MERG

Model Electronic Pailway Group

PD3 Dual Turnout Motor Driver Kit 37- Building Instructions

Issue 3

This kit is suitable for driving standard twin-coil point motors such as PECO or SEEP but may also be used to drive two wire KATO Unitrack point motors and /or as drivers for TOMIX 5541 semaphore signals. (See instructions on page 2). These instructions apply to rev 2 of the PCB which can accommodate either 1000uF(kit 37A) or 2200uF (kit 37B) capacitors. See **MERG Technical Bulletin T33/21** for wiring and technical information before assembling.





Kit Contents

QTY	CCT REF	VALUE
1	PCB	PD3 rev2
3	LK1-LK3	24swg wire
5	D1-D5	1N4148 diode
2	R1, R3	47R resistor
2	R2,R4	560R resistor
6	PD1-PD6	1N4002 diode
4	T1-T20	5-way pcb header
2	RL1-RL2	BT47W/6H
4	C1-C4	1000uF or 2200uF35V
4	T1-T20	5-way connector shell
20	T1-T20	Crimo terminal

COMMENTS 100 x 44 mm

Cut the wire supplied to lengths of approx 25mm glass case, black or white bar indicates the cathode end Colour bands begin yellow-violet-xxx Colour bands begin green-blue-xxx black plastic case, white bar indicates the cathode end 0.1-inch pitch single-in-line connector blue DPDT relay with 12V coil early kits may have 63v version

20 T1-T20 Crimp terminal Suitable crimp tool Rapid Electronics 85-0262 Please note, this kit is the PD3. Please do not confuse this with the component diodes marked PD1 - PD6.

Kit Options

PD3-1 - A straight-forward dual turnout driver. The 2 drivers can be operated either independently - or from the same panel switch. Each driver includes a single changeover relay contact which may be used for frog switching, signalling etc. Fit LK1. Fit all components except LK2, LK3, D4 and D5.

PD3-2 - a single turnout driver plus a separate DPDT relay. The turnout driver includes a single changeover relay contact which may be used for frog switching, signalling etc. The second DPDT relay may be operated independently of the turnout driver, or slaved from the same panel switch. Fit LK2 and LK3. Fit all components except LK1, R3, C3, C4, D4, D5, PD5 and PD6

PD3-3 - a single turnout driver with superBloc switching for a diverging junction (see TB T33/21). The turnout driver includes a single changeover relay contact which may be used for frog switching, signalling etc. The second relay is slaved to the driver to provide superBloc switching on one set of contacts. The 2nd contact set is free for other use. Fit LK2 and LK3. Fit all components except LK1, R3, C3, C4, PD5 and PD6.

PD3-4 - a single turnout driver with superBloc switching for a converging junction (see TB T33/21). The turnout driver includes a single changeover relay contact which may be used for frog switching, signalling etc. The second relay is slaved to the driver to provide superBloc switching. Fit LK2 and LK3. Fit all components except LK1, R3, C3, C4, PD5 and PD6.

Assembly

Choose your options, and set aside those components not needed. Component positions are clearly marked on the PCB. Bend the component legs to fit the board and insert them into the holes from the picture side of the board. Fit components in the order in the parts list above, smallest first so they do not fall out when the board is turned over for soldering. Fit components of one size, solder them in place, and cut off the excess leads, before moving up to the next. Inspect the finished board and the solder joints carefully, ideally with a magnifying glass.

Take care to get all diodes the right way round, as shown by the cathode bars. For the 4 large 1000uF or 2200uF capacitors, the +ve hole is marked "+" on the board, while the -ve component lead is marked "-" on the case. The

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+ve lead is the longer of the two. Do get them all the correct way round, otherwise they may explode when power is applied. Holes in the PCB have been provided for a number of capacitor sizes.

Testing the Finished Board

The simplest way to test the board is just to connect up power and twin-coil turnout motor, and switch on. Connections are labelled on the circuit diagram and pin numbers for the terminals T1-T20 are marked on the PCB.

The turnout driver is powered from a DC power supply (nominal 20v if you have one) or from a **rectified and smoothed** 15Vac transformer. Connections to the board are made between 0V (T4) and +20V (T5). **Do not apply more than 23Vdc to the +20V pin.** Technical Bulletin T33/21 gives more information about using the board with different supply voltages.

Coil C (T1 or T11) goes to the common connection of the 2 motor coils. Take great care never to short-circuit the motor coil connections, as operating the driver into a short-circuit will damage the relay contacts and lead to premature failure.

Having powered the board and connected it to a turnout motor, the turnouts are operated by connecting the /SWITCH pin T3 (driver 1) and/or T13 (driver 2) to 0V. To operate both drivers (or more than 2) from the same switch, link the /CHAIN pin of one driver to the /SWITCH pin of the next with external wires. This must always be done for variants PD3-2, -3 and -4 so that both relays operate together.

Further Options - see TB T33/21

If you don't need the spare relay in PD3-2, then LK2, LK3, D3, R4, RL2 and the two 5-way headers T11-T20 need not be fitted, and can be kept for other use. In other words, if you need just one turnout driver at a particular location then use a PD3 board but just fit the components for driver 1.

Diodes PD3-PD6 need not be fitted on the PCB itself, but instead can be mounted on the turnout motor. This enables it to be driven using only 2 wires instead of 3. Fit wire links in place of PD3/PD5, and connect to the motors from terminals T1/T2 and T11/T12 only.

For Kato Unitrack 2-wire points build as a PD3-1. For the first driver, link T2 and T9 to one point motor wire and T1 to the other. For the second driver link T12 and T19 to one point motor wire and T11 to the other.

For Tomix semaphore signals (or equivalent) connect as for Kato points but employ not more than 12vDC on T5, replace R2 by a link, do not connect T7, and use standard 1000uF capacitors only. Alternatively, if wishing to retain a 20vDC supply across all motor drivers then retain R1 and exchange diodes PD3 and PD4 for approximately 15R resistors.



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