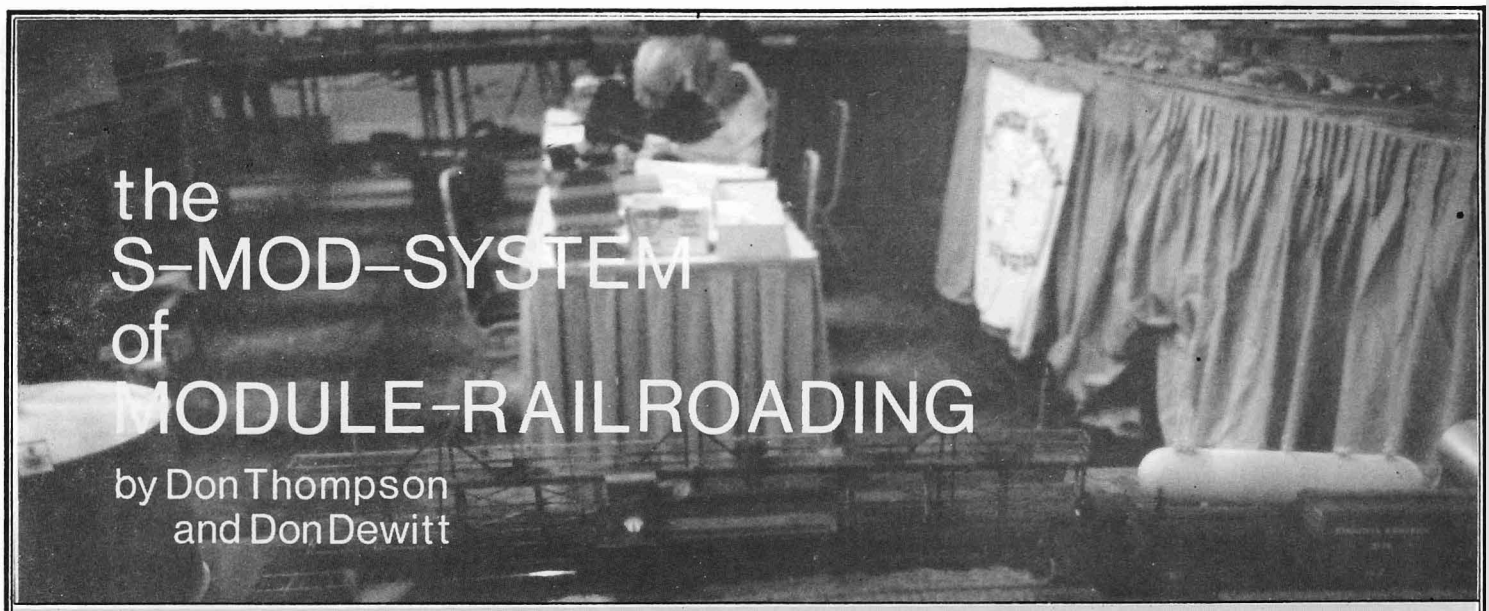


the S-MOD-SYSTEM of MODULE-RAILROADING

by Don Thompson and Don Dewitt

The first installment in this series dealt with theories of planning and laying out a module. Now to the actual building of the platform upon which the trackwork will be attatched. The method described in this series allows an infinite numbers of sizes to be built. It will also develop woodworking skills in the modeler. The tools are simple and the work is not difficult, but it does reqire the ability to cut a straight line. Now, if we haven't scared you away, lets begin Chapter II: Benchwork.

Description

We are going to construct a swicthing module in three sections. They will be nearly identical, except for joiners as describe below. Lets begin with a desciption of the module.

Each section is 64" long. When joined together, they form a module 16' in length. When stacked, they will fit into most cars with rear doors and collapsable seats. Since the overall length is 16', the complete module will fit into a layout which has at least four 4' sections to offset its length allowing a loop to be assembled.

The module will have a double track mainline, but it could be built with single line. It is built to stand alone and be used as a switching layout, or it can become part of a home model railroad. The 64" sections fit the track plan allowing easier placement of switches and eliminates on set of bridge rails*.

The frame's stringers cross braces and transoms are made of 1X3" lumber. The legs are 2X2" pieces ripped from 2X4"s, (more on this later). A complete list of materials for three sections appears on the main drawing, as does a glossary of terms.

Lets get started

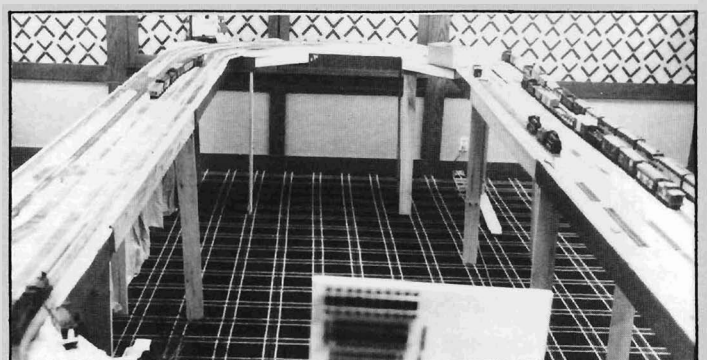
Begin by cutting the wood. Be sure to get dry straight lengths of lumber that is as free from as many knots as possible. If you have access to a furniture wood supplier, you might try to obtain lengths of Maple or Oak. Bear in mind that the frame and supports are really pieces of furniture that are going to be leaned on, moved around and bumped. It behooves the builder to use the best materials available in order to insure a long and useful life.

Follow the list on the main drawing and when all the parts are finished, we are ready for assembly. We should tell you now that good square cuts are essential for a well constructed module frame.

We used #6 & 8 dry wall screws because they do not need pre-drilled holes and they will not split the wood. (On harder woods such as Maple, a starter hole may be necessary.) They work well with an an electric screwdiver and a phillips screwdiver bit. If these are not available, or if you prefer, the equivalent countersunk wood screw is as functional. You will have to pre-drill the holes.

We use a wood glue in addition to the screws in order to get the tightest joints possible. Nothing can be more frustrating than working on a wobbly module. With a little care during construction, the finished product should support fifty or so pounds of layout without a sway.

It is best to work on a large flat surface. A 4X8' sheet of plywood laid on a table or work bench is an ideal work surface. The floor is another but this will require a lot of stooping.



A module setup at Cleveland, Ohio, many years ago.

Assembling the Frame

Following the plan in FIG.2, lay the 1 X 3 X 62 1/2 stringers on their sides and mark off the locations of the cross members. To be sure that they will be square when they are assembled, lay out the holes on both stringers at the same time. We begin by turning one of them so that the three inch side is vertical and after applying wood glue to one end of a 1 X 3 X 28 1/2" cross member, attatch it to a stringer with drywall screws at the locations previously marked. repeat this step until all of the cross members are so assembled. Now begin on the other stringer using the same procedure. A carpenter square or a known to be square piece of plywood is of great use to insure a true 90°.

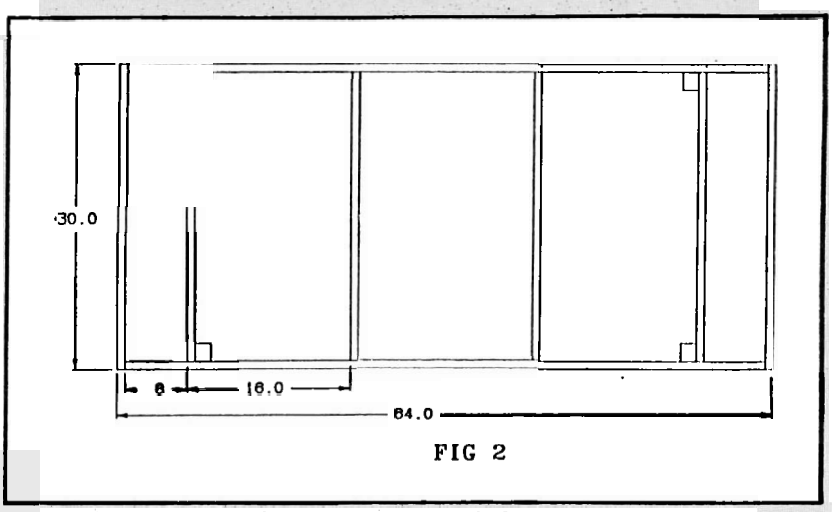


FIG 2

The plan for the frame is identical for the three sections of the module.

Once the cross members are in place, we can install the 1 X 3 X 30" transoms. These are the pieces that close the box. They mount over the ends of the stringers. The same glue and screw procedure is used to secure them in place. Check to see that the frame is square and if so, set it aside and start work on the other two. Once completed, it is best to let them rest a while in order for the glue to set. We've got plenty to do on the decks any way.

Cutting the Deck and Roadbed Levels

The deck or sub roadbed covers the frame entirely and is made of 3/8" plywood. A module that is designed for open roadbed where the plywood is used only under the tracks would require heavier thicknesses for rigidity. (1/2" or better will suffice.) Use "good one side" which becomes the top surface. The roadbed will be attatched to this later. Where dampness is a problem, obtain exterior plywood.

Three pieces are cut 30X64" and deburred. It's recommended that tl edges and bottom be sealed after cutting in order to prevent warping. (The frame anc legs will be painted to accomplish the same.)

The roadbed covers the deck completely and is cut exactly to the same dimensions as the deck. Homosote™ is used here and again, where dampness becomes a problem, the edges should be sealed or waterproof Homosote™ can be substituted. This is identified by having a green color. For designs where the roadbed is open, the homosote can be cut to fit or roadbed can be obtained from BO Manufacturing*. They make a 3/8th" thick product that is useful for this purpose. Another possibility is the blue extruded styrofoam that builders use to insulate houses. It can be glued to the deck with the same glue the builders use and has the advantage of being waterproof and will not warp.

Once the deck and roadbed levels are cut and checked , they should be sealed as mentioned above. They may reqire more than one coat, and should be set aside after each application.

The Legs

There are many ways to make legs and attatch them to module sections. The most common is to use 2X2" studs ripped from 2X4s. (The reason for this can be seen at any builder's supply. Most 2X2s look like Shilealas: not one in a hundred's straight.) They should be cut so the top of the rail is 42" from the floor in S gauge, (O or HO gauge rail heights may vary, so its best to check the standard you are using to determine the exact rail height in those gauges.) The slight variations in floor or leg mounting errors is taken up with adjusting screws or furniture levelers.

Whatever scale you are in, the following formula will apply:

Leg Length = R(h) + T(t) + Rb(t) + D(t) - S(h) ± V

This equates to: Rail (h)eight + Tie (t)hickness + Roadbed (t)hickness + Deck (t)hickness - Standard (h)eight above the floor. V is the adjusting bolt explained below.

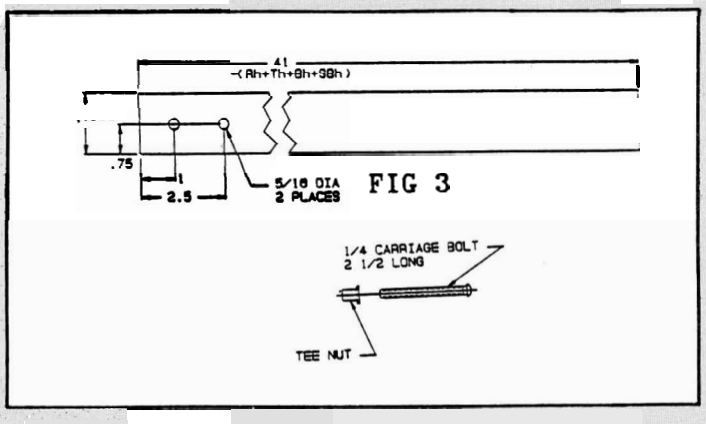


FIG 3

The drawing for the legs and the leveling screws.

Now, if the rail is code .125, (1/8"), and the ties are 1/8" thick and the roadbed is 1/2" thick and the deck is 3/8" thick, then the legs should be 41" long. However, because we recognize the fact that wood and floor have variations that may effect the final height, we use adjusting bolts have 1" of travel, or 1/2" in either direction. Therefore, the final length of the leg is 40 1/2" which will yield a 42" rail height.

**BO Manufacturing, RD3, Box 357B, Kingston, NY 12401*
HOMOSOTE is a trade mark of the Homosote Corp.

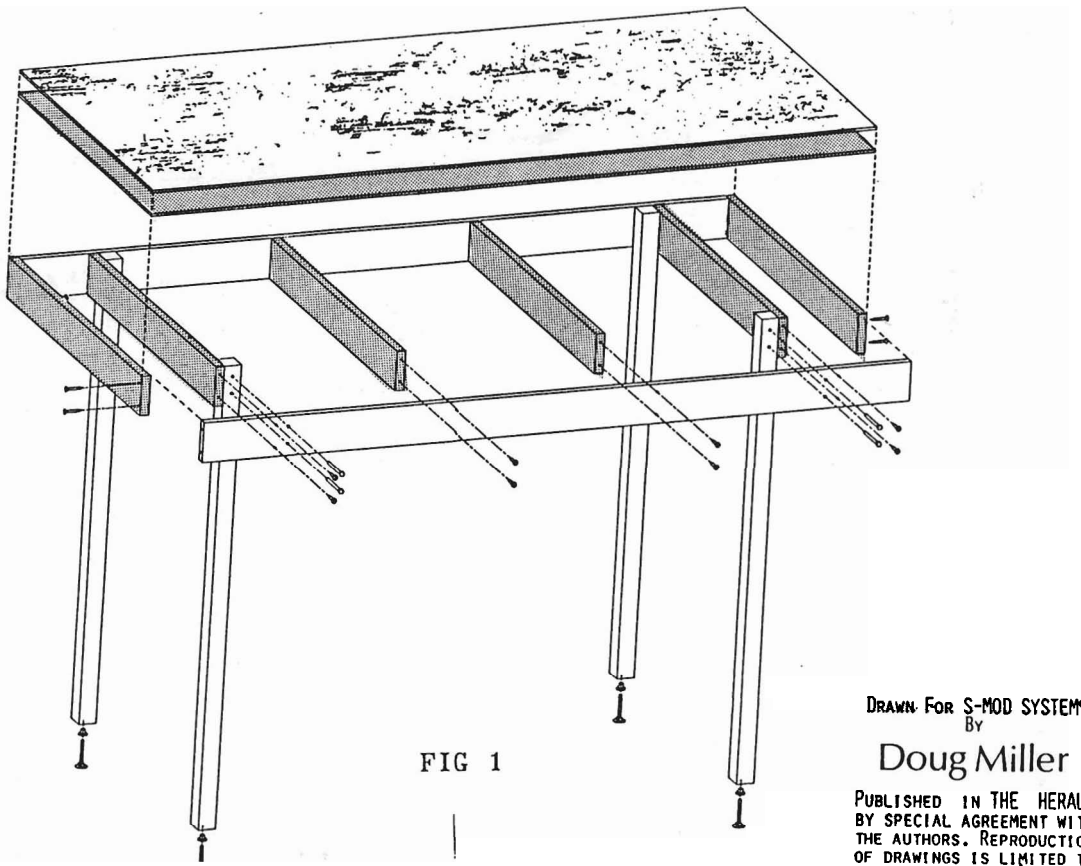


FIG 1

DRAWN FOR S-MOD SYSTEM® BY
Doug Miller

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Assembling the Sections

Return one of the frames to the work surface and lay it down flat. Position one of the legs, (as shown in FIG 1.), in the corner formed by a stringer and the first cross member from either end. Notice that the leg is not positioned in the corner opposite the transom because this area must be kept clear to accommodate the C-clamps that will join the sections together. Once the leg is positioned so as the top surface is flush with the work surface and is squarely in the corner, use one of the C-clamps to hold the leg in place and drill two 5/16" holes through the stringer, using the holes in the leg as a guide. Repeat this in the four places shown on FIG 1. on each section. It is a good idea to temporarily assemble the legs to the sections at this time to insure that they will fit. When this is done, sanding and a coat of the porch paint is applied to all surfaces except the top edge. (The deck will be glued and screwed to this surface.)

After the paint is dry, we are ready to install the deck and roadbed. Lay the frame down on the work surface with the unpainted edge up. Run a bead of glue on all of these edges. Then place the plywood deck on top of the frame and begin screwing it in place using the sheetrock screws. A starter hole might have to be drilled, however we have found that the sheetrock screws generally go in easy and do not need to be countersunk. A screw every eight or so inches should be sufficient. Take care that no screw heads protrude above the deck surface as they will prevent the roadbed from laying flat. When this is done the homosote layer is applied in much the same manner, except that screws are only used on the peripheral edges.

When all the surfaces are in place and the glue is dry, the sections are ready for the final check out before we get to laying track. It is important that the decks join together fairly flush, but it is more important that the transoms be butted against each other without any interference from the deck and roadbed edges. Inspect the transom ends of each unit to see that no deck surface protrudes over the edge. If so, remove it with a rasp or sandpaper. Now install the legs on one unit and level them so that the roadbed top is 41 3/4" from the floor. (The remaining 1/4" is the track height.) When this is complete, assemble the legs to one end of the next section and join the free transom to the end of the first unit using a C-clamp in each corner. Repeat the procedure on the last secion, leveling each unit as completed.

We are now ready to lay track, which will be the subject of the next installment.