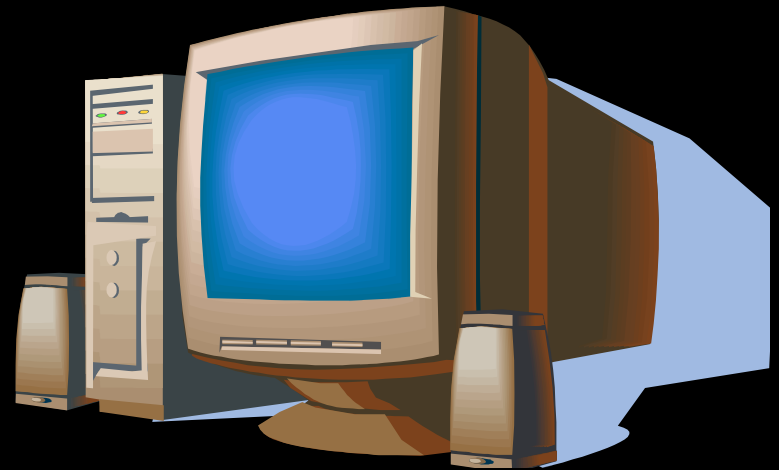
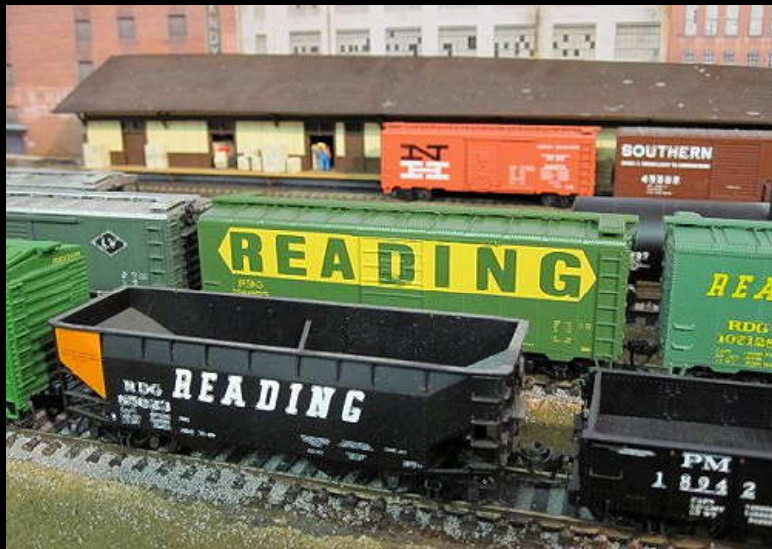


Your Computer: An Essential Modeling Tool



Tom Jacobs
Philadelphia Chapter, NMRA Meet
November 2, 2013

Overview

- Changing Hobby Dynamics
- Your Computer: An Essential Modeling Tool
 - Prototype Research and Layout Design
 - Model Railroad Operations
 - DCC Support, Signaling & Control
 - Decals, Signs and Printed Materials
 - Real Live Modeling
- Conclusion / Q&A

Changing Hobby Dynamics

- Modeling becoming more “High Tech”
 - More detailed products – ExactRail, Tangent, etc.
 - Greater interest in prototype fidelity – growth of Railroad Prototype Modelers (RPM) meets nationally
- Evolving Demographics
 - Discretionary income
 - Modeling standards
 - Familiarity with technology
- DCC has become the new standard
 - Most locomotives available with DCC or Plug-n-Play
 - Variety of systems available at different price points and feature levels, locos available DCC / DCC Ready

Your Computer: A Modeling Tool

- Over half of Americans own a computer
- Over 80% of Americans use the internet
- Computer technology continues to become more affordable
- Most modeling applications do not require cutting-edge PC technology
- Time is both an investment and a payoff
 - Learning curve of software
 - Repetitive/Duplicative ability of PC

Prototype Research

The Internet has Revolutionized the Research Process

- Photographic Archives
 - Locomotives and Rolling Stock
 - Historical views of locations
- Proliferation of “Enthusiast” Websites
 - General Modeling
 - Industrial History

Prototype Research - Examples

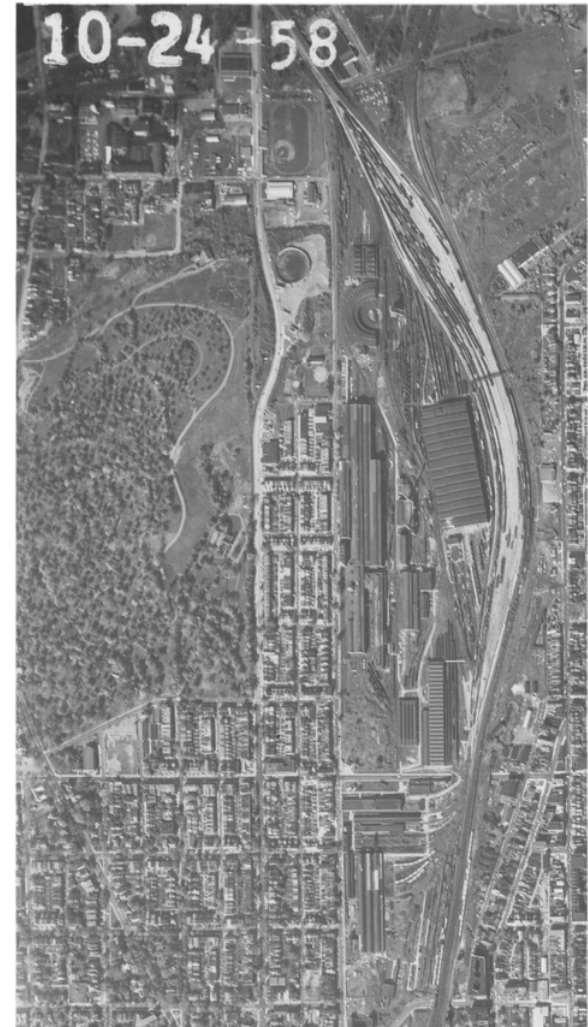
Locomotive and Rolling Stock galleries

- railpictures.net
- rrpicturearchives.net
- rr-fallenflags.org
- northeast.railfan.net
- [Hagley Digital Archives:
http://cdm16038.contentdm.oclc.org/cdm/](http://Hagley Digital Archives: http://cdm16038.contentdm.oclc.org/cdm/)
- sd45.com
- Don't forget eBay!

Prototype Research - Examples

Penn Pilot: pennpilot.psu.edu

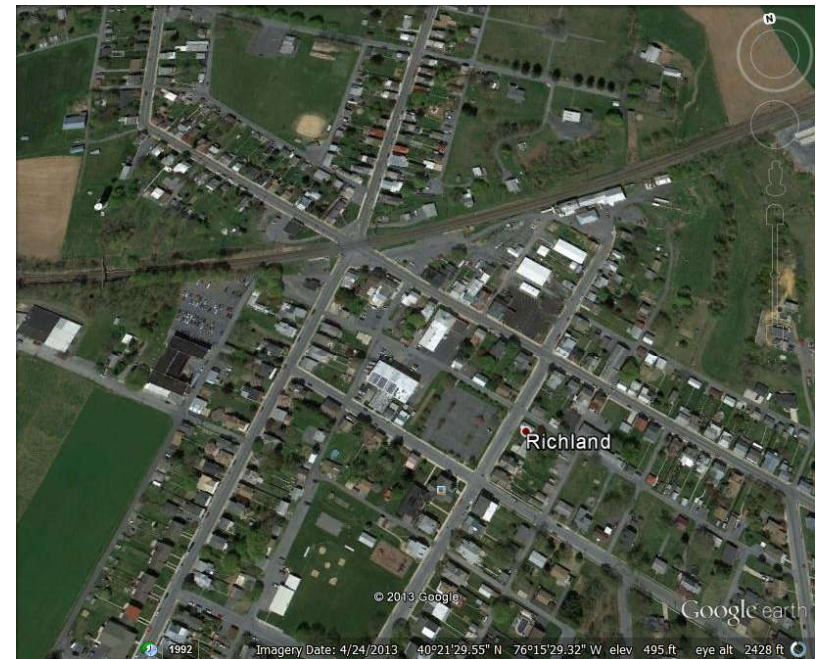
- Aerial views of PA
- Various eras
- Helpful for reviews of ROW, buildings, etc.
- Can compare same locale in different eras



Prototype Research - Examples

Google Earth

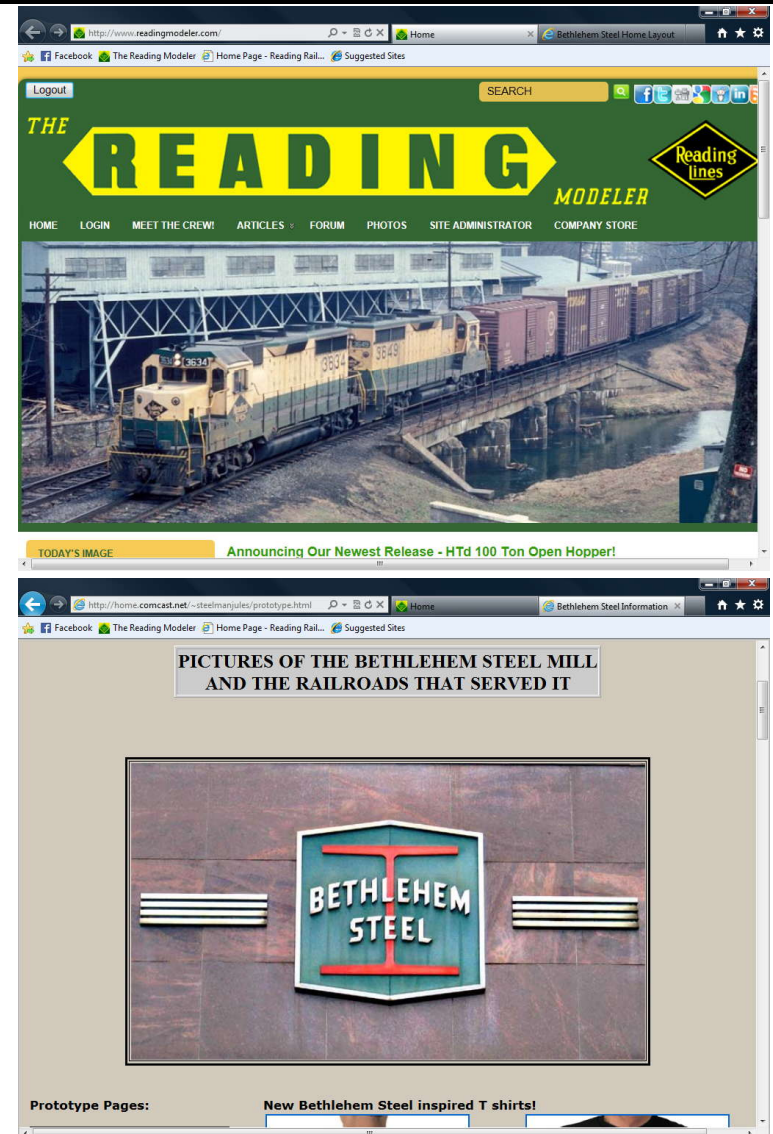
- Free download
- *Current* global aerial views
- Useful for zooming in on ROW
- Although current, can often discern prior info



Prototype Research - Examples

“Enthusiast” Websites

- Internet publishing readily accessible to the layperson
- Interests in industrial history also have modeling value
- Personal web sites
- Historical Society sites
- Facebook groups / pages
- YouTube videos
- “Google it!”



Layout Design

Use of CAD for layout design

- More accurate than paper-and-pencil
- Regular CAD programs, i.e. AutoCAD
- Model Railroad-specific programs
 - Cadrail – www.cadrail.com
 - 3rd Planit – www.trackplanning.com
 - XtrkCAD – www.xtrkcad.org – FREEWARE!

Model Railroad Operations

Computer is invaluable asset for operations
“legwork”

- Creating prototype-based paperwork
- Car Cards and Waybills
- Prototypical industry info
- Free internet resources
- Commercial programs

FORM 19 FORM 227 READING COMPANY FORM 19
TRAIN ORDER NO. _____ 19____
To _____
At _____
Each employe addressed must have a copy of this order.
Made _____ time _____ M. _____ Ogr.

Model Railroad Operations

Prototype-Based Paperwork

- Create with Desktop Publishing Program
 - MS Word, Publisher or Open Office
- Train orders, Clearance Forms, Switch Lists
- “Operations Paperwork” section on ReadingModeler.com

Rolling Stock Inventory

- MS Excel spreadsheet, MS Access database
- Various freeware/commercial programs on internet
- Integrate with operations paperwork
- Very useful for insurance purposes – valuation of collection

Model Railroad Operations

Car Cards & Waybills

- “Gold Standard” for prototype-based operations
- Time investment in initial setup
- Level of complexity/flexibility up to layout owner
- Broad coverage in hobby press and online



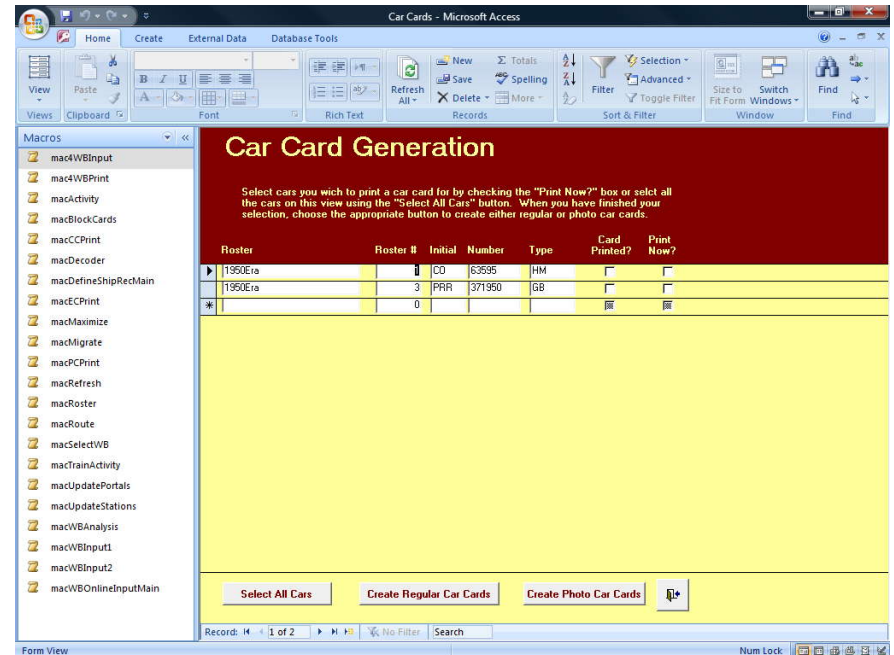
Commercial Resources Online

- www.dallasmodelworks.com
- www.albionsoftware.com

Model Railroad Operations

FREE Online Resource

- Car Cards Operations Group
 - groups.yahoo.com
 - MS Access-based system
 - Combines several functions
 - Collection Inventory
 - Car Card generation
 - Waybill generation
 - Active Yahoo! support group
 - **It's Free!**
- Several other freeware programs – Google “Car Card Generator”



Model Railroad Operations

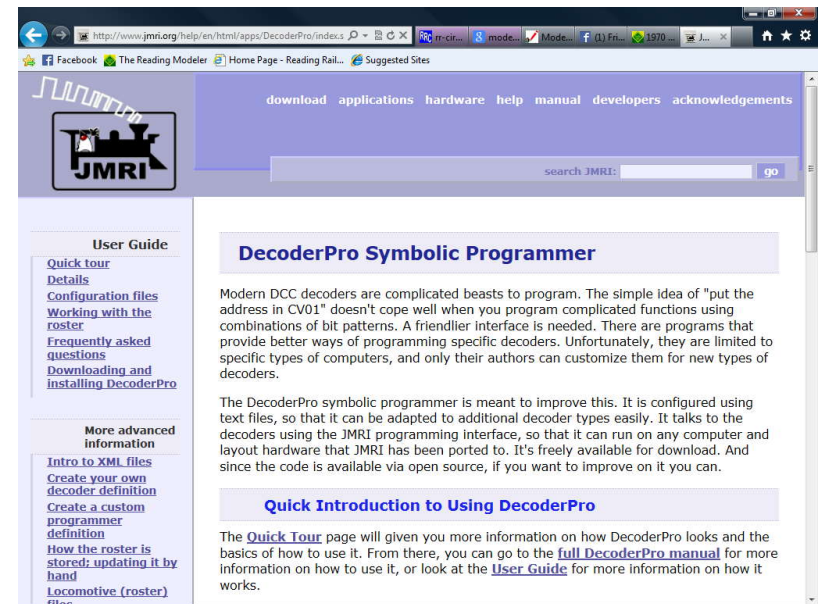
Prototypical Industry Info

- NMRA Operations Special Interest Group – www.opsig.org
 - Industry Database – www.opsig.org/reso/inddb/
 - 40,000+ North American Industries
 - Organized geographically
 - Era, Industry, Location, Serving Railroad, Commodities
 - Can “complete” a car card/waybill system
- OPSIG website is a must-view online resource if interested in prototype-based operation



DCC Support, Signaling & Control

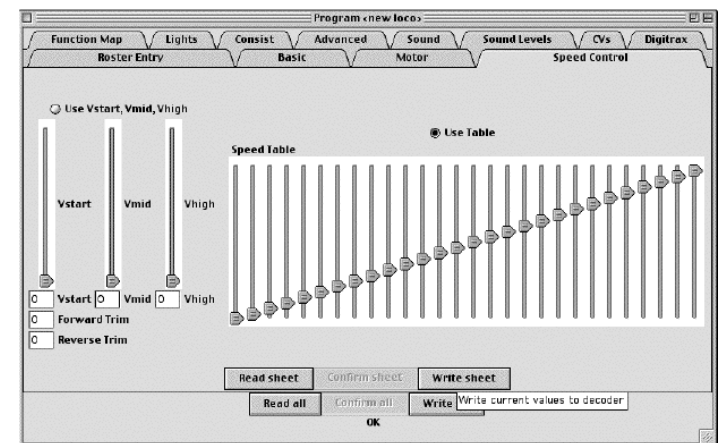
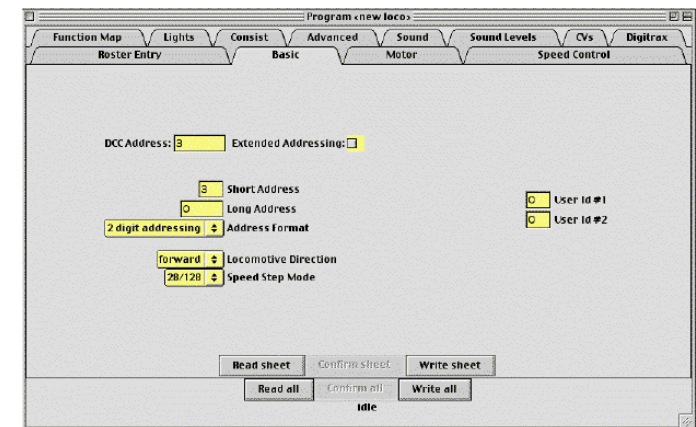
- DCC is becoming the new standard
- Decoder programming can be a pain - Configuration Variables (CVs), calculations, etc. – **MATH!**
- JMRI Decoder Pro – www.jmri.org
- Free, open-source download
- PC/Layout connection
 - Example: Locobuffer USB
 - www.rr-cirkit.com



DCC Support, Signaling & Control

JMRI Decoder Pro

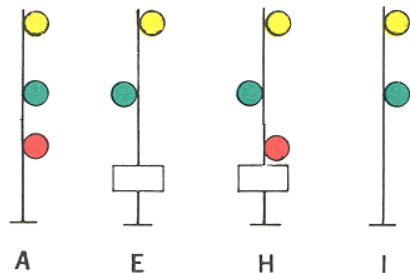
- Database of common decoder types
- User-friendly programming of decoder functions from PC
 - Sound, Lights, Consisting, etc.
- Takes the hassle out of decoder programming
- Copy/Paste functionality
 - Useful for identical loco/decoder combos
- Free, open-source program
- Extensive documentation
- Active Yahoo! support group
- www.jmri.org



DCC Support, Signaling & Control

- Everybody loves railroad signals
- The art of railroad signaling is a discipline unto itself
- Signaling becoming more prevalent on layouts

RULE 282



DCC Support, Signaling & Control

A CTC/signaling system requires the following:

- Track occupancy detection
 - Metal wheelsets with resistors on all cars
- System Logic
 - Drive switches and signals, Interlocking protection
- PC-Layout connection

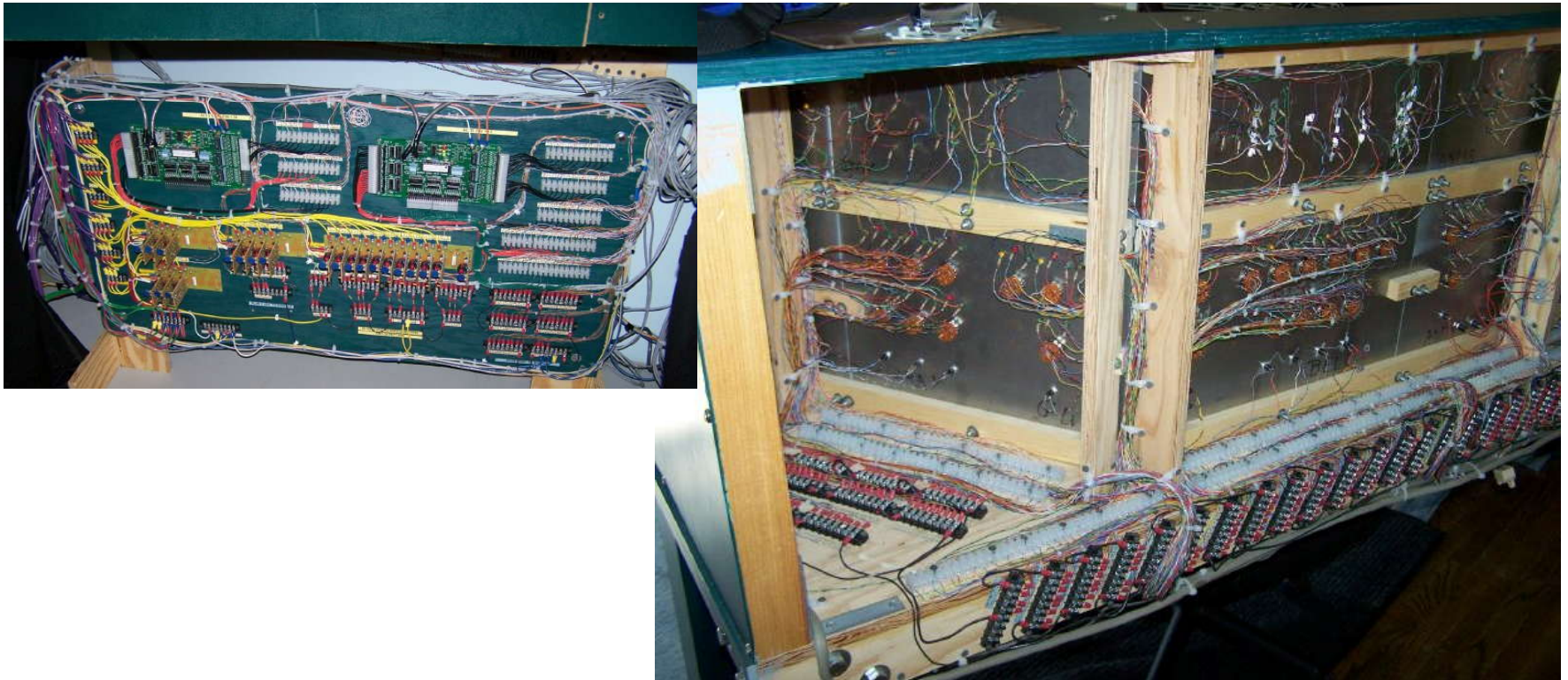
Online resources

- www.rrsignal.com
- www.ctcparts.com
- www.rr-cirkits.com
- www.jmri.org



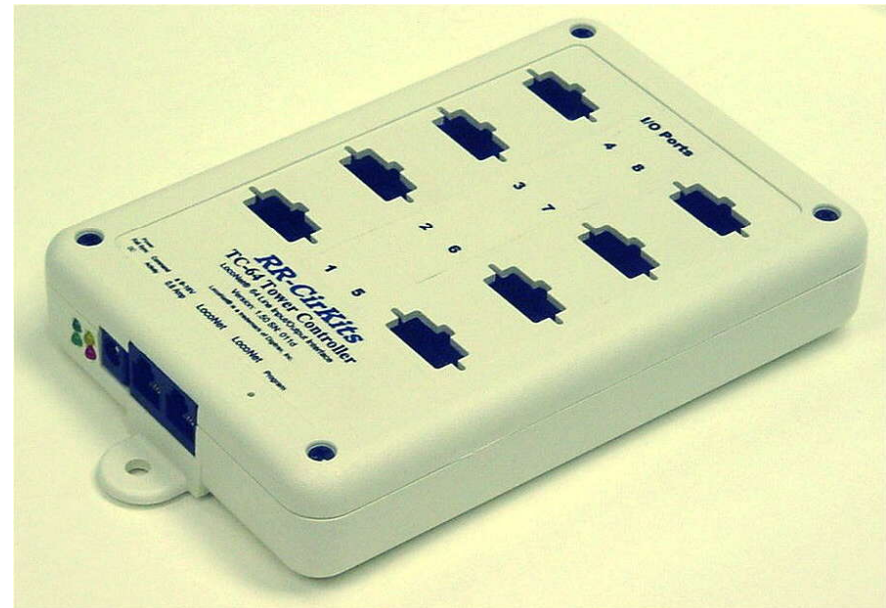
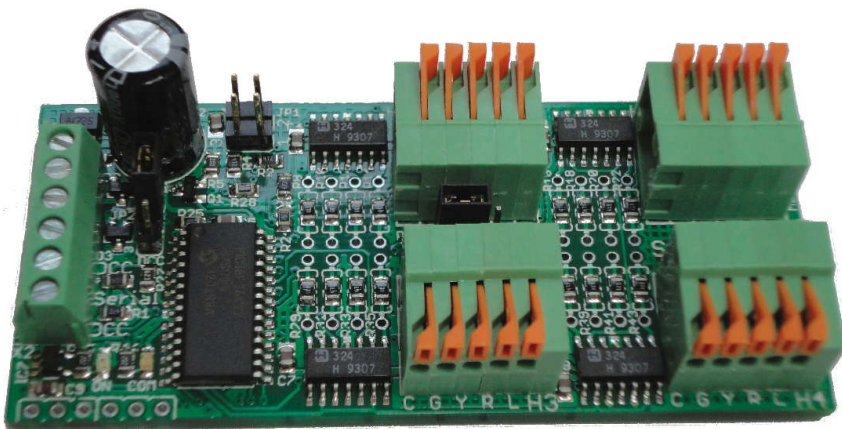
DCC Support, Signaling & Control

Connecting a computer to your layout can be daunting...



DCC Support, Signaling & Control

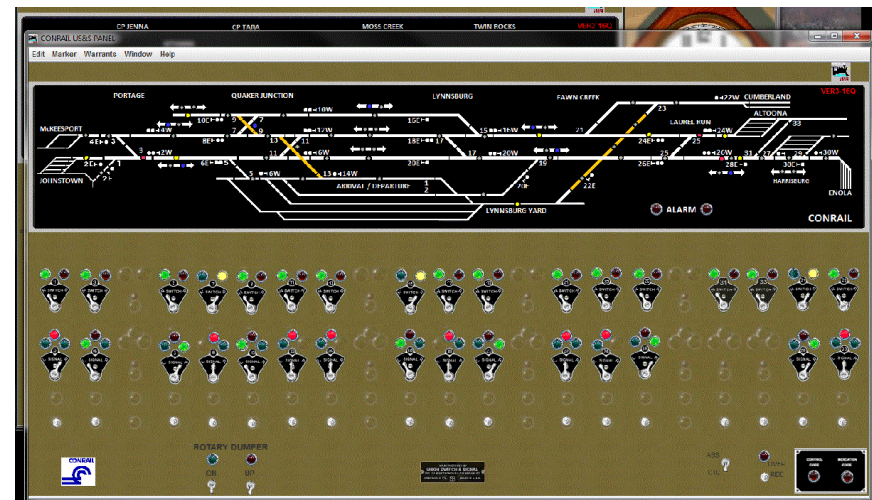
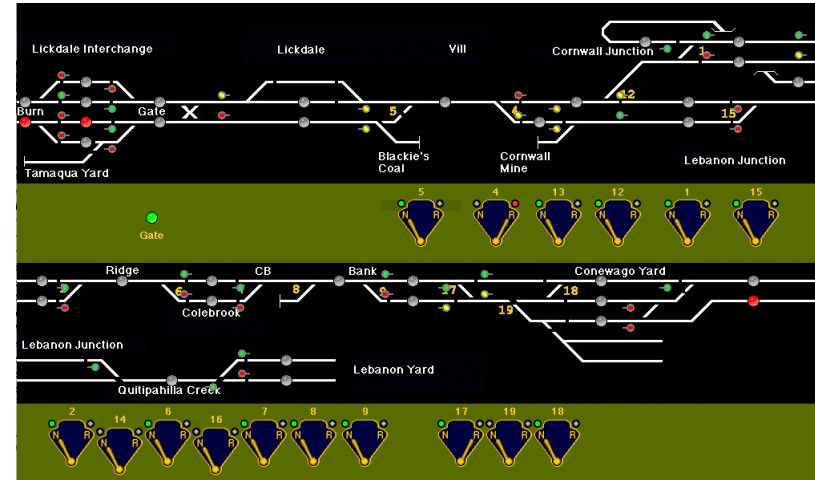
But it doesn't have to be...



DCC Support, Signaling & Control

JMRI PanelPro

- Free, open-source download
- Create graphical control panels on your computer
- Point-click interface
 - No “programming” required
- Built-in signal rules and logic
- Can drive “physical” CTC machine if desired
- Active Yahoo! support group



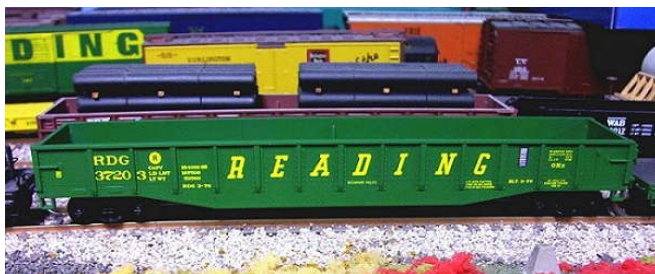
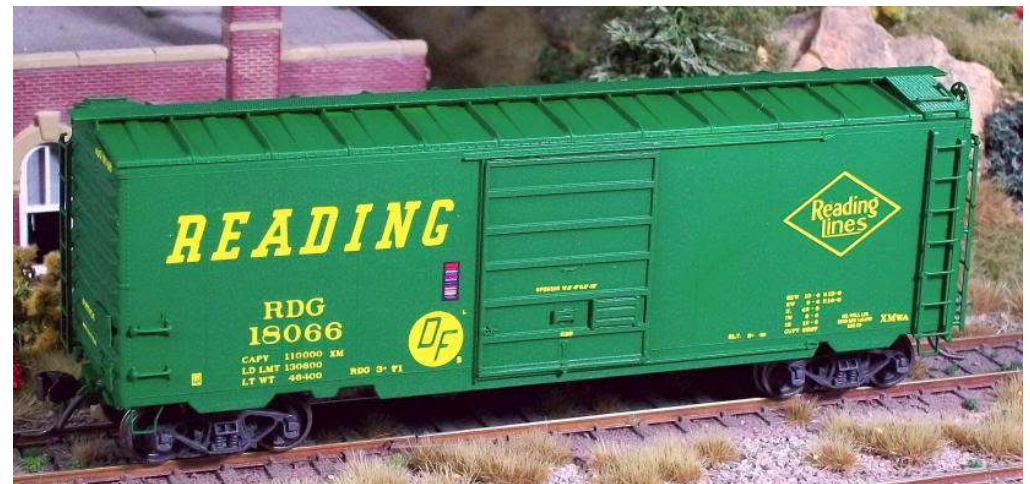
DCC Support, Signaling & Control

RR-Cirkits Electronic Components

- www.rr-cirkits.com
- Locobuffer – connection between DCC system/layout and PC
- Tower Controller – drives input/output cards
- Input/Output cards for a variety of functions
 - Block occupancy detection
 - Drive switch machines (stall motor and dual-coil solenoid)
 - Drive signals LEDs
- Easy integration with JMRI/Panel Pro
 - Components programmable via Decoder Pro
 - Set up signal logic, etc. in Panel Pro
- Online clinic info available at www.jmri.org and www.rr-cirkits.com

Decals, Signs & Printed Materials

How did we do this?



Decals, Signs & Printed Materials

Start with Prototype data

- Scans of ARHS MW plan book
- Freight car lettering diagrams
- Prototype photos (historic)
- Measurement of surviving equipment
- Many lettering components are standardized and usable across different types of freight cars
- “Cheat a little” – high-res scans of existing decal sets

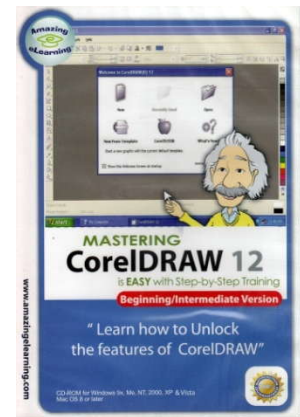
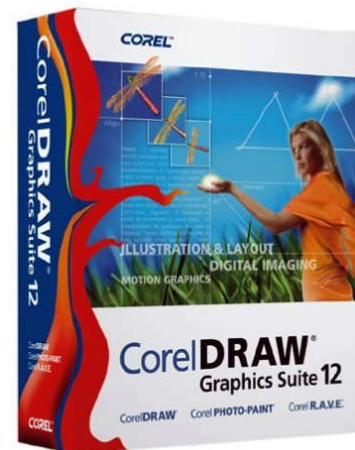


X2

Decals, Signs & Printed Materials

Vector Graphics vs. JPG Scans

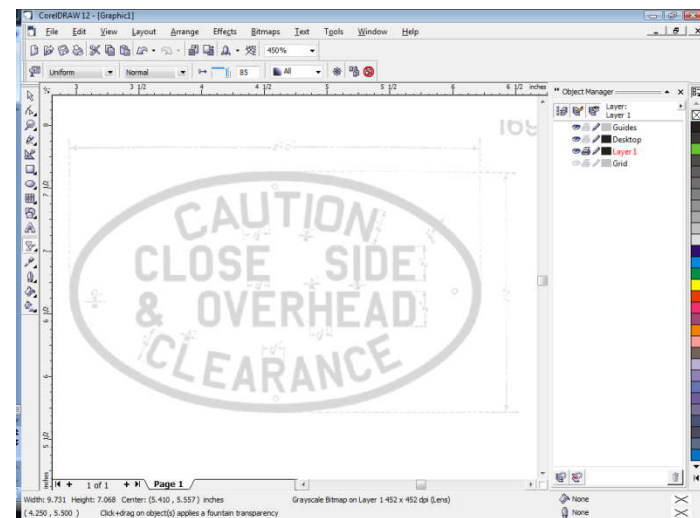
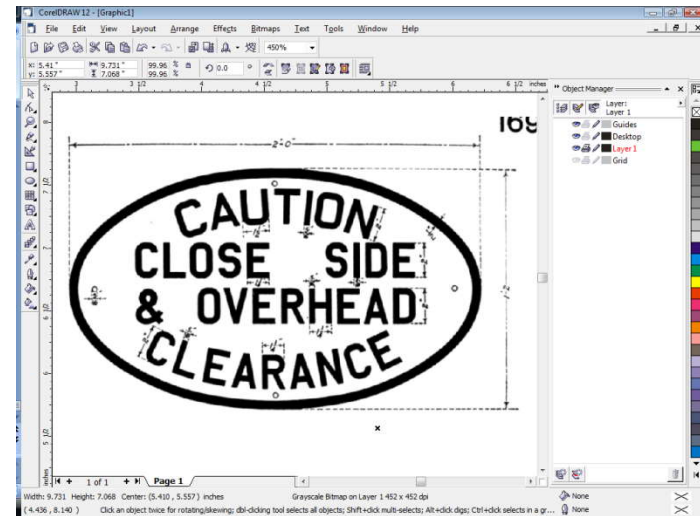
- JPG/Scans create square pixels, not suitable for print
- Vector graphics are based on curves (math again!) and scalable, which makes them suitable for print work
- Corel Draw – widely used vector graphics program
 - Older, cheaper versions available on eBay and perfectly suitable for use
 - Inexpensive tutorial programs also available on eBay
- “Onion Skin” tracing process



Decals, Signs & Printed Materials

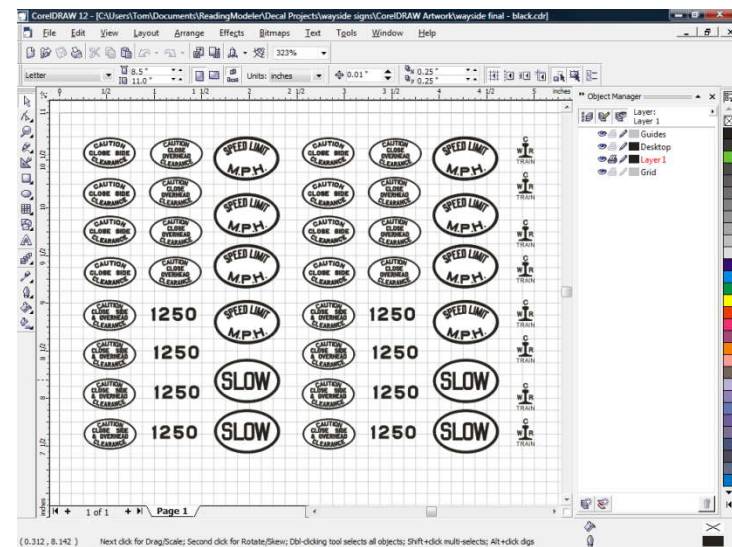
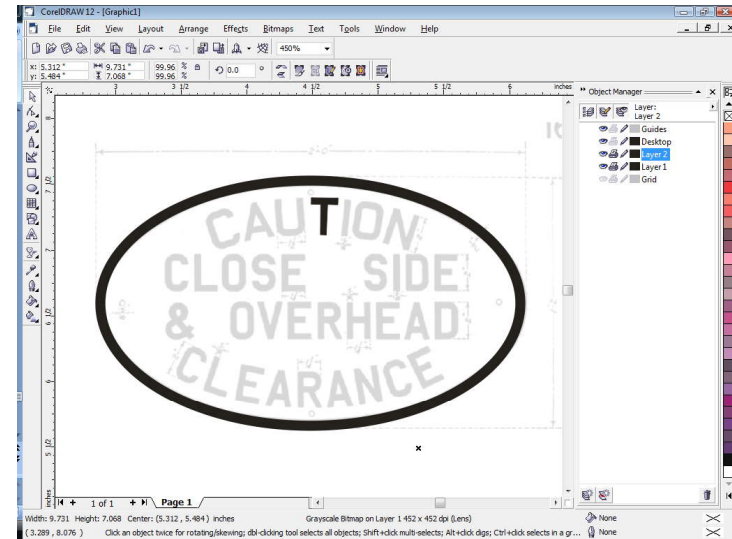
The “Nickel Tour”

- Import original scan into Corel
 - Place on own layer
 - Size doesn't matter
- Make partially transparent – onion skin
- Add new “drawing” layer on top of artwork layer



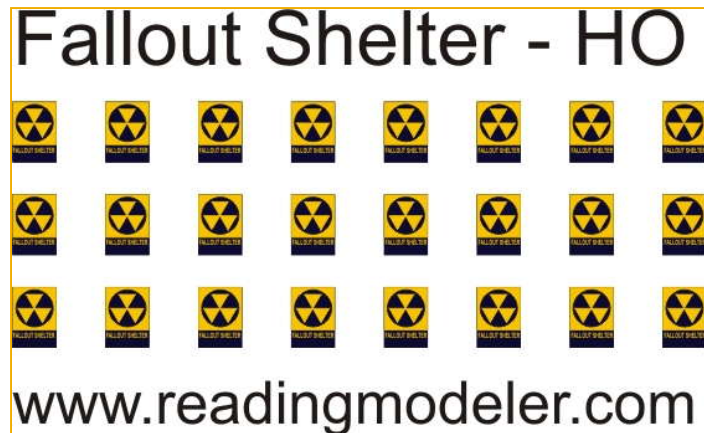
Decals, Signs & Printed Materials

- On “drawing” layer, trace over artwork using drawing tools
- When complete:
 - Delete “artwork” layer
 - Group all items on “drawing” layer
 - Resize as appropriate
 - Copy/paste various components together in final artwork
 - Most decal printers require 2x final print size
 - If working on a multicolor decal, each color must be on separate layer



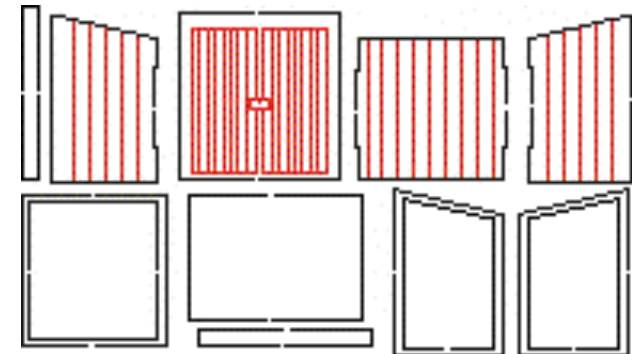
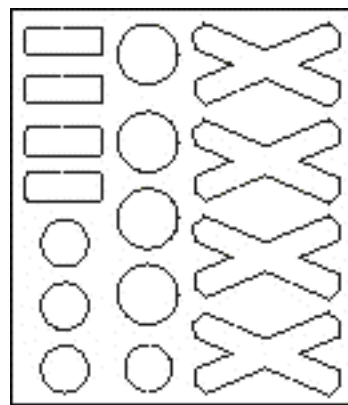
Decals, Signs & Printed Materials

- Process is essentially the same for printed signs for buildings, etc.
- JPG files often OK for this purpose – billboards, etc.
- Corel or MS Publisher useful for mass production
- Lots of signs available online



Real Live Modeling

- Laser-cut structures and details increasingly coming into the mainstream
- No longer the exclusive domain of “Craftsman” kits
 - Manufacturers often do custom cutting for individuals
- Corel Draw can create drawing files for laser cutting



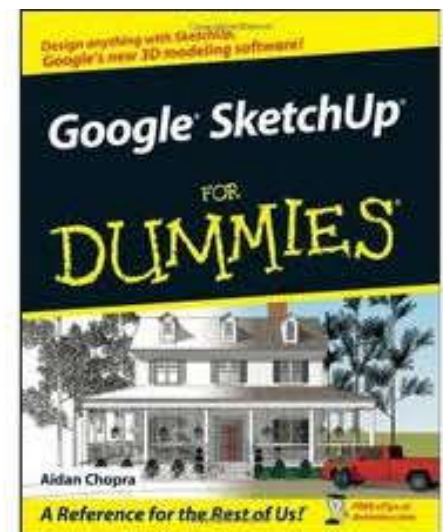
Real Live Modeling

- Prediction: The rise of rapid prototyping/3-D printing will revolutionize the hobby
- If you can dream it, it can be made!



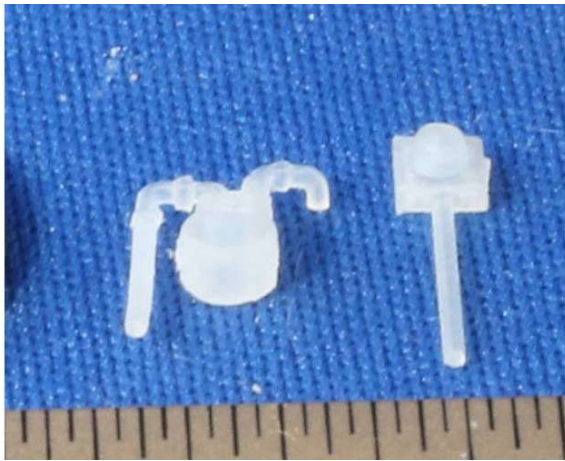
Real Live Modeling

- While cost and quality of 3D printers continues to improve, acquisition still a significant investment (\$1300 at Staples vs \$20K two years ago)
- Fortunately, there's an easier, cheaper way for model railroaders to access this technology:
 - Google SketchUp 3D modeling program
 - Shapeways.com 3D print-on-demand service

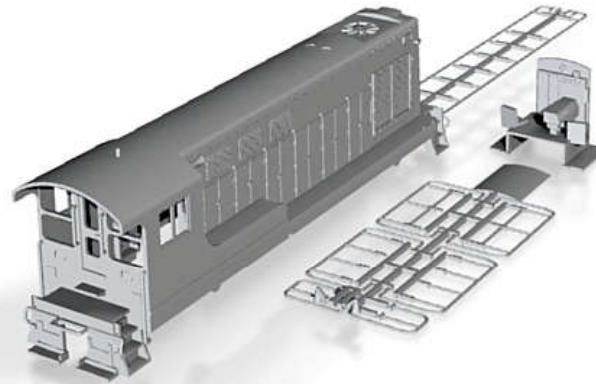


Real Live Modeling

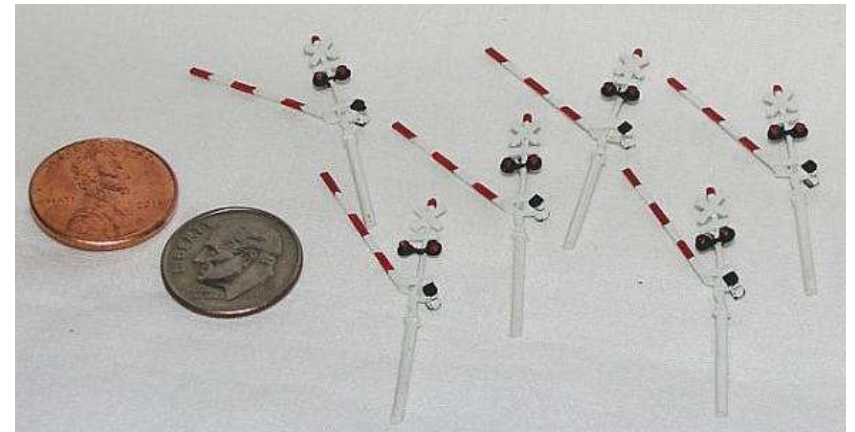
Examples of 3D-printed models on Shapeways.com



HO Scale Gas & Electric Meters



N Scale FM H10-44

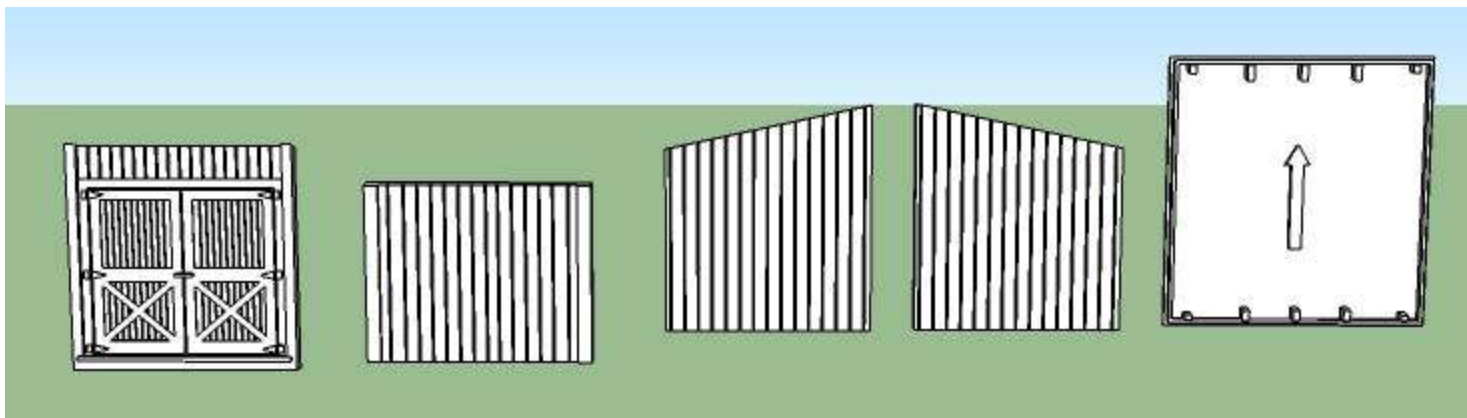


Z Scale Crossing Gates

Real Live Modeling

Google SketchUp – Free Download

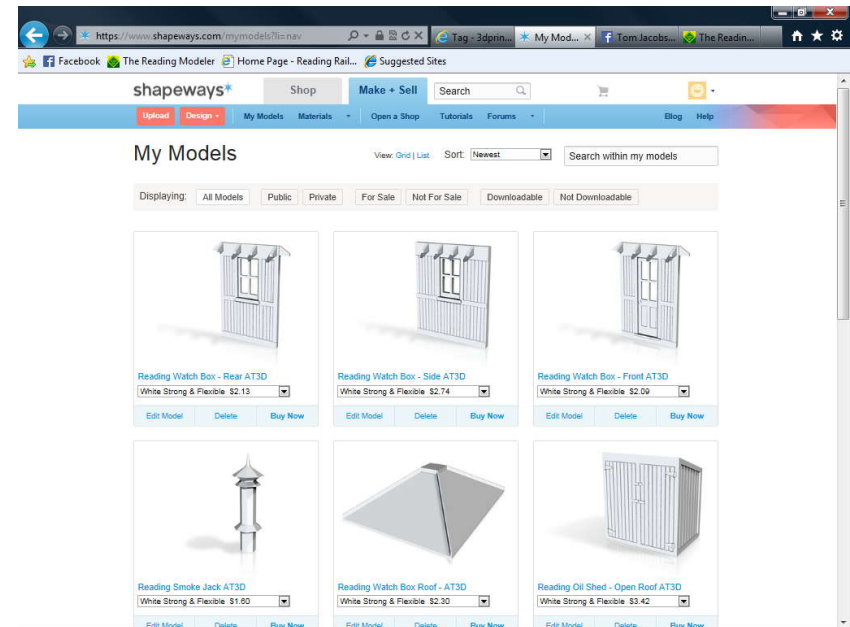
- Differences from Corel Draw
 - Create in 1:1 Scale, then scale down prior to production
 - Think in 3D
 - Think like a kit manufacturer – break into pieces
 - Think about size of finished product



3D Artwork – pieces for HO Scale Reading Company Motor Car Shed

Real Live Modeling

- After finished in SketchUp, export to .DAE format
- Use AccuTrans program to scale down to HO Scale
- Upload to Shapeways.com
 - Cost of 3D printing subject to volume and material selection
 - Frosted-Ultra-Detail recommended
 - Can make models “public” and available for sale

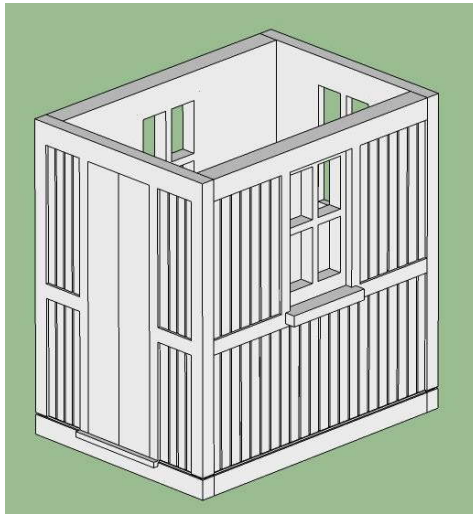


My approach: Use 3D printing to make detailed masters for rubber molds and resin casting – more suitable and cost-effective for multiple copies

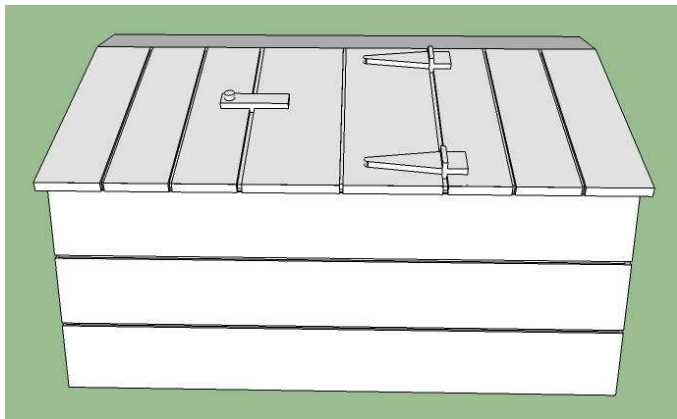
Real Live Modeling

Examples of 3D Reading Company Models

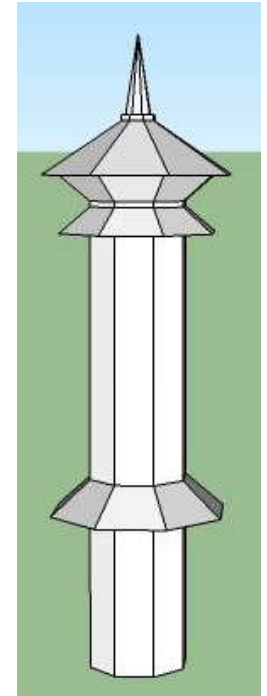
Crossing Watch Box
(in progress view)



Coal Bin



Oil Drum
Storage
Shed



Smoke Jack

Conclusions

- Computers are significantly impacting several aspects of our hobby
- Simplifying previously challenging tasks
- Entirely new skill sets facilitate improved end results, “democratizing” the hobby
- Warning about “armchair modeling” still holds true - a means, not an end

Thank You!

Questions?

Happy Modeling!