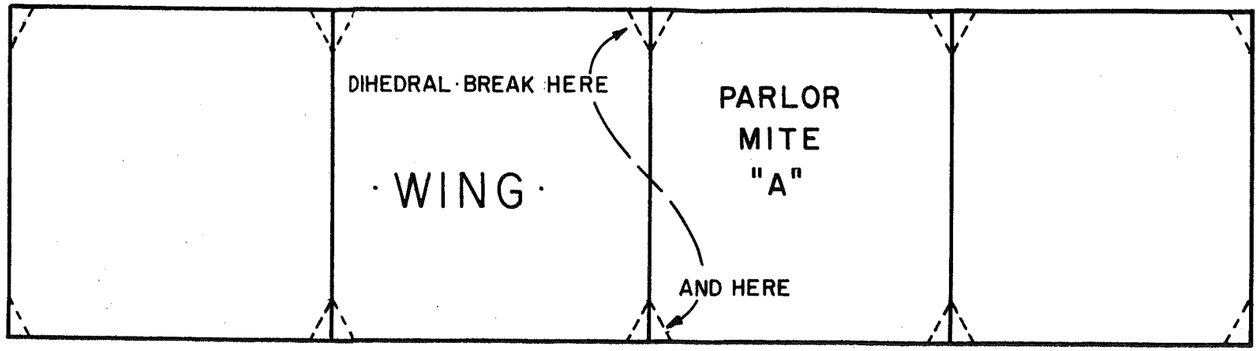
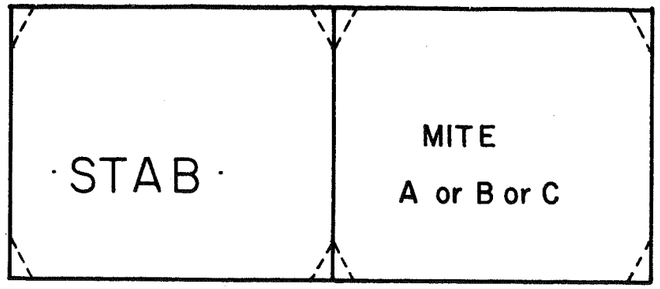
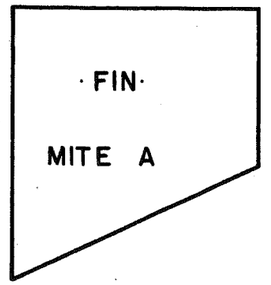
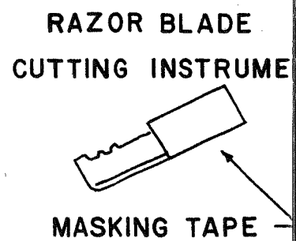
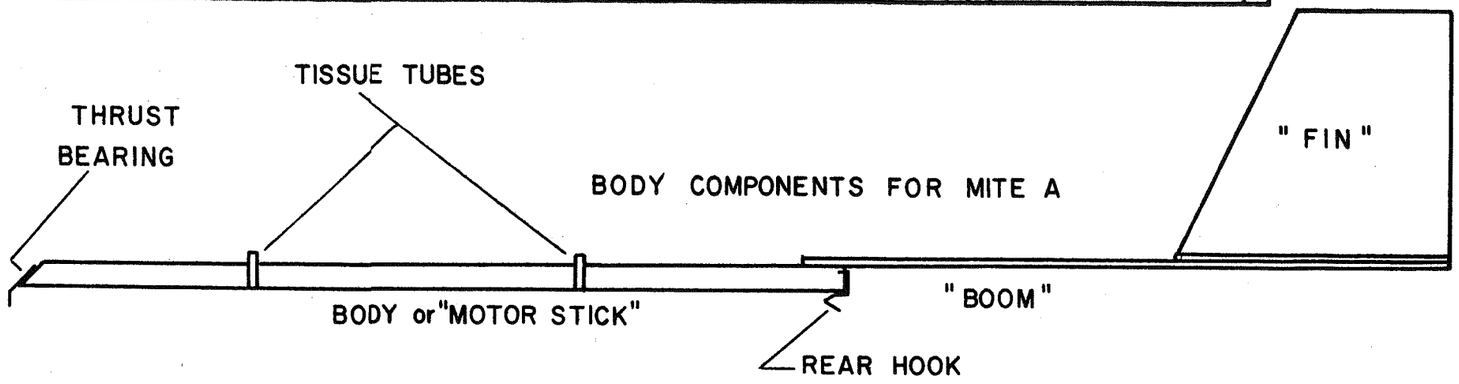
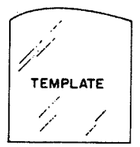

DIHEDRAL·BREAK HERE
·WING·
PARLOR
MITE
"A"
AND HERE

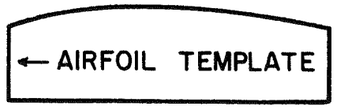

·STAB·
MITE
A or B or C

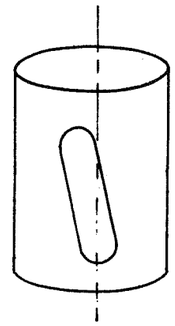

·FIN·
MITE A

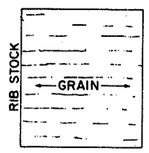

RAZOR BLADE
CUTTING INSTRUME
MASKING TAPE

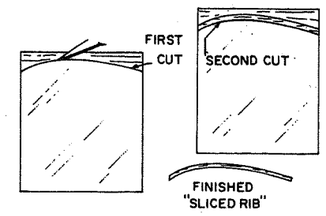

TISSUE TUBES
THRUST
BEARING
BODY COMPONENTS FOR MITE A
" FIN "
" BOOM "
BODY or "MOTOR STICK"
REAR HOOK

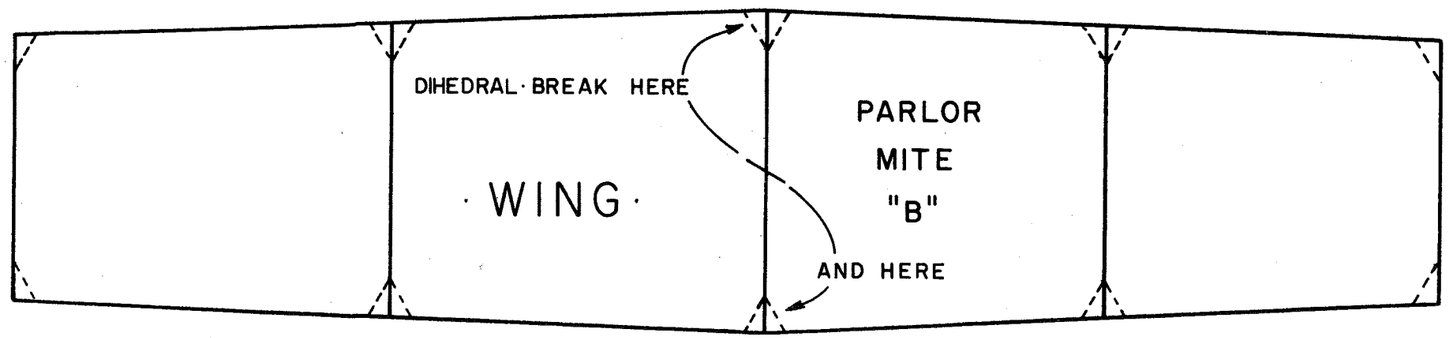

TEMPLATE

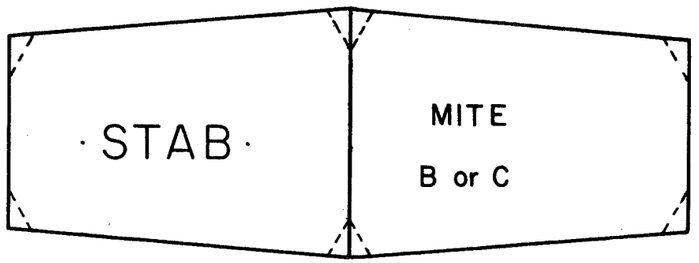

← AIRFOIL TEMPLATE

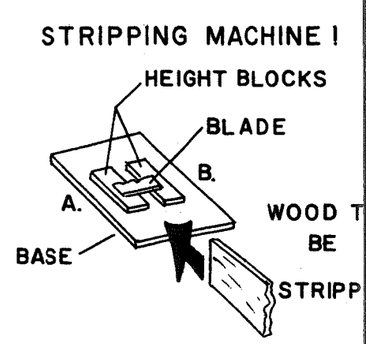

PLACE WET PROP BLADE
ON CAN WITH 3/8" OFFSE

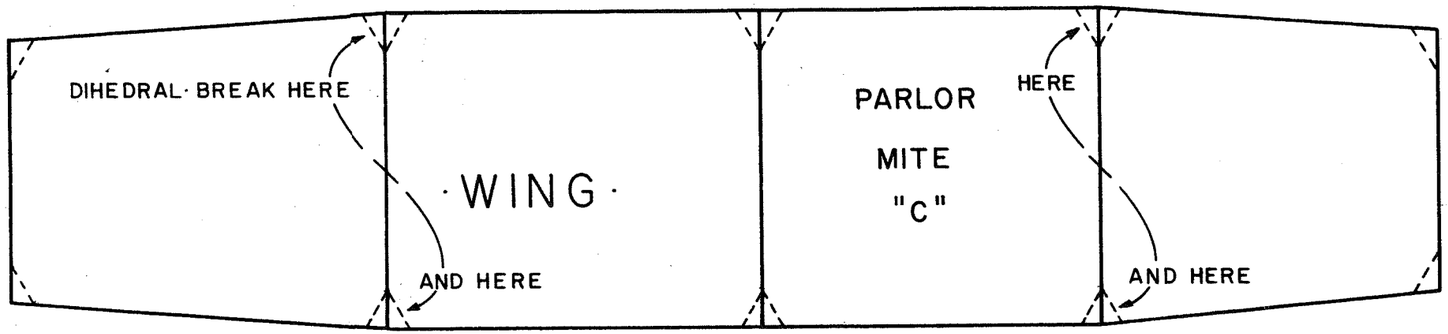

RIB STOCK
GRAIN

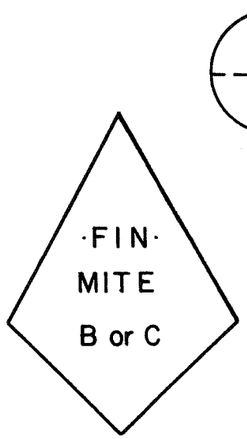

FIRST
CUT
SECOND CUT
FINISHED
"SLICED RIB"

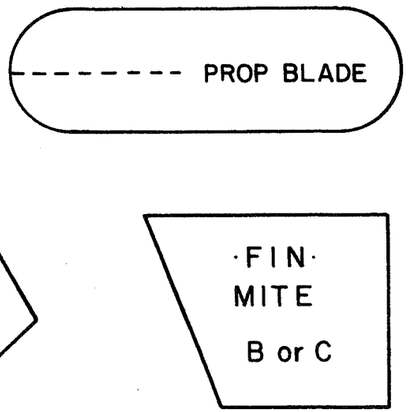

DIHEDRAL·BREAK HERE
·WING·
PARLOR
MITE
"B"
AND HERE

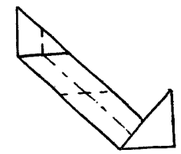

·STAB·
MITE
B or C


STRIPPING MACHINE !
HEIGHT BLOCKS
BLADE
B.
A.
WOOD T
BE
BASE
STRIPP

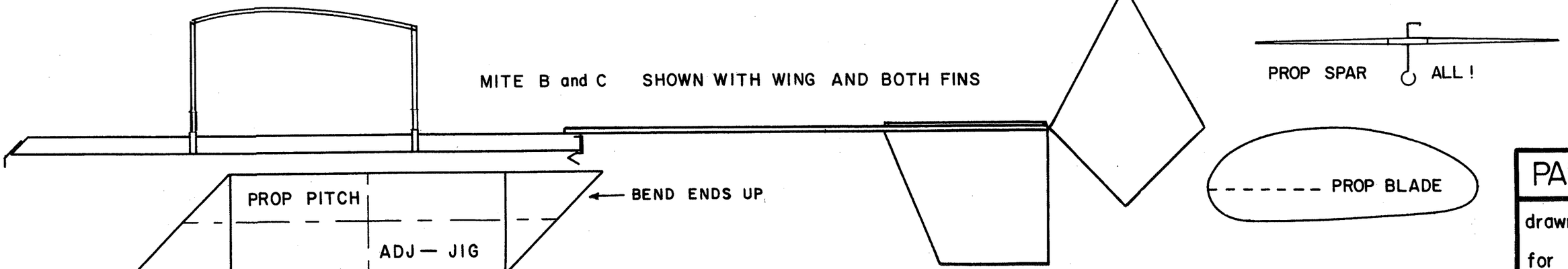








PROP PITCH ADJ- JIG



PARLOR MITE

drawn by G. SKRJA NC

for MICRO-X ® 1976

PARLOR MITES

Written by Gerald Skrjanc

Everyone has wanted a little airplane that could be flown in their very own house, without damage to the furniture and surroundings: but such things are impossible — or are they? Indoor models have been flying in buildings for years, and the only damage they cause is to themselves. However, most of them are too large to fly in a tight circle that would fit in your front room. Therefore, we have decided to design and kit the little airplanes we call Parlor Mites, which not only can fly successfully in your living room, but are too small and too light to cause any damage to the surroundings. With a weight of 1/50th of an ounce and flight times of over 1 minute, they are fun to fly and all the excitement of the larger, more complicated models is there!

SOME MYSTERIES EXPLAINED

Three different model designs are included in this kit. Parlor Mite A, with its square wing and stab construction is the simplest of the three, and a good one to start with. Parlor Mites B and C are just a little more complicated because of the tapered wing and stab construction. Parlor Mites A and B have the wing dihedral break in the center of the wing, where you find the slash mark on the drawing. Parlor Mite C has a flat center section on the wing with tip dihedral. This is called polyhedral. This is also shown by two slash marks through the ribs again. If you look carefully at the drawing marked wing, you will understand that this is the actual size of the wing, with the ribs indicated by a solid line running into dashed triangles. In order to construct the wing, the wing drawing has to be transferred to a cardboard template (carbon paper is the easiest way to do this), and the dotted lines cut out to actually leave V-notches in the cardboard wing template. The template should then be thumbtacked to a piece of white pine or similar construction board, as you will build the wing frame around the cardboard template. The wing spars (leading and trailing edge of wing) are held to the front and back of the cardboard template by pinning a scrap piece of balsa to the white pine building board in such a way that the scrap balsa is fitted snugly against the spar, holding it against the template. When you have done this, the ribs are then inserted at the V-notches and at the ends. When this is dried, the excess spar is trimmed off. With only two spars and five ribs, it shouldn't take longer than 5 minutes to literally throw this together. The stab (or stabilizer) is done in the same manner except that there are only three ribs and you will trim from the rear of the ribs so that the exact length will be achieved here. For the fins, just glue the outline together around the cardboard template, which is also tacked to your building board, and the fin is complete except for covering. The ribs for all the Parlor Mites are identical and should be trimmed using the airfoil template drawn on the plans. Referring to little sketch, the arrow points to the leading edge of the rib on the template. Different airfoils may be tried and you may also switch stabilizer and fins on the different models and maybe even design your own little Parlor Mite. Although there are only three thrust bearings included in the kit, you will find you will have enough wood left over for a few more Parlor Mites, as these little critters do not eat up much building material. However, the wood is critical in the sense that to have real good flite times, the wood must be of excellent light quality, such as we have given in the kit.

One special note on Mite A. When making the fin, let the wood side outline extend down below the template a good 1/8", as on this plane the fin is glued to the boom near the front and back of the stabilizer. The fin has to be about 1/8" up in the air to clear the airfoil on the stabilizer. When gluing the fins on the little airplanes, they should be offset approximately 3/16" to the left, for left turn. Also please note, we are speaking of left as though you were sitting in the cockpit of the plane, or viewed from the rear. Thusly to compensate for the tight left turn, the left sides of the wings on all the Mites are a little longer than the right side. This helps somewhat in preventing the plane from spiraling in to the left under full power, but does not control the torque completely. The torque tends to make the plane twist to the left, and to get away from this condition, we will twist the leading edge of the left wing up higher than the trailing edge. This will give that wing tip a climbing tendency, which will tend to roll that wing tip back up. The common term for this is called "Wash in". If this does not completely control Torque, the front of the right hand wing tip can be twisted down lower than the trailing edge. This will tend to make that wing tip dive. This is called "wash out". These two controls and the rudder turn should keep your plane in a left hand circle throughout the whole flight. To control the correct amount of climb, or what we properly term "trim the plane out." The wing is adjusted by sliding the leading edge strut up or down in the paper tube socket glued to the motor stick. This is termed getting the "proper decalage". The correct incidence is usually between 3/64 and 3/32 of an inch. That is the leading edge is 3/64 to 3/32" higher from the motor stick than the trailing edge is. This angle is called the angle of incidence and is usually measured in degrees. The wing is held in the paper tubes by a little 1/16" sq. stick sanded round for a proper sliding fit — snug, but not too tight. This is called the wing strut and one is glued to the leading edge and the trailing edge of the wing at the center rib joint. When the wing is completed on the

template the spars should be cracked at the rib joint where the slash mark shows on the plans and the proper dihedral glued in, this is done by holding one half of the wing down on the template and proping the other wing tip up 2-1/2". On Parlor Mites A and B this will give a dihedral of approximately 1-1/4" per tip. On Parlor Mite C, with the center section flat on the template, both tips are blocked up and proper dihedral is 1 inch under each tip. The condenser paper covering included in the kit can easily be applied to the wing after dihedral is put in by covering the part that is flat on the template with the other tip up in the air. To paper the other half of the wing, just reverse this procedure. Use condenser paper cement for adhering the condenser paper to the Parlor Mites, as this is a very light adhesive and works excellently with this tissue. Now that I've gone over a few of the mysteries of indoor model airplanes with you, let's mention some of the tools that work best and some different methods of construction to help you along the way.

Tools

First of all, to cut cleanly through the very lite balsa in the kit without crushing it, you will need the very sharpest instrument available. No, this is not a $20 surgeon's scalpel, but merely a double-edged razor blade, brand new and unused, of course. To make your tool from the razor blade, just break it in half lengthwise and wrap one half with a couple wraps of masking tape to form a handle. (See sketch on plan.) You now have the sharpest and thinnest cutting blade for your money that's available today. Make a few of these, and when they dull, just throw them away. Be careful when using these, for you can easily cut yourself without even feeling it! The indoor fliers also use this type of blade in what I call a stripping machine (also shown on the plan). This consists simply of a very smooth piece of wood for a base about 1" wide by 1-1/2" long with two small pieces of wood (the thickness you intend to strip) glued to the base, no more than 1/8" apart. Be sure this 1/8" is clean and free from glue. This 1/8" gap is termed the cutting channel. Now to complete your stripping machine, you coat the two pieces of balsa on top with a lite coating of model airplane cement, making sure that you don't get any in this cutting channel. Then place a small piece of the double edged razor blade on the two balsa pieces across the cutting channel as shown in the drawing. Put a little glue on each end of the blade now to be sure it's held down firmly, but be careful here not to get any glue in the cutting channel, since you can't cut balsa if the blade is covered with glue. To use the stripping machine, simply hold it between your thumb and forefinger in your left hand at points A and B with the cutting edge of the blade facing toward you. Hold the balsa to be stripped with the thumb and forefinger of your right hand and push it through the stripper slowly and gently. You may not get a perfect strip the first time, but it will only take you a few minutes to become expert at cutting perfect strips with this wonderful little tool, especially if you're careful to hold the wood you're stripping fairly close to the blade. You should make several of these strippers — one with 1/32" pieces on the top to strip 1/32" sq. for the wing spars and stabilizer outline using pieces cut from the blue coded wood for the height blocks. Make another stripper using pieces of wood cut from the orange coded wood to strip the boom, wing struts and prop spars.

Propellers

You're probably wondering by now how to get the pretty curves in the prop blade that you need to propel the little airplane through the air. On the plan you will notice a drawing of a can or bottle with a 2" diameter with a prop blade lying across it at a slight angle. The can will give the proper curvature to the prop blade and the angle you put it on the can or bottle will determine how much less pitch it has at the tip of the prop than at the middle. If you put the blade straight on the can you will have what is termed a true-pitch propeller. This is the most simple kind and is not considered as efficient as one that looks like it has less pitch at the tip than it has at the "root" (center) and these more efficient props are called "helical". Since the tip of the prop travels further than the root, it needs less pitch; and since the root travels less distance in the same circle, it naturally needs more pitch to push the same amount of air. In other words, for a 3" diameter propeller to move forward 10" in one revolution (called pitch) it must have more of an angle than a 12" diameter prop with the same amount of pitch.

To form the prop blades, they are first cut out of the red coded wood and soaked in warm water for a few minutes, then they are both placed on the can or bottle, being careful to get the same angle on both blades, which for a prop of this size should be 1/4" to 3/8" off set. Then put one or two wraps of plain old newspaper around the can to hold the blades firmly in place and fasten the newspaper with masking tape. Bake this in the oven for about 10 minutes at 250°F. Be careful when removing the blades, as they may tend to stick to the form in the baking process. The dotted lines on the prop blade templates in the drawing show the placement of the prop spar. To glue the prop blades on the spar and get the proper pitch (both blades identical), transfer the prop jig template shown on the plans to cardboard with ends glued on vertically. Tack-glue the prop spar to the two dots with the prop shaft in the center of the jig. Apply a little cement to the prop spar and lay the blade on the spar, using the up-rights to align the proper pitch. To make props with more pitch, move the 45° angles further out toward the tip of the propeller; and to make a prop with less pitch, move the vertical angles in toward the center. The prop jig shown is what I use for a 1:15 minute flight in my living room. Experimentation here

is the rule, as every model seems to like a slightly different propeller. The wire shown in the prop spar should have the little round hook bent in it first before piercing through the prop spar, and the sharp bends put in last. Then coat the center of the prop spar with glue and pull the wire back, lining it up perfectly so the prop will not wobble. A true running prop gives much better times and a prop with more pitch in one blade than the other can sure cause the tails of the Mites to wobble.

Wing Sockets

The paper tubes that hold the wing on the body are constructed by taking 1/2" sq. piece of tissue and rolling it around a 1/16" drill or wire about 1-1/4 times, then run a small bead of glue on the tissue near the drill or wire and continue wrapping for 2 or 3 more turns. Slide the paper a bit on the drill so you don't glue it solid, and when the glue is almost set, slide the paper tube off. Do not attempt to pick it up or handle it at this point as glue is still wet and the tube is very soft. Waxing the drill liberally first will help you in removing the tube. Allow tube to dry, then glue it to the motor stick at points shown on plans.

Bearing and Rear Hook

When installing the rear hook and the thrust bearing on the nose, make sure you use a double application of glue and be sure that the bearing hole and the hook line up so that you have at least 3/32" clearance between the rubber and the motor stick, for if the rubber rubs against the motor stick during flight, it will lose some power and will not perform efficiently.

Winding

A word of warning here — the Parlor Mites (as all indoor models) cannot be hand wound by cranking the prop over with your finger. You will surely break the prop and probably the rest of the model as well if you try this. The model must be wound by removing the rubber from the rear hook and holding the front of the plane (prop hub, bearing, and nose of ship) with your fingers while a helper winds the rubber from the rear using a 16:1 winder. These winders, extra rubber and other supplies are available from your local hobby shop or from "Micro-X Products", P. O. Box 1063, Lorain, Ohio 44055. Twenty to thirty winds on a 16:1 winder is enough turns for over 1 minute flying time in your front room, and this amount of winds will not tire the rubber out readily, since this is only about 1/3 the amount that the rubber can take. If you wind the rubber up full, it will tire quickly and you will have to make a new loop. Rubber life can be extended by using what we call rubber lube, which is a mixture of very pure glycerin and tincture of green soap. With this rubbed on the motor, it makes the motor very slippery and extends the life of the rubber considerably, especially if you wash the lube off when you're done flying and put your "motor" in a light-proof envelope til the next time you fly. To start flying, a 14" piece of rubber should be cut from the strip included in the kit and after the knot is tied you will have what we term a 6" or 6-1/2" "loop". The Mites use .020" to .030" Pirelli rubber strip, depending of course on how "heavy" you build them and on how well you've made your prop.

"Center of Gravity"

Your model will probably be tail heavy and you may have to add just a little clay to the nose, but I feel this is better than moving the paper tubes back near the tail and ending up with a very short tail moment. Remember that the stab is only a lever on the end of a stick (this is true of every airplane — even the supersonic jets!) and a little longer tail moment will give you a slightly more stable model. You will find out that a good place for the C. G. (center of gravity) or balance point of your model is about half way between the leading and trailing edge of the wing at the body. This is called a 50% C. G. To have the C. G. much farther forward than this is rather useless because the leading edge of the wing has to be raised quite high to compensate for the nose heaviness; and, although some people like this, I do not recommend it. In fact, my favorite little Mite is a combination of Mites B and C with a diamond shaped fin, a little clay on the nose, and a 65% C. G. (the plane balances about 3/4" from the trailing edge with the rubber band on). Remember here that the longer tail moment you use and the larger the stab, the farther back the center of gravity can be, because when you move the C. G. back, there is more weight riding on the stab. You are doing what we call "loading the stab" and the stab has a bigger job to do keeping the model in a stable flying attitude. Again, removing or adding clay is quite simple and I feel this is the easiest way to experiment with the little model. You will find that the more clay you add in the nose, the more you will raise the leading edge of the wing or what we call "use more incidence".

Flying Tips

If you keep track of all your experiments you will find that you have learned more with these 3 little Mites than you have for a long time! In your experiments you will probably be cutting the body or motor stick from the black coded wood a little thinner than you did when you first started. The idea here is to make your new ships with as thin a wood as possible to cut down on the weight. If you don't believe that lighter flies better, just try making one of heavier wood — you'll find that it must fly faster to stay in the air because the same amount of wing is lifting more weight. It will also take more power and the flights will be shorter. The true indoor technique is to make the plane as light as possible by any and all means, to make it fly as slow as you can, and finally to get the revolutions of the prop down to as slow a speed as possible. This is so it will use the turns in the rubber more slowly and stay airborne longer, using the available power more efficiently.

Mite C with the poly-hedral wing should be your best flyer since it has the most wing area and, consequently, the most lift. Mite B and C body components are shown on the plans with two fins attached, so you can see the proper placement of whichever fin you choose. The underslung fin is smaller on Mite C because it is riding in clean air and will work more efficiently here than on the top in the turbulence of the wing. The diamond shaped fin shown installed on the rear of the boom is just a little bit different in that it has a little bit of style all of its own and has a little more leverage since it is further away from the center of gravity, but is not riding in as clean air as the underslung fin — so take your choice here and use whichever you prefer.

Wood Color Code

Black — 3/32" sheet for motor sticks cut 1/8 to 3/16" high, 5-5/8" long.

Orange — 1/16" sheet for boom and prop spars and wing struts. Should be cut square and sanded.

Blue — Light 1/32" sheet for wing spars and stab spars and fin outline.

Green — Approximately 1/64" sheet for all ribs.

Red — Approximately 1/100 sheet for prop blades.

The Parlor Mites are truly fantastic little airplanes and your flight times are only limited by your ability and extended by your ingenuity.

Well, let's all go fly the Mites now and let me wish you many happy landings — on the lamp, on the T.V., on the — !

PARLOR MITES

Written by Gerald Skrjanc

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SOME MYSTERIES EXPLAINED

Three different model designs are included in this kit. Parlor Mite A, with its square wing and stab construction is the simplest of the three, and a good one to start with. Parlor Mites B and C are just a little more complicated because of the tapered wing and stab construction. Parlor Mites A and B have the wing dihedral break in the center of the wing, where you find the slash mark on the drawing. Parlor Mite C has a flat center section on the wing with tip dihedral. This is called polyhedral. This is also shown by two slash marks through the ribs again. If you look carefully at the drawing marked wing, you will understand that this is the actual size of the wing, with the ribs indicated by a solid line running into dashed triangles. In order to construct the wing, the wing drawing has to be transferred to a cardboard template (carbon paper is the easiest way to do this), and the dotted lines cut out to actually leave V-notches in the cardboard wing template. The template should then be thumbtacked to a piece of white pine or similar construction board, as you will build the wing frame around the cardboard template. The wing spars (leading and trailing edge of wing) are held to the front and back of the cardboard template by pinning a scrap piece of balsa to the white pine building board in such a way that the scrap balsa is fitted snugly against the spar, holding it against the template. When you have done this, the ribs are then inserted at the V-notches and at the ends. When this is dried, the excess spar is trimmed off. With only two spars and five ribs, it shouldn't take longer than 5 minutes to literally throw this together. The stab (or stabilizer) is done in the same manner except that there are only three ribs and you will trim from the rear of the ribs so that the exact length will be achieved here. For the fins, just glue the outline together around the cardboard template, which is also tacked to your building board, and the fin is complete except for covering. The ribs for all the Parlor Mites are identical and should be trimmed using the airfoil template drawn on the plans. Referring to little sketch, the arrow points to the leading edge of the rib on the template. Different airfoils may be tried and you may also switch stabilizer and fins on the different models and maybe even design your own little Parlor Mite. Although there are only three thrust bearings included in the kit, you will find you will have enough wood left over for a few more Parlor Mites, as these little critters do not eat up much building material. However, the wood is critical in the sense that to have real good flite times, the wood must be of excellent light quality, such as we have given in the kit.

One special note on Mite A. When making the fin, let the wood side outline extend down below the template a good 1/8", as on this plane the fin is glued to the boom near the front and back of the stabilizer. The fin has to be about 1/8" up in the air to clear the airfoil on the stabilizer. When gluing the fins on the little airplanes, they should be offset approximately 3/16" to the left, for left turn. Also please note, we are speaking of left as though you were sitting in the cockpit of the plane, or viewed from the rear. Thusly to compensate for the tight left turn, the left sides of the wings on all the Mites are a little longer than the right side. This helps somewhat in preventing the plane from spiraling in to the left under full power, but does not control the torque completely. The torque tends to make the plane twist to the left, and to get away from this condition, we will twist the leading edge of the left wing up higher than the trailing edge. This will give that wing tip a climbing tendency, which will tend to roll that wing tip back up. The common term for this is called "Wash in". If this does not completely control Torque, the front of the right hand wing tip can be twisted down lower than the trailing edge. This will tend to make that wing tip dive. This is called "wash out". These two controls and the rudder turn should keep your plane in a left hand circle throughout the whole flight. To control the correct amount of climb, or what we properly term "trim the plane out." The wing is adjusted by sliding the leading edge strut up or down in the paper tube socket glued to the motor stick. This is termed getting the "proper decalage". The correct incidence is usually between 3/64 and 3/32 of an inch. That is the leading edge is 3/64 to 3/32" higher from the motor stick than the trailing edge is. This angle is called the angle of incidence and is usually measured in degrees. The wing is held in the paper tubes by a little 1/16" sq. stick sanded round for a proper sliding fit — snug, but not too tight. This is called the wing strut and one is glued to the leading edge and the trailing edge of the wing at the center rib joint. When the wing is completed on the

template the spars should be cracked at the rib joint where the slash mark shows on the plans and the proper dihedral glued in, this is done by holding one half of the wing down on the template and proping the other wing tip up 2-1/2". On Parlor Mites A and B this will give a dihedral of approximately 1-1/4" per tip. On Parlor Mite C, with the center section flat on the template, both tips are blocked up and proper dihedral is 1 inch under each tip. The condenser paper covering included in the kit can easily be applied to the wing after dihedral is put in by covering the part that is flat on the template with the other tip up in the air. To paper the other half of the wing, just reverse this procedure. Use condenser paper cement for adhering the condenser paper to the Parlor Mites, as this is a very light adhesive and works excellently with this tissue. Now that I've gone over a few of the mysteries of indoor model airplanes with you, let's mention some of the tools that work best and some different methods of construction to help you along the way.

Tools

First of all, to cut cleanly through the very lite balsa in the kit without crushing it, you will need the very sharpest instrument available. No, this is not a $20 surgeon's scalpel, but merely a double-edged razor blade, brand new and unused, of course. To make your tool from the razor blade, just break it in half lengthwise and wrap one half with a couple wraps of masking tape to form a handle. (See sketch on plan.) You now have the sharpest and thinnest cutting blade for your money that's available today. Make a few of these, and when they dull, just throw them away. Be careful when using these, for you can easily cut yourself without even feeling it! The indoor fliers also use this type of blade in what I call a stripping machine (also shown on the plan). This consists simply of a very smooth piece of wood for a base about 1" wide by 1-1/2" long with two small pieces of wood (the thickness you intend to strip) glued to the base, no more than 1/8" apart. Be sure this 1/8" is clean and free from glue. This 1/8" gap is termed the cutting channel. Now to complete your stripping machine, you coat the two pieces of balsa on top with a lite coating of model airplane cement, making sure that you don't get any in this cutting channel. Then place a small piece of the double edged razor blade on the two balsa pieces across the cutting channel as shown in the drawing. Put a little glue on each end of the blade now to be sure it's held down firmly, but be careful here not to get any glue in the cutting channel, since you can't cut balsa if the blade is covered with glue. To use the stripping machine, simply hold it between your thumb and forefinger in your left hand at points A and B with the cutting edge of the blade facing toward you. Hold the balsa to be stripped with the thumb and forefinger of your right hand and push it through the stripper slowly and gently. You may not get a perfect strip the first time, but it will only take you a few minutes to become expert at cutting perfect strips with this wonderful little tool, especially if you're careful to hold the wood you're stripping fairly close to the blade. You should make several of these strippers — one with 1/32" pieces on the top to strip 1/32" sq. for the wing spars and stabilizer outline using pieces cut from the blue coded wood for the height blocks. Make another stripper using pieces of wood cut from the orange coded wood to strip the boom, wing struts and prop spars.

Propellers

You're probably wondering by now how to get the pretty curves in the prop blade that you need to propel the little airplane through the air. On the plan you will notice a drawing of a can or bottle with a 2" diameter with a prop blade lying across it at a slight angle. The can will give the proper curvature to the prop blade and the angle you put it on the can or bottle will determine how much less pitch it has at the tip of the prop than at the middle. If you put the blade straight on the can you will have what is termed a true-pitch propeller. This is the most simple kind and is not considered as efficient as one that looks like it has less pitch at the tip than it has at the "root" (center) and these more efficient props are called "helical". Since the tip of the prop travels further than the root, it needs less pitch; and since the root travels less distance in the same circle, it naturally needs more pitch to push the same amount of air. In other words, for a 3" diameter propeller to move forward 10" in one revolution (called pitch) it must have more of an angle than a 12" diameter prop with the same amount of pitch.

To form the prop blades, they are first cut out of the red coded wood and soaked in warm water for a few minutes, then they are both placed on the can or bottle, being careful to get the same angle on both blades, which for a prop of this size should be 1/4" to 3/8" off set. Then put one or two wraps of plain old newspaper around the can to hold the blades firmly in place and fasten the newspaper with masking tape. Bake this in the oven for about 10 minutes at 250°F. Be careful when removing the blades, as they may tend to stick to the form in the baking process. The dotted lines on the prop blade templates in the drawing show the placement of the prop spar. To glue the prop blades on the spar and get the proper pitch (both blades identical), transfer the prop jig template shown on the plans to cardboard with ends glued on vertically. Tack-glue the prop spar to the two dots with the prop shaft in the center of the jig. Apply a little cement to the prop spar and lay the blade on the spar, using the up-rights to align the proper pitch. To make props with more pitch, move the 45° angles further out toward the tip of the propeller; and to make a prop with less pitch, move the vertical angles in toward the center. The prop jig shown is what I use for a 1:15 minute flight in my living room. Experimentation here

is the rule, as every model seems to like a slightly different propeller. The wire shown in the prop spar should have the little round hook bent in it first before piercing through the prop spar, and the sharp bends put in last. Then coat the center of the prop spar with glue and pull the wire back, lining it up perfectly so the prop will not wobble. A true running prop gives much better times and a prop with more pitch in one blade than the other can sure cause the tails of the Mites to wobble.

Wing Sockets

The paper tubes that hold the wing on the body are constructed by taking 1/2" sq. piece of tissue and rolling it around a 1/16" drill or wire about 1-1/4 times, then run a small bead of glue on the tissue near the drill or wire and continue wrapping for 2 or 3 more turns. Slide the paper a bit on the drill so you don't glue it solid, and when the glue is almost set, slide the paper tube off. Do not attempt to pick it up or handle it at this point as glue is still wet and the tube is very soft. Waxing the drill liberally first will help you in removing the tube. Allow tube to dry, then glue it to the motor stick at points shown on plans.

Bearing and Rear Hook

When installing the rear hook and the thrust bearing on the nose, make sure you use a double application of glue and be sure that the bearing hole and the hook line up so that you have at least 3/32" clearance between the rubber and the motor stick, for if the rubber rubs against the motor stick during flight, it will lose some power and will not perform efficiently.

Winding

A word of warning here — the Parlor Mites (as all indoor models) cannot be hand wound by cranking the prop over with your finger. You will surely break the prop and probably the rest of the model as well if you try this. The model must be wound by removing the rubber from the rear hook and holding the front of the plane (prop hub, bearing, and nose of ship) with your fingers while a helper winds the rubber from the rear using a 16:1 winder. These winders, extra rubber and other supplies are available from your local hobby shop or from "Micro-X Products", P. O. Box 1063, Lorain, Ohio 44055. Twenty to thirty winds on a 16:1 winder is enough turns for over 1 minute flying time in your front room, and this amount of winds will not tire the rubber out readily, since this is only about 1/3 the amount that the rubber can take. If you wind the rubber up full, it will tire quickly and you will have to make a new loop. Rubber life can be extended by using what we call rubber lube, which is a mixture of very pure glycerin and tincture of green soap. With this rubbed on the motor, it makes the motor very slippery and extends the life of the rubber considerably, especially if you wash the lube off when you're done flying and put your "motor" in a light-proof envelope til the next time you fly. To start flying, a 14" piece of rubber should be cut from the strip included in the kit and after the knot is tied you will have what we term a 6" or 6-1/2" "loop". The Mites use .020" to .030" Pirelli rubber strip, depending of course on how "heavy" you build them and on how well you've made your prop.

"Center of Gravity"

Your model will probably be tail heavy and you may have to add just a little clay to the nose, but I feel this is better than moving the paper tubes back near the tail and ending up with a very short tail moment. Remember that the stab is only a lever on the end of a stick (this is true of every airplane — even the supersonic jets!) and a little longer tail moment will give you a slightly more stable model. You will find out that a good place for the C. G. (center of gravity) or balance point of your model is about half way between the leading and trailing edge of the wing at the body. This is called a 50% C. G. To have the C. G. much farther forward than this is rather useless because the leading edge of the wing has to be raised quite high to compensate for the nose heaviness; and, although some people like this, I do not recommend it. In fact, my favorite little Mite is a combination of Mites B and C with a diamond shaped fin, a little clay on the nose, and a 65% C. G. (the plane balances about 3/4" from the trailing edge with the rubber band on). Remember here that the longer tail moment you use and the larger the stab, the farther back the center of gravity can be, because when you move the C. G. back, there is more weight riding on the stab. You are doing what we call "loading the stab" and the stab has a bigger job to do keeping the model in a stable flying attitude. Again, removing or adding clay is quite simple and I feel this is the easiest way to experiment with the little model. You will find that the more clay you add in the nose, the more you will raise the leading edge of the wing or what we call "use more incidence".

Flying Tips

If you keep track of all your experiments you will find that you have learned more with these 3 little Mites than you have for a long time! In your experiments you will probably be cutting the body or motor stick from the black coded wood a little thinner than you did when you first started. The idea here is to make your new ships with as thin a wood as possible to cut down on the weight. If you don't believe that lighter flies better, just try making one of heavier wood — you'll find that it must fly faster to stay in the air because the same amount of wing is lifting more weight. It will also take more power and the flights will be shorter. The true indoor technique is to make the plane as light as possible by any and all means, to make it fly as slow as you can, and finally to get the revolutions of the prop down to as slow a speed as possible. This is so it will use the turns in the rubber more slowly and stay airborne longer, using the available power more efficiently.

Mite C with the poly-hedral wing should be your best flyer since it has the most wing area and, consequently, the most lift. Mite B and C body components are shown on the plans with two fins attached, so you can see the proper placement of whichever fin you choose. The underslung fin is smaller on Mite C because it is riding in clean air and will work more efficiently here than on the top in the turbulence of the wing. The diamond shaped fin shown installed on the rear of the boom is just a little bit different in that it has a little bit of style all of its own and has a little more leverage since it is further away from the center of gravity, but is not riding in as clean air as the underslung fin — so take your choice here and use whichever you prefer.

Wood Color Code

Black — 3/32" sheet for motor sticks cut 1/8 to 3/16" high, 5-5/8" long.

Orange — 1/16" sheet for boom and prop spars and wing struts. Should be cut square and sanded.

Blue — Light 1/32" sheet for wing spars and stab spars and fin outline.

Green — Approximately 1/64" sheet for all ribs.

Red — Approximately 1/100 sheet for prop blades.

The Parlor Mites are truly fantastic little airplanes and your flight times are only limited by your ability and extended by your ingenuity.

Well, let's all go fly the Mites now and let me wish you many happy landings — on the lamp, on the T.V., on the — !