

## Warranty

PinHead Electronics provides a One-Year Warranty for Parts and Labor which cover all factory defects for all Bally/Stern Rectifier boards. This warranty does not cover cosmetic damage or any damaged caused by improper handling or installation. Date and proof of purchase must be validated or the warranty is considered void.

## Disclaimer & Safety Warning

Please note that this rectifier board contains high voltages up to 230 VDC. It is important to use extreme caution when working around these voltages and to always insure that the game is powered off, if you are planning to:

- Solder
- De-solder
- Dismount the board
- Disconnect/Reconnect (J1-J3)

PinHead Electronics will not be held responsible for any personal injury that may result from not following proper safety guidelines.

## Removal and Installation

### Removal:

**Step 1:** Turn off the main power switch and unplug the AC cord from outlet.

**Step 2:** Locate the rectifier board and remove J1, J2 and J3 connectors from the board. (*See Note \**)

**Step 3:** Remove the rectifier board by releasing the four snap-in PCB supports, then remove the PCB supports from the metal frame and discard.

**Step 4:** Verify that the E-connection wire colors are consistent with the charts on page 4 (Bally) and page 5 (Stern). (*See Note \*\**)

**Step 5:** Remove all of the E-connection wires from the board with a soldering iron that has been set to at least 750 degrees.

## Installation:

**Step 1:** Install the four new PCB supports provided in the accessory package.

**Step 2:** Solder all E-connection wires starting from E1 to E12 following the correct chart attached and/or noted color changes based on owner manual/schematic. Once all of the wires have been installed, recheck each E-connection and verify that each wire is connected securely and correctly. *(See Note \*\*\*)*

**Step 3:** Snap the board onto the newly installed PCB supports while making sure that the E-connections are not pinched between the PCB supports.

**Step 4:** Replace the old connectors with the new Molex housings and trifurcon connectors. (This job requires a Molex style crimping tool). It is best to replace one wire at a time, this helps reduce the risk of placing a wire in the wrong position. *(See Note \*\*\*\*)*

**Step 5:** Verify that the newly installed wires are in their proper locations (refer to the original schematic if necessary). Reconnect J1, J2 and J3 connectors to the rectifier board. Plug the AC cord into the outlet and power on the machine to verify that the machine boots properly. If the game does not boot then turn off the machine and unplug the AC cord from outlet to recheck all of your connections.

**Step 6:** Remove the protective plastic from the fuse cover and snap the fuse cover back into place using the four supports that are provided.

**Step 7:** Sometimes the large R1 and R2 power resistors can move around during shipping, so it is important to verify that both resistors are not lying against the bridge rectifier or the board's surface. Both resistors should have a 1/16 inch gap between the board and the resistor. This gap helps to reduce the surface temperature of the board.

## Installation Notes

\* If the original rectifier board is present you will need to remove the 3 screws that hold the bridge rectifiers to the heat sink. All 3 screws are located near the top center of the board.

\*\* The charts given may contain slight differences based on your particular machine and therefore should only be used as a general guideline. If one of the wire colors does not match the chart, then refer to your original owners manual and schematic, make note of the change and proceed to the next step.

\*\*\* Typically most soldering applications require a temperature setting of 750 degrees Fahrenheit. However, for this application I recommend setting your iron to 800 - 850 degrees. The reason for this is that your new board has a heavy duty copper layer which dissipates heat at a much higher rate than a standard 1oz copper board. Therefore, a higher soldering iron temperature is required to melt the solder quickly and efficiently.

\*\*\*\* You will notice that connector J1 has 9 pins whereas your game may only have 8 pins for J1. The 9<sup>th</sup> pin is required for Future Spa, KISS and Space Invaders. For all other games the 9<sup>th</sup> pin will remain unused.

## Bally Wiring Diagram

<b>Board Connection</b>	<b>Wire Color / Gauge</b>	<b>Transformer Lug</b>	<b>Circuit Description</b>
E1	Red 18 AWG	5	Primary AC Hot
E2	Yellow 18 AWG	1	Primary Neutral
E3	Red 20 AWG	2	Solenoid Bus Hot
E4	White/Red 20 AWG	6	Solenoid Bus Neutral
E5	Green 20 AWG	8	Display High Voltage Hot
E6	White/Green 20 AWG	10	Display High Voltage Neutral
E7	Blue 18 AWG (2 wires)	17	GI Bus Hot
E8	Black 18 AWG (2 wires)	18	GI Bus Neutral
E9	Orange 18 AWG	13	Controlled Lamp Bus Hot
E10	Green 18 AWG	14	Controlled Lamp Bus Neutral
E11	White 20 AWG	15	12V Input for 5-Volt Regulator Hot
E12	White/Black 20 AWG	16	12V Input for 5-Volt Regulator Neutral

## Stern Wiring Diagram

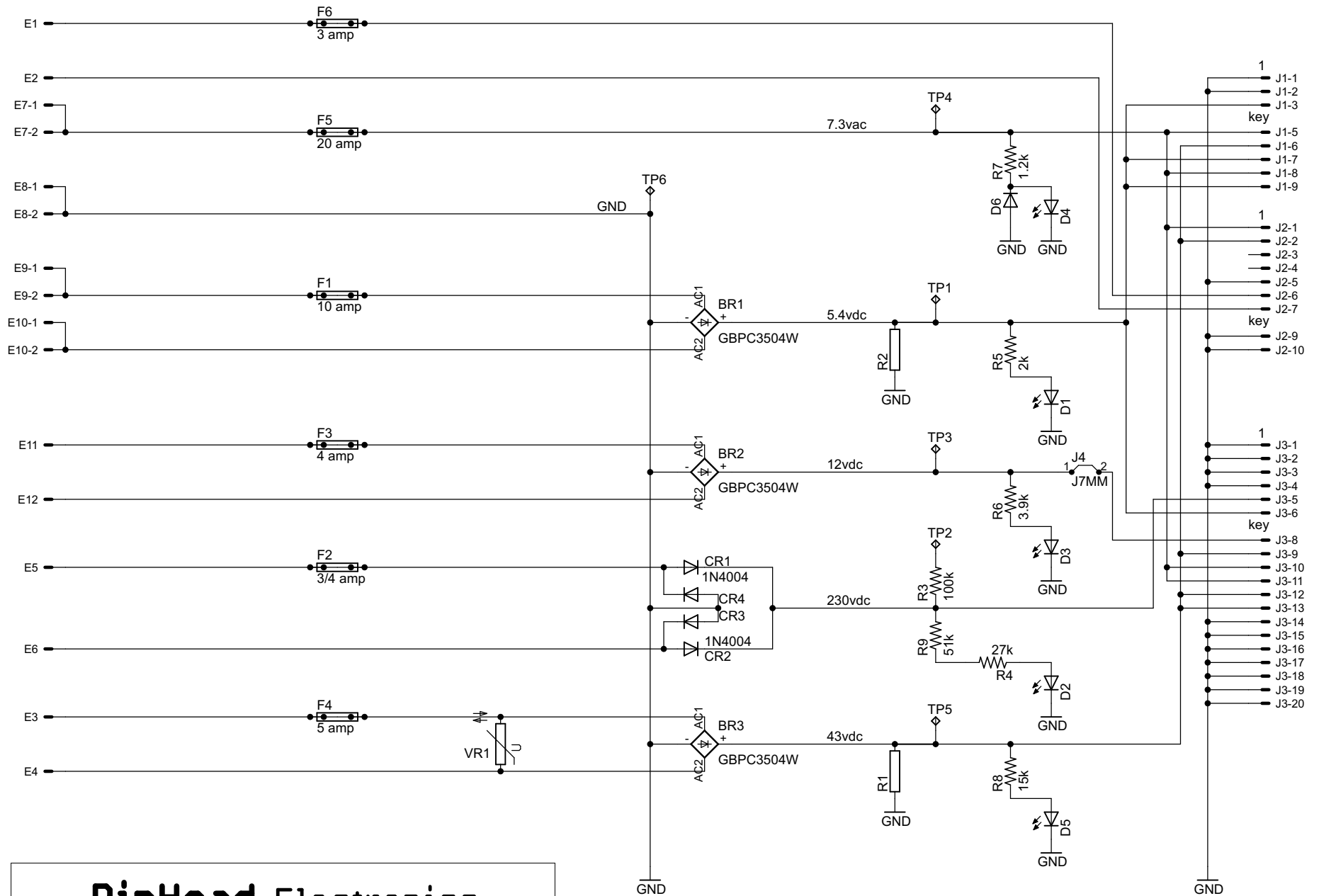
<b>Board Connection</b>	<b>Wire Color / Gauge</b>	<b>Transformer Lug</b>	<b>Circuit Description</b>
E1	Red/Red	1	Primary AC Hot
E2	Yellow/Yellow	9	Primary Neutral
E3	Red/Yellow	2	Solenoid Bus Hot
E4	White/Red	6	Solenoid Bus Neutral
E5	Green/White	8	Display High Voltage Hot
E6	White/Green	10	Display High Voltage Neutral
E7	Blue/Blue	17	GI Bus Hot
E8	Black/Black	18	GI Bus Neutral
E9	Orange/Orange	13	Controlled Lamp Bus Hot
E10	Green/Green	14	Controlled Lamp Bus Neutral
E11	White/White	15	12V Input for 5-Volt Regulator Hot
E12	White/Gray	16	12V Input for 5-Volt Regulator Neutral

## Bally Games Supported

<b>A-F</b>	<b>H - Night Rider</b>	<b>Nitro - Six Million Dollar Man</b>	<b>Skateball-V</b>
Black Jack	Harlem Globetrotters	Nitro Ground Shaker	Skateball
Dolly Parton	Hotdoggin	Paragon	Space Invaders
Eight Ball	Kiss	Playboy	Star Trek
Evel Knievel	Lost World	Power Play	Strikes and Spares
Freedom	Mata Hari	Rolling Stones	Supersonic
Frontier	Mystic	Silverball Mania	Viking
Future Spa	Night Rider	Six Million Dollar Man	Voltan Escapes

## Stern Games Supported

<b>A - D</b>	<b>F - L</b>	<b>M - Q</b>	<b>S - Z</b>
Ali	Flight 2000	Magic	Seawitch
Big Game	Free Fall	Memory Lane	Split Second
Catacomb	Galaxy	Meteor	Stargazer
Cheetah	Hot Hand	Nine Ball	Stars
Cosmic Princess	Iron Maiden	Nugent	Stingray
Dracula	Lazorlord	Orbitor One	Trident
Dragonfist	Lectronamo	Pinball	Viper
	Lightning	Quicksilver	Wildfyre



# PinHead Electronics

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