

# F-14 Tomcat Retrofitting the Proto-Flasher



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Version 1

## Table of Contents

<b>Table of Contents .....</b>	<b>1</b>
<b>1      <b>Description.....</b></b>	<b>2</b>
1.1     Safety.....	2
1.2     Explanation.....	2
1.3     Separating the white and blue flashers.....	2
1.4     Installation of the red flashers.....	4
1.5     Electrical connection of the red flashers.....	5
<b>2      <b>Table of Figures .....</b></b>	<b>8</b>

## 1 Description

### 1.1 Safety

Knowledge and safe handling in electrical engineering are a prerequisite for this conversion. I assume no responsibility for damage to equipment or persons.

Use at your own risk! If you have no idea – hands off!



### 1.2 Explanation

The first pre-series devices were still delivered with the red flashers. Due to short-circuit problems in the switch matrix, the red flashers were removed and the electrical connections were also changed. Then the F-14 Tomcat pinball machines were delivered in series without the red flashers in the upper playing field. In addition, the blue flasher and the white flasher were connected in parallel so that they were controlled simultaneously. A message was sent via Service Bulletin SS41 (see appendix).

However, the information in the Service Bulletin is not quite sufficient for a dismantling. I have collected the information here and illustrated it accordingly.

### 1.3 Separating the white and blue flashers

The channel Flasher 9 was used to control the white and blue flashers after removing the proto flasher. To remove the flasher, the two flashers are separated and connected to separate channels. The blue flasher is further controlled via the Flasher 9 channel, while the white flasher is connected to Flasher 10 channel.

To find the right resistor board for the Flasher 9 and 10, simply follow the cable color of Flasher 10. The cable has the colors white/black and is soldered in parallel with the white cable of Flasher 9 at the **LAMP** connector.

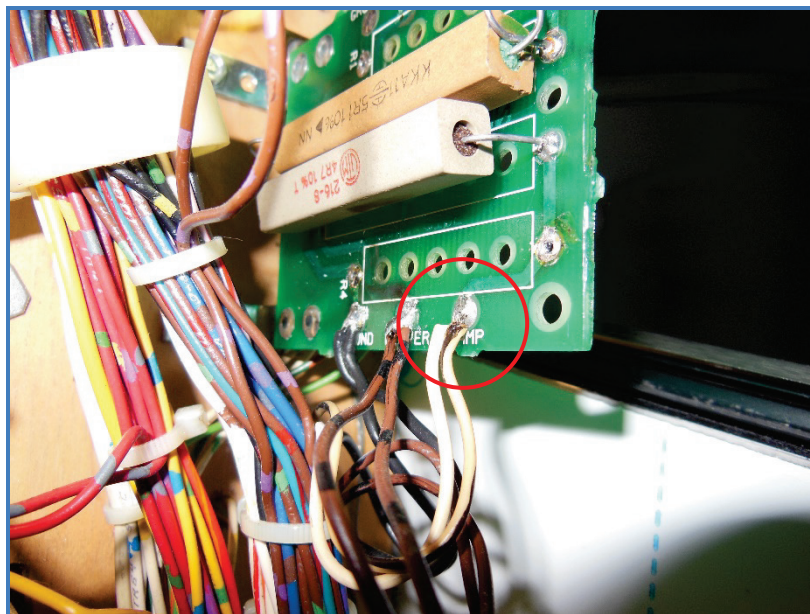


Fig. 1: Resistor-Board Flasher 9 and 10

The white/black cable is unsoldered and soldered back to the **LAMP** connector on the other side of the resistor board.

## F-14 Tomcat Retrofitting the Proto-Flasher

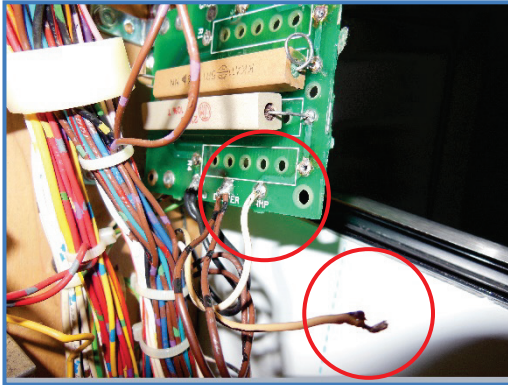


Fig. 2: Cable Flasher 10 unsoldered

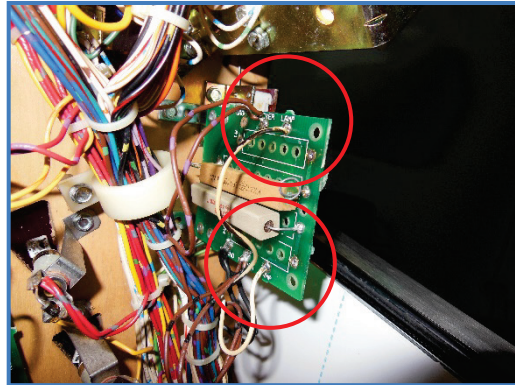


Fig. 3: Cable Flasher 10 soldered

The circuit can now be checked directly via the service menu. In this case it is also important to see if the sockets are installed correctly, because they have been swapped.



Fig. 4: Test Flasher 9



Fig. 5: Test Flasher 10

### 1.4 Installation of the red flashers

For the installation of the red flashers, the corresponding sockets must be insulated against short-circuiting, as the mounting can only be done very much after the targets in front – at least if you don't want to drill new holes in the playing field.

Furthermore, the rear side of the targets **-O-** and **-A-** is covered with the same "foam" as on the front side. Thus it is impossible that a short circuit can occur here again.



Fig. 6: Insulated Sockets

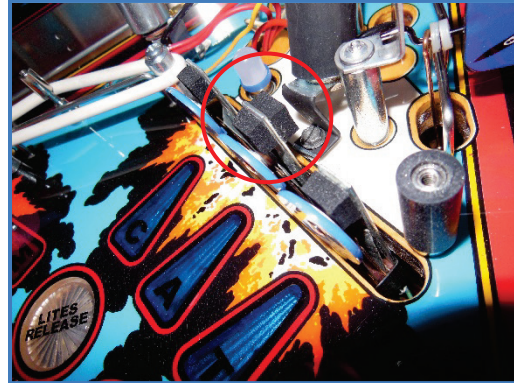


Fig. 7: Insulated Target (Backside)

## F-14 Tomcat Retrofitting the Proto-Flasher

### 1.5 Electrical connection of the red flashers

First we look at the diode plate at the bottom in the middle of the playing field, where the transistor connector **A7** coming from the CPU is free on the right.

At **A7** we solder a black cable and lead it to any resistor board with the free connectors **GROUND**, **DRIVER** and **LAMP**.

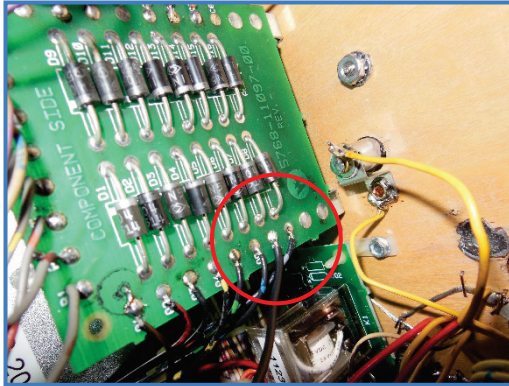


Fig. 8: Diode plate Connector A7

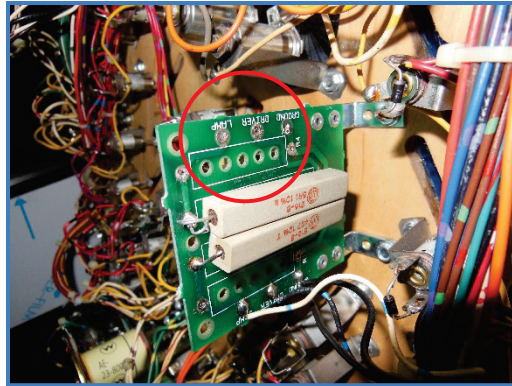


Fig. 9: Resistor Board for Flasher 7

We solder the cable from connector **A7** to the **DRIVER** connector of the resistor board.

Solder the line for the red flashers to the **LAMP** connector of the resistor board and lead the cable back to the red flashers. The **GROUND** connector remains free.

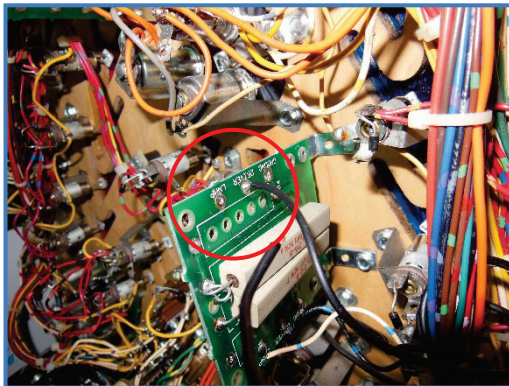


Fig. 10: Connector Driver Flasher 7

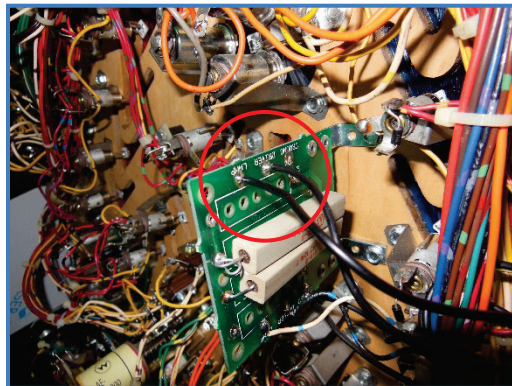


Fig. 11: Connector Lamp Flasher 7

## F-14 Tomcat Retrofitting the Proto-Flasher

The positive supply must **not** be tapped at a coil, as these are switched off via relays. The positive supply was originally tapped from the lighting. The cable is therefore soldered to one of the multiple soldered orange cables for the lighting and led to the red flashers. The flashers are then connected in parallel.

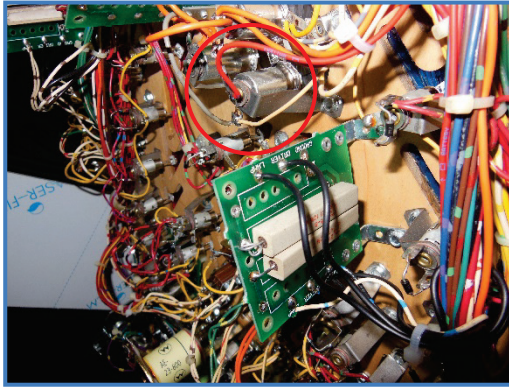


Fig. 12: Positive supply Flasher 7

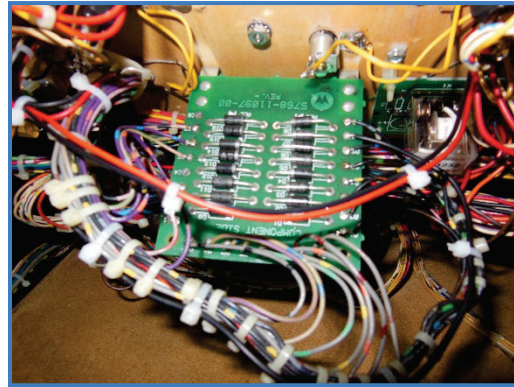


Fig. 13: Parallel Wiring Flasher 7

For space reasons, I first connected the parallel tap to the left red flasher and led the cables under the playing field to the right red flasher.



Fig. 14: Wiring on the playfield



Fig. 15: Installed Flasher 7

The circuit can now be checked directly via the service menu – the red flashers now work on channel Flasher 7.



**READY**

**F-14 Tomcat  
Retrofitting the Proto-Flasher**

**Fig. 16: Test Flasher 7**



## 2 Table of Figures

Fig. 1: Resistor-Board Flasher 9 and 10 .....	2
Fig. 3: Cable Flasher 10 soldered .....	3
Fig. 2: Cable Flasher 10 unsoldered.....	3
Fig. 4: Test Flasher 9.....	3
Fig. 5: Test Flasher 10.....	3
Fig. 7: Insulated Target (Backside).....	4
Fig. 6: Insulated Sockets.....	4
Fig. 8: Diode plate Connector A7.....	5
Fig. 9: Resistor Board for Flasher 7 .....	5
Fig. 11: Connector Lamp Flasher 7.....	5
Fig. 10: Connector Driver Flasher 7.....	5
Fig. 13: Parallel Wiring Flasher 7 .....	6
Fig. 12: Positive supply Flasher 7 .....	6
Fig. 14: Wiring on the playfield.....	6
Fig. 15: Installed Flasher 7.....	6
Fig. 16: Test Flasher 7 .....	7

# SERVICE BULLETIN

April 21, 1987

Since F14 TOMCAT production commenced, WILLIAMS has made several improvements. For performance consistent with current-production machines, games in the field should be updated.

### IMPROVEMENTS INCLUDE:

- 1 The two upper flipper coils have been changed to FL11722 (green label). These coils provide a longer life span for the upper targets, along with better playability.
- 2 Added precaution preventing switch column failure (Q42). Refer to the figures on the reverse side; a step-by-step summary follows:
  - a Remove the three Phillips screws (left, center, and right, shown in Figure 1) that mount the top loop plastic assembly. Remove the top loop plastic assembly from the playfield.
  - b Unsolder the wires from the bulb socket (CLEAR, Figure 1) near the "C" in CAT. Push the four wires through the playfield. Resolder the two orange wires for a proper electrical connection. Tape ends of soldered orange wires with electrical tape. Separately tape the ends of the white/violet wires.
  - c Unsolder the wires from the bulb socket (RED 2, Figure 1) near the "A" in CAT. Solder the yellow jumper wire to the top tab of "C" bulb socket; solder the white/black wire to the bottom tab. Using a 1/4" socket wrench, remove the wood screw that mounts this "A" bulb bracket to the playfield. **Remove the bulb, socket, and bracket.**
  - d Unsolder the wires from the bulb socket (RED 1, Figure 1) near the "O" in TOM. Push the three wires through the playfield. Resolder the two orange wires, and tape this soldered connection. Separately tape each white/violet wire with electrical tape. Using a 1/4" socket wrench, remove wood screw that mounts the "O" bulb bracket to the playfield. **Remove the bulb, socket, and bracket.** Check that the wiring connections now match the "AFTER" view in Figure 2.
  - e On the underside of the playfield, locate the lamp resistor board (near the Right Eject Hole microswitch). Unsolder the white/black wire from the LAMP terminal of the board (Figure 3, left side of the "BEFORE" view). Resolder the white/black wire to the white wire (LAMP terminal) on the right side of board. Verify that the wiring now matches the "AFTER" view of Figure 3.

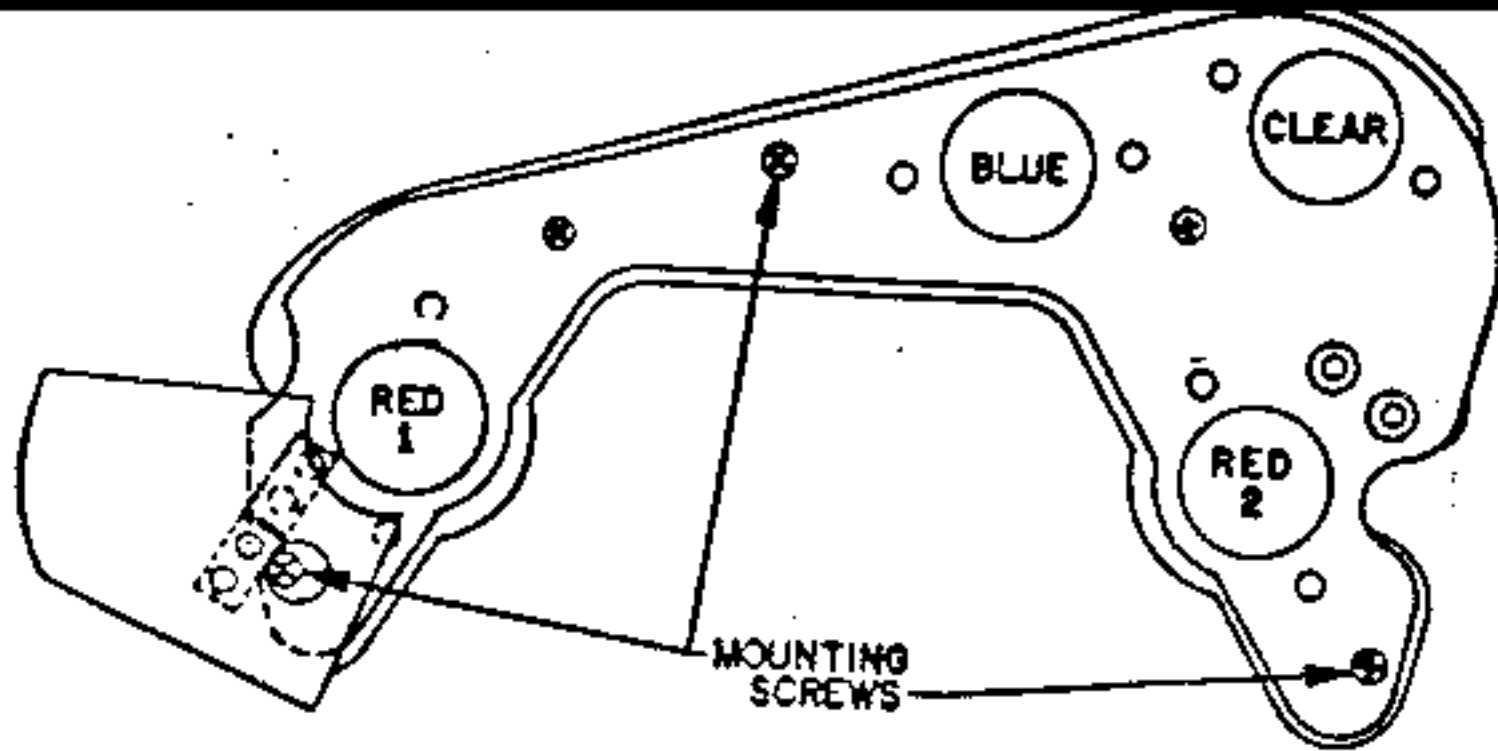


Figure 1. Top Loop Plastic Assembly

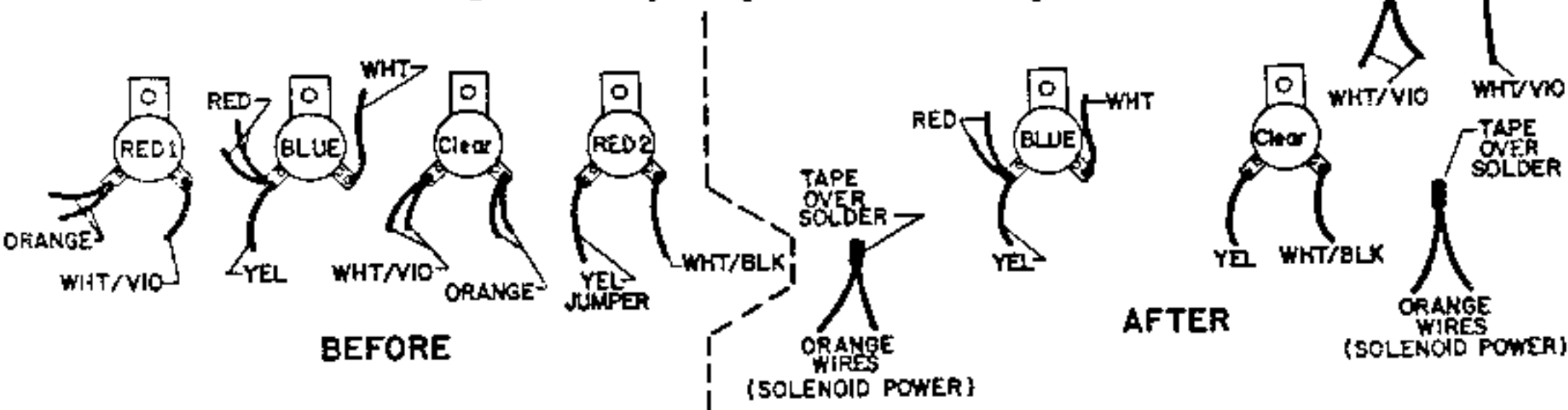


Figure 2. Flasher Lamp Connection Changes

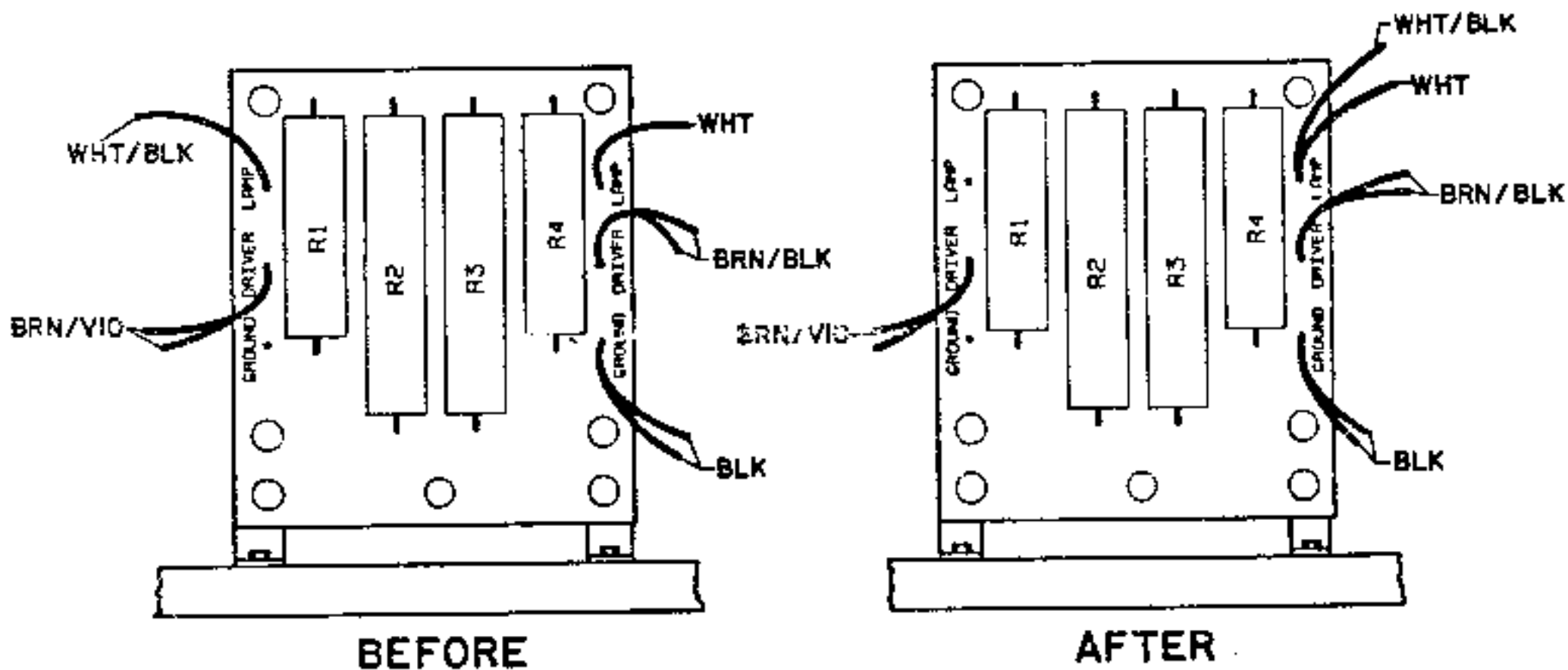


Figure 3. Lamp Resistor Board Connection Changes