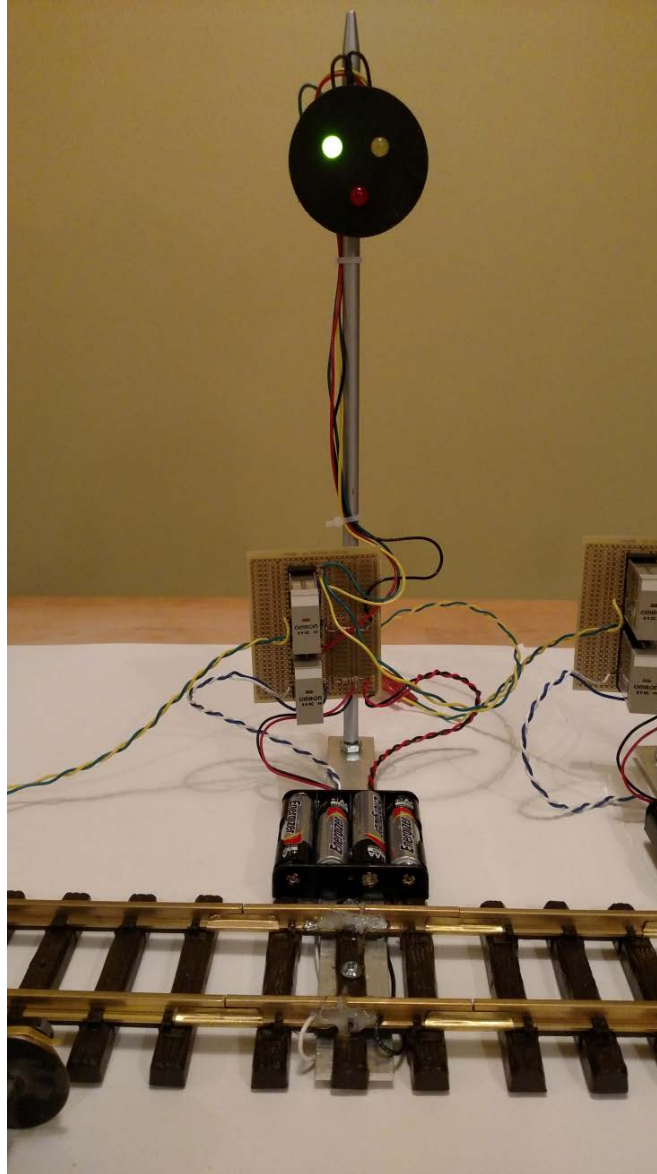


4 Block, 3 Aspect Signal System Demonstrator

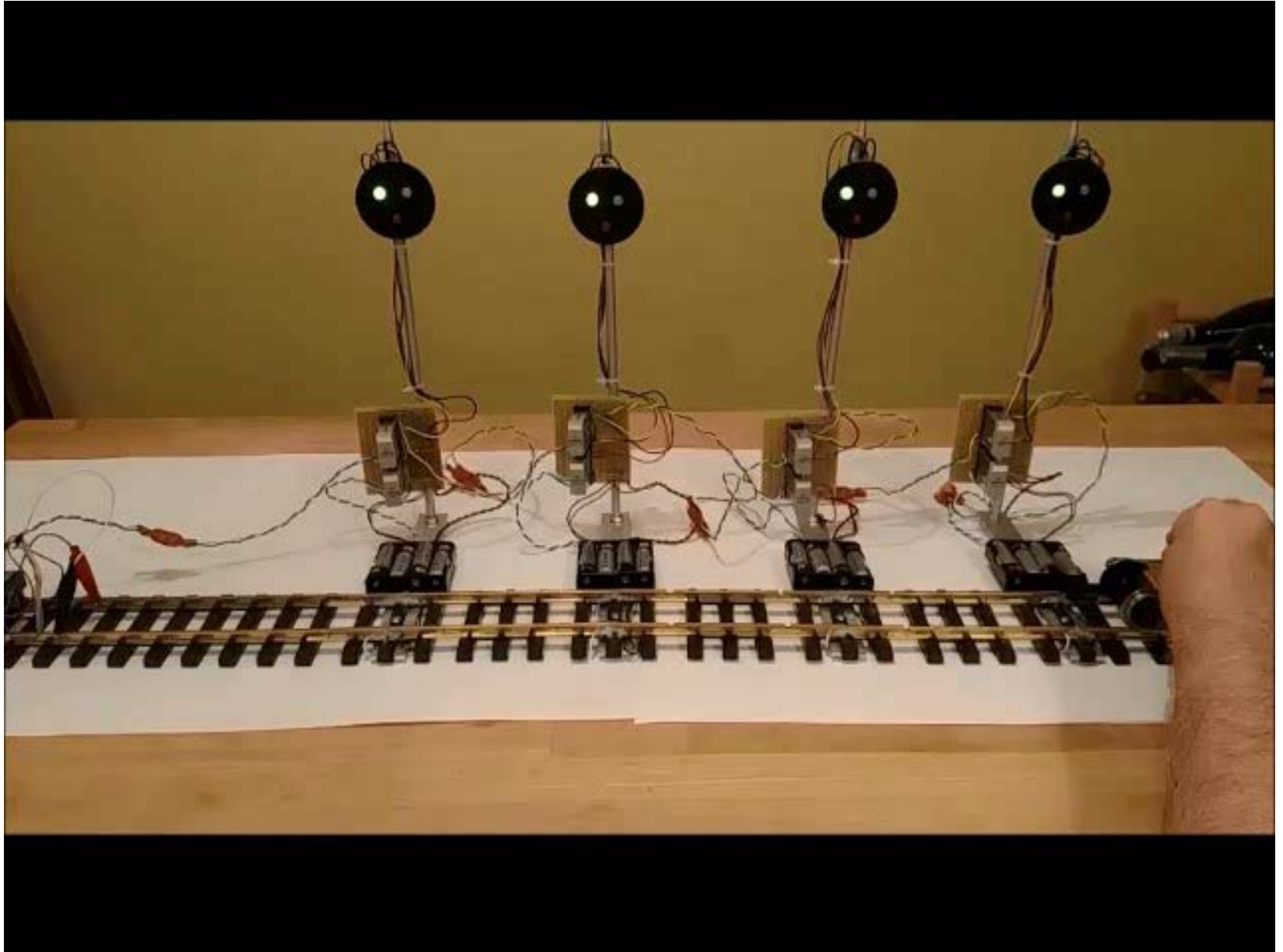
Parts List and Assembly Instructions

Rev. 0

Automatic Signal Assembly

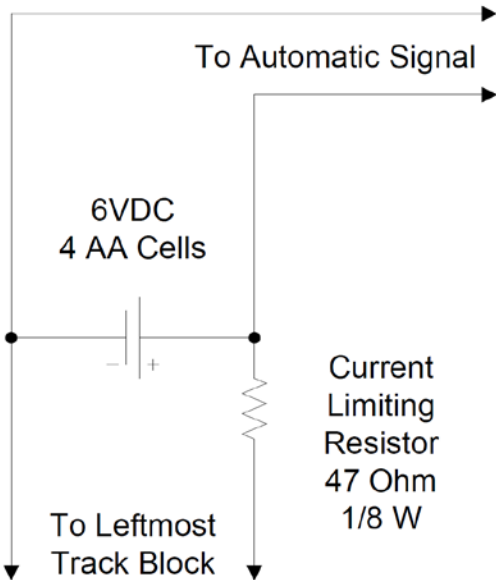


Demo Video

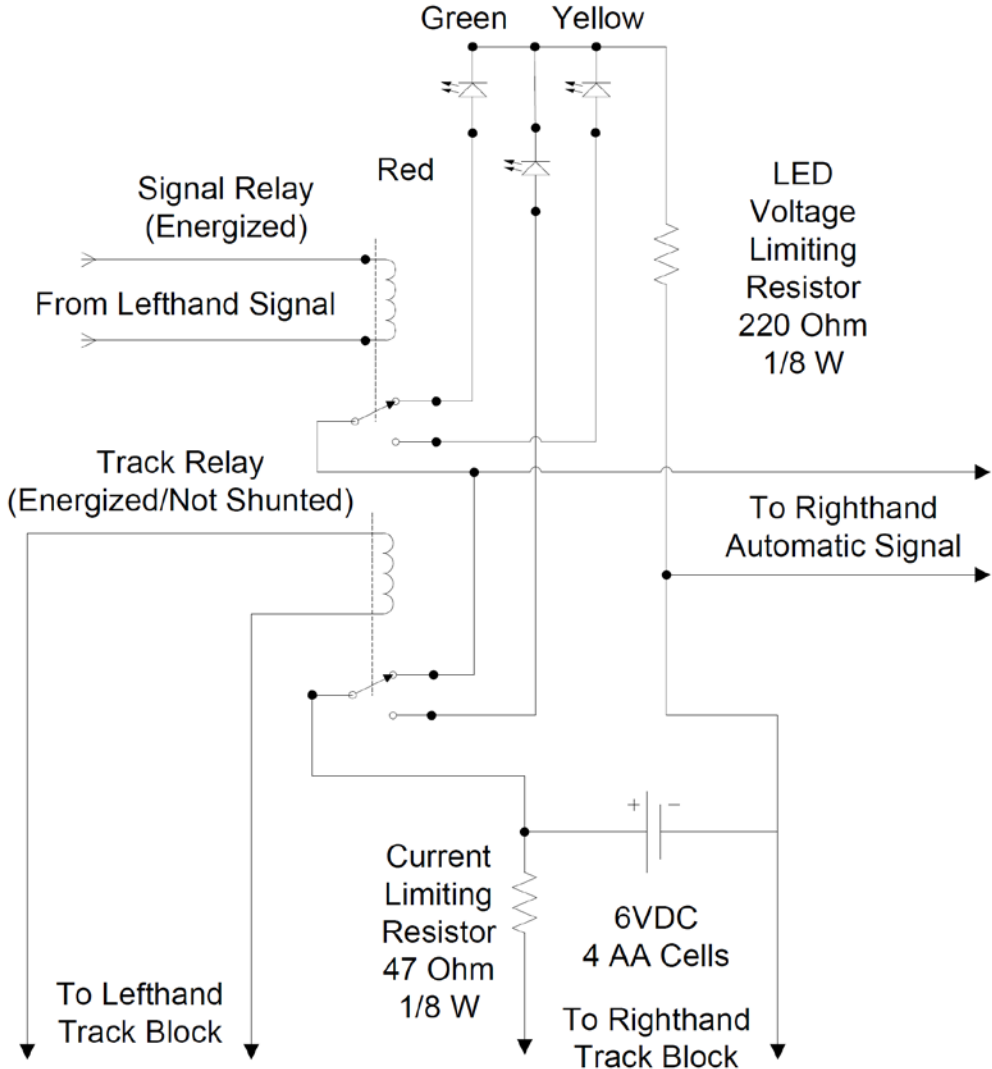


Automatic Signal Assembly Schematic

Leftmost Track Block / Test Rig

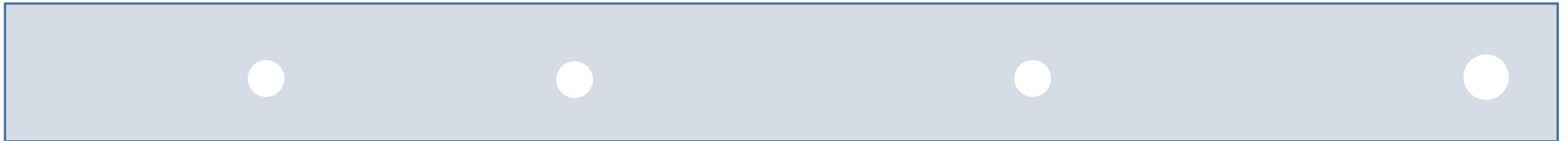


Automatic Signal

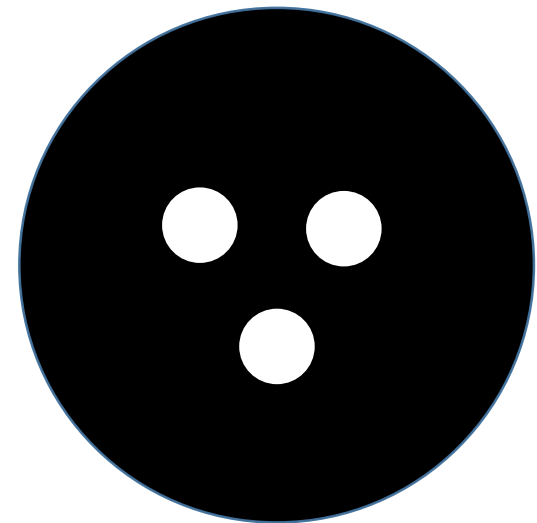


Hardware Parts 1 of 3

- Support Bar
 - 9" long
 - $\frac{1}{4}$ " hole at right end and 3 $\frac{3}{16}$ " holes



- Signal Head
 - Drill $\frac{3}{8}$ " holes for press fit of LED



Hardware Parts 2 of 3

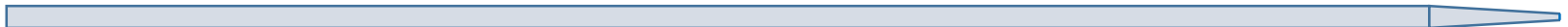
- Signal Head Mount

- $\frac{3}{4}$ " piece



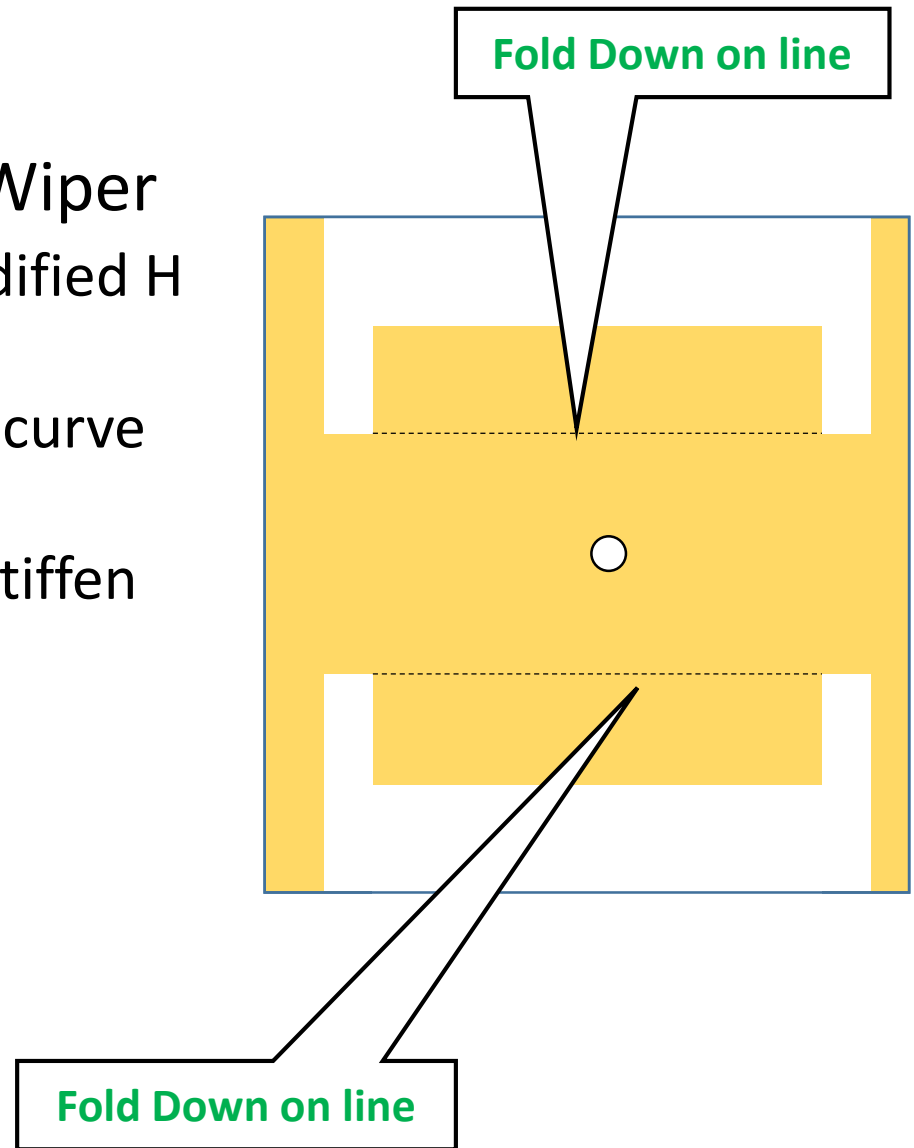
- Signal Mast

- 13 $\frac{1}{2}$ " long
- Cut off end cap and $\frac{1}{4}$ " from pointed tip



Hardware Parts 3 of 3

- Brass Shunt Enhancing Wiper
 - Cut Brass sheet into modified H shape
 - Curl outside legs of H to curve over wheels
 - Fold two flaps down to stiffen H crossbar
 - Drill hole in center of H

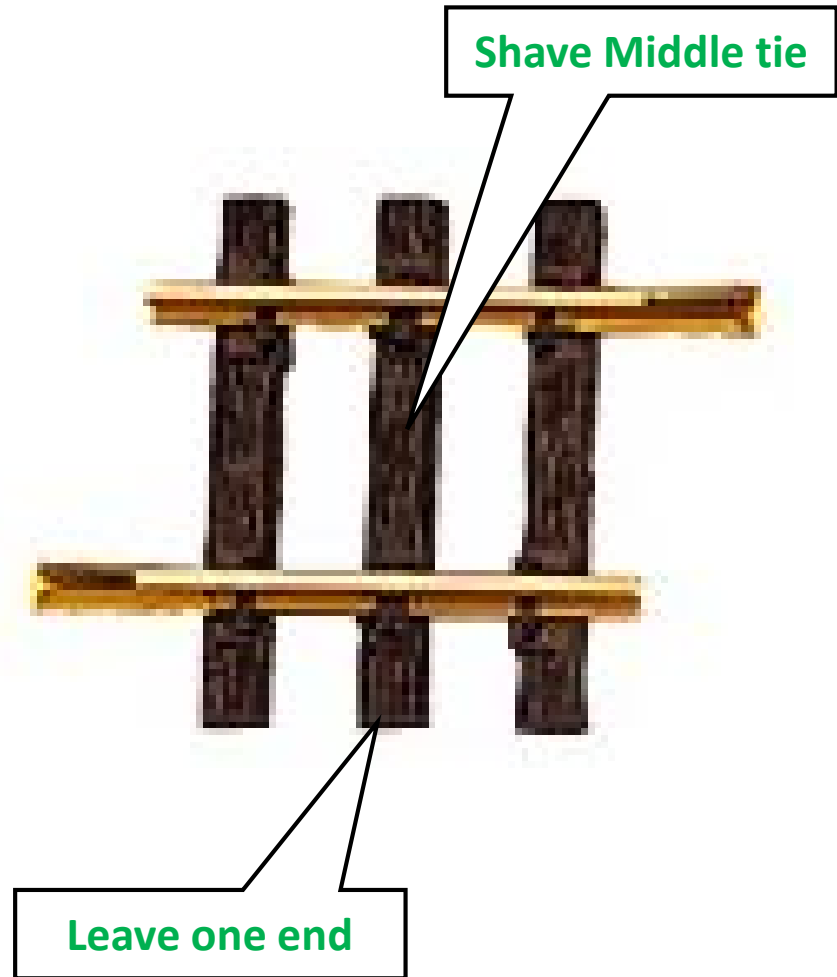


Wires

- Blue/White Track Circuits – 16” Twisted
- Black/Red Track Circuits – 16” Twisted
- LED Signal Head Red/Yellow/Green/Black – 16” Twisted
- Yellow/Green Interconnects Long – 14” Twisted
- Yellow/Green Interconnects Short – 8” Twisted
(Yellow Green wires have crimped disconnects on one end of both long and short)
- Red Jumper – 1/2”
- Blue Jumper – 3”

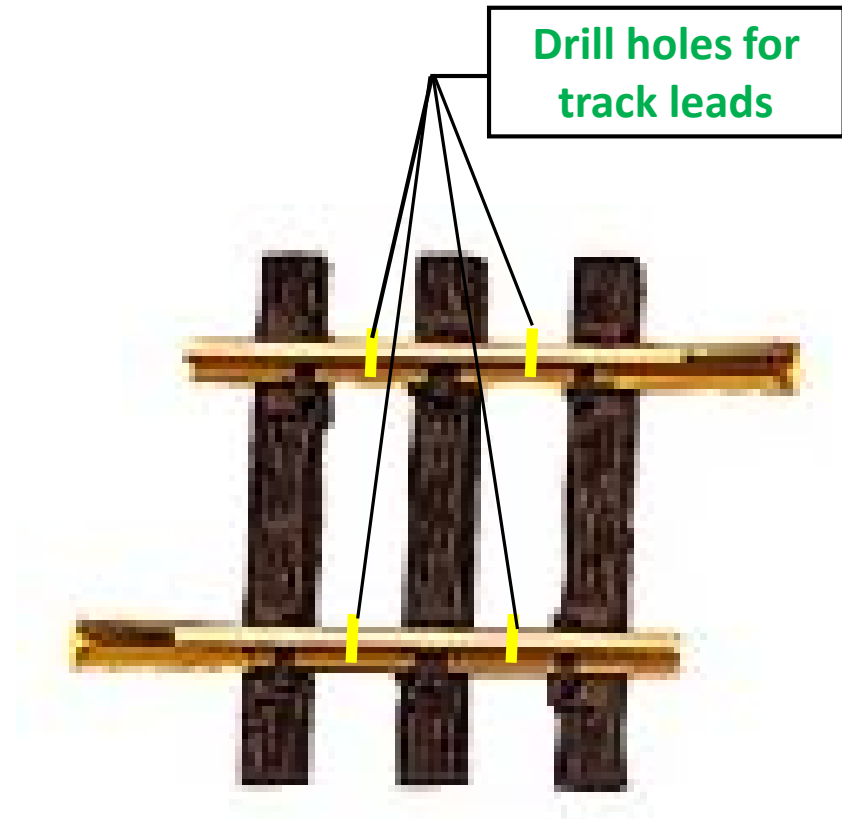
Signal Block Joint Track Section 1 of 4

- Shave bottom of middle tie to accept bar to support signal mast.



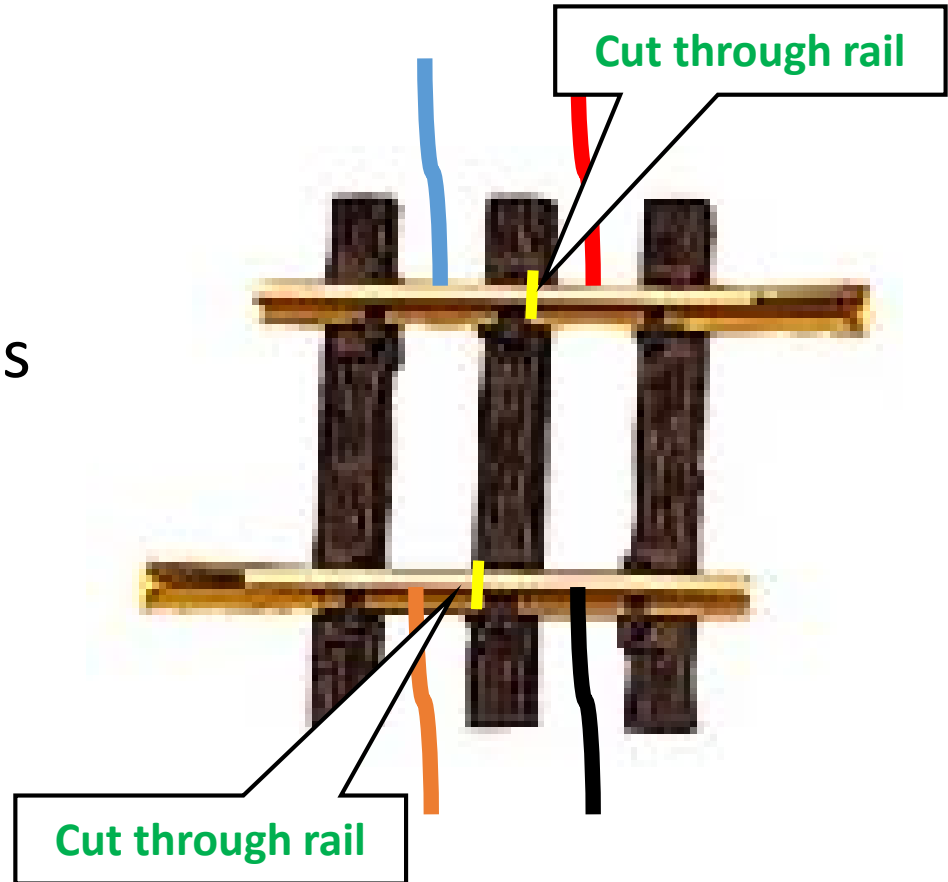
Signal Block Joint Track Section 2 of 4

- Drill 1/16" holes through rail web
- Burnish rail at drill holes to improve soldering
- Solder 4 track leads



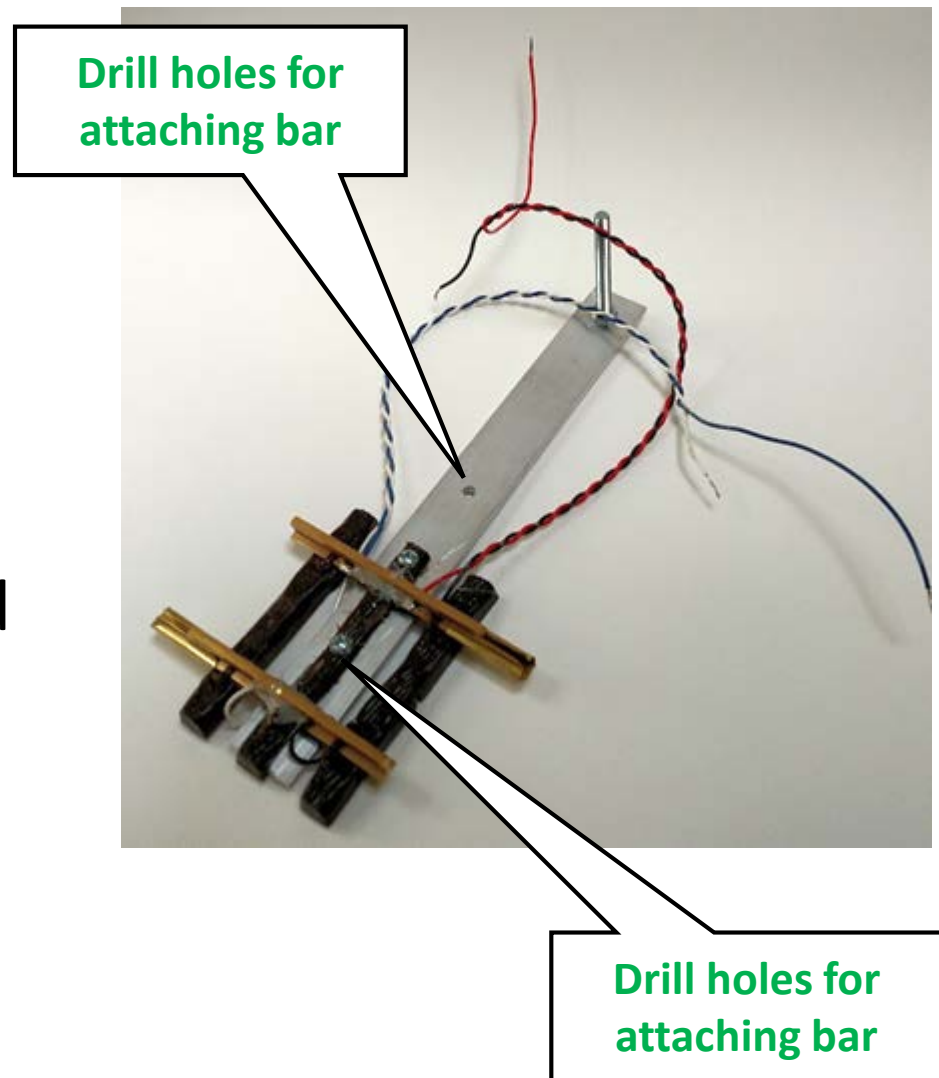
Signal Block Joint Track Section 3 of 4

- Cut through rail
- Use Hot melt glue to hold rails and fill gaps (hint: connect two other track pieces to place rails in correct alignment)



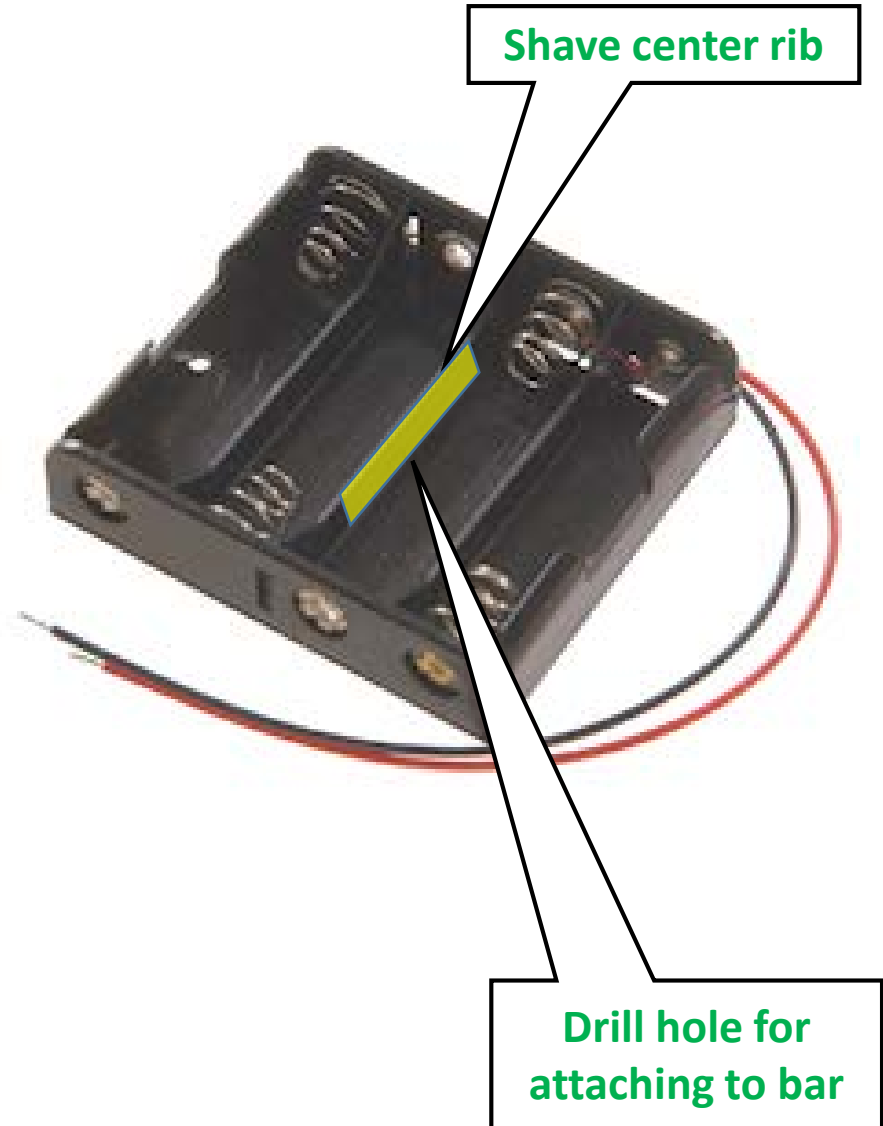
Signal Block Joint Track Section 4 of 4

- Drill 3/16" holes for signal support bar
- Attach bar with #6 screws
- Install 1/4" x 3" bolt and nut
- Done



Battery Holder

- Shave central rib to allow screw to seat against the holder
- Drill $3/16$ " hole for attaching to signal support bar in center



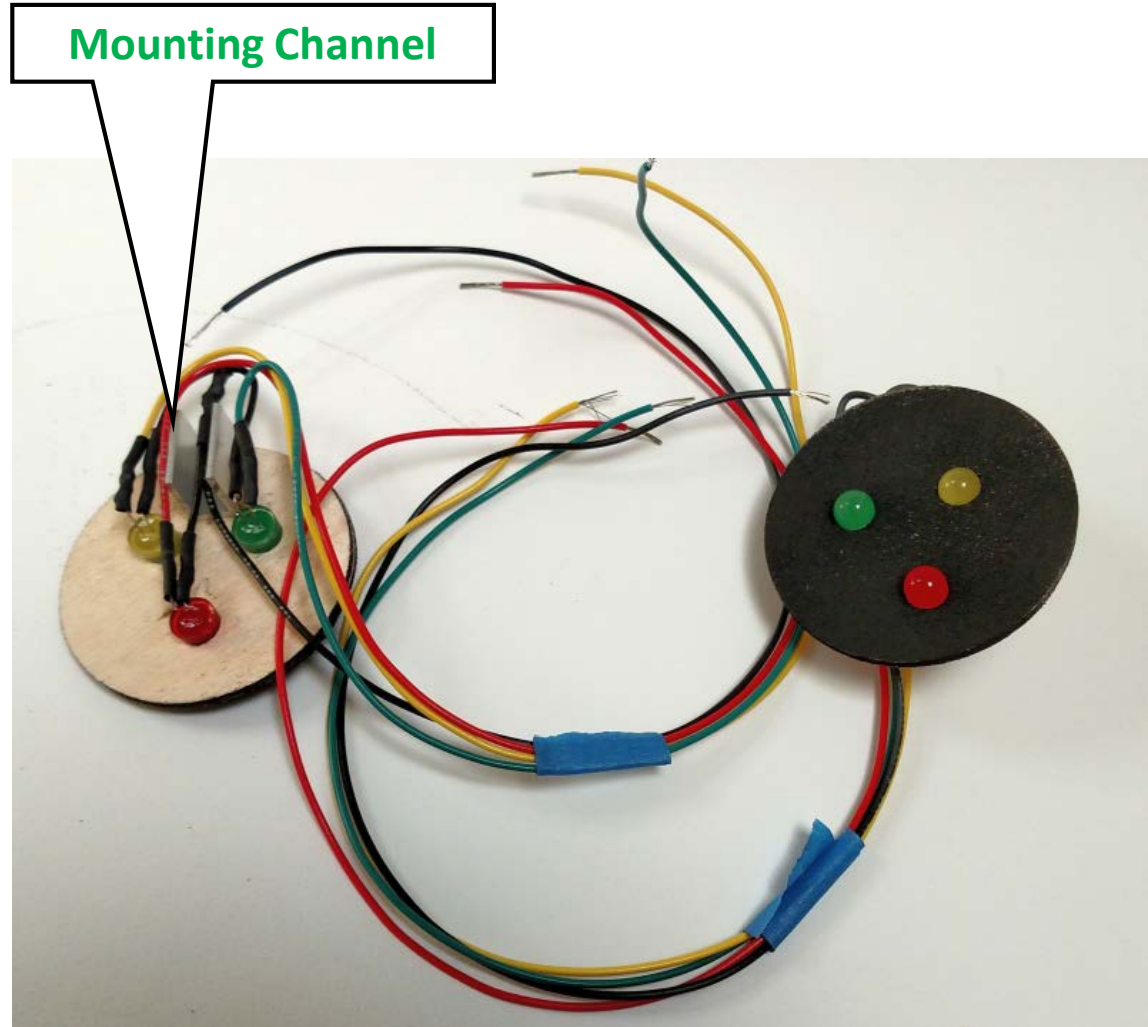
Track Shunting Truck

- Bolt H shaped shunting wiper onto truck with Drawer pull hardware (bolt may need to be shortened)
- Done



Signal Head

- Paint Disk Flat Black
- Press fit LED's into Disk Note G, Y ,R positions
- Wire Leds
- Glue Channel to mount to Mast
- Done



Circuit Board 1/3

- Work from **front of board**. Backside shown to identify soldering pads
- Install Relay Sockets
- Enlarge holes receiving 22 ga. wire with 1/16" drill bit (Shown with o)
- Solder LED wires
- Solder Battery Leads

LED Common

Y LED

G LED

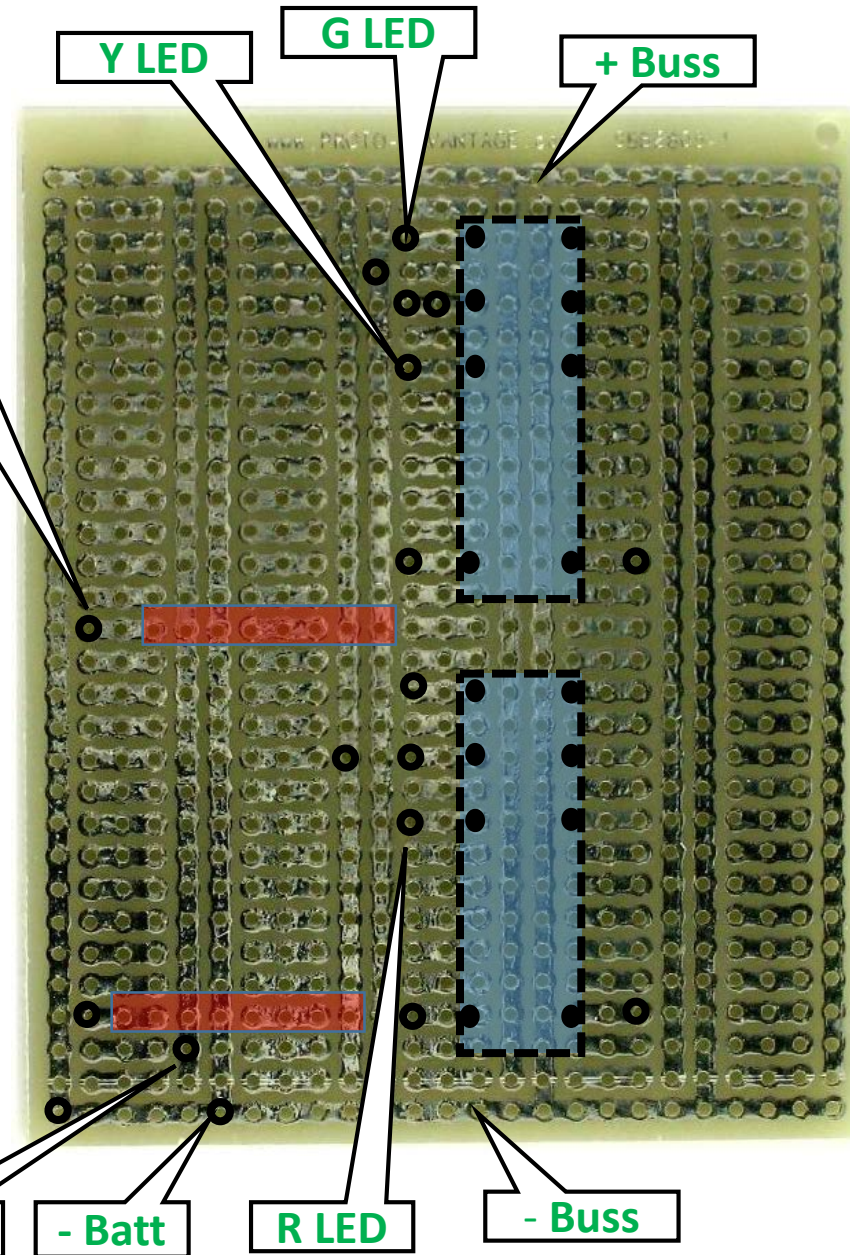
+ Buss

+ Batt

- Batt

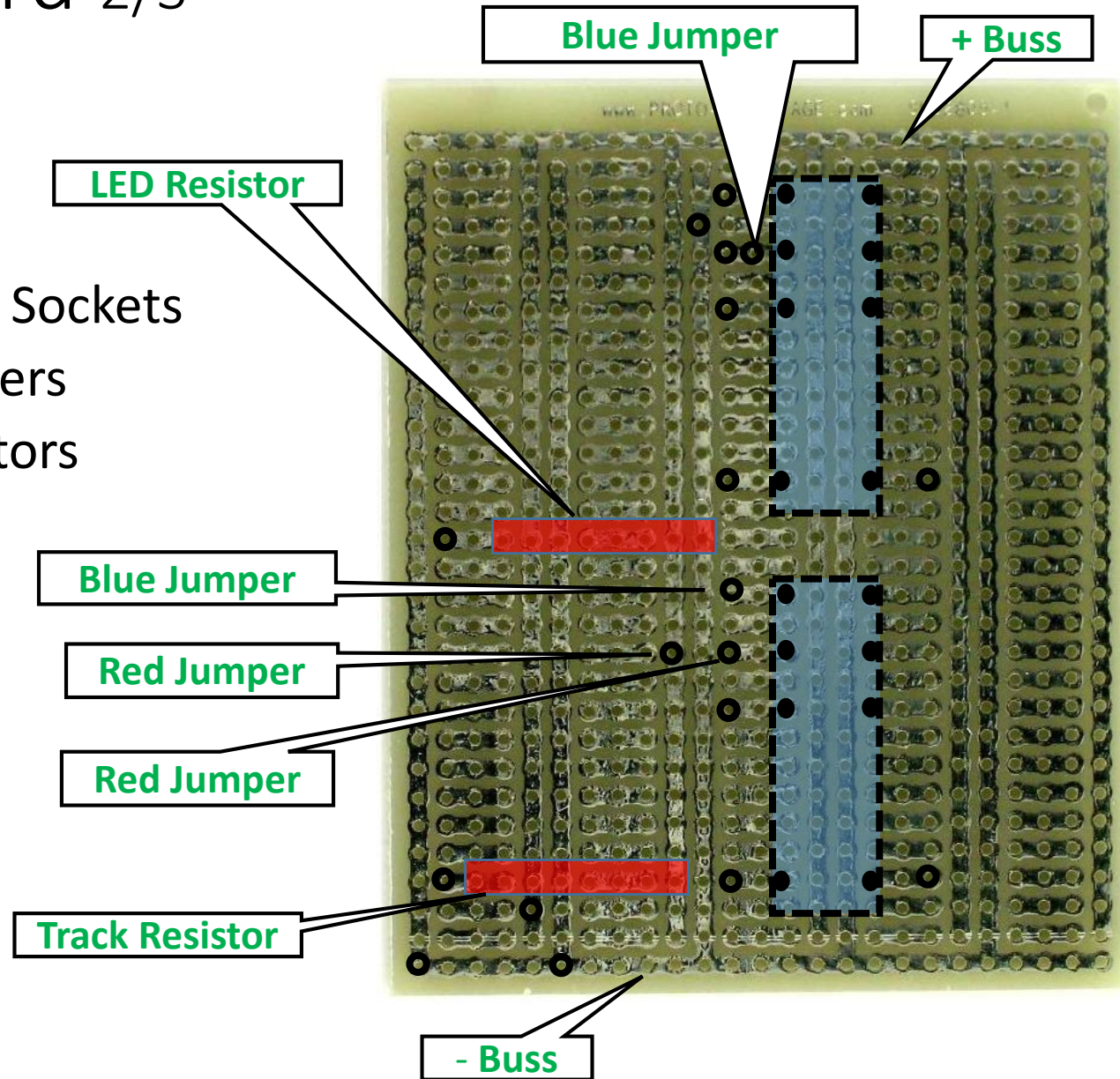
R LED

- Buss



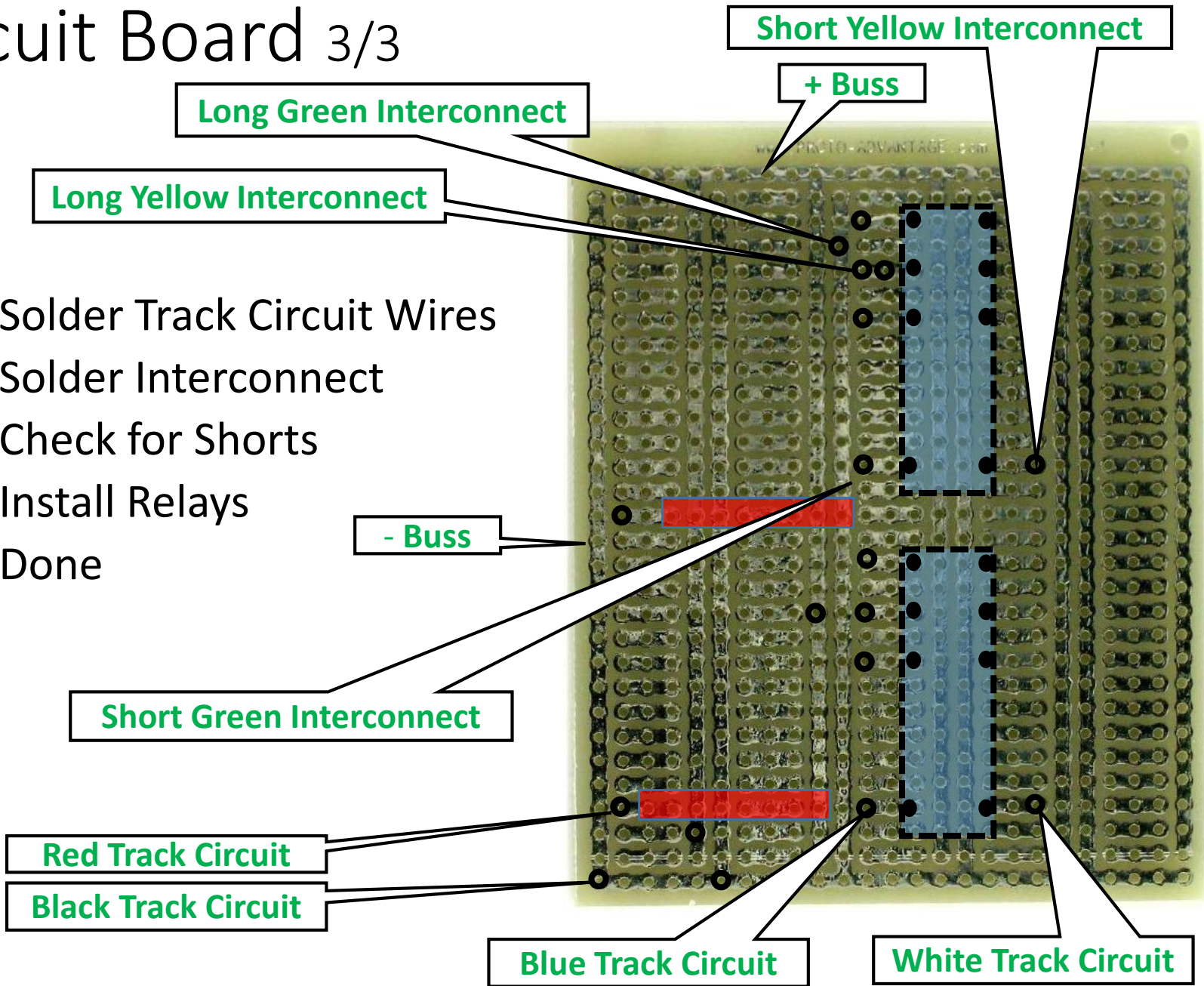
Circuit Board 2/3

- Solder Relay Sockets
- Solder Jumpers
- Solder Resistors



Circuit Board 3/3

- Solder Track Circuit Wires
- Solder Interconnect
- Check for Shorts
- Install Relays
- Done



Parts List ^{1/2}

	Qty.	Supplier	Part Number
OMRON G2R-2-S RELAY DPDT 5A 6V	8	Digi-Key	Z2225-ND
RELAY SOCKET PC MNT FOR G2R-2-S	8	Digi-Key	Z2605-ND
HOOK-UP WIRE ASSORT STRAND 22AWG	2	Digi-Key	1568-1358-ND
LED GREEN DIFF 8MM ROUND	4	Digi-Key	754-1742-ND
LED RED DIFF 8MM ROUND	4	Digi-Key	754-1743-ND
LED YELLOW DIFF 8MM ROUND	4	Digi-Key	WP793YD-ND
SOLDER BREADBOARD 28 ROW 5 COLUMN	4	Digi-Key	SBB2805-1-ND
47 Ohm 1/8 W Resistor	5	Digi-Key	CF18JT47ROCT-ND
220 Ohm 1/8 W Resistor	4	Digi-Key	CF18JT220RCT-ND
Heat Shrink Tubing pkg.	3	Home Depot	
Zip Ties 4" pkg.	1	Home Depot	
Zip Tie Mounting Pad 1" pkg. of 10	1	Home Depot	
Aluminum Bar	2	Home Depot	
Aluminum Channel	1	Lowe's	
Battery Holder 4 AA	5	Lowe's	364395
¼ X 3 Bolt and nut pkg.	2	Lowe's	
AA Batteries	20		
#6 x3/8" Bolt and nut pkg.	4	Lowe's	
Alligator Clips pkg	1	Lowe's	
Crimp Disconnects pkg.	2	Lowe's	
Drawer Pull	1	Lowe's	

Parts List 2/2

	Qty.	Supplier	Part Number
Knitting Needles 14" 10mm pkg. of 2	2	Hobby Lobby	
Brass sheet	1	Hobby Lobby	
Wooden Disk 2.68" diameter	4	Michael's	
LGB Track 10000 11-3/4" Straight track	5	Amazon	
LGB Track 10080 3-3/4" Straight Track	4	Amazon	
Freight Truck	1	USA Trains	R2038

Tools and Supplies

30 W Soldering Iron with narrow and wide chisel tips

Rosin Core Solder

Drill and Bits 1/16", 3/16", 3/8", 1/4"

Wire Stripper / Crimper

Diagonal cutter

Tin Snips

Adjustable Wrench

Hack Saw

Dremel Tool and Cut-off Wheels

Screw Driver

Hot/Cool Glue Gun and Glue Sticks

AA Batteries