How to use Electronics to Enhance your Layout: An Introduction

© Howard Watkins, Peter Brownlow, MERG

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Model Electronics Railway Group

- An International UK based group of over 1300 members.
- MERG's aim is to actively promote and advance the use of electronic and computer technology for model railway operation.
- Many kits are available to members.

www.merg.org.uk

Contents

- Wiring Points
- How to drive point motors
- Baseboard wiring
- Layout Control Bus

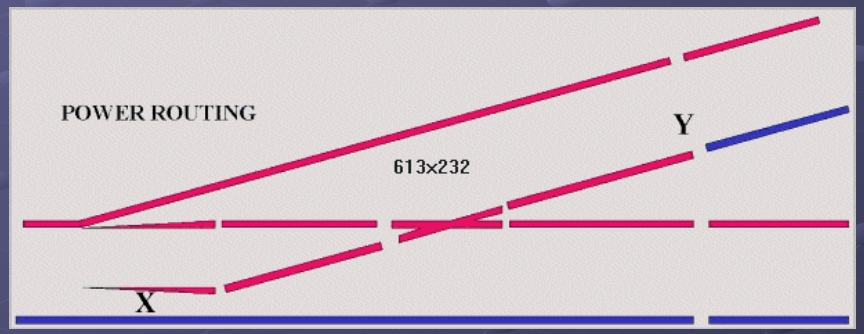
Wiring Points

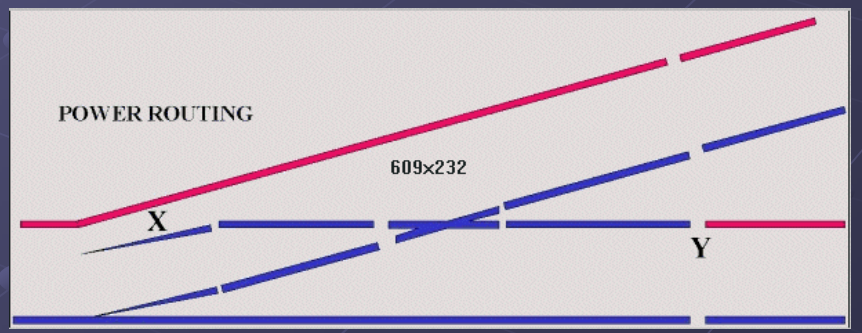
Animated Images on

http://www.proto87.com/turnout-wiring-for-DCC.html

Wiring Points - Electrofrog

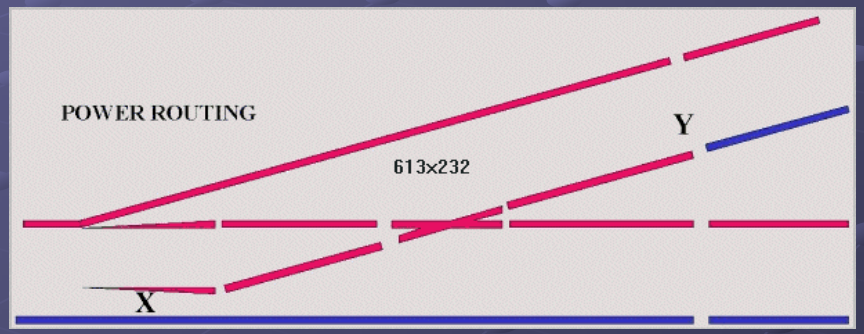
- Power Routing – self isolating sidings (stop at Y)
- Relies on switch rails contacting stock rails
- Continuous Pickup but can cause shorts at X if clearances tight and/or wheels wide.
- Used on Peco points

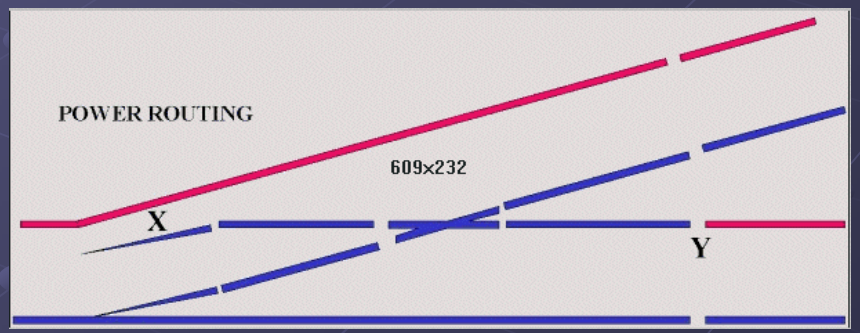




Wiring Points - Electrofrog

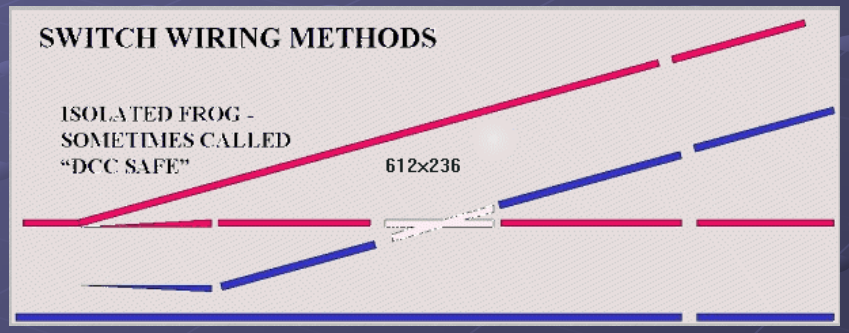
- Switching the Frog e.g. via a relay.
- Now have another potential short - Relay may change before switch blades disconnect.

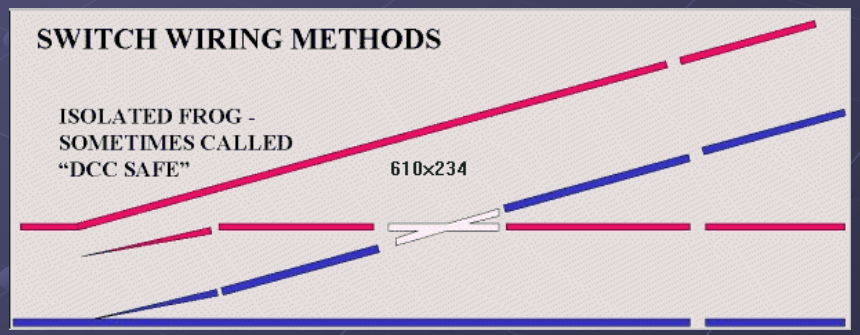




Wiring Points – Dead Frog

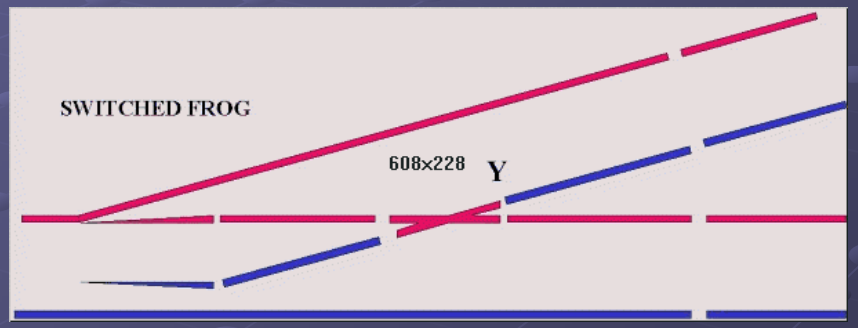
- switch rails bonded to stock rails “DCC friendly”
- No shorts between switch rail & stock rail
- Siding not isolated
- But - short wheelbase locos may stall on the frog

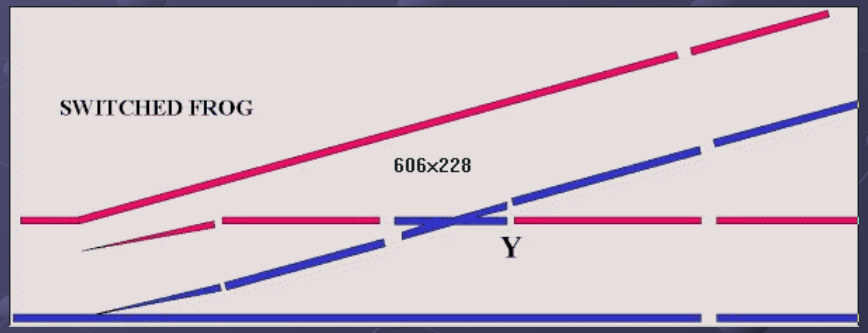




Wiring Points – switching the frog

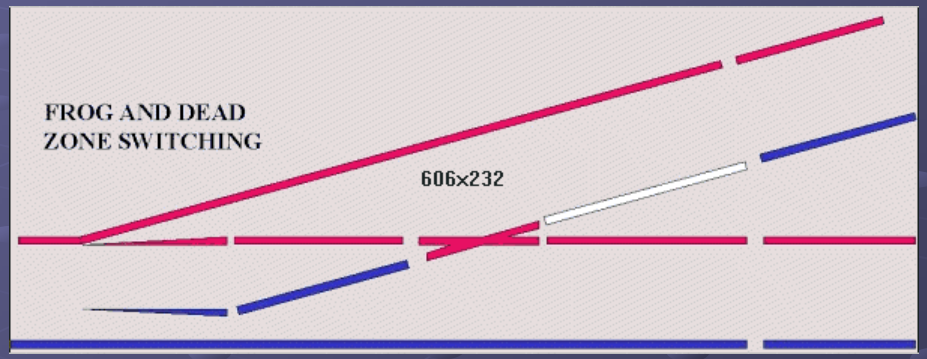
- switch rails bonded to stock rails as before, but now with continuous pickup.
- Can get a short at Y if loco approaches with point against it.

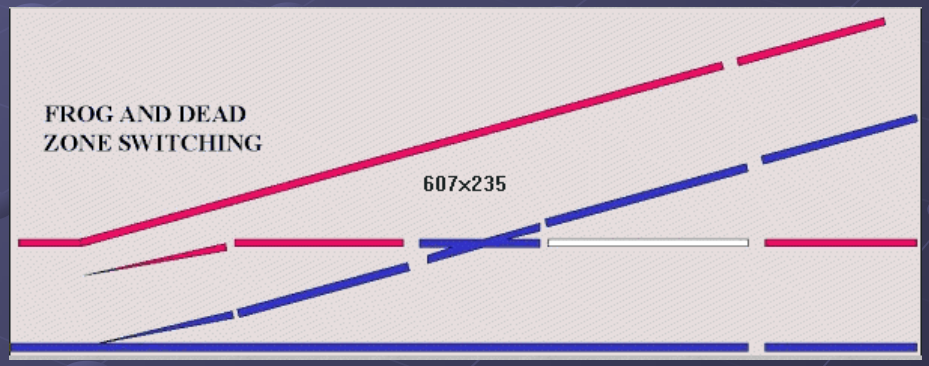




Wiring Points – add a Dead Zone

- Make the Dead Zone at least as long as the longest loco.
- Now a loco approaching the point set against its travel will stop before creating a short.





From

http://www.proto87.com/turnout-wiring-for-DCC.html

How to Drive Point Motors

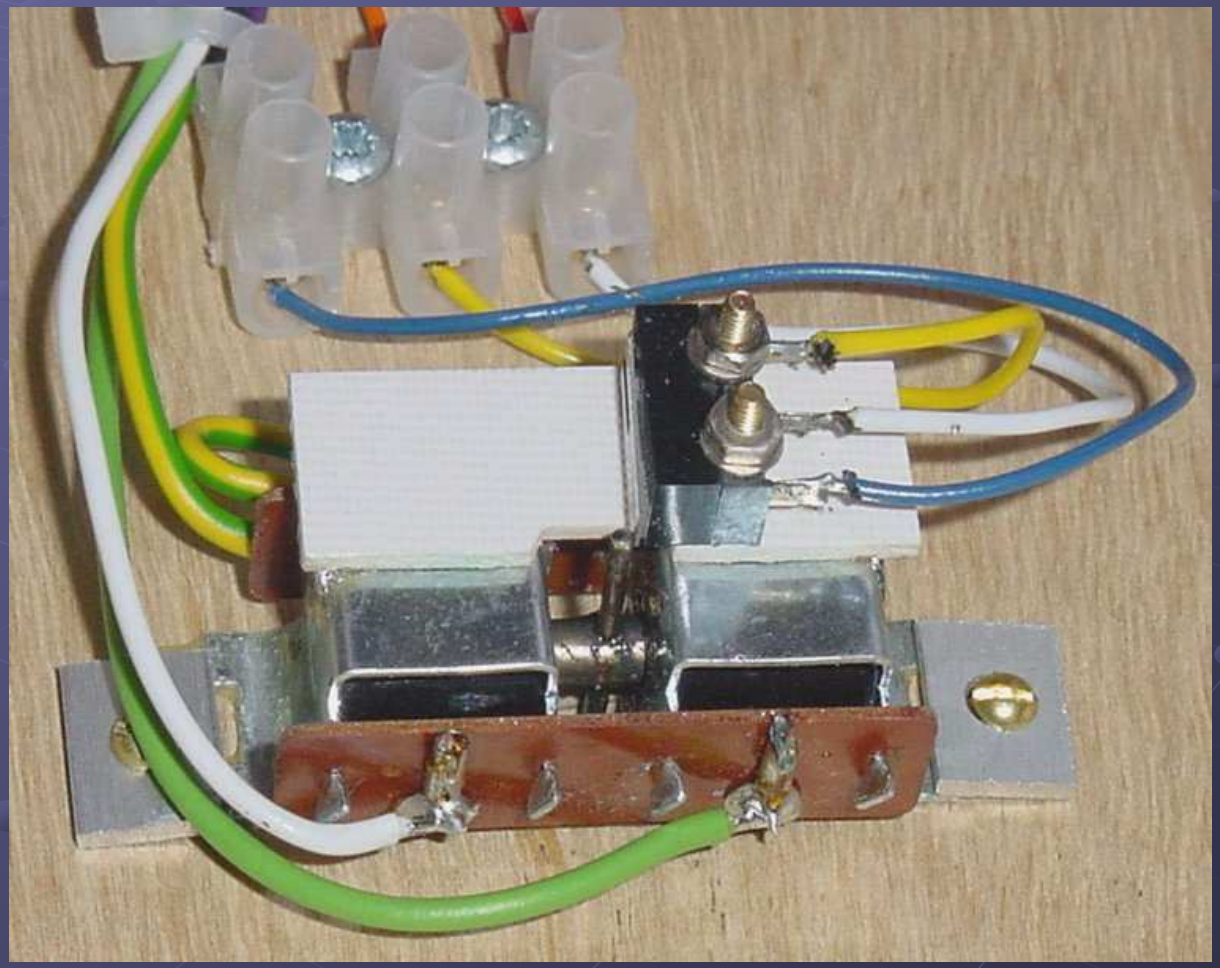
How to Drive Point Motors

- (Mechanical e.g. wire-in-tube)
- Solenoid (Clunk Click every trip)
- Motorised (Fulgurex, Lemarco, Tortoise, Cobalt)
- Servo Motors.

- May want to get Feedback on Point Position.
- Need to switch frog polarity (can be done remotely via Relays)

Peco Solenoid

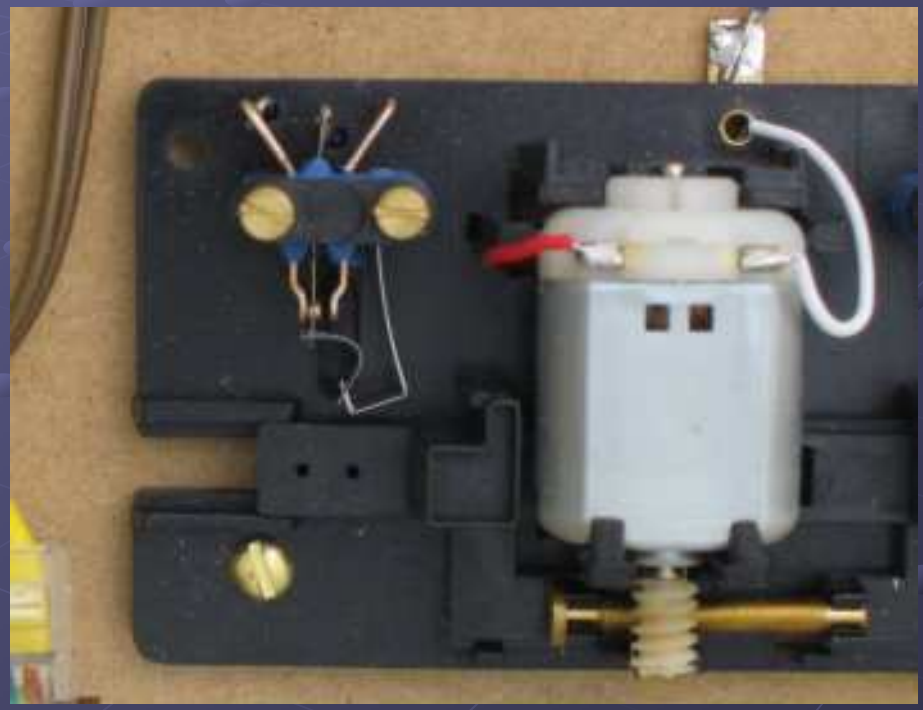
Feedback via add-on Microswitch



(photo by Mike Bolton)

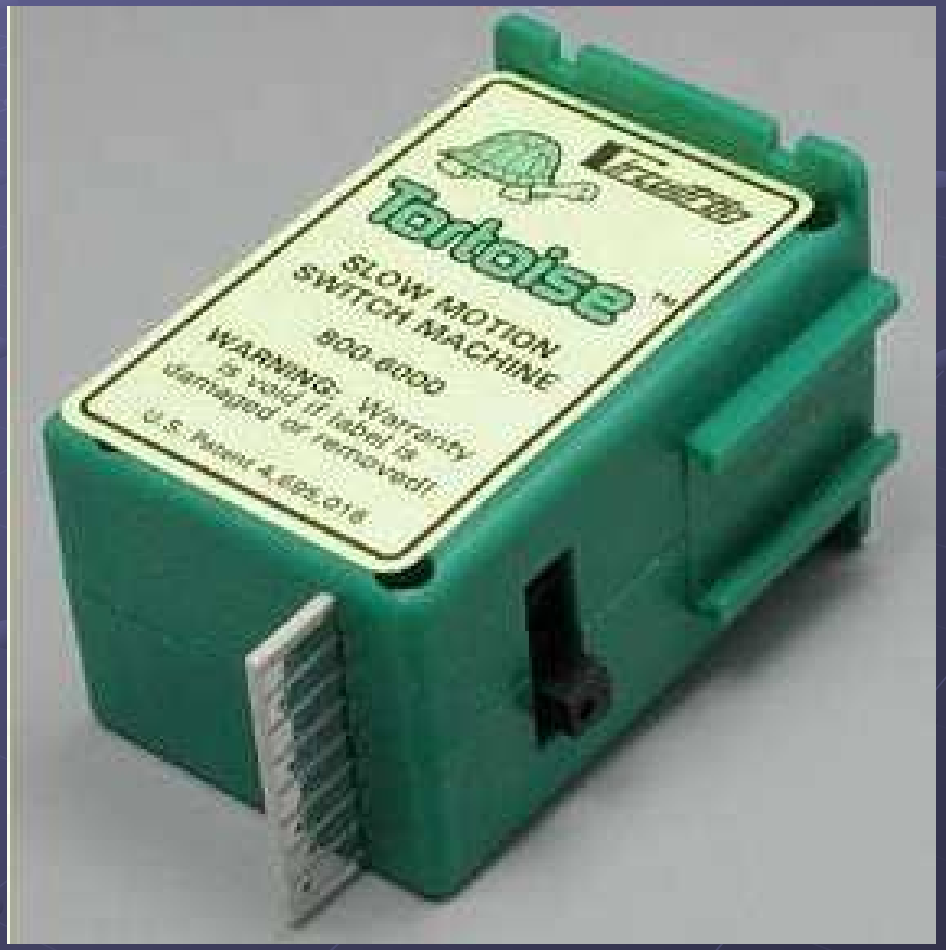
Fulgurex with built in switches

- 1st bank cuts power at end of travel
- 2nd bank can be used to switch frog
- 3rd bank (or 2nd bank on RHS) can be added for feedback



Tortoise with in-built switches

Switches work by wiping a contact on PCB –not very reliable. But Cobalt look-alikes are more robustly built.

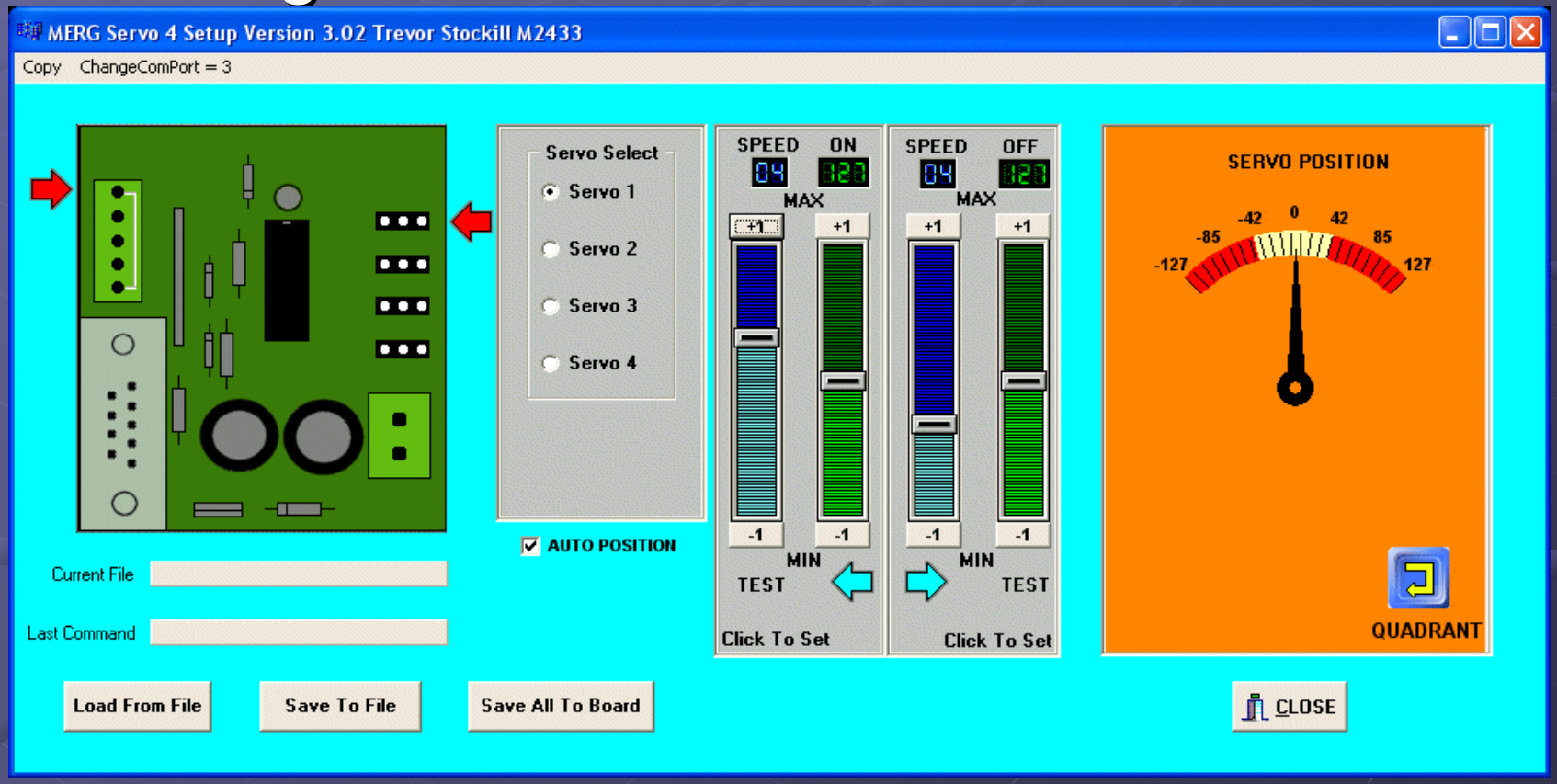


Servos

- the end points can be adjusted electronically – no need for complex mechanical adjustment.
- Can be set on MERG Servo4 board via PC program (see “Rhineside” stand 107).
- Can be set via DCC CVs (e.g. Team Digital Servo Controller, or ECOS Switchpilot)

MERG PC program for Servos

- Settings can be saved to/from a file



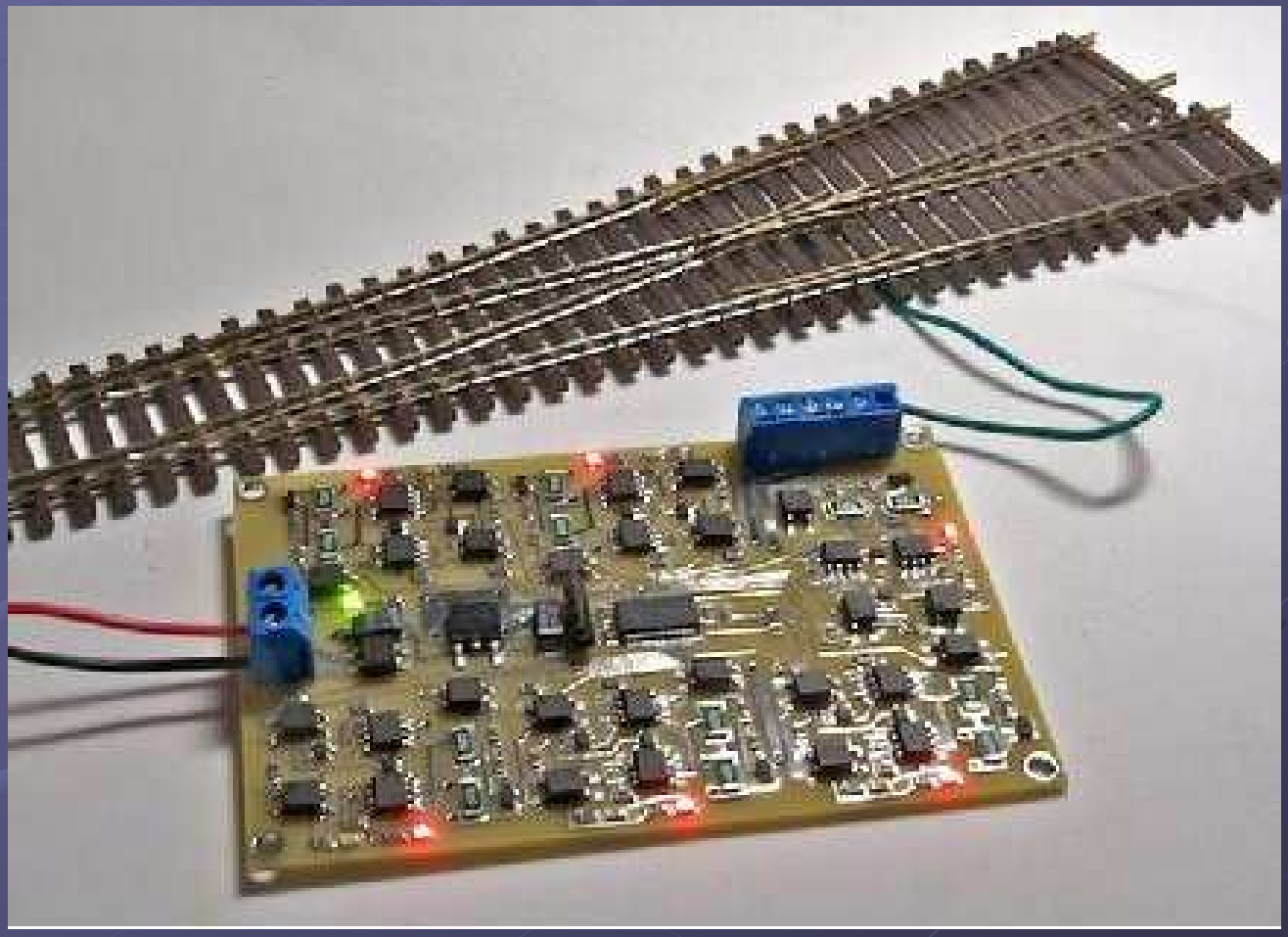
Servos

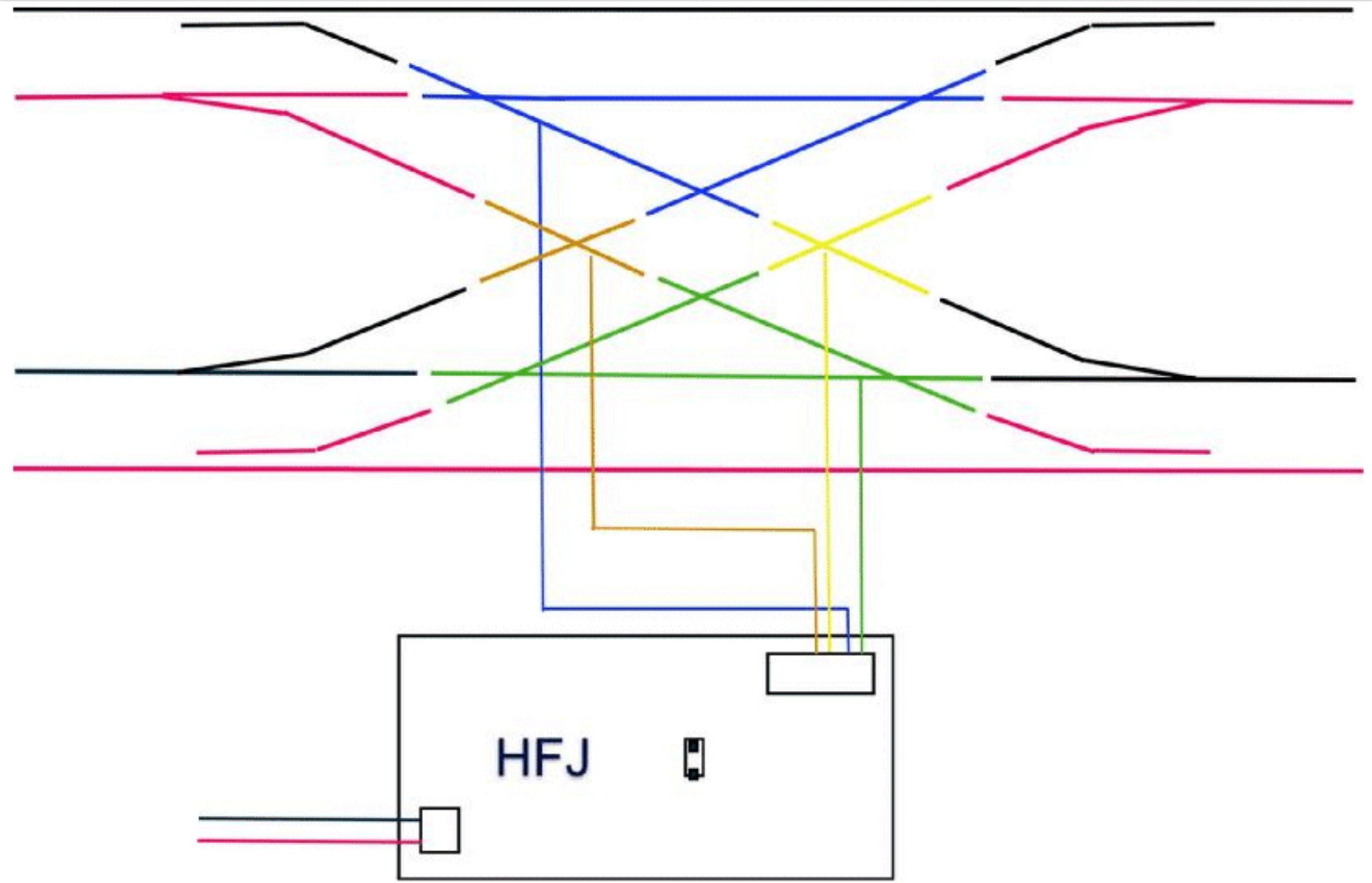
- Can use micro switches, preferably adjustable. (example is from South West Digital)

Or

- Can use a relay, 1 side control servo, 1 side controls frog.

Automatic DCC frog switching Hex Frog Juicer



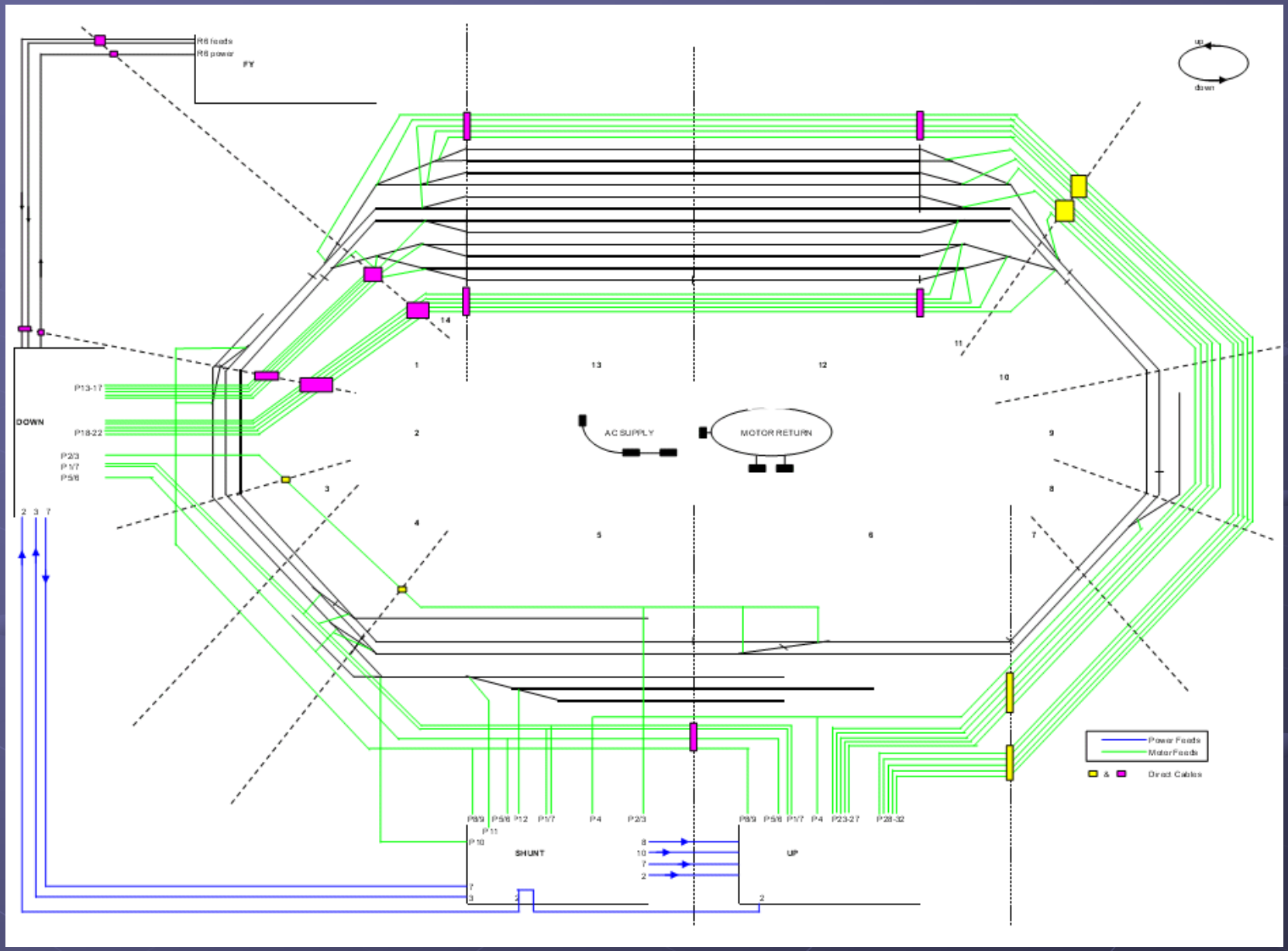


Double Crossover Wiring Diagram

Baseboard Wiring

“Tradition Way” to wire Baseboards

- The “traditional way” = lots of wires
- Can be many 25way D connectors, even some spanning baseboards.
- This takes time to setup and introduces reliability problems.
- An example shows a proposal for a club layout – this picture is just for point motors!


R6 feeds
R6 power
FY
up
down
P13-17
DOWN
P18-22
P2/3
P1/7
P5/6
AC SUPPLY
MOTOR RETURN
P8/9 P5/6 P12 P1/7 P4 P2/3
P11
P10
SHUNT
P8/9 P5/6 P1/7 P4 P23-27 P28-32
UP
Power Feeds
Motor Feeds
& Direct Cables

Getting More Information

A useful first stop is the MERG Links page

http://www.merg.org.uk/links

The End