Revenge From Mars Opto Expansion Upgrade Install Instructions

Thanks for buying one of our Revenge From Mars Opto Expansion Upgrade kits. Purchase of this kit supports our Pinball 2000 software update efforts. This kit is designed for the medium pinball tech user. If you don't have experience with soldering and installing wires into connectors, seek help from a friend or pinball tech.

Please read the below instruction carefully to ensure correct installation.

Kit Contents

1) Opto Expander Board REV 3 x 1
2) Opto Transmitter LED x 2
3) Opto Receiver LED x 2
4) Individual LED Board Assembly A-16908 x 2
5) Individual Photo Transistor Board Assembly A-16909 x 2
6) 4-Way JST2.0 Cable with included headers x 1
7) 6-Way JST2.0 Cable with included headers x 1
8) Self tap #6 x3/8" screw x 4

Board Installation

Make sure game is switched OFF. Lift up playfield and install expander board onto existing opto board. Reinstall the 12-way switch matrix plug onto the new expander board as shown below. (Fig 1)
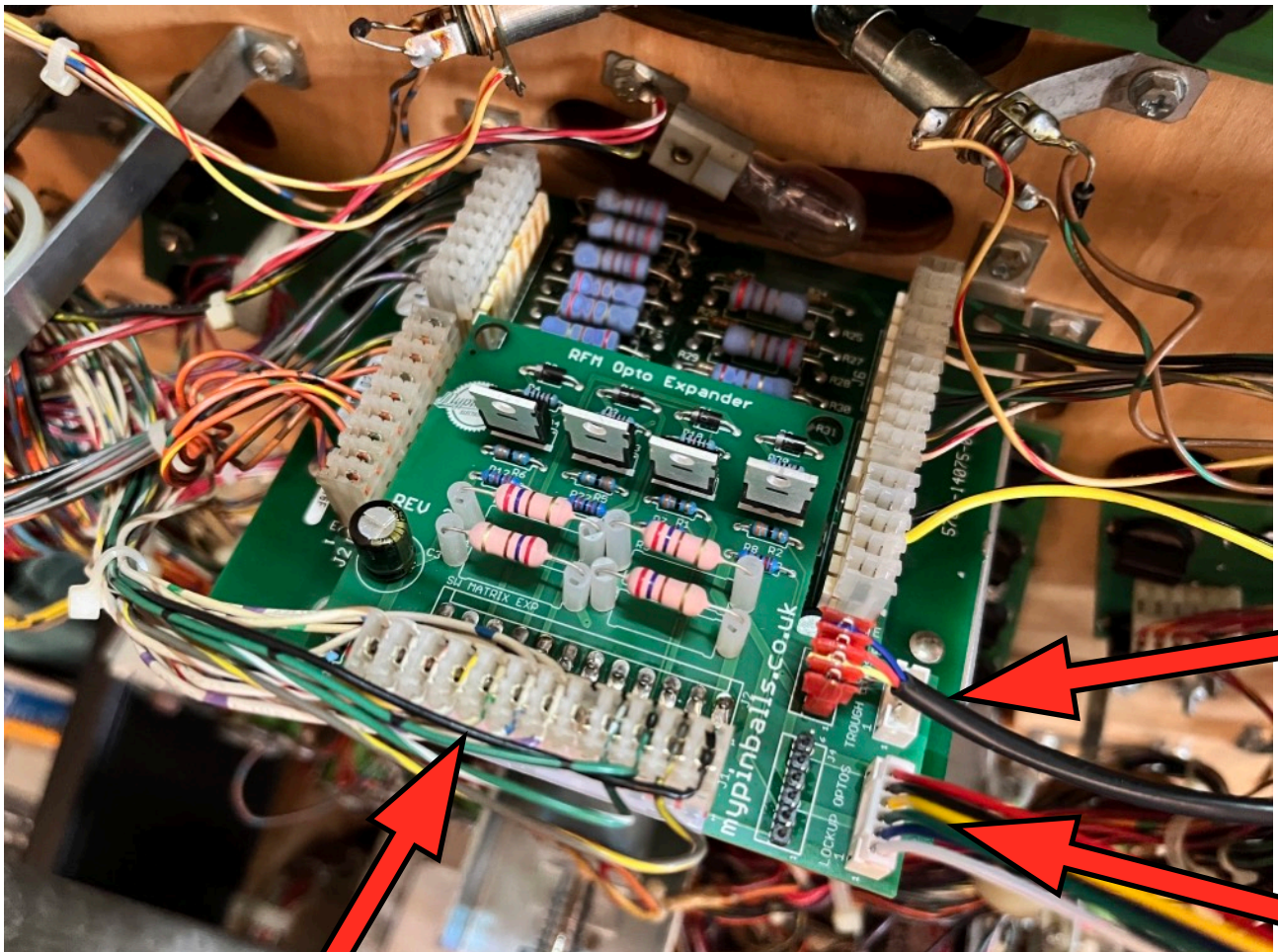

Fig 2

Fig 3

Fig 1

Existing Trough Modification

Use the following table and pictures to help install the extra 2 sets of included optos plus wiring. Both opto boards will need to be removed and the extra optos installed into the blank spaces on the pcbs. Soldering skills are required. Seek help from a pinball tech if you are not comfortable removing solder and installing new electronic parts on to pcbs.

Important Notes: The transmitter optos are pink in colour and the receiver optos are black in colour. The Transmitter Cathode (K) is the short leg and case flat. The Receiver Emitter (E) is the short leg and case flat. Use the game manual schematics to check the orientation of the transmitter & receiver optos. Please DO NOT rely on the silkscreen of the pcbs to determine orientation. The Transmitter optos are usually installed so the flat matches the notch on the silkscreen not the flat on the silkscreen.

Opto Expansion Connector J3 & J5 (Fig 2)						
Pin	Wire Colour (Early Kit)	Wire Colour (Current Kit)	Description	Opto Board Position	Switch Matrix Colour	Switch No.
1	Black	Green	Trough 5 Receiver Drive	Receiver Brd J1-8	Wht-Org	53
2	Yellow	Yellow	Trough 6 Receiver Drive	Receiver Brd J1-9	Wht-Yel	54
3	Red	Black	Trough 5 Transmitter Power Resistor	Transmitter Brd J1-2	-	-
4	Blue	Red	Trough 6 Transmitter Power Resistor	Transmitter Brd J1-1	-	-

Ball Lockup Mechanism Modification

The ball lock mechanism requires 2 sets of standard WMS individual opto sets (included) to be installed on the ball lock mechanism. The mounting positions are present on the weldment as the feature was removed from production games for cost reasons. See fig 7 for reference on where to mount each side etc.

The optos should be wired as shown in table for Connector J4/J6. Please note that some wires go to both optos where there is a common power/ground etc. Hence there are 8 total opto wires and only 6 cable positions.

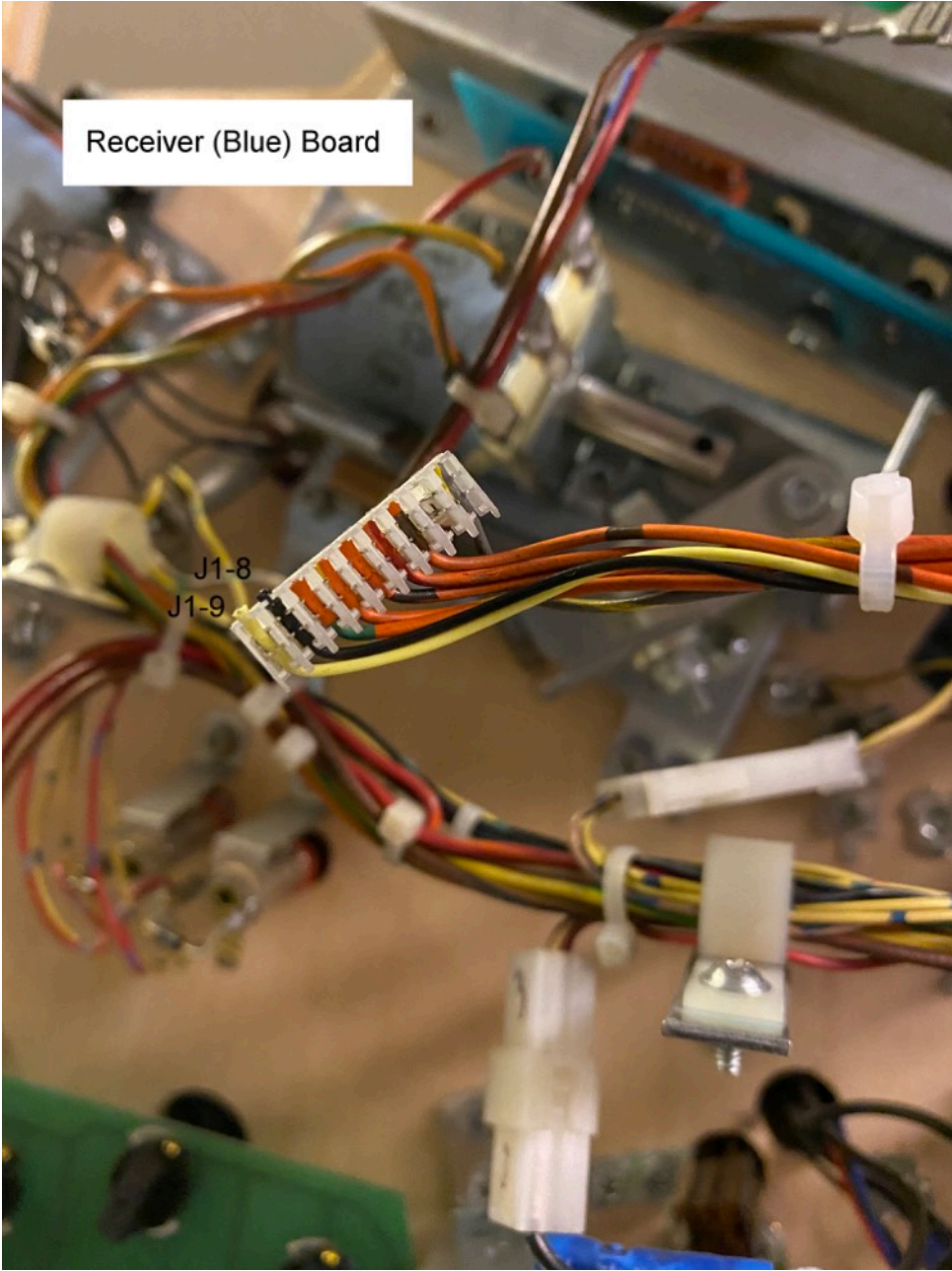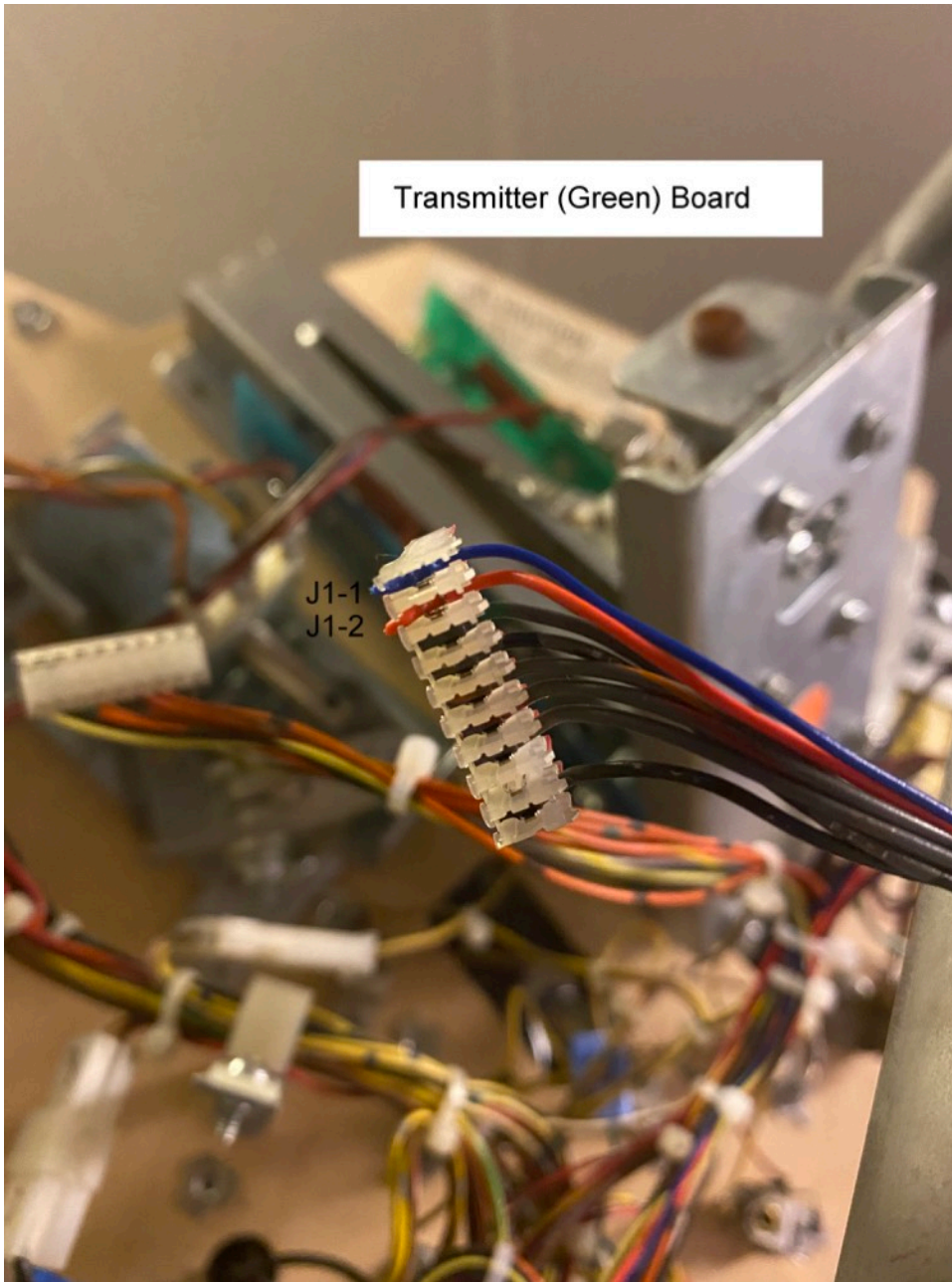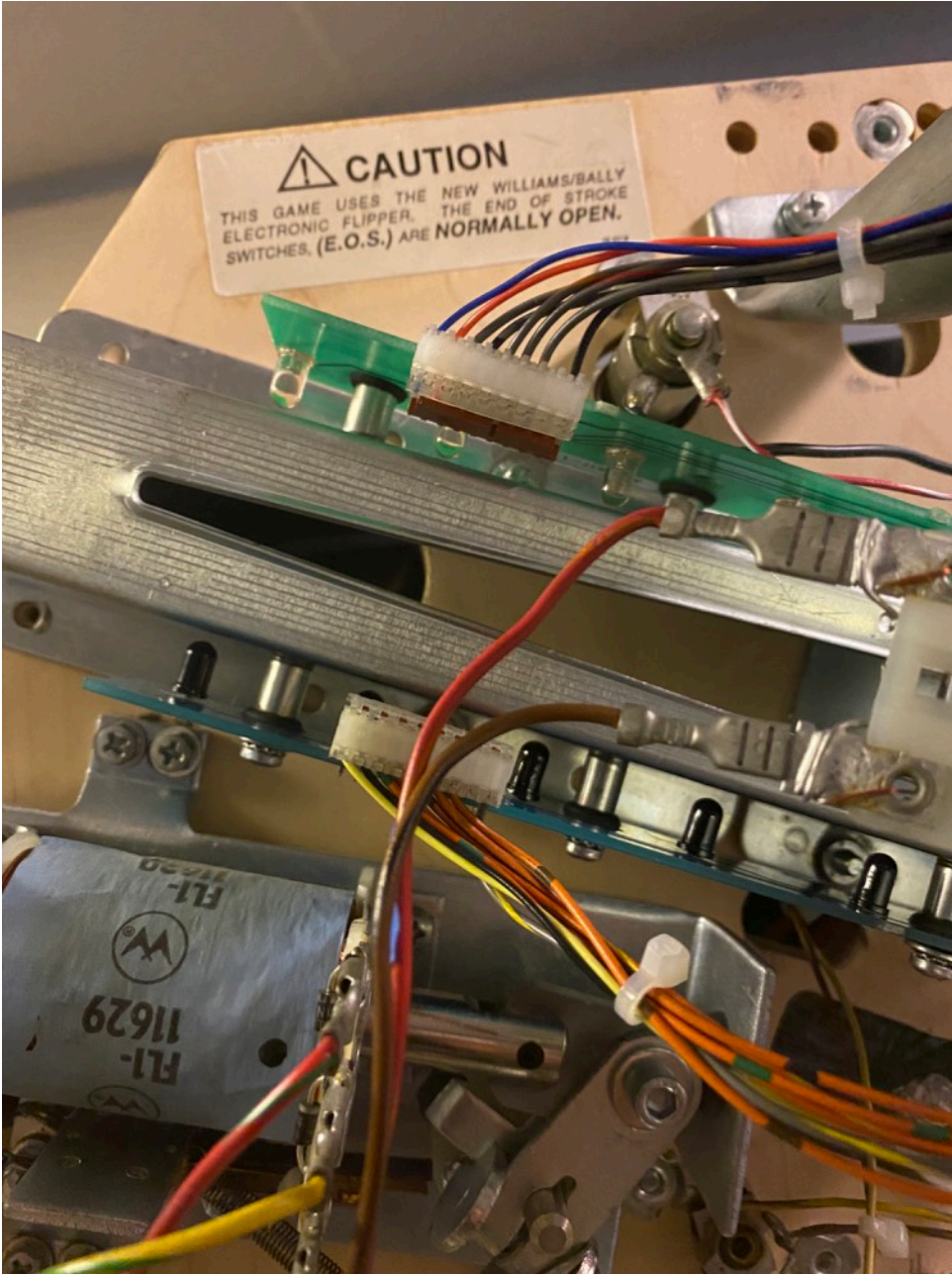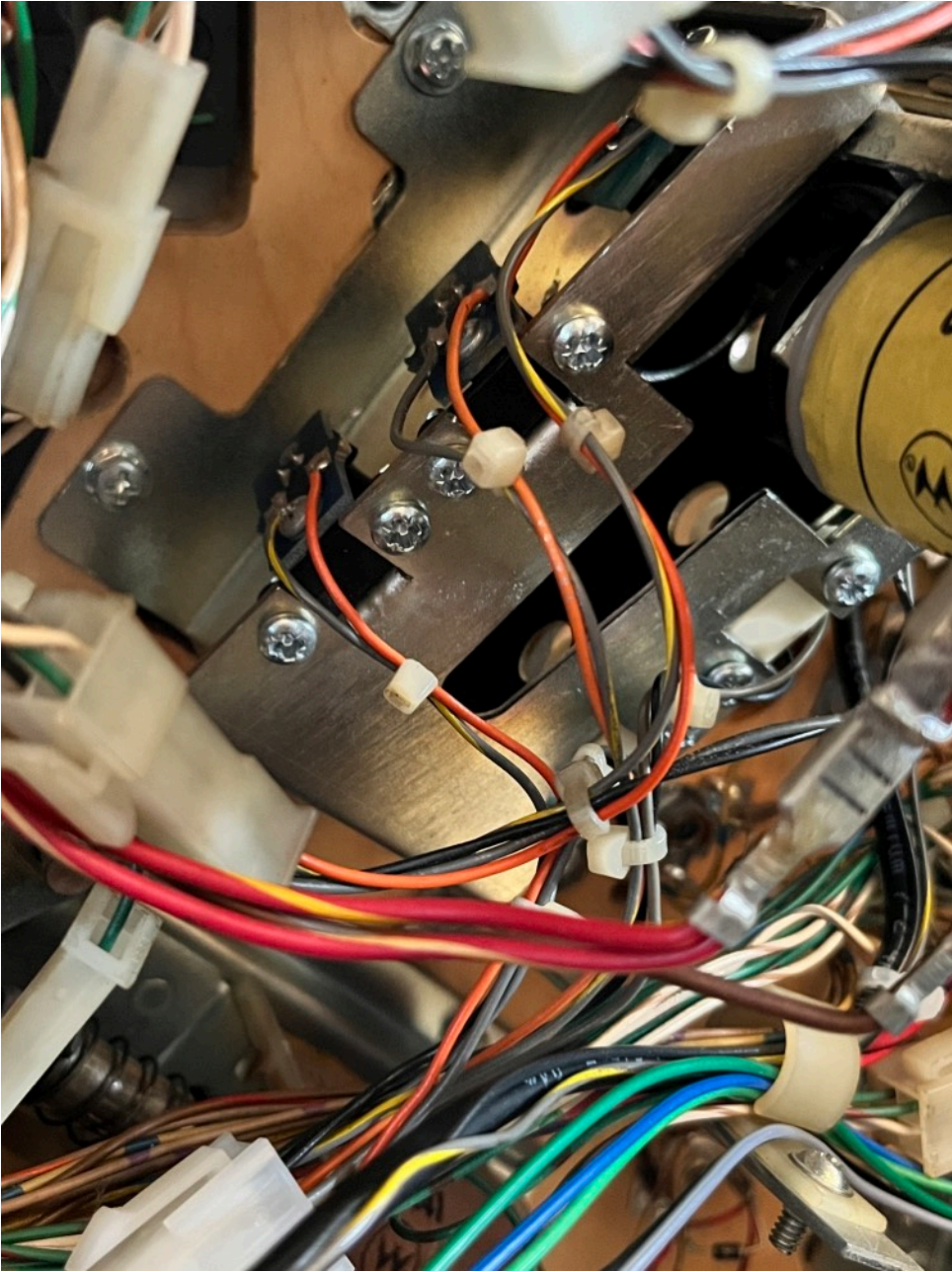| Opto Expansion Connector J4 & J6 (Fig 3)					
Pin	Wire Colour	Description	Opto Board Position	Switch Matrix Colour	Switch No.
1	White	Ball Lock 2 Receiver Drive	Photo Transistor Board E Lug	Wht-Grn	55
2	Blue	Ball Lock 3 Receiver Drive	Photo Transistor Board E Lug	Wht-Blu	56
3	Green	Ball Lock 2 Transmitter Power Resistor	LED Board A Lug	-	-
4	Yellow	Ball Lock 3 Transmitter Power Resistor	LED Board A Lug	-	-
5	Black	+12V	Photo Transistor Board C Lug (Both Boards)	-	-
6	Red	GND	LED Board K Lug (Both Boards)	-	-

Fig 4

Fig 5

Fig 6

Fig 7

Appendix A

○ Please note that modifying your game is at your own risk and myPinballs Electronics takes no responsibility for any damage caused to yourself and/or the game. All mods that we create are for fun and enjoyment of enhancing your game. Please take your time and seek help if needed.