

MODEL MAKING 101

By Randal Parsons, STAGE DIRECTIONS, February 2005.

So what comes first, the drafting or the model? It all depends on what your design concept happens to be. If it's a design based in architecture and linear structure, it might be best to work out the major issues in the ground plan, section and elevations before going into the model stage. If you're taking a more sculptural or organic approach, you might find doing a model first will help you realize the look, which you can then refine in the drafting.

In either case, you'll need to start with accurate ground plans and section drawings of the theatre space you're working in. There's nothing worse than having to get rid of scenery that won't fit into the theater because of incorrect measurements or unknown obstructions.

If you're working in a space that isn't familiar to you, a thorough survey is a must. Since drafting conventions may vary, you should first familiarize yourself with the draftsman's line vocabulary. For example, you may need to ask the meaning of various line weights, or about the use of phantom lines if the answer is not obvious in the space. Double check all dimensions, and be sure to notate any changes made since the drawings you have were made, especially if there have been upgrades in sound, electrics, seating or even air conditioning.

Once you have all the accurate information about the space, you're ready to start thinking about your concept. First, you'll want to build a model box that gives the truest possible representation of your venue. You may choose to include a great deal of architectural detail and color, especially if you think the proscenium will inform or intrude upon your design, or you might decide to render the architecture in generic terms, while maintaining accurate dimensions.

Most designers work in either ¼-or ½-inch scale – and there are advantages and disadvantages to both. While a ¼-inch scale model is usually faster to build, easier to move or ship, and less expensive, you can lose some of the detail. A ½-inch scale model shows more detail and is easier to work with in meetings, but it can be expensive to build and difficult to move and ship, especially if the theater is a large one. Base your choice of scale on what works best for your design. When finished models also serve as paint elevations for the shop, the scenic artists appreciate the larger scale.

If you design frequently for the same space, a good, strong model box can be used several times over. If you don't have to move it around a lot, you could choose to build it out of wood. For rough models, a simple foam-core box may suffice. For finished models, I look to construct a sturdy house of foam core laminated to black mat board on both sides, with a framework of scale lumber inside to prevent warping and to provide strength. All outer surfaces should be finished in the same mat board (different brands of black boards may vary in blackness). For a proscenium stage, leaving the wings (the sides of the box) open makes for easier access, scene changes and lighting of the model.

If you have drawn a rough or finished drafting of the design, a white model is an easy first step in rendering a three-dimensional image to show the rest of your production team. Simply paste copies of the elevations to the inexpensive white foam board, cut it out and tape or glue it together in the model box. If you have color elevations, you may choose to use color copies to make it more complete. At this stage of the game, the designer or director can make quick and easy alterations to the model.

With a more organic or sculptural design, carving in foam or sculpting from papier mache can get you a rough model fairly quickly. Heavy, brown paper towels (without an embossed design) hold up very well when soaked in glue, matte medium or gesso, and the finished sculpture is quite strong. While on vacation, I once made a rough model from bamboo skewers, twist ties, cheesecloth and vinyl spackle, because I have to work with what I could find in the grocery and hardware stores. Although that one went into the trash, sometimes, with a little more work and paint, such pieces can be reused in your final model.

Good tools and supplies are worth their cost in time saved. While each designer will find tools that fit the project at hand, a good starting setup consisted of a large cutting surface, X-acto, breakaway and mat knives, good scissors and metal rulers in several lengths. The cord-backed rulers are excellent for preventing slippage on the materials as long as you keep them clean. Keep plenty of extra blades on hand for the knives. Blades dull quickly in mat board, and you waste a lot of energy and time with dull blades. Be sure to have a safe disposal container for used blades. Your kit should also include a saw for model lumber (small miter boxes are great), and awl, tweezers, sandpaper, emery boards and bristle paintbrushes in various sizes for gesso and glue.

If you choose to work with brass or copper, a good soldering gun or a crème brûlée torch are must-haves. Drafting tape and large pins help to anchor pieces while glue sets. Waxed paper and plastic are good quick-release surfaces for wet sculpture, and plastic cutlery also comes in handy for working in soft media. For me, a Dremel tool for shaping and drilling and a Dust Buster vacuum for cleanup are indispensable. A work area that's clear of clutter and waste keeps the concept clear and helps you from getting stuck by stray pins or knives hiding under cuttings. Which reminds me – always have a first-aid kit nearby, and keep the finger bandages well stocked.

Basic materials for theatrical models include foam-core board; mat board either white, white/black or black-on-black; Bristol board; and scale lumber. Of course, practically anything can be used if it furthers the realization of the design. Cheap poster board or “shirt” cardboard, cereal boxes, deli paper, paper towels, tissue, fabric, toy parts, old socks or dryer lint might have uses. As Michelangelo envisioned beautiful figures inside blocks of stone, we must learn to see big things in odd materials or objects: a perfect arch in a piece of packing foam, a Weber grill in a toy spinning top, the batten in a bamboo skewer, a rococo ceiling on a candy box, or the fluted column in a light-bulb box.

Of course, you can find almost everything you would ever need in a large art supply house, but why limit yourself/ clip out photos of rugs and paintings from magazines and catalogs; file them away until needed. Keep an eye out for print figures, too. Copy them to scale, stick them on mat board, and cut them out.

A variety of adhesives are also necessary in the studio. A good white glue such as Sobo is the workhorse of paper materials. A household cement, such as Duco or Zap-a-Gap, works well in bonding plastics and other nonporous materials. Rubber cement is useful in laminating boards, as is a sheet adhesive such as Interex Twin-Tak. Be sure to read content labels and always provide yourself with good ventilation when indicated.

When building a model that will be painted or treated with any wet media, adequate back bracing is a must for either foam core or mat board. You can use a frame, just like a Hollywood flat, of scale lumber, or strips of mat board. Plan ahead as you're building individual components so that your framing fits together and doesn't get in the way. Always seal the back with paint or gesso to prevent warping. Remember, black gesso can be your best friend.

An easy way to create various stone textures begins with peeling the paper off one side of the black foam-core board. Use an awl, emery board or Dremel tool to carve the desired effect, and then complete the work with gesso and paint. The black foam provides deep shadow in mortar lines and crevasses; usually, very little paint is required on top to get a great realistic stone look. This method also works well for cobblestones, flagstone and large brick surfaces. For a smoother effect, leave the thinnest layer of paper on the foam. To create a rough concrete, spray a board with “orange peel” ceiling touch-up spray. After letting it dry, lightly sand it, apply several very thin color washes, then sand again. The effect is incredibly realistic.

If a model required no wet media, you can save yourself a lot of back framing. If you have created paint elevations, you can mount color copies to your model with spray or sheet adhesive. Graphics can be printed from the same files as the full-scale ones used on the actual set, then mounted with adhesive in the model.

For resources, check out your local art supply store, pore through catalogs or go online. Also, look for

architectural, hobby and model-train sources such as Oak Ridge Hobbies and Plastruct. All should provide you with the materials you'll need to create an effective model.