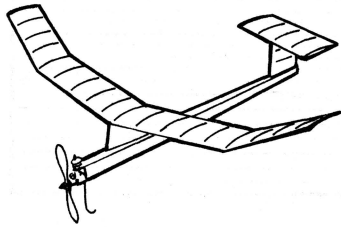
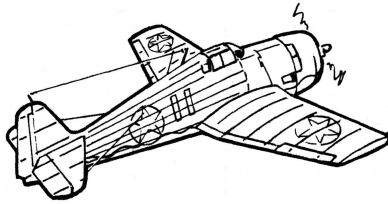


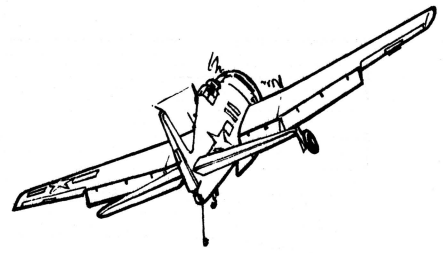
SCALE ENTHUSIASTS ARE NEVER SATISFIED!



"BUT IT'S NOT SCALE!"



"BUT IT'S TOO TRANSPARENT!"



"BUT IT DOESN'T HAVE RIVETS!"

Covering and Trimming

By BILL HANNAN

● There are several possible ways to finish a flying scale model. We are dealing in this case with free flight models, which are much more sensitive to weight variations than control-line or radio control types. In fact, weight constitutes one of the most important factors governing the performance in a free flight model, and thus one must apply the finish with a great deal of care and forethought.

A model may be suitably covered with tissue and balsa, then completely painted. The article by J. D. McHard, elsewhere in this volume, treats this approach. Another method involves the use of the relatively new plastic covering materials, such as Fascal, Monokote and Solarfilm. To date, their use has been confined primarily to non-scale models, but doubtless they will be employed more on scale models in the future as their advantages become more widely known, the price reduced, and more suitable thicknesses, colors, and finishes become available.

The third method is the time-honored traditional system of colored tissue finishing. This approach offers several advantages. First, as the covering is applied, so is the coloration, without additional effort or weight increase. Second, additional trim colors or markings are added using the same material, which eliminates the need for making, stencils, air brushes, and the like. Thus, the risk of "goofing" is greatly reduced.

As with most things in life, there are also a few disadvantages! To some people, a tissue colored model simply does not appear realistic. With the exception of very early aircraft of the pioneer era, very few full size machines have been translucent. Therefore, a model of say, an all-metal aircraft, which has light shining through it illuminating the internal structure, is just not acceptable to some. Of course, one might raise the argument that even an opaquely painted model severely

misses the mark in terms of genuine "scaleness" in many respects.

The author regards a translucent scale model aircraft as a separate art form, which can stand on its own merits. The visual lightness of the finished model suggests the physical lightness of the machine. A comparison might be made with sculpture . . . picture a marble statue and one made of bronze. Neither correctly depicts actual human coloration, and yet each can be charming and effective in its own way.

Actually, most translucent models also employ a certain amount of paint, and a combination of methods are often used, gaining advantage from each.

Covering with tissue is a painstaking proposition, even for many experts. One is tempted to suggest the Oriental approach . . . with meditation . . . to assure serenity before commencing the task! Seriously though, there are certain fundamental "ground rules" which can

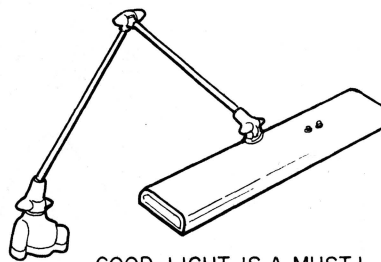
ease the task. A well-lighted and uncluttered work area is a must. Also paramount is proper preparation of the model framework prior to covering. All roughnesses, lumps, and protrusions must be minimised, if best results are to be achieved.

TOOLS

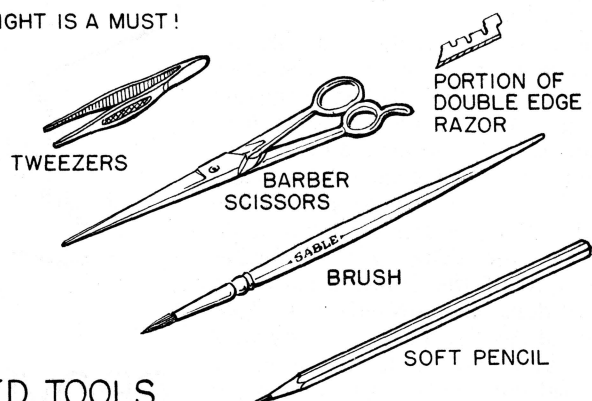
The author has settled upon barber scissors, after years of trying other types. Double edge razor blades, broken in half for safety, have no peer when it comes to slicing tissue along a framework edge. For applying clear dope, a top-quality brush is a must, as having to remove hairs shed by a cheap brush is a distraction. Tweezers often prove handy for placing small bits of tissue in their correct location. A very soft pencil is handy for marking locations, etc., and of course, a sharp modeling knife is always important.

MATERIAL

Colored tissue is presently available

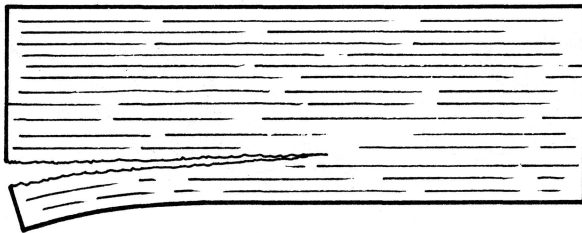


GOOD LIGHT IS A MUST!

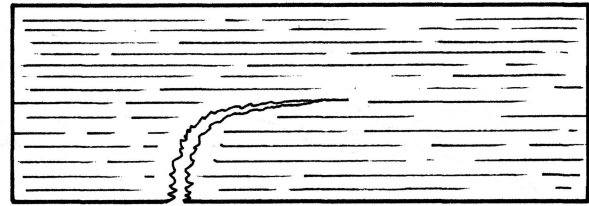


SUGGESTED TOOLS

TO FIND DIRECTION OF GRAIN IN JAPANESE TISSUE



TEAR WITH THE GRAIN



TEAR AGAINST THE GRAIN

in a tremendous variety. The traditional "Japanese tissue," while sometimes difficult to find, is still on the market in various grades. Perhaps the most frustrating aspect of the material, is the bewildering array of forms it takes. One man's "superfine" is the next man's sheet iron. We can only suggest direct comparison of samples. The cost is so low that it behooves one to buy at least a few sheets of every type encountered. Unfortunately, Japanese tissue is generally available in only limited range of colors, some of which are more suited to sport models than scale types. Locally, red, yellow, blue, orange, and black constitute virtually the entire spectrum of colors being sold; every now and then some green will turn up, and occasionally rumors of pre-war type silver, which usually turns out to be merely pale grey.

Certain domestic tissues are also on the market, which can be employed for model covering. Although several brands are involved, there seem to be basic similarities. Most Japanese tissue has a pronounced grain, which can be easily detected by tearing a section. Domestic tissue is often grainless, and can be torn in any direction. A second distinguishing characteristic; some domestic colored tissues are not color-fast. This means that when the covering is shrunk, the water must be applied in a fine mist to avoid droplets which could cause unsightly streaking of the color. Thicknesses and weights vary greatly, along with porosity and shrinking properties.

ADHESIVES

The most commonly used adhesive for tissue covering seems to be clear dope, but some prefer the use of thinned white glue or aliphatic resins, such as "Titebond." Still others mix a small amount of model cement with clear dope. Each system has its points. The use of white glue permits direct application of the tissue without further preparation of the frame, whereas the use of dope typically involves application of several coats to provide a proper base. Owing to the moisture contained in water-base glues, the wood warping may be increased. The clear

dope, if suitably plasticized, should help prevent wood warping caused by moisture.

OTHER MATERIALS

Often in small models, certain sections, such as cowlings, are covered with paper other than tissue. On plans, this is usually called out as bond or typing paper, and that is O.K., if the paper is to be subsequently covered with tissue for color. Sometimes, however, it is desirable to paint the paper. In that case, the use of coated stock is suggested. Coated stock is the type of paper which is shiny, such as used for magazine covers. This type of stock can be obtained in various thicknesses, and almost any printer will have samples. Perhaps he will give you a sheet or two for the asking, or certainly at very low cost. One or two thin coats of paint on this material will provide a finish superior to several coats on ordinary bond paper. The same remarks apply to card stock, which is often useful for small detail parts such as landing gear doors. Card stock will bend, rather than break as

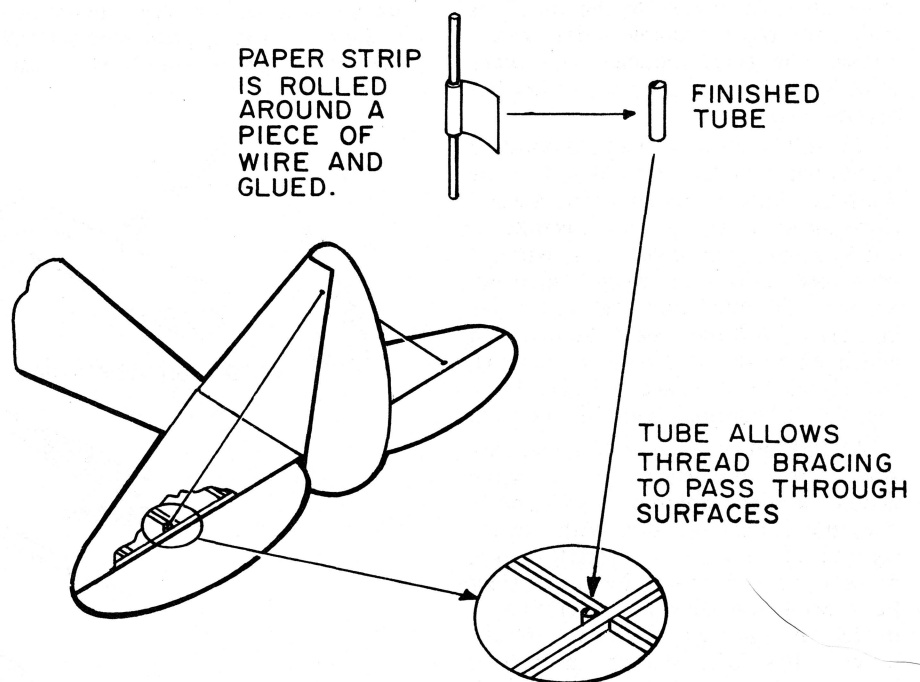
balsa would, under similar loads.

Another useful material for finishing certain parts of models is pre-printed paper. For example, the instrument panels on some full-size aircraft are made of decorative wood. This can be effectively simulated with contact paper featuring a wood-grain pattern, or even with printed color photos of wood.

Weight must be considered during the choosing of all materials. Sometimes, for reasons of strength, celluloid must be employed for windshields. This is not generally true of cabin windows, however, so cellophane may be used instead, with a worth-while weight savings.

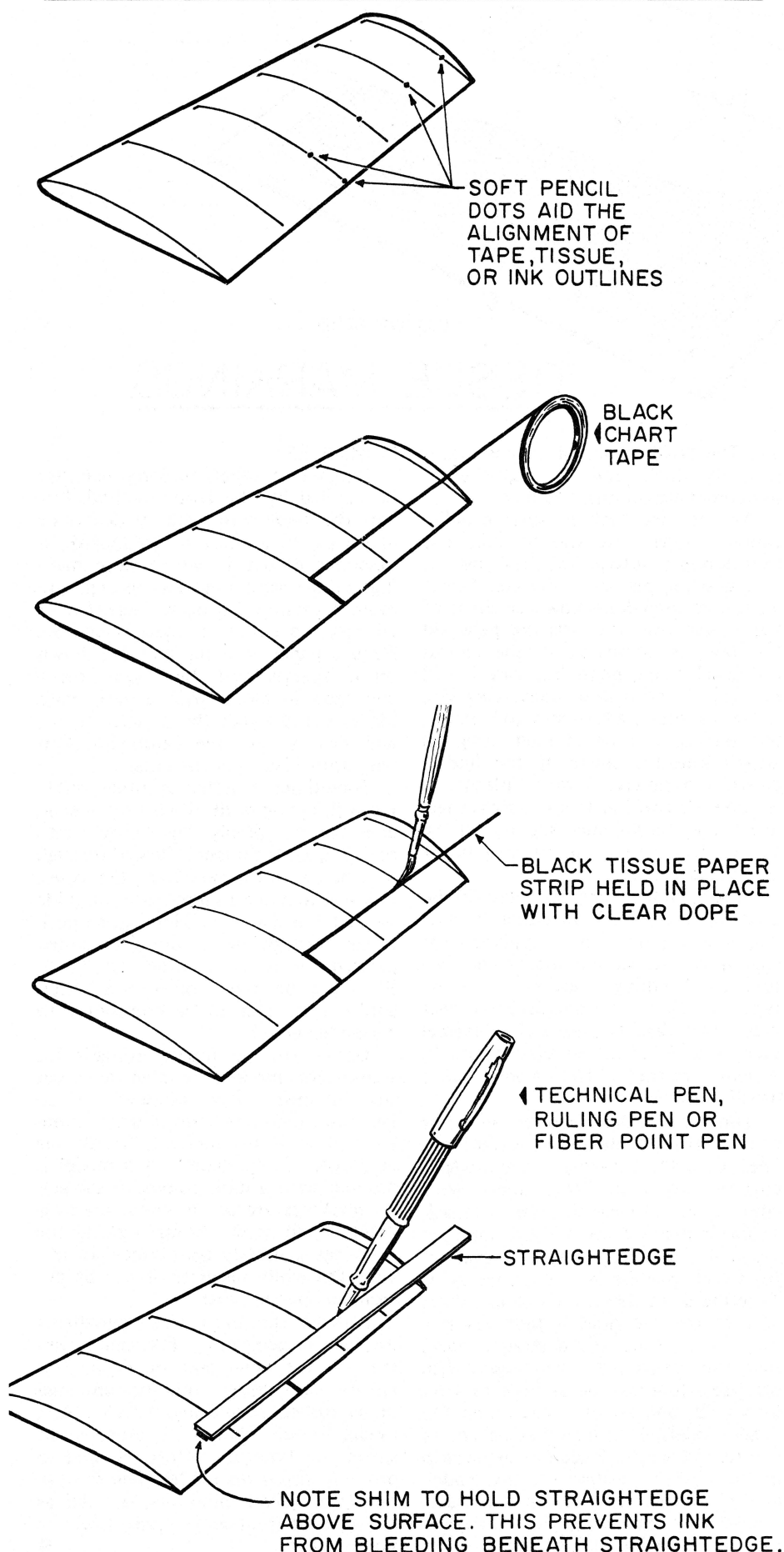
RIGGING

If the model features external control wires, antennas or wire bracing, these items should be given consideration before covering is applied. Often, tiny rolled paper tubes can be attached to the structure, permitting the rigging to pass completely through the member. It may then be tied with a single knot at the least conspicuous possible location.



PROVISIONS FOR RIGGING

CONTROL SURFACE OUTLINES



Since the rigging is all one piece, as in our illustrated example, the knot can be placed completely out of sight, if desired, by making the tie adjacent to a tube, then carefully working the knot inside the tube by sliding the rigging. A drop of glue applied to each point where rigging enters a tube will add strength to the structure. In the case of antennas or control wires which disappear into the model, a tiny glue-coated sliver of balsa can be inserted in the paper tube to lock the wire in position. Thread is generally employed on flying models in lieu of wire, to reduce weight. Silk thread is best for this purpose, since it is not fuzzy as are most common threads. Another suitable material is nylon monofilament, such as is used for fishing lines. It is available in many diameters, and may be shrunk with the application of heat to tighten the rigging. Silk thread may be tightened by water shrinking.

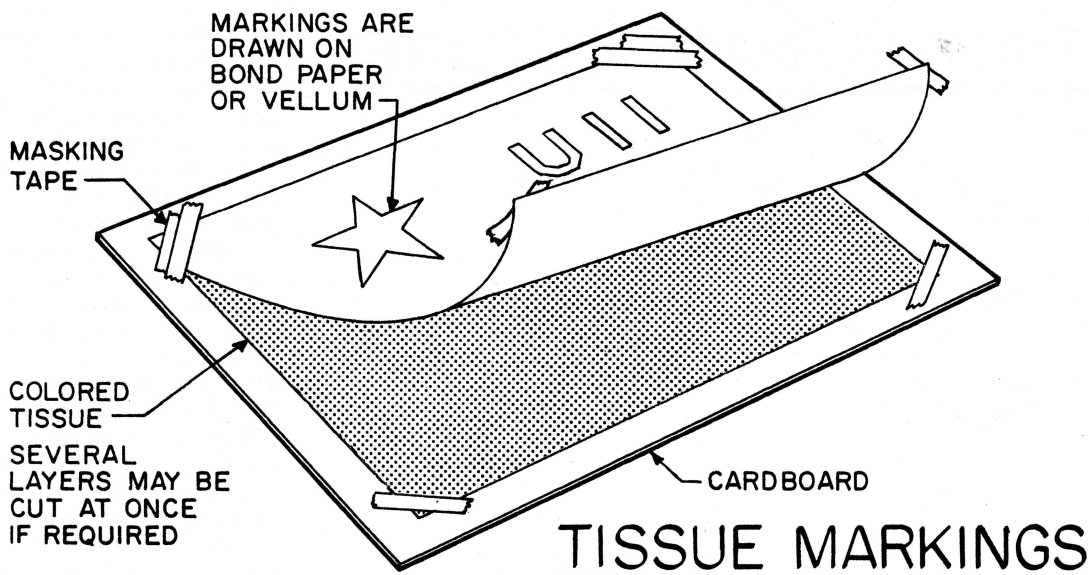
TECHNIQUE

Assuming the tissue is to be applied by the clear dope method, give the framework an overall sanding with No. 400 wet-or-dry and apply two coats of clear. The framework is then resanded to eliminate balsa fuzz raised by the doping, and two more coats of clear are applied. Prepare a section of tissue for application by cutting it slightly larger than the area to be covered. Don't attempt to cover too much at a time, but rather, use smaller sections, particularly where curves are involved, as for example on wing tips. Place the tissue over the panel to be covered, and flow dope thinner THROUGH the tissue from the top, which softens the clear dope underneath enough to render it sticky. Work the tissue into place smoothly. It need not be tight at this stage, as shrinking will see to that later, but do try to avoid wrinkles. In the event of a goof, additional applications of thinner will enable the tissue to be lifted and replaced. Be careful not to get dope on the tissue beyond the framework, as it may cause wrinkles when the covering is shrunk.

Occasionally, a little extra clear dope will need to be applied to secure edges, overlaps, etc. Also, a little water on a fingertip can sometimes tame edges which have a tendency to pop up. (Bear in mind, however, the earlier mention of certain tissues that are not colorfast). Balsa wood areas, such as cowlings, can also be covered with tissue, and left as is or painted, in which case the tissue will serve as a primer for paint.

SHRINKING

This seemingly simple subject can be a source of frustration to the unwary. As mentioned earlier, certain tissues have pronounced grain characteristics which can cause unequal shrinkage, leading to warpage, wrinkles or both.



Most authorities suggest application of the grain parallel with the length of the surface, but others disagree, and it seems a matter of experimentation for each builder. In any event, delicate surfaces should be pinned to the work during the shrinking operation, if possible. Sometimes a simple balsa jig can be made to hold the part off the work board, so that both sides may be shrunk at once.

Water for shrinking may be applied with a piece of cotton, an atomizer, or in the form of steam. Again, the lack of color-fastness may help determine the choice. Another approach, which seems to have originated in France, involves the use of alcohol for shrinking. Alcohol has an affinity for water of course, and the fact that it is in solution seems to produce a milder shrinking action, which may be safer for delicate structures.

SURFACE DECOR

Here is where an average model may be transformed into a real showpiece. Markings can add sparkle and visual interest to a model, weigh very little, and are well worth the time required to apply. While a really "serious" scale model will feature separate ailerons, rudder, elevators, etc., the average model usually has these components constructed integral with the main surfaces. By outlining these controls, an effective simulation can be achieved with much less effort than building the parts separately. Perhaps the simplest approach involves the use of chart tapes, which may be obtained in art supply stores. This tape is available in many colors, and in various widths which can also be used for striping.

For control surface definition, dull finish tape is far more effective than the shiny variety. When applying it to the model, make every effort to keep the lines straight. Making tiny dots with a soft pencil at each end may help. Avoid stretching the tape, as it might later contract, causing wrinkles in the cover-

ing. The disadvantage of tape is that it is fairly thick, and its sticky edges sometimes attract dust and hairs.

Another approach to surface delineation involves the use of ink. The time-honored system requires the use of a drafting pen and india ink. This is easier said than done, however. Some of the newer technical drawing pens aid the task as compared to the almost diabolical ruling pens, but care is still required to do a neat, convincing job. If the ink shows a tendency to "crawl", the surface can be cleaned using an artist's kneaded eraser. If the line is drawn too slowly, it may "bleed" to an unwanted width. Use a straight edge, which may be shimmed slightly off the surface to prevent ink running under and smearing.

Fine-tip fiber point pens may also be used for the task. With either type of ink, it is a good plan to apply a clear coating to protect the lines from moisture and handling. Caution . . . some types of ink can be dissolved by clear dope. Test first! Or, use a clear enamel such as sold for use on plastic models. A light coat applied from a spray can is usually sufficient.

The third method requires thin strips of black tissue to define the surface outlines. Give the covering of the model a coat or two of thin clear dope. Next, apply a coat of clear to a sheet of black tissue. It may be necessary to tape the tissue to a picture frame to prevent it from curling while the clear dope dries. Tape the dried sheet of tissue to a sheet of cardboard to hold it taut. Using a very sharp blade and a straight edge, slice thin strips from the tissue. With practice, these can be as little as 1/64 inch wide, and as long as required. On larger models, 1/32 inch may be a more appropriate width. Place the tissue strip in the desired position on the model, and apply thinner to secure it in place. A final very thin coat of clear dope over the top will lock it in position.

MARKINGS

Insignia or other markings can also be applied by the tissue method. Prepare the tissue with a coat of clear dope and tape to a sheet of cardboard, as described before. If two or more markings of the same kind are needed, add more layers of tissue, as required, so all may be cut in a single operation. Place a paper with the marking drawn on it directly over the colored tissue and tape in place. With a very sharp blade, cut through the pattern, tissue, and slightly into the cardboard. This will insure clean, concise cuts.

Sometimes a letter or other marking will line up with a wing rib or spar, and can be simply "eyeballed" into position, while thinner is flowed through to adhere it to the model. In other cases, it is well to make a simple locating guide so that the tissue marking can be positioned through the cut out space in the pattern for exact location. Or, guide lines may be drawn on with a VERY soft pencil, later to be removed with a kneaded eraser.

Decals are not usually suitable for translucent models, tending to upset the "stained glass window" effect. However, there are cases in which some sort of opaque markings should be employed. For example, if a model is covered with a dark colored tissue and its markings are to be white, the base color would show through, giving the markings a muddy appearance. In this case, the white decorations can be cut from an opaque paper.

Perhaps the most vital ingredients involved in achieving a first rate finishing job are time and patience. Top results can simply not be obtained under rushed conditions. A flying scale model builder should be prepared to spend the time and effort required to properly finish his model. The compliments of fellow modelers, as well as extra points from contest judges, will be your reward. ●