics. 234 flights, so far.



sport contests which are similar to your Class B. Then I had to fly FAI Class and won 10th in Reggio Emilia, then a 2nd and a 1st in two contests of our championship. Not bad for me! All this was done with my M-31 "Andromeda" which has flown 234 flights. By the way, although I'm far from the States, RC information gets here pretty completely. This is through the merit of the magazines, through letters from Nino Campana, and from the 8 newsletters I receive. RC CUE I like very much. Enclosed are some pictures I took during the contest season. I like to fly in as many contests as possible since this is the best way to meet new people who like to fly models too. Sincerely yours, Poldo."

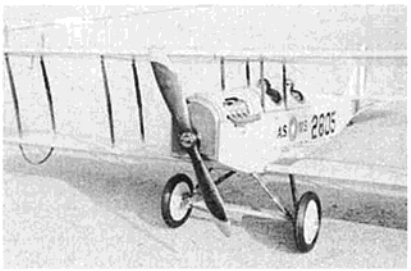
NEW ZEALAND. "A great show!" Russ Johnson comments about the fall contest between New Zealand and Australia. Russ' enthusiasm is understandable since the NZ fliers evened the series this time by outscoring the Aussies in their spirited RC rivalry. A full FAI pattern schedule was used and planes and equipment were along U.S. standard lines with mostly Micro Avionics being seen, Russ relates. New Zealanders, now in the height of their flying season, are looking forward to the NZ Nats set for this month. Russ promises results of that meet also.

Winning New Zealand team in recent NZ-Australia meet. Kendrick, Perry, Whitehead, Dawson, Milne, and Putt were team members. Whitehead top team score.



FRANCE. Maj. Francis Plessier sent word that the 1968 Storks Circus was another outstanding RC event. Although windy, which hampered scale fliers, sunny weather brought out many spectators (we counted 2000 cars then stopped, too tired) to watch races, limbo, and speed trials. Hit of the meet, most spectacular, for sure, were the speed runs of Bosch and Kaseberg at over 200 mph from out of split S dives that brought a roar from the Super Tiger 60's fueled with 40% nitro. Simprop 2+1 radios were used in the speed mites. Besides American makes of radio, there were many Graupner Variotons, a set beginning to be replaced among RCers by the new Variprop digital radio which features inexpensive (. . .about $9) servos that have the electronics in the receiver. Radio Pilote and Air Command, both French radio systems, were also used by fliers at the Storks Circus. Most popular engine presently is the ST 60, with OS and Enya filling in the rest of the power plant picture. Plessier's "Unbelievable Mammoth" was also flown during the meet.

Well done scale Jenny by Maj. Francis Plessier. Note full wire rigging and cowl and gear details. 82" span. Plessier designer of "Mammoth," giant RC model seen at Circus.



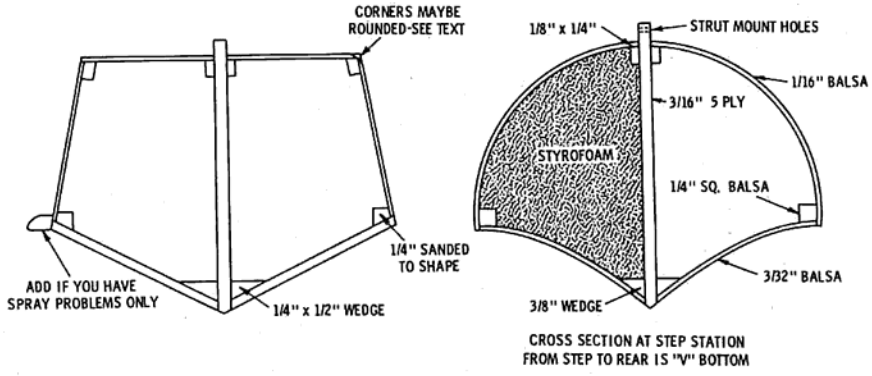
BUILD YOUR OWN STYROFOAM FLOATS

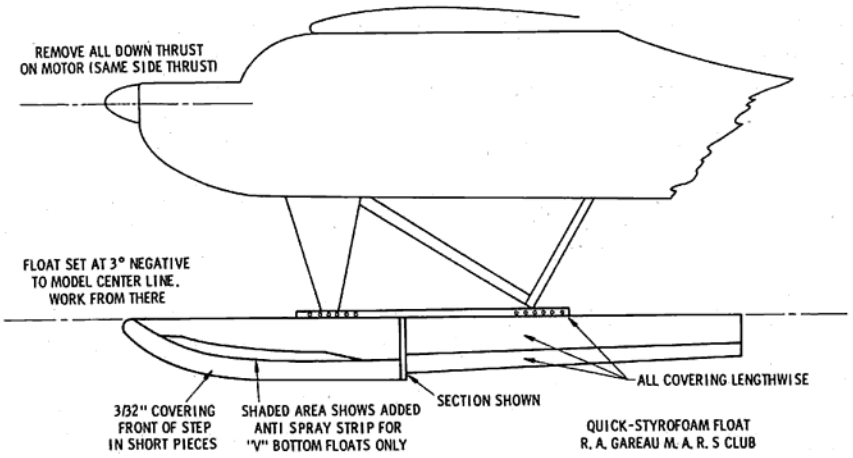
BY RAY GAREAU

PHOTO BY JIM NORTHMORE COURTESY OF RAND MFG. CO.

With winter here, and many modelers contemplating taking their aircraft with them on next summer's vacation, the need for a quick and inexpensive set of floats for flying off the lake is apparent. The drawings accompanying this article illustrate just such a homemade float. It is easy to construct, economical, and completely practical.

Since the drawings are self-explanatory, the following notes are simply to aid you in building your set of floats. The shaded area shown just ahead of the step station is an anti-spray strip which may be needed on those models that evidence spray problems. The concave type hull does not need it, since this type of design is much smoother on the touch down, but evidences slightly more suction on the take-off. The keel has built in mounting holes for the landing gear as well as the adjustment in relationship to the center line of the model. If additional trim is needed, aluminum plates of approx. 1" x 2½", two per float (for front or rear, as needed for more negative at the front end or less negative incidence at the rear). A standard spreader bar is used. For extra lightness the keel can be cut out, leaving about 3/4" all around, with the cross sections evenly spaced, starting at the step and working both ways to the ends. On the square section it will be necessary to make the sides 1/8" instead of 1/16". You will also note the support balsa braces at all joints. Either style could be more difficult to make depending on the equipment one has in his shop. The square design can be saw cut, and sanded, while the other can be made on the hot wire process and sanded to final shape.





Glue the covering over the styrofoam in the conventional manner with your favorite foam contact cement, such as Core-Grip, or 3M77, then cover with silk or nylon, dope well, add trim, then apply three more coats of clear dope to really seal the floats well overall. You will find that on the concave bottom float, the 1/16" balsa covering will have to be installed in short pieces in order to follow the contour.

The center of gravity should be close to the step or just ahead of it. Remove all down thrust, set the floats at 3° negative incidence to start with (in reference to the datum line of the model). This may often be the same as the thrust line BUT NOT ALWAYS.

If you are one of the lucky ones your model will most likely operate well on floats without further modifications. Since I build heavier than the plans usually call for, and usually overshoot the design weight, I always have to go to one larger size engine.

One other note – on the square type float the upper corner may be rounded some but it really does not add much to the beauty of the float.

An easy formula for other size floats, for larger or smaller models, is as follows: 2¼" of float width for each pound of model weight divided by 2. In other words, an 8 pound model calls for 10" or 5" width for each float. The length of the float should be 3/4 of the fuselage length. Therefore, a model with a fuselage length of 48" should have floats measuring 36". As for water taxiing techniques, see the summer 1966 edition of Air Progress.

Amphicat