



Upper Cumberland Railroad Society

A Chartered Tennessee Non-Profit Corporation, IRC 501(c)(3) designated

MODEL RAILROAD WIRING CONSIDERATIONS & TECHNIQUES

**May 11, 2024
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OVERVIEW

- TRACK WIRE PATTERNS:
 - Wiring pattern: Loop or Star pattern
 - DC or DCC
 - DC likely will need blocking
 - DCC
 - Size of layout
 - Wiring pattern: Loop or Star pattern
- WIRE TYPE: Solid or Stranded
- WIRE INSULATION TYPE: Simple hook-up wire best

OVERVIEW

- WIRE SIZE:
 - Size depends on Voltage & Current requirements
 - Estimate varies dependent on Scale, # of Locomotives running at same time, DC or DCC, Sound or No Sound, etc.
 - Size of layout
 - Wiring pattern: Loop or Star pattern
- WIRE TYPE: Solid or Stranded
- WIRE INSULATION TYPE
- EVERY TRACK SOLDERED? PROS/CONS

OVERVIEW

- **OTHER WIRING**

- Signal wiring
- Turnout motor wiring
- Scenery wiring (street lights, buildings, ect)
- Multi-core data wiring (loconet) for stationary decoders
- Under layout lighting
- 120 volt wiring for main power, wall warts and convenience

REMEMBER TO WORK SAFELY. NO POWER ON THE WIRES YOU ARE CONNECTING

WIRE TYPES

Solid Wire

- More Rigid
- Soldering can be difficult
- Easier to use with some connectors

Stranded Wire

- More Flexible
- Soldering is easier
- Better when solder wire to wire

Both have Advantages & Disadvantages

**Color Coding & Labeling –
Strongly Recommended**

OTHER WIRE TYPES

- Twisted pairs
- Flat data (6 conductor) for loconet
- Multi-colored ribbon

Labeling – Strongly Recommended

Connecting Wires

- Twist & Tape
- Wire Nuts
- Screw terminals
- Swage-on connectors
- Solder-on lugs
- Insulation displacement (scotch-lock style)
- Lever Connectors
- Loconet "jewel" connectors
- Soldering

SOLDERING

- TYPE: 60/40 (Sn/Pb) or 63/37 Rosin Core
- Rosin Flux: Flux first – do NOT rely on flux embedded in solder
- Pre-tinning helps
- Use copper braid or solder sucker when de-soldering
- Demo at the end.

Some Tools & Supplies Required

Pliers, screw drivers, soldering tools, wire strippers, swagers, crimpers, VOM meter, loconet tester, patience, drill motor & bits, small file for track prep

Splicing pieces, cable ties, electrical tape, flux, solder, patience, connectors, q-tips & alcohol for cleaning

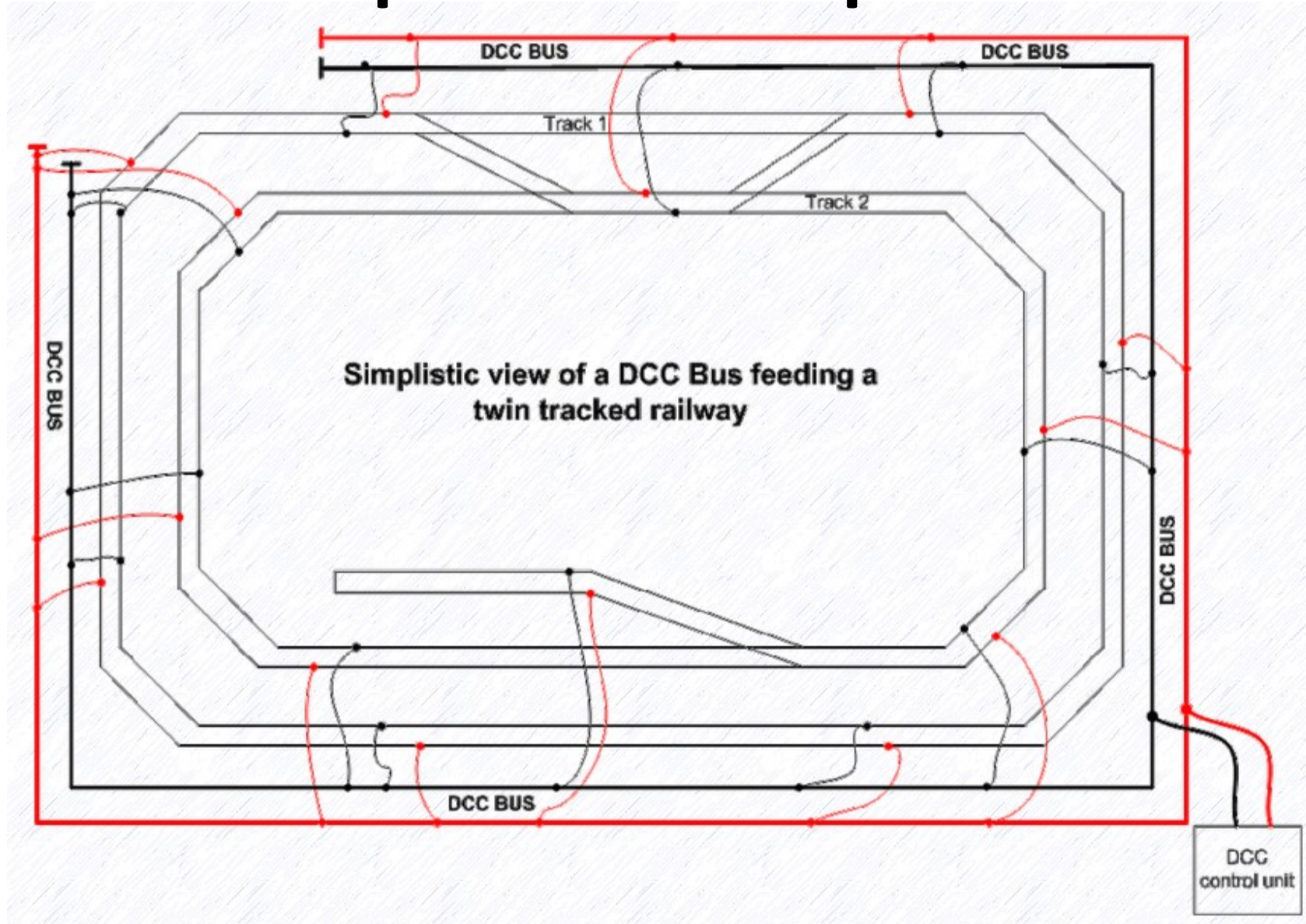
TESTING as You Go

- VOM Meter Check for continuity and correct voltages often
- Test run locos, lighting, turnouts as you go
- Labeling: Confirm labels are correct as recorded

DOCUMENTATION

- **Loose Leaf Binder:** (Sample)
- **Electronic Files**
- **LABELING: Different Methods for different uses**

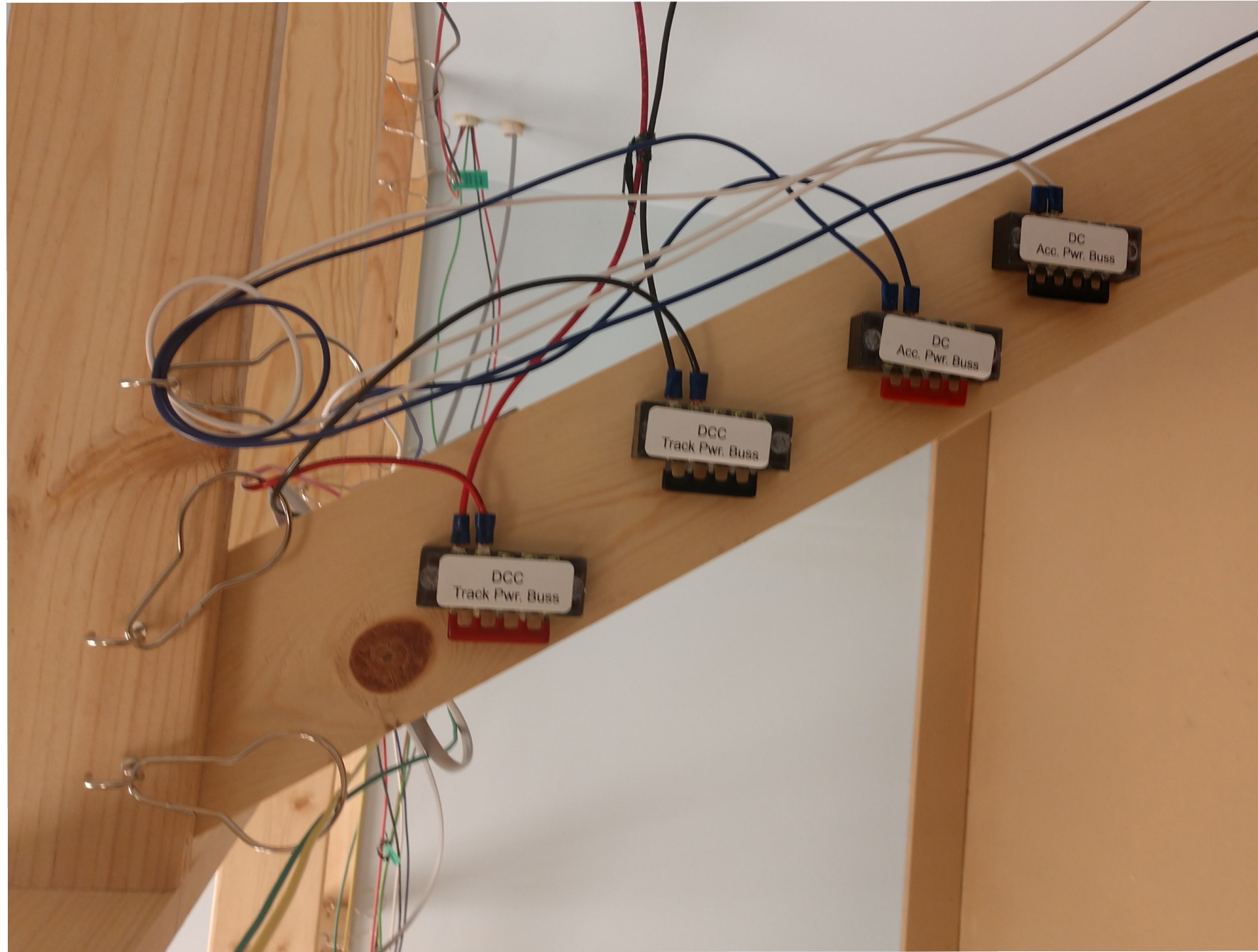
Simple DCC Example



Wire Routing Example



Wire Label Example



Questions & Links

www.wiringfordcc.com

www.digitrax.com

www.model-railroad-hobbyist.com