

Mon Valley Railroad Historical Society NMRA Division 2 Meeting 17 March 2024 Wally Venable Wallace.Venable@mail.WVU.edu

#### **Classic Paper Buildings**

There are many good ways to get buildings for model railroads, including kits with plastic or wooden parts as well as pre-assembled structures. Why would we want to use old-fashioned paper buildings now that we have access to finely detailed plastic kits and 3-D printed models? There a number of reasons. Cost is one factor since a paper model can be made for a dollar or so in out of pocket costs while a commercially produced one may cost \$50 or more – an important factor if out layout requires many structures. If we are building a street of houses, we may want them to be similar, but each should have unique details. All too often these are sold in a configuration or scale which does not really fit our needs for a particular location on a layout.

My first contact with paper buildings was in England about 50 years ago. I walked into a hobby shop and saw paper buildings on display and couldn't resist them. I bought a few of them and brought them home and then put them away on top of a cabinet for many years. Later I discovered the Dover series of cut and assemble buildings and bought several of those books but again I didn't do anything with those for a while.

More recently when I started into doing some N-scale model railroading I began to convert the buildings that I had on paper into buildings for an N-scale layout. Of course in many cases that's just a matter of taking a building printed building in HO-scale and sizing it to fit in N-scale and I had a lot of fun doing that. I began with the Dover Main Street Cut and Assemble the book and created buildings that currently on the MVRRHS's N-scale layout. I moved on into modifying buildings, and then into "scratch building" in paper.



Many paper buildings are readily available in book form. A list of most of these can be found in *Appendix 1, Cut And Assemble Books*. Almost all of these are in HO scale and in color. If you don't have a computer, copies of book pages can be made in any scale at most sign shops or on many

office color copy machines. With a computer, a graphics program and a color printer it is relatively easy to create customized paper buildings.

Basic assembly of buildings from printed copies of book pages is straight forward. The books include illustrated instructions. That said, if details like cornices, steps and railings are included, this may become challenging in the smaller scales.

Only a small tool set is required. The picture below shows my basic kit. It includes a cutting surface, I use semi-transparent sheets from Dollar Tree's kitchen section although ones from a craft store are equally acceptable. You need a good paper cutting knife such as the X-acto at the top or may favorite black "break-off" knives which come in 3-packs. You need a straight-edge for some critical edges, although may cuts mat be made free-hand. Finally and extremely important is a "creasing tool" for scoring the lines where folds are to be made. My creasing tool is at the bottom and was made by grinding a dull, smooth, somewhat rounded edge on a craft knife.



You should also have a scale rule for the model scale(s) in which you will be working. I have included an image of rules in O, HO, and N in *Appendix 4*.

You will also need some adhesive. I use Elmer's Glue. Some builders recommend glue sticks, but I have not been particularly happy with the results. You should have a variety of markers, cheap hobby paints and colored pencils, primarily to color the edges so that white strips don't show. I have found that markers sold for fixing scratches on furniture are great for edges and back sides where wood would be visable.

#### **Using Computers**

My work has been done with fairly basic Windows 10 computers. I have used both desktop and lap-top machines. My printer is a \$30 USB connected Canon ink-jet from Walmart.

If you are working from a book of course the first thing you have to do is get the pages into the computer. That requires a scanner. I use a stand-alone desktop scanner which will scan letter size sheets. Once you have scanned a page you can save it in many different forms. A *.JPG* file can work very well. For many things my preference is to use a *.TIFF* file. You can scan at any size. I sometimes

scan at a very high resolution like 1200 DPI although more frequently I will scan at 600 DPI which will pick up practically every detail on a printed page. You might be satisfied to do the work at 300 DPI.

With only basic computer graphics skills, readily available book pages for HO models can be scanned and printed full size to preserve the book or re-scaled to N or Z as they are. Scaling up to O will generally require copying and pasting elements to several pages to make them printable. With little difficulty building faces can be reversed left to right, and sections created to make or remove additions to the basic structure.



To do this, of course, you need a graphics program. Some sort of software that will let you edit the various picture parts of the picture. Although the popular title for this sort of thing is "photoshopping" actually there are several programs which work very well. Although Photoshop may be the best known others that work well include at CORELDraw, GIMP and Adobelllustrator. The one I've been using for years is called Paint Shop Pro version 7, a program which is about 20 years old. Recently I discovered another program which may be very useful and that which you may want to consider because it's free, a program called Paint.Net. Yes that looks like a website but it's also the name of the program.

All of these programs allow you to change the size of an image, to adjust colors, and to cut and paste portions of an image as well as drawing lines, painting spaces and many more things. More sophisticated graphics programs are not necessarily better for model railroad work since the added features are frequently intended for editing portrait photos and end up making the menus more complex and hard to decipher. Re-scaling is very easy you will just click on the image resize command or tool the image resize tool and then select percentage of change that you want to make and going from an HO book of pictures to end the scale I will use the percentage that comes from dividing 160 DP nope 87 DPI by 160 DPI to once I have made a building if I want to scale it up to for example O scale I will use a conversion which is 160 divided by 48. N-scale is 1 model unit long when the prototype is 160 units in length, and O scale has 1/4 in equals a foot or 1/48th of the Prototype size. The scaling percentage is determined by the ratio of the scales.

O to N is 48 / 160 or 30% N to O is 160 / 46 or 333% HO to N is 87 / 160 or 54%

#### Level of Detail

Graphics programs let us zoom in to do detail work. If we are working at 300DPI or higher resolutions we can create details which will print, but may not be visible. When I created a kitchen addition to a roadside diner I put a self-portrait in a window. In N-scale this window is only about 1/8 inch high.



Adding three dimensional details to paper buildings, or other models for that matter is complicated by by the difficulty of finding, shaping and connecting fine parts. In N-scale it is very difficult to model porches and other exterior additions. As shown in the table below, a toothpick is over a foot in diameter in N-scale and a one inch handrail requires smaller than 30 gauge wire.

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Item	Actual (in)	Actual (mm)	O scale (in)	HO scale (in)	N scale (in)
20 lb copy paper	0.004	0.102	0.2	0.3	0.6
105 lb	0.018	0.445	0.8	1.5	2.8
Matte photo paper	0.011	0.279	0.5	1.0	1.8
Cereal box	0.022	0.559	1.1	1.9	3.5
1/16 inch board	0.063	1.588	3.0	5.4	10.0
1/8 in board	0.125	3.175	6.0	10.9	20.0
1 point line	0.014	0.356	0.7	1.2	2.2
5 point line	0.070	1.778	3.4	6.1	11.2
1 pixel line @ 300 dpi	0.003	0.076	0.1	0.3	0.5
1 pixel line @ 600 dpi	0.002	0.043	0.1	0.1	0.3
5 pixel line @ 600 dpi	0.008	0.203	0.4	0.7	1.3
Round toothpick	0.082	2.083	3.9	7.1	13.1
12 gauge wire	0.081	2.057	3.9	7.0	13.0
16 gauge wire	0.051	1.295	2.4	4.4	8.2
20 gauge wire	0.032	0.813	1.5	2.8	5.1
24 gauge wire	0.020	0.508	1.0	1.7	3.2
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## **Relative Dimensions**

Sheets of what we used to call "brick paper" and "stone paper" are now referred to as "texture files" in the computer graphics world. Texture sheets may be found on the internet or created by cutting and pasting sections from scanned buildings. Those of us who are immersed in making paper buildings create personal texture sheets (digital pages of small images) with all sorts of doors, windows, signs and other details. These can then be copied and pasted onto original or modified structures.

#### **Changing Colors on Buildings**

Graphics programs have many powerful tools for editing colors. These may differ both in their abilities and menu selections from one to another, but here are two examples from PaintShop.

The *Brightness/Contrast* tool is very powerful and straight forward. It can be applied to an entire image or to only a selection selected with the *Rectangular Selection* or *Lasso Selection* tools.



The *Hue/Saturation/Lightness* tool can also be applied to an entire image or to only a selection selected with the *Rectangular Selection* or *Lasso Selection* tools. Three sliders allow each of these qualities to be independently adjusted and the results previewed.



I also use the *Color Replacer* tool a lot. This lets you substitute one single color for another, and can be used on an image or a selected section.

#### Printing

I use a laser printer for images which only require black and white because this is low in cost. If I had a color laser printer I would probably use that for all printing because I think the colors are less likely to fade or be damaged by moisture. As mentioned above, I am currently using an inexpensive ink-jet printer for most of my work.

Of course we need some paper. "65 lb cardstock" is easy to find and feeds well in ink-jet printers. I would prefer to use "110 lb" paper, but it is harder to find. Matte photo paper is also good, but I don't think it is worth the extra cost. Glossy photo paper can be used for window back-ups.

#### Some Results

Here are some examples of structure modifications from my work on a Mine Camp for the MVRRHS N-scale layout. A "coal mine" isn't just a "coal tipple," it's a community, typically with housing, a store, equipment and supply storage and often a school, church, or community center.

The first picture pair shows how I modified a downloaded country store building into a 2story house, removing signs, adding modified windows, an attic vent, a chimney, and a stone foundation.



The second pair shows how I used the *Color Replacer* to change the paint from red to offwhite. I also mirrored the front to create more variety in the town.



I reshaped elements of the red house to create a single story "company house." The stove pipe is a straight sewing pin painted black.



I "scratch built" a company store and a one-room school.





I will be creating a coal tipple from scratch in the near future, but I want to fit that to space on the tracks which are still being positioned.

Although my focus is on N-scale, as an experiment I re-scaled the 1-story company house to O-scale and printed the multiple copies needed to build a layered structure with transparent windows and a paper interior. I'm pleased with those results.





# Appendix 1 Cut And Assemble Books

Dover Publications issued many books of HO scale buildings. All are now out of print, but most are available through used book sellers including eBay and Amazon.

- *Cut And Assemble Victorian Houses* by Edmund v.Gillon, Jr. features 4 scale buildings. These are rather ornate homes
- *Cut and Assemble a Western Frontier Town* by Edmund V. Gillon (Author) has 10 buildings, mostly for an 1880s wooden business district
- Cut & Assemble an Early American Seaport by A. G. Smith has 11 buildings
- *Cut and Assemble an Old-Fashioned Train* by A. G. Smith features a locomotive, tender, passenger car, baggage car, boxcar, flatcar, and caboose along with a water tower and a small station.
- *Cut and Assemble an Early New England Village* by Edmund V. Gillon Jr. has 12 buildings
- *Cut & Assemble Suburban Houses of the Twenties* by Edmund V. Gillon has four typical houses popular during the 1920's.
- *Cut & Assemble Victorian Railroad Station* by Edmund V. Gillon Jr. is a replica of an actual station in Point of Rocks, Maryland, built in 1875.
- *Cut & Assemble Victorian Cottage* by Edmund V. Gillon Jr. selected from an 1880 sourcebook of residential designs for prospective home builders, re-creates a Queen Anne-style residence.
- *Cut and Assemble a Southern Plantation* by Edmund V. Gillon Jr. Includes spectacular Greek Revival-styled main house with portico, colonnades connecting house and two wings, carriage house, garconniere, privy, slave cabin, fence.
- *Cut & Assemble Historic Bulidings At Greenfield Village* by A. G. Smith includes models of Henry Ford's Bagley Avenue Shop, the Wright Brothers' Cycle Shop, Edison's Menlo Park Laboratory and Six Other Structures
- *Cut and Assemble an Old-Fashioned Farm* by A. G. Smith has 9 buildings including a farmhouse, large barn and assorted outbuildings.
- *Cut and Assemble an Old English Village* by Michael Grater & Marc Sewell has 12 buildings and structures including a pub, shops and church.
- *Cut & Assemble Plains Indians Teepee Village* by A. G. Smith might be of interest to someone modeling the Southwest.
- *Cut & Assemble Pueblo Village* by A. G. Smith and Josie Hazen might be of interest to someone modeling the Southwest.

Schiffer Publishing has released two books of HO buildings. These appear to be still in print and available as new books.

- *A Shaker Village* by Edmund V. Gillon, Jr. includes 6 cut-out models, some which might serve as source material for c. 1900 industrial structures.
- An Early New England Seaport by Edmund V. Gillon Jr. contains 10 cut and assemble models.

If you are doing interiors, this may be useful.

• *Cut & Assemble Paper Dollhouse Furniture* by American Colortype Co. It has 16 heavy cardstock pages of detailed old fashioned furniture with 3 rooms of rugs and furnishings. These are large scale - maybe 1/2 inch to the foot.

# Appendix 2 Internet Resources

A Google search will reveal many websites offering "free paper buildings," but most are simply leads to paper building kits for sale. There are a few exceptions.

Build Your Own Historic Illinois Buildings

This is probably the best site for FREE mainstreet and Lincoln related historical structures. <u>https://dnrhistoric.illinois.gov/preserve/construct-mainstreet.html</u>

<u>Clever Models</u> sells paper building packages but has a few free samples online. Their FREE "Silver City Tool House Kit" is a good source for corrugated building materials. <u>http://clevermodels.squarespace.com/free-downloads-01/</u>

<u>Evans Designs</u> sells a package called Model Builder Software for creating paper buildings. They have a good Shack/Store FREE sample in O, HO, N and S scales at <u>https://evandesigns.com/pages/mb-free-building</u>

# Appendix 3 Ready to Print Structures

The following pages contain several structures which I created as part of developing buildings for a coal mining company town. I hold the copyright to them. You have my permission to build them yourself or share them with others provided you distribute them in unmodified form. Any commercial use is expressly forbidden.

Make sure that you print them "full size" or "100%" and NOT "fit to page" and check the scale before you assemble them. There should be no problem printing them directly from this .PDF file.







# O-scale 1 story company house Page 2/2 © 2024 by Wally Venable - MVRRHS Base





Company Store Prepared for NMRA meeting MVRRHS - March 2023 © Wally Venable





# Appendix 4 Scale Rules

The image below can be printed on paper for use as a hand tool, or as a file for creating transparent images for overlay use in measuring images on screen.

	ļ	8		12		16	]	20		24		28
O Scale Feet												

0	'   4	8	12	16	20	24	28	32	36	40
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**HO** Scale Feet

1 inch square

300 dpi

**N** Scale Feet