



Avatar Scorpion Gunship Mod Kit Installation Guide



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Rev A. All specifications and included hardware are subject to change.

<http://www.lundyelectronics.com>

Product overview

The Lundy Electronics **Avatar Scorpion Gunship Mod Kit** is designed to integrate an AT-99 Scorpion gunship toy to the Stern Avatar Pro and LE model pinball machine. The gunship toy is a perfect complement to the existing factory playfield gunship spinner. A custom Lundy Electronics controller module integrates a PIC microcontroller with associated circuitry required to monitor the factory spinner signal as an interrupt to activate red LEDs flashing from the wings based on the spinner rotation speed to simulate the gunship firing. The factory spinner and associated sound is one of the most satisfying shots in the game, and having a gunship toy simulate firing at the player just makes the experience even better. In addition to the spinner firing effect, the cockpit is illuminated with a blue LED, and when a game is active, a flashing red LED beacon on top of the gunship is active. The controller module also senses when the game is inactive and will turn off the beacon and will also do various attract mode effects in a controlled manner using the available beacon and wing LEDs.

What's included

- Scorpion gunship toy assembly with wiring harness
- Controller module assembly with wiring harness
- Power wiring harness
- Hardware kit
 - One #6-32 x 7/16 screw
 - One #6 washer
 - One #6-32 x 1" hex standoff
 - Cable ties



Tools Required

- 1/4" nut driver
- Phillips screwdriver
- Cutting pliers

Installation instructions

Step 1: Power down the Avatar machine and remove glass and balls as per normal service procedure on a pinball machine.

Step 2: Remove the upper plastic from above the left-most pop bumper behind the Transporter toy. Remove the four screws and washers as shown in **Figure 1**. Retain them for later use.

Step 3: Place the gunship toy loosely over the left ramp area and carefully fish its wiring harness down in the same playfield hole where the existing ramp switch wiring harness is routed. You may find it necessary to use a screwdriver to help guide the gunship connector through the hole. You may also need to lift the playfield to help guide the wiring harness even further if it gets bound up on components under the playfield. See **Figure 2**.

Step 4: With the gunship wiring harness in place, guide the gunship assembly mounting bracket hole closer to the standoff pictured in **Figure 2** for proper placement in the next step.

Step 5: Reinstall the top plastic that was removed in **Step 2**. Install all screws *except* for the screw above the standoff shown in **Figure 2** between the switch and pop bumper just behind the transporter toy. From the provided hardware bag, install the 1" standoff along with the original factory washer and screw it in where the original factory screw and washer was placed. The factory screw is no longer required and can be safely stowed away for future use. *It is important to make sure the standoff is as tight as possible using a 1/4" nut driver to ensure the gunship toy will not work loose later.*

Step 6: Mount the gunship toy using the provided #6-32 x 7/16 screw and washer from the provided hardware bag. Before tightening the screw fully, ensure the toy is positioned where it will not interfere/rub the cabinet inner side wall or ramp switch arm on the



Figure 1



Figure 2



Figure 3

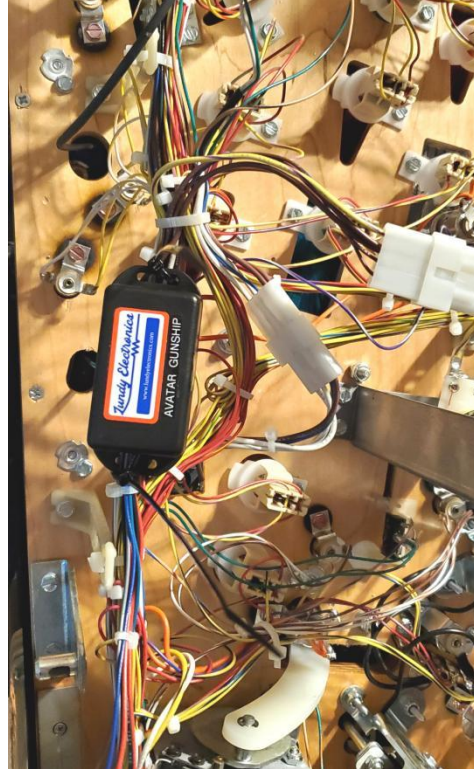


Figure 4

toy landing skids. Once correctly positioned, tighten the mounting screw fully. Rotate the wing rotor blades to your liking for the best look. *Note: If the toy is able to wiggle from side to side, the hex standoff was not tightened fully in the previous step and needs to be addressed first before proceeding.* See **Figure 3**. All work on the topside playfield is now complete.

Step 7: Lift the playfield to a secure, upright position using your preferred precautions to prevent any side art damage or scratches/damage.

Step 8: Install the Lundy Electronics controller module assembly per the following steps.

1. Using the supplied two large black cable ties, position and mount the controller as shown in **Figure 4**.
2. Connect the 4-pin large Molex (gray/blue/red/black) gunship harness and mating controller connectors together as shown in **Figure 5**.
3. Connect the controller 2-pin IDC (green/white) harness connector tap by disconnecting the gunship spinner side connector from the factory male/male "Z" connector and inserting the controller tap female side to the male/male "Z" connector then connect the original spinner side female connector to the new controller tap black male connector. The factory spinner cable enters the lower playfield from the left side near where the controller was mounted. Follow that cable to the required male/male "Z" connector. See **Figures 6 and 7**.



Figure 5



Figure 6

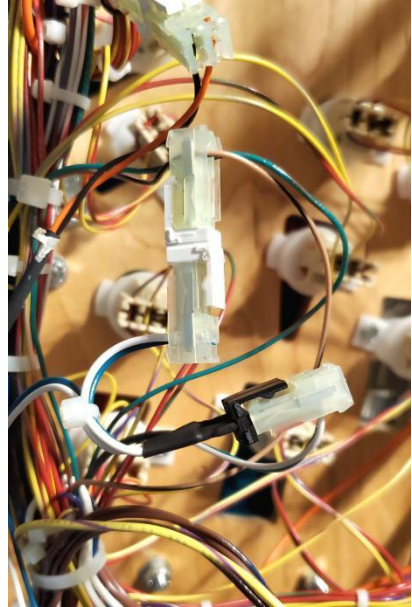


Figure 7

4. Connect the controller single brown wire with an alligator clip up to the left flipper assembly and connect it to the gray wire side of the flipper EOS (end of stroke) switch tab. See **Figure 8**. Note: Be careful not to short the tabs together with the clip and make a solid connection. It is helpful to bend the tabs a little further away from each other for best results.

5. Connect the power wiring harness from the 3-pin (red/black/yellow) power connector near the cabinet service power outlet box located in the front right of the cabinet to the controller 2-pin small Molex (red/black)



Figure 8

connector. See **Figures 9 and 10**. All connections are now complete.

6. Take this time to use the provided cable ties to ensure all wiring is secured and out of the way of the pop bumper and not getting pinched when lowering the playfield.
7. Double-check all connections and work before lowering the playfield.



Figure 9

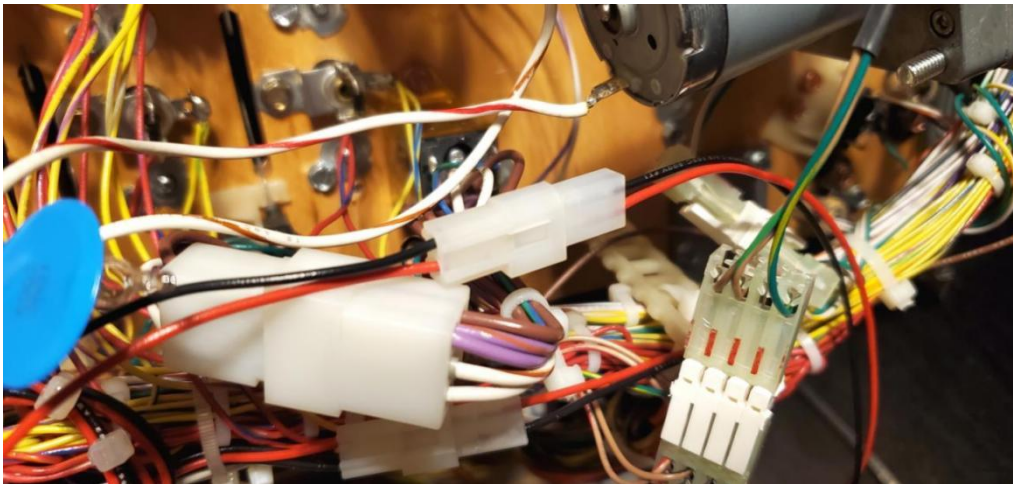


Figure 10

Testing

Power up the machine without any balls inserted and with the front door closed before performing the following testing steps.

- Verify the machine successfully boots without any issues.
- Manually lift the left flipper bat and verify the gunship top beacon red LED starts flashing.
- Manually spin the gunship spinner and verify the gunship toy red wing LEDs flash when the spinner spins.
- Allow the machine to remain untouched for a while and verify the gunship top beacon red LED stops flashing.

These steps conclude all testing and verify your gunship mod is working correctly and ready to use. If any of these tests fail, see the troubleshooting section below.



Troubleshooting

Issue: No LEDs of any kind light at all.

- Verify small controller Molex 2-pin connections and large 3-pin power inlet tap connections.
- Make sure no wires have pulled out of their connector sockets.
- Trace wires to see if any wires have been pinched and cut.
- Use a volt meter to verify +5v power is getting the controller side 2-pin connector (red/black).

Issue: The red beacon LED is always on and never turns off.

- Verify the controller single brown wire with alligator clip up to the left flipper assembly has a solid connection to the gray wire side of the flipper EOS (end of stroke) switch tab.
- Make sure the brown wire hasn't broken off the alligator clip.
- Make sure the brown wire has not been pinched and cut.

Issue: The red beacon LED is always off.

- Verify the controller single brown wire with alligator clip up to the left flipper assembly only has a solid connection to the gray wire side of the flipper EOS (end of stroke) switch tab and not also shorting to the other black wire tab.

Issue: The spinner is not making the wing red LEDs flash. Regardless if a game is active or not, the spinner will always activate a controller interrupt making them flash.

- Verify the 2-pin IDC (green/white) connector tap at the factory male/male "Z" connector and the original spinner side female connector to the new controller tap black male connector are all making a solid connection.
- Make sure none of the connectors were accidentally connected backwards. Verify green and white wire connections are consistent all the way through.
- Make sure no wires have pulled out of their connector sockets.
- Trace wires to see if any wires have been pinched and cut.
- Enter service mode switch test and verify the spinner registers. If not, it's possible the actual spinner switch is faulty or has a broken wire.

If you still have issues, contact Lundy Electronics at <https://lundyelectronics.com/contact-us>.

Thank you for choosing Lundy Electronics, and we hope you enjoy your pinball product.

