PHOENIX MODEL AIRPLANE CLUB

HAVING FUN WITH MODEL AIRPLANES SINCE 1937

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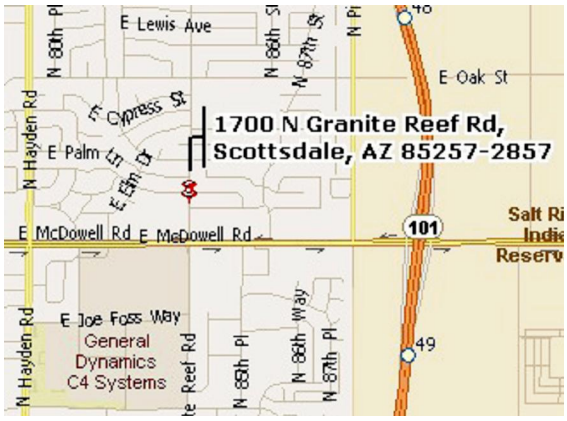

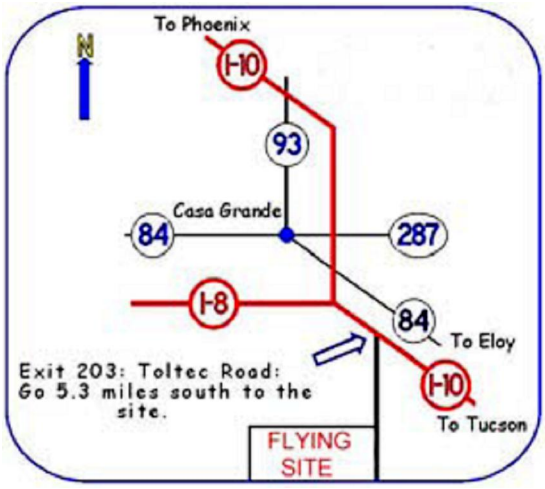

NEXT MEETING
Tuesday Sept. 13th
07:00 PM
Granite Reef Senior Center
1700 N. Granite Reef Rd.
Scottsdale, AZ

NEXT CONTEST
"FALL KICK OFF"
Sunday
September 18th
WEBSTER FIELD
ELOY

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PREZ SPEAKS

Itôs time to overhaul our contest scoring system. Iôve asked Bruce Grawburg to come up with a proposal to either modify our current system or to propose something entirely different. He has a clean slate to work with, but he will need your help. Please think thru this and give him some input. As a reminder, here is what we attempted to do with the current system.

Combining Events. We currently have six categories that lump together models that have somewhat similar flying characteristics. To be sure, there are some inequities that exist. However, it permits us to enter any model that we drag out to the field. Thus the opportunity to fly something is wide open. It is one of the factors that led to more flying activity during our contests.

Flying activity. Until the current system was enacted, we used to schedule specific events for each contest. We had a four core events we flew at each contest: 1/2A Gas, 1/2A Nos, P-30, & Cat Glider. We then added selected power and rubber events to round out the mix. The problem was simple, if the list of events didnôt fit your inventory of models; you didnôt fly or flew very little.

Award Activity. We currently award activity by awarding points for each flight you fly for any given model. You earn 3 points for the first flight, another 3 points for the second and 4 points for the third. Thus a total of 10 if you fly all three. In earlier systems, if someone was the only person to enter a given event, there was little incentive to fly more than one flight, even if it was nothing more than hand launching a 1/2A gas ship for a five second glide to the ground. This happened more than you might believe.

Award Excellence. We now award max flights with 5 points for each flight including fly-off flights. This has proven to be a major factor in gathering points.

Total Time. Within each category we award an increasing number of points for total time for each model entered. Low man gets 2 points with an addition 2 points for each total time from bottom to top. Thus if five people are entered the low total gets 2 points and the top total gets 10 points.

Category Winner. Total points earned for each model in a given category is then the accumulation of points for total time, max flights, and for each flight.

Club Champion. Points earned in each category are added up and go towards the annual club championship.

Conclusion. Thus our current system is based on activity and excellence. The common denominator that exists between this system and previous systems is the simple fact that he who flies a lot has the best chance to win the annual club championship. If the objective is to award the club championship on excellence only, this can be done by selecting only the top scoring event for each individual for each contest.

Elmer Nelson

From Dick Nelson
Thought Experiments

It was Albert Einstein who first said time is not always constant. He posited that as one moves faster, time becomes a variable. He used a simple feat called a thought experiment where he simply sat down in a quiet place and thought about it.

He thought about a train and two observers. One observer is stationed on a bridge over the track, the other on the train. The observer on the bridge fires a strobe light when the train is many miles away and then fires it again as the train observer passes under the bridge. Both observers hack their stop watches at the exact instant they see the flash of the strobe. Einstein knew the speed of light is 186,000 miles per second. Therefore it should have taken a bit longer for the train observer to see the first flash and the stop watches confirmed that fact. If time were constant, the watches would have shown the same elapsed time.

Later he went on to prove that time really does change as one moves. He also showed how the clock slows down as one moves faster and his theory that time actually stands still if one moves at the speed of light has been accepted by all science. Fair enough, but how does that impact our Freeflight endeavors? Stay with me here. Should a Freeflight model behave the same when gliding in a wind as it does gliding in calm air?

Let's do a thought experiment with Einstein's train and find out. It is moving at 60 miles per hour on a level track in a fixed direction, no curves. It is pulling a big boxcar and inside the boxcar is a guy with a Freeflight model getting ready to launch in the calm air inside. It is a very big boxcar. The wind outside is blowing steadily at 60 mph in the same direction. Just before the model is launched, imagine the roof and the sides of the boxcar go away. (Do what you want here, blow them off with dynamite or anything else you prefer, just get them gone). Does the model climb and transition to a glide and then glide the same as if it had been launched in calm air?

Since the train and the wind are moving in the same direction at the same speed, the sides and top of the boxcar are quite expendable. Launching the model with or without the sides and top makes no difference; therefore the climb, transition and glide are the same also. And there is no upwind or downwind because the model was launched into a big sea of moving air. To an observer on the train, it glides in smooth, even circles just as it would in calm air conditions.

Off the train, we can observe what happens to bubbles from a bubble machine or fluffies from a desiccated cat tail as they are released. They are immediately at the mercy of the wind and begin to move in the direction of the wind. Probably a second or two at most puts them into that same sea of moving air as the launch from the train. Do we have any reason to suspect that a Freeflight model is any different? Therefore, whatever the difference between a launch into moving air and a launch into calm air, that difference happens very quickly after launch.

Now let's do another thought experiment and take a ride on the model. A launch in a stiff wind can be a scary experience so we'll limit our ride to, say, a wind of 10 mph. Once the model has successfully transitioned from the ground forces to the forces of the friendly air it has been taught to fly in, will it climb merrily up as it has always done? Will it be unaffected by the wind at the ground? Will the transition to a glide be the same? Is this ride now the same one we watched from the moving boxcar cum flatcar?

Our launcher on the ground sees a glide that is not smooth circles; rather it is a series of fast and slow curves in flight where the model may appear to hang without moving as it turns upwind. Then it appears to accelerate as it heads downwind. Or does it? Whatôs going on here?

Just as we have a hard time accepting that time changes with velocity, we have a hard time accepting our innate human visual mediocrity. We expect the model to stall as it approaches the upwind part of the glide circle and it certainly appears to slow down. When possible, we try to have the transition from climb to glide take place during the downwind part of the circle we see in our heads so that it will not stall.

Whatôs going on is a true optical illusion. What we see from the earth is not what is happening as the model sees itself. If it seems to pick up a stall that was not there before, it is not because of the wind direction. If it appears to trace warped circles and appears to accelerate and decelerate at regular intervals, it is most probably doing just about what it always does.

The sea of air on a windy day with lots of sun will definitely be bumpy. It will have ups and downs, both big and small and any freeflight model will have to navigate those bumps. It may require a change in decalage or CG location and some folks even build windy day models. But it will not, however, pay any attention to north or south, east or west, or upwind or downwind.

Dick Nelson

Report on the Dawn Patrol, AUG 11th and SEPT 3rd.

I got to Eloy about 10 minutes before the sun came up. Dick Nelson arrived just a few minutes later. Next to arrive was Mike Fruciano, who had initiated the call for company on this Dawn Patrol Sunday. John Patton showed up with a couple of little rc models because his Half-a-Wake model wasn't quite done. It's really amazing just how much flying can be done with a little battery the size of a postage stamp. Next to arrive were Chris Lidberg and Katy Cowhey from Tucson.

Dick's model were large, numerous, noisy, and mostly successful. He's getting things ready for the SAM Champs in October at Las Vegas. I'm working toward that as well as are Chris and Katy. My stuff tended toward smaller or quieter: a compressed air model and a diesel model that would only run for one flight. Couple that with another diesel on a test stand that wouldn't run at all and you can tell that the local wildlife wasn't disturbed very much. Chris is getting closer to good flight trim with a Gollywock and Katy will have her Jabberwock done soon. Mike quietly flew his F1G from the other end of a short flight line.

The weather was very nice and a lot cooler than expected, plus a breeze that was more gentle than usual. Finally about 9:30 we noticed that it was getting warm so we all packed up and went home.

Al Lidberg

We couldn't have asked for a better morning for the September 3 Dawn Patrol. Non-existent winds for the most part, and a high thin overcast which didn't make us wear sunglasses. Attendees; Jean Andrews and Dick Nelson from Tucson, and Al Lidberg and Steve Hensla from Phoenix.

You all who missed it missed one of the best testing days of the year. We finally left the field about nine AM after three hours of (...mostly...) fun.

Jean Andrews

Preparing Rubber Motors

Ramon Alban

There is a range of opinion and expertise regarding the preparation of rubber motors for free flight model airplanes from the professionalism of world championship competitors down to the relative ignorance (no offence intended) of the rank beginner. Somewhere in between are we (amateur) "experts" who have developed methods of preparation which satisfy our individual needs. We infest model airplane forums to dispense questionable wisdom to help answer perpetual novice questions from our knowledge hungry colleagues. By so doing, we spread our individual gospels throughout the hobby, invoking occasional disagreement as to best practice.

With this in mind, what follows is a system of rubber prep and management learned from others over 25 yrs of competitive vintage rubber powered free flight, that works for me.

Leave the rubber in its original sealed boxes and keep it in a dark and stable atmosphere of a cupboard in an unheated room. Don't use fridges/freezers simply because it's difficult to control humidity. Leave talc on the rubber until its time to make up a motor because it's so much easier to measure out as it slips through the fingers easily without clinging. Talc also takes up small amounts of moisture in the atmoshere particularly if the temperature drops unduly.

To make up a typical motor from (say) 1/4" strip, weigh out the total amount (eg; 100 grams) required and divide into two hanks as follows. For 16 and 12 strand motors - two equal parts, for 14 strand motors - 6/14ths and 8/14 ths. For 10 strand motors - 4/10 ths and 6/10 ths. Make up two separate loops using a favourite knot. Worth trying is a single half reef and bind the free ends tight with crochet cotton wrapped 5 or 6 times before knotting and trimming.

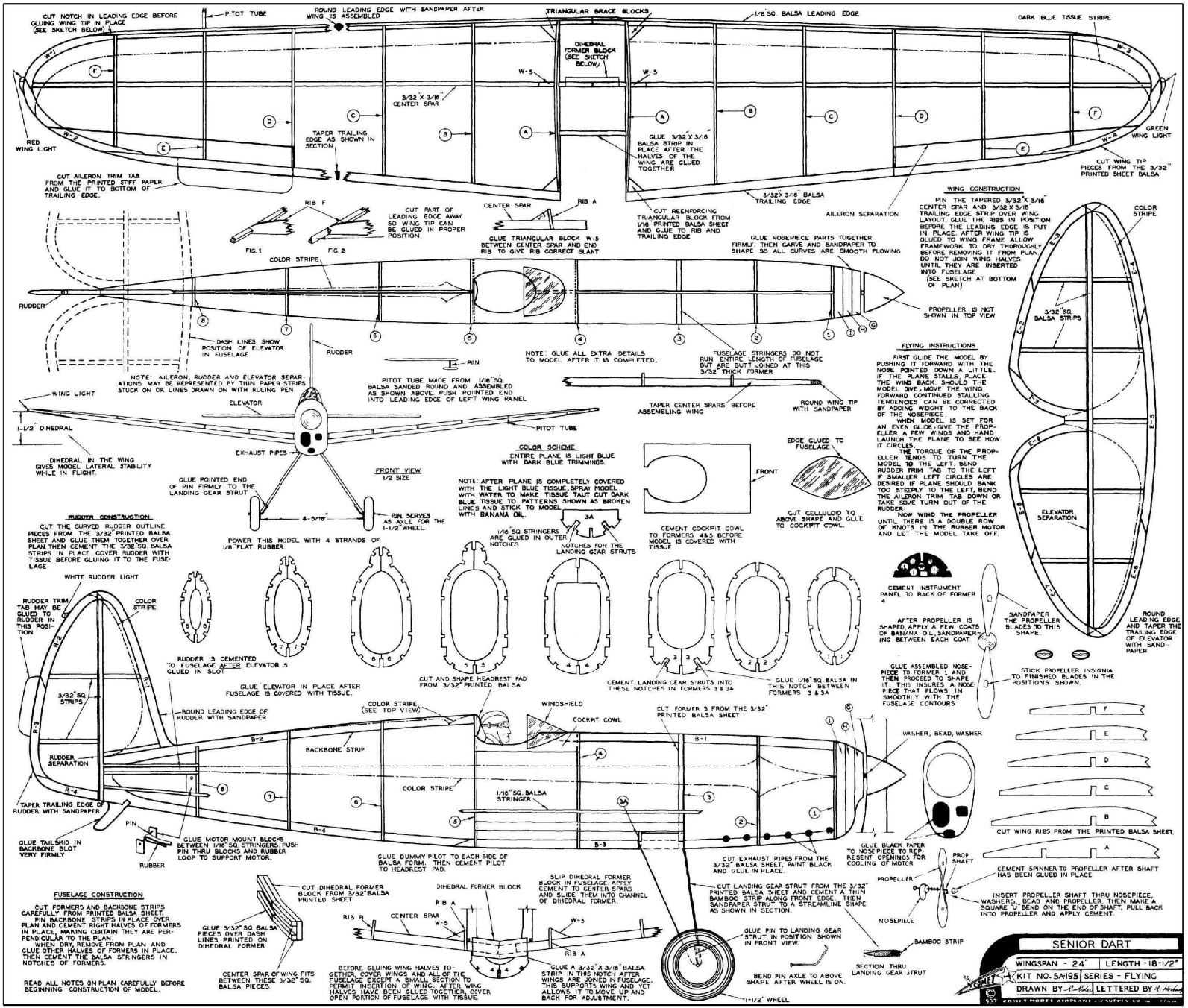
Fold the loop into the intended half motor, either 4, 6, or 8 stands and secure one end of the hank with a small rubber band to keep it tidy. Take both hanks to the sink, wash off the talc in warm soapy water (not detergent), knead the slimy bundle to remove all the talc, rinse in cold running water and allow it to drip off. When nearly dry, thoroughly lube with a favourite such as the excellent soft soap and glycerine mix, pulling, stretching and kneading, especially the knots. Bring the two hanks together at a bobbin and secure with a small band ready for cording. Cord the motor as desired using a Tim Grey prop hook, securing 1 loop to each arm of the hook to stop the rubber climbing off the hook as each half tries to climb in opposition and bind with a small band. I favour 2 different cording methods. To determine the number of cording turns required, measure the length of motor in inches and multiply that number by 2.6. For freewheeling propellers, put half this number of cording turns on each half motor and bring the halves together at the Tim Grey hook as mentioned. Note, when the "halves" are unequal add (say) 5 turns to the thinner half and subtract 5 turns from the thicker half to equalise the tensions on each half. An alternative method, having determined the required cording turns as before, put half that number on each separate pair of strands, again bringing them to the Tim Grey hook, producing a loosely braided "rastafarian" motor ideal for folding propellers.

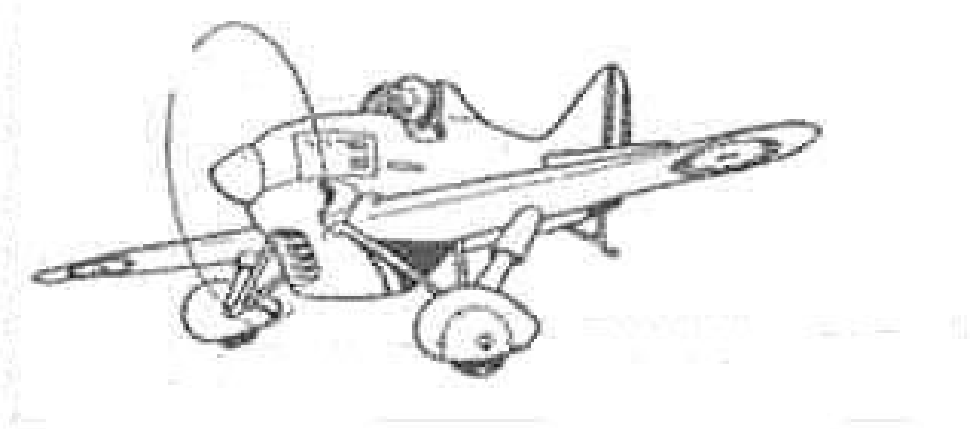
Wind the motor to 100 turns, stretch well, let it unwind to equalise the cording, pop it in a poly bag and seal. Keep the bagged motor in a dark place (usually) in the box with the model plus two other identical motors and the whole kit n' kaboodle is ready to go the field. When winding for flight, only go to maximum torque for the model (empirically determined at the trimming stage) and after the first flight return the motor to its poly bag. Use different motor for each of three (usually) qualifying flights and if lucky enough to get three maxes use the best of the three motors for the fly-off.

Back home inspect all three motors for damage, repair as required and return them to their bags and model box. All models (plus motors) are stored in a constant temperature north facing integral garage. Don't worry about keeping them super cool, just try to avoid too many atmospheric changes. The preserving effect of soap and glycerine allows motors to be kept, fully prepared for use for long periods of time. Motors go many months or even years between use and can be used in "balls out" competitions. They never seem to deteriorate, they rarely catastrophically break (except individual strands), unless careless with winding technique or lubrication, and because motors are used relatively infrequently, they alway give out full torque.

The cost may seem excessive but its not. Look at it this way. A 1lb box of 1/4" Tan II or S/S (£20) makes up into 4 X 100 gr motors. Each motor goes for about 5 flights before its knackered, so that is £1 per flight. Lets say it possible to make 8 flights in a days competition, that's £8. Peanuts (10%) compared to the £50 spent on petrol getting to the venue, £8 to get on the field, £8 to enter 2 comp's plus £10 for a meal with mates before going home. PLUS, there is no badgering around trying to make up motors in the heat of competition. Only wash and re-lube if a motor gets dirty.

This process may suit only a small number of readers. The amateur "experts" already have their own system that works - so no need to change and the professionals may not even get to read it. However, those who are searching for their own system may want to consider if elements of this process might work for them. There is nothing to lose but time, so give it a try!


CUT NOTCH IN LEADING EDGE BEFORE GLUING WING TIP IN PLACE (SEE SKETCH BELOW)
PITOT TUBE
ROUND LEADING EDGE WITH SANDPAPER AFTER WING IS ASSEMBLED
TRIANGULAR BRACE BLOCKS
1/8" SQ. BALSA LEADING EDGE
DARK BLUE TISSUE STRIPE
DIHEDRAL FORMER BLOCK (SEE SKETCH BELOW)
3/32" X 3/16" CENTER SPAR
TAPER TRAILING EDGE AS SHOWN IN SECTION
GLUE 3/32" X 3/16" BALSA STRIP IN PLACE AFTER THE HALVES OF THE WING ARE GLUED TOGETHER
RED WING LIGHT
GREEN WING LIGHT
CUT WING TIP PIECES FROM THE 3/32" PRINTED SHEET BALSA
3/32" X 3/16" TRAILING EDGE
CUT AILERON TRIM TAB FROM THE PRINTED STIFF PAPER AND GLUE IT TO BOTTOM OF TRAILING EDGE.
RIB F
FIG. 1
FIG. 2
CUT PART OF LEADING EDGE AWAY SO WING TIP CAN BE GLUED IN PROPER POSITION.
CENTER SPAR
RIB A
CUT REENFORCING TRIANGULAR BLOCK FROM 1/16 PRINTED BALSA SHEET AND GLUE TO RIB AND TRAILING EDGE
AILERON SEPARATION
GLUE TRIANGULAR BLOCK W-5 BETWEEN CENTER SPAR AND END RIB TO GIVE RIB CORRECT SLANT
GLUE NOSEPIECE PARTS TOGETHER FIRMLY. THEN CARVE AND SANDPAPER TO SHAPE SO ALL CURVES ARE SMOOTH FLOWING
WING CONSTRUCTION
PIN THE TAPERED 3/32" X 3/16" CENTER SPAR AND 3/32" X 3/16" TRAILING EDGE STRIP OVER WING LAYOUT. GLUE THE RIBS IN POSITION BEFORE THE LEADING EDGE IS PUT IN PLACE. AFTER WING TIP IS GLUED TO WING FRAME ALLOW FRAMEWORK TO DRY THOROUGHLY BEFORE REMOVING IT FROM PLAN. DO NOT JOIN WING HALVES UNTIL THEY ARE INSERTED INTO FUSELAGE. (SEE SKETCH AT BOTTOM OF PLAN)
COLOR STRIPE
3/32" SQ. BALSA STRIPS
ELEVATOR SEPARATION
ROUND LEADING EDGE AND TAPER THE TRAILING EDGE OF ELEVATOR WITH SANDPAPER
COLOR STRIPE
RUDDER
PROPELLER IS NOT SHOWN IN TOP VIEW
DASH LINES SHOW POSITION OF ELEVATOR IN FUSELAGE
RUDDER
NOTE: AILERON, RUDDER AND ELEVATOR SEPARATIONS MAY BE REPRESENTED BY THIN PAPER STRIPS STUCK ON OR LINES DRAWN ON WITH RULING PEN.
PIN
PITOT TUBE MADE FROM 1/16" SQ. BALSA SANDED ROUND AND ASSEMBLED AS SHOWN ABOVE. PUSH POINTED END INTO LEADING EDGE OF LEFT WING PANEL
NOTE: GLUE ALL EXTRA DETAILS TO MODEL AFTER IT IS COMPLETED.
FUSELAGE STRINGERS DO NOT RUN ENTIRE LENGTH OF FUSELAGE BUT ARE BUTT JOINED AT THIS 3/32" THICK FORMER
TAPER CENTER SPARS BEFORE ASSEMBLING WING
ROUND WING TIP WITH SANDPAPER
FLYING INSTRUCTIONS
FIRST GLIDE THE MODEL BY PUSHING IT FORWARD WITH THE NOSE POINTED DOWN A LITTLE. IF THE PLANE STALLS, PLACE THE WING BACK. SHOULD THE MODEL DIVE, MOVE THE WING FORWARD. CONTINUED STALLING TENDENCIES CAN BE CORRECTED BY ADDING WEIGHT TO THE BACK OF THE NOSEPIECE.
WHEN MODEL IS SET FOR AN EVEN GLIDE, GIVE THE PROPELLER A FEW WINDS AND HAND LAUNCH THE PLANE TO SEE HOW IT CIRCLES.
THE TORQUE OF THE PROPELLER TENDS TO TURN THE MODEL TO THE LEFT. BEND RUDDER TRIM TAB TO THE LEFT IF SMALLER LEFT CIRCLES ARE DESIRED. IF PLANE SHOULD BANK TOO STEEPLY TO THE LEFT, BEND THE AILERON TRIM TAB DOWN OR TAKE SOME TURN OUT OF THE RUDDER.
NOW WIND THE PROPELLER UNTIL THERE IS A DOUBLE ROW OF KNOTS IN THE RUBBER MOTOR AND LET THE MODEL TAKE OFF.
WING LIGHT
ELEVATOR
1-1/2" DIHEDRAL
DIHEDRAL IN THE WING GIVES MODEL LATERAL STABILITY WHILE IN FLIGHT.
EXHAUST PIPES
PITOT TUBE
COLOR SCHEME
ENTIRE PLANE IS LIGHT BLUE WITH DARK BLUE TRIMMINGS.
FRONT VIEW 1/2 SIZE
GLUE POINTED END OF PIN FIRMLY TO THE LANDING GEAR STRUT
4-3/16"
PIN SERVES AS AXLE FOR THE 14-1/2" WHEEL
NOTE: AFTER PLANE IS COMPLETELY COVERED WITH THE LIGHT BLUE TISSUE, SPRAY MODEL WITH WATER TO MAKE TISSUE TAUT. CUT DARK BLUE TISSUE TO PATTERNS SHOWN AS BROKEN LINES AND STICK TO MODEL WITH BANANA OIL.
3A
FRONT
EDGE GLUED TO FUSELAGE
CUT CELLUOLD TO ABOVE SHAPE AND GLUE TO COCKPIT COWL.
CEMENT COCKPIT COWL TO FORMERS 4&5 BEFORE MODEL IS COVERED WITH TISSUE
POWER THIS MODEL WITH 4 STRANDS OF 1/8" FLAT RUBBER
1/16" SQ. STRINGERS ARE GLUED IN OUTER NOTCHES
NOTCHES FOR THE LANDING GEAR STRUTS
RUDDER CONSTRUCTION
CUT THE CURVED RUDDER OUTLINE PIECES FROM THE 3/32" PRINTED BALSA SHEET AND GLUE THEM TOGETHER OVER PLAN. THEN CEMENT THE 3/32" SQ. BALSA STRIPS IN PLACE. COVER RUDDER WITH TISSUE BEFORE GLUING IT TO THE FUSELAGE
WHITE RUDDER LIGHT
RUDDER TRIM TAB MAY BE GLUED TO RUDDER IN THIS POSITION
COLOR STRIPE
3/32" SQ. STRIPS
RUDDER SEPARATION
TAPER TRAILING EDGE OF RUDDER WITH SANDPAPER
RUDDER IS CEMENTED TO FUSELAGE AFTER ELEVATOR IS GLUED IN SLOT
GLUE ELEVATOR IN PLACE AFTER FUSELAGE IS COVERED WITH TISSUE.
ROUND LEADING EDGE OF RUDDER WITH SANDPAPER
CUT AND SHAPE HEADREST PAD FROM 3/32" PRINTED BALSA
CEMENT LANDING GEAR STRUTS INTO THESE NOTCHES IN FORMERS 3 & 3A
GLUE 1/16" SQ. BALSA IN THIS NOTCH BETWEEN FORMERS 3 & 3A
CEMENT INSTRUMENT PANEL TO BACK OF FORMER 4
AFTER PROPELLER IS SHAPED, APPLY A FEW COATS OF BANANA OIL, SANDPAPERING BETWEEN EACH COAT.
SANDPAPER THE PROPELLER BLADES TO THIS SHAPE.
GLUE ASSEMBLED NOSEPIECE TO FORMER 1, AND THEN PROCEED TO SHAPE IT. THIS INSURES A NOSEPIECE THAT FLOWS IN SMOOTHLY WITH THE FUSELAGE CONTOURS
STICK PROPELLER INSIGNIA TO FINISHED BLADES IN THE POSITIONS SHOWN.
COLOR STRIPE (SEE TOP VIEW)
WINDSHIELD
COCKPIT COWL
CUT FORMER 3 FROM THE 3/32" PRINTED BALSA SHEET
WASHER, BEAD, WASHER
BACKBONE STRIP
COLOR STRIPE
1/16" SQ. BALSA STRINGER
GLUE BLACK PAPER TO NOSEPIECE TO REPRESENT OPENINGS FOR COOLING OF MOTOR
PROP. SHAFT
PROPELLER
NOSEPIECE
CUT WING RIBS FROM THE PRINTED BALSA SHEET.
CEMENT SPINNER TO PROPELLER AFTER SHAFT HAS BEEN GLUED IN PLACE
INSERT PROPELLER SHAFT THRU NOSEPIECE, WASHERS, BEAD AND PROPELLER. THEN MAKE A SQUARE 'U' BEND ON THE END OF SHAFT, PULL BACK INTO PROPELLER AND APPLY CEMENT.
GLUE TAILSKID IN BACKBONE SLOT VERY FIRMLY
PIN
RUBBER
GLUE MOTOR MOUNT BLOCKS BETWEEN 1/16" SQ. STRINGERS. PUSH PIN THRU BLOCKS AND RUBBER LOOP TO SUPPORT MOTOR.
GLUE DUMMY PILOT TO EACH SIDE OF BALSA FORM. THEN CEMENT PILOT TO HEADREST PAD.
CUT EXHAUST PIPES FROM THE 3/32" BALSA SHEET. PAINT BLACK
CUT LANDING GEAR STRUT FROM THE 3/32" PRINTED BALSA SHEET AND CEMENT A THIN BAMBOO STRIP ALONG FRONT EDGE. THEN SANDPAPER STRUT TO A STREAMLINE SHAPE AS SHOWN IN SECTION.
BAMBOO STRIP
SECTION THRU LANDING GEAR STRUT
FUSELAGE CONSTRUCTION
CUT FORMERS AND BACKBONE STRIPS CAREFULLY FROM PRINTED BALSA SHEET. PIN BACKBONE STRIPS IN PLACE OVER PLAN AND CEMENT RIGHT HALVES OF FORMERS IN PLACE, MAKING CERTAIN THEY ARE PERPENDICULAR TO THE PLAN. WHEN DRY, REMOVE FROM PLAN AND GLUE OTHER HALVES OF FORMERS IN PLACE. THEN CEMENT THE BALSA STRINGERS IN NOTCHES OF FORMERS.
READ ALL NOTES ON PLAN CAREFULLY BEFORE BEGINNING CONSTRUCTION OF MODEL.
CUT DIHEDRAL FORMER BLOCK FROM 3/32" BALSA PRINTED SHEET
GLUE 3/32" SQ. BALSA PIECES OVER DASH LINES PRINTED ON DIHEDRAL FORMER
CENTER SPAR OF WING FITS BETWEEN THESE 3/32" SQ. BALSA PIECES.
DIHEDRAL FORMER BLOCK
SLIP DIHEDRAL FORMER BLOCK IN FUSELAGE. APPLY CEMENT TO CENTER SPARS AND SLIDE THEM INTO CHANNEL OF DIHEDRAL FORMER.
RIB B
CENTER SPAR
W-5
RIB A
BEFORE GLUING WING HALVES TOGETHER, COVER WINGS AND ALL OF THE FUSELAGE EXCEPT A SMALL SECTION TO PERMIT INSERTION OF WING. AFTER WING HALVES HAVE BEEN GLUED TOGETHER, COVER OPEN PORTION OF FUSELAGE WITH TISSUE.
GLUE A 3/32" X 3/16" BALSA STRIP IN THIS NOTCH AFTER WINGS ARE JOINED IN FUSELAGE. THIS SUPPORTS WING AND YET ALLOWS IT TO MOVE UP AND BACK FOR ADJUSTMENT.
GLUE PIN TO LANDING GEAR STRUT IN POSITION SHOWN IN FRONT VIEW.
BEND PIN AXLE TO ABOVE SHAPE AFTER WHEEL IS ON.
1-1/2" WHEEL
SENIOR DART
WINGSPAN - 24" | LENGTH - 18-1/2"
KIT NO. SA195 | SERIES - FLYING
DRAWN BY - | LETTERED BY
1937 COMET MODEL AIRPLANE SUPPLY CO.



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Steve Riley
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