

Tips & Tech #7

SCRATCH BUILDING

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IN TRAINING – Scratch Building – Pt 1

So just what is scratch building? Where does one get a bunch of scratch building materials?

It seems that quite a few new modelers have heard the term “Scratch Building” but when confronted with actually doing it they are really not sure just how to do begin.

I know I was not really familiar in how to get started way back in the early 90’s. I had seen quite a number of models scratch built and they really looked good. I had always read in the model magazines how to scratch build cars and buildings but had never tried it.

Most of the articles back then used plans that the modeler had drawn up. While I was able to draw the plans or use those printed in the magazines I never really wanted to spend the time drawing a plan for a building or the building was not what I wanted.

As the club was into building it’s new (at that time) LEF&C layout and the plans were to do a prototypically accurate design, I spent a lot of time going around the LEF&C taking pictures of various buildings in the area. I probably should have taken more but at the time I was not sure if we would really need all of them and besides the buildings would always be there, wouldn’t they?

Well here we are almost 15 years later and while quite a number of the buildings are still around, but there are quite a few that are not! Or they, the buildings, have been remodeled and no longer look like they did in the time period the Club’s layout is to depict (1975 to 1985).

That leaves us, the club members, in a quandary. How do we build an accurate model of a building and only have a limited number of pictures to use?

One way, if the building still exists is go and take a number of pictures of it. Now several members state that some of the buildings in Summerville have changed since the pictures we have were taken, I ask, “is the building still there?” If it is then take a number of pictures. Unless the remodeling of the building was done like the old L&R building in downtown Clarion (which was/is not a new building but a remodeled building of which none of the original is left) then the building size will still be there. Yes, a porch was removed/added or steps rebuilt/changed but the overall size of the building will be the same.

It is obvious that they are not thinking in the scratch building mode. Very few people putting money in a building are going to go to the trouble of building a new structure if they can help it, unless they are getting a lot of free money as they did with the old L&R building in Clarion! The owner is only going to change the inside and maybe put on a new roof and new siding on the outside. The basic structure size will still be there.

Now we can get an idea how it was laid out, roof pitch and even the placement of the windows, even if they were replaced, most times they have not been moved.

I have been involved in too many remodeling projects and this is what I have seen way too many times. Money is always the limiting factor!

IN TRAINING – Scratch Building – Pt 2

Well now that we have the preliminaries out of the way, it is time to decide how to build.

How do I determine the size of the building? If you have a plan and a scale rule, just measure the plan and it will give you the dimensions.

But what do you do when all you have is one or two pictures?

Well now is the time to do a little interpolation! Now what is that?

It is as simple as measuring an item in a picture (such as a door) and then using a known dimension of a real door and coming up with a ratio (that is a math thing!). Using a formula (that is another math thing!) to convert the size in the picture to a scale to build a model or at least draw a some what scaled plan.

Here are a few givens in the house building trades:

- Front Doors are usually a 3/0 door (36" wide opening)
- Large front windows are usually 30" or sometimes 36" wide and 60" tall
- Roof pitch is either 4/12 to 12/12 (there are others but older houses usually had these)
- A story (as in 2 story home/floor) is figured at 10 ft (while most newer homes only have 8ft ceilings you still need to figure floor and ceiling joists height).

With these basic dimensions you can come up with a fairly close scale home or older building when having to make a plan from a picture. The only other way to make a more accurate model is to measure the actual building!

Now industrial buildings are another matter, as they used their own sizes for everything. But the front door is still the best size indicator I have found. Even if the door is slightly larger or smaller using the standard of 36" wide front door will scale the building only slightly smaller than the real thing. And most of the time we can use a slightly smaller size as the layout never has enough room available.

Making a sketch of the building either free hand or using a CAD program will allow you to begin building the model. With the CAD program plan you will be able print out the plan in the exact scale you are working in. This makes transferring the design from paper to the work material easy. All that needs to be done is lay the plan directly on the styrene, if you are using that material, and mark the edges of the design and then cut the styrene at the lines and you are set to go.

Making lots of notes is very helpful if you have to go back and make any changes later.

IN TRAINING – Scratch Building – Pt 3

Well now we have decided what to model and we have the plans or at least a drawing and pictures, now what?

Now we have to make a decision as to the type of material to use!

There are quite a number of materials we can use, Plaster, Wood, Card Stock/Mat board, Styrene, Resin and combinations of all of these.

They all have their good and bad points. While I have only done scratch building in wood, styrene and card stock I have built kits with all of these materials.

I really have no real preferences when I build but some of the properties I have found/like when I begin a project.

Card Stock/Mat Board - It is easy to cut. I used a lot of matt board scraps and using white glue goes together slow due to the drying time of the glue. You have to make everything yourself as all it comes in is sheets. Using wood strips is required to reinforce most all of the pieces as dampness will eventually warp the card stock.

Wood – It too cuts easily, glues with white glue is restively strong. Special shapes are available so you are able to make fancy trim pieces a lot easier. Speed of assemble is slow due to the drying time of the glue. The wood can also be affected be dampness.

Styrene – Cuts reasonably easy. Glues quickly with the super fast evaporating liquid solvents and there is just about any type of special shape available. This makes styrene the choice of materials to use for most modern buildings as well as the older houses. Dampness has no real effect on the Styrene.

There are relatively large sheets of styrene available and some sign shops can get 4 ft x 8 ft sheets in various thicknesses which makes really large structures much easier to build.

As far as detail parts styrene as again hands down the winner as just about every type of door or window is available as well as any type surface texture (cement block, brick, stone, etc.).

Doing scratch buildings is a lot easier now than in years past. So why don't modelers do more scratch building? Time!

With the number and types of kits now available, it almost makes it too easy to populate a layout with buildings.

It is only those that are trying to do a prototypically accurate layout (as in duplicating specific building) that have to get serious about scratch building unless you are modeling a really, really popular prototype and the buildings have already been manufactured for you!

One thing that can be said for scratch building is that no two models will be alike!

IN TRAINING – Scratch Building – Pt 4

OK! We have the plans (with a couple of extra copies), pictures of the building and the materials in hand (or at least some big sheets of styrene), we are ready to start.

I usually look over the plans to see if I can cut out some simple walls to start. If the building is complicated (has a lot of off-sets to different roof lines) I try and find a side where most of the off-sets meet and begin with this.

I have laid one of the copies of the plans onto a sheet of plastic and then just used a sharp pointer to mark the corners of the wall by pushing the pointer through the paper plan and lightly make an indentation into the plastic.

This way I have transferred the major outside corners of the largest wall to have a good starting point.

I then use a thin steel rule and a sharp X-Acto knife and begin scribing lines by connecting the dots left in the styrene from the pointer. I make a few very light passes with the knife to get the line started. If you try and take heavy cuts right at the beginning the knife blade will have a tendency to wander (the blade will move around under the heavy pressure) and your line will not be straight. I have ruined a lot of plastic this way, being in too much of a hurry.

Point-To-Remember: If you are in a hurry to build this model, don't even start! You will tire way too soon as scratch-building is not a fast art!

Once you have made a few light passes you can place some additional pressure to the knife. The Styrene can be snapped easily once there are a few passes made with the knife.

I usually make all of the connecting of the dots using the light passes of the knife first before I get into the heavier knife passes. I will make one pass to the edges of the plastic sheet so when I begin snapping off the excess materials it will break cleanly. I then work around the other side of the piece. If I have to extend any of the cuts to reach the edge of the piece I do so using the steel rule as a guide and try to make as straight cuts as possible so the scraps can possibly be used later.

Once the first wall is cut out then mark the next wall and cut it out. I also mark all of the windows and doors when I mark the wall corners out. Doing everything at one time helps eliminate any mistakes, when trying to realign the plan over the wall cut-out.

If you have missed some points in the process of transferring the plan to the sheet I have been able to realign the plan on the plastic sheet by carefully realigning the pin marks by using a long straight pin (from the wife's sewing kits) and pushing the pin through the hole in the plan and placing it in the corresponding hole in the plastic. Then while holding the pin to the plastic, carefully align one of the other holes in the plan to the plastic and hold it down. Make the proper markings and you are ready to go!

Now that you have all of the walls cut out, cutting in the window openings would be next. I have the actual window pieces to measure from using a dial caliper. This way I can use the calipers inside edges to gage how much the window is larger or smaller than the marked openings. I usually check this before cutting the window openings. In most cases I use the window detail piece as a reference value when drawing the plan so the windows will actually fit the plan.

I then cut the top and one side of the window opening and then the other two cuts I make them a little smaller than the plan shows to allow file fitting of the window pieces snugly into the openings. I much rather file the opening out a little than have the opening too large.

Once all of the windows openings are ready then I do the doors. This is because the doors usually are cut to the edge of the sheet and they start to make the sheet more flimsily to apply pressure to during the cutting process.

Now that the walls are cut out I take a file and lay it on the flat surface and file the edge that has been rolled up from the cutting process. You may have to go over both sides of the sheet as the cutting through of the windows and doors will sometimes leave an edge on both sides.

Now you need to fit the walls together. Now depending on the thickness of the material you have used you either have to bevel the inside corners or cut the width of the walls down slightly so that when they are glued together the outside dimensions are correct. If you are using textured plastic you may be able to cover the corners with angle plastic pieces which would act as corner post trim, thus covering the corner. Otherwise you

need to use the inside bevel and make a smooth corner joint (not fun). Using the beveled edge will require a reinforcing piece of scrap square plastic glued into the corner to provide support.

- Laser Lines -

For one of my projects I had to make a cone roof. I used .020 styrene to make the cone and found that it was rather fragile. I ended up making a second cone and placed it inside the first one and glued them together. Knowing that this cone roof was not so easy to build I was not sure how I would be able to cut the roof and not make a wrong cut or worse yet the roof explode! The roof had to have a 2 inch by 2 inch square cut out of the one side so that it would slip around the end of a building. The cone roof covered a round tank about 4 inches in diameter.

After making a paper template of the cutout it was easy to transfer it to the bottom of the cone roof as I had put a .060 styrene bottom in it. The sides of the bottom piece were tapered to match the cone angle. With the template placed on the bottom (in the proper orientation) I marked the cutout. I started to use a modelers saw to cut out the notch. But I worried about not getting the top cone piece cut out 90 degrees to the flat bottom.

What to do. No method I tried would work as the cone part would not allow me any way to get a reference mark up the taper. I had just purchased a new bench drill press with the new Laser-Trak center alignment lines. I thought, why not try that as the laser projected the line vertical. I marked the notch at the edges of the cone and set it on the drill press table and aligned the marks. The laser lined up across the cone and I just drew a pencil mark along the laser line. I continued to cut out the notch and it fit perfectly. So using the laser line was a real lifesaver and timesaver!