



## - WIRING DIAGRAM V3.2 & INSTRUCTIONS -

### MEGA-1701-R BOARD FOR THE 1:350 SCALE ENTERPRISE 1701 REFIT

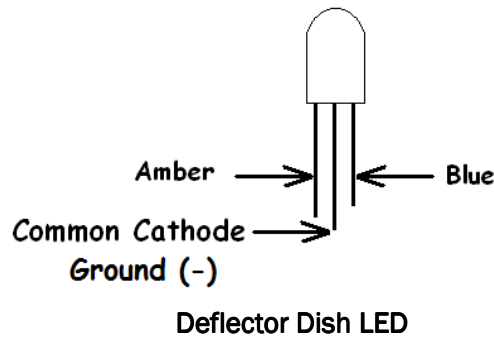
#### ITEMS YOU WILL NEED:

Soldering Iron  
Solder  
Cutter  
Wire Stripper

Refer to the below wiring diagram for each connector for all external connections to the circuit board.

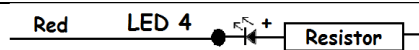
Below is a pictorial of how to tell which side the Amber is, Blue and which is the Cathode on the Bicolor LED for the Deflector Dish.

**Please make sure to wire it correctly.**

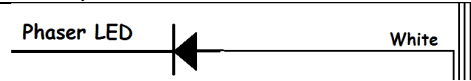


Deflector Dish LED

\*Some circuits on this board require external resistors  
Example:



\*Some circuits on this board have built-in resistors (factory resistance) and **DO NOT** need external resistors  
Example:



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Due to the complexity of the number of connections, which control all the internal and external lighting of this ship, it is best handled by pictorial diagrams for each individual connector. This lighting kit is best suited for experienced modelers who are very familiar with all the locations of below lighting.

\*\*\*A digital version of this Manual can be requested via email: \*\*\*  
[sales@tenacontrols.com](mailto:sales@tenacontrols.com)

The below sections describe the functions of this board

## HOW TO SET UP MODES:

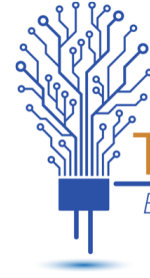
Select the mode: Dry-Dock Mode, Movie Mode or Flight Mode

1. Press the **Set** button to place it Setting Mode
2. Press the **Deflector Dish** button to place it in Dry-Dock Mode
3. Press the **Deflector Dish** button again to place it in MVE (Movie Mode)
4. Press the **Deflector Dish** button again to place it in Flight Mode

You can see which mode you are in by looking at the landing bay lights.

If LED1 is lit, then you are in Dry-Dock mode. If LED1 and LED2 are lit, then you are in Movie Mode, and if LED1, LED2 and LED3 are lit, then you are in Flight Mode.

Once you have selected the mode, press the **Set** Button to store your selection. Now it will always work in this mode until you change it.



## HOW TO CHANGE THE TIME PERIOD FOR NAVIGATION AND STROBE:

**Note:** The board comes preset to the correct Navigation and Strobe timing sequence, although if you want to modify the time sequence, use the below procedure. The Navigation “On Time” and “Off Time” is adjusted equally. The Strobe “On Time” stays fixed, the “Off Time” is adjusted.

### Select the On/Off timing period of the Navigation and Strobe Lights.

Press the **Set** Button to place it Setting Mode. To adjust the Navigation Time period, press the **Demo Mode** Button repeatedly until the correct time is reached. To adjust the Strobe off Time period, press the **Torpedo** Button repeatedly until the correct time is achieved. Press the **Set** Button to store these selections. See following tables:

The best way to utilize these tables is to get to the fastest flash rates and then go up from there.

### STROBE TABLE

SETTING	RATE
1 (FASTEST)	0.06 sec ON/ 0.10 sec OFF
2	0.06 sec ON/ 0.20 sec OFF
3	0.06 sec ON/ 0.30 sec OFF
4	0.06 sec ON/ 0.40 sec OFF
5 (STANDARD)	0.06 sec ON/ 0.50 sec OFF
6	0.06 sec ON/ 0.60 sec OFF
7	0.06 sec ON/ 0.70 sec OFF
8	0.06 sec ON/ 0.80 sec OFF
9	0.06 sec ON/ 0.90 sec OFF
10	0.06 sec ON/ 1.00 sec OFF
11	0.06 sec ON/ 1.10 sec OFF
12	0.06 sec ON/ 1.20 sec OFF
13	0.06 sec ON/ 1.30 sec OFF
14	0.06 sec ON/ 1.40 sec OFF
15 (SLOWEST)	0.06 sec ON/ 1.50 sec OFF

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## NAVIGATION FLASH TABLE

SETTING	RATE
1 (FASTEST)	0.10 sec ON/ 0.10 sec OFF
2	0.20 sec ON/ 0.20 sec OFF
3	0.30 sec ON/ 0.30 sec OFF
4	0.40 sec ON/ 0.40 sec OFF
5	0.50 sec ON/ 0.50 sec OFF
6	0.60 sec ON/ 0.60 sec OFF
7	0.70 sec ON/ 0.70 sec OFF
8	0.80 sec ON/ 0.80 sec OFF
9	0.90 sec ON/ 0.90 sec OFF
10 (STANDARD)	1.00 sec ON/ 1.00 sec OFF
11	1.10 sec ON/ 1.10 sec OFF
12	1.20 sec ON/ 1.20 sec OFF
13	1.30 sec ON/ 1.30 sec OFF
14	1.40 sec ON/ 1.40 sec OFF
15	1.50 sec ON/ 1.50 sec OFF
16	1.60 sec ON/ 1.60 sec OFF
17	1.70 sec ON/ 1.70 sec OFF
18	1.80 sec ON/ 1.80 sec OFF
19	1.90 sec ON/ 1.90 sec OFF
20 (SLOWEST)	2.00 sec ON/ 2.00 sec OFF



## **DRY DOCK MANUAL AND DEMO MODE FUNCTIONS:**

1. Power comes on when power switch is put to its ON position
  - a. Navigation: the usual 1 second on/off function
  - b. Strobe: the usual 2 flashes per second and all the other internal and external ship lighting comes on except for the Navigational Deflector Dish and Side Navigational Deflector Dish Lights
  - c. **Manual Function of the Navigational Deflector dish Button:**
    1. Press the momentary switch once and the Navigational Deflector Dish and Impulse Deflection Crystal ramps up from off to full brightness Amber, the Impulse Engine Red LED's and Side Navigational Deflector Dish lights come on.
    2. Press the momentary switch, the Navigational Deflector Dish and Impulse Deflection Crystal ramps down from full-brightness Amber, to off, while simultaneously the Blue color Navigational Deflector Dish and Impulse Deflection Crystal ramps up to full-brightness. The Nacelle Blue Chiller Grills come full on. The Impulse Engine Red LED's, Front Nacelle Lights, Exterior Neck Lighting, Lower Saucer Dome Lighting, Pylon Lighting, Rear Nacelle Registry (Raytheon) Lighting and Thruster lighting all go off.
    3. Press the momentary switch again and the Navigational Deflector Dish and Impulse Deflection Crystal ramp down Blue (bi-color) from full-brightness to off.
    4. Press the momentary switch again to repeat steps 1-3.
  - d. **Function of the Demo Mode Button:**
    1. Press the Demo Mode button and the whole ship shuts off for 2 seconds.
    2. The Pylon Lights (U19) come on
    3. 2 second mark the front nacelle lights (U22) come on.
    4. 4 second mark the exterior neck lights (U15) come on.
    5. 6 second mark rear nacelle registry lights (U17) come on.
    6. 8 second mark the Lower Saucer Dome lights (U21) come on.
    7. 10 second mark the Top Bridge lights (U20) come on.
    8. 12 second mark the Side Navigational Deflector Dish lights (U18) come on, Navigational Deflector ramps up from off to full on Amber. Amber Impulse Deflection Crystal and Impulse Engines come on.
    9. 14 second mark the Navigation lights come on.
    10. 16 second mark the Thruster lights (U27) come on.
    11. 18 second mark the Strobe lights come on.
    12. 20 second mark the neck interior lights (U25) come on.
    13. 22 second mark the Sec Hull interior lights (U26) come on.
    14. 24 second mark the Saucer interior lights (U6) come on.
    15. 26 second mark the Plasma lights on top of front nacelle lights (U16) come on.
    16. 28 second mark the shuttle bay lights #37 & #40 lights (U23) come on.



17. 30 second mark the interior shuttle bay lights (U24) come on.
18. 32 second mark the Sequential Landing Bay lights come on.
19. 34 second mark the Navigational Deflector and Impulse Deflection Crystal ramps down from full on Amber while simultaneously Navigational Deflector and Impulse Deflection Crystal ramps up full on Blue. Chiller Grills come on at this time and Impulse Engines go off.
20. 36 second mark Side Navigational Deflector Dish lights (U18), Blue Navigational Deflector and Blue Impulse Deflection Crystal ramps down full off. Chiller Grills go off.

## **MOVIE MANUAL AND DEMO MODE FUNCTIONS:**

1. Power comes on when power switch is put to its ON position
  - a. Navigation: the usual 1 second on/off function.
  - b. Strobe: the usual 2 flashes per second and all the other internal and external ship lighting comes on except for the Navigational Deflector Dish, Side Navigational Deflector Dish Lights, Impulse Deflection Crystal and Impulse Engines.
  - c. **Manual Function of the Navigational Deflector dish Button:**
    1. Press the momentary switch once, Side Navigational Deflector Dish lights come on, Navigational Deflector Dish Amber bi-color ramps up from off to a half-brightness. Ten seconds later, the Navigational Deflector Dish Amber bi-color automatically ramps up to a full-brightness. The Impulse Engines (Red led) start to glow and Impulse Deflection Crystal ramps up Amber (bi-color) from off to full brightness. Another ten seconds afterwards, the Navigational Deflector Dish Amber bi-color automatically ramps down from full-brightness to off, while simultaneously, the Blue bi-color Navigational Deflector Dish and Impulse Deflection Crystal ramp up from off to full-brightness.
    2. The Impulse Engines (Red led) go off and. After which, the Nacelle lights (Chiller Grills, Blue led strip) instantly turn on (no ramp up effect).
    3. Press the momentary switch the Nacelle lights (Chiller Grills, Blue led strip) turn off (no ramp down effect). The Navigational Deflector dish and Impulse Deflection Crystal Blue bi-color LED's ramps down to off.
    4. Press the momentary switch again to repeat steps 1-3.
  - d. **Movie Mode function when Demo Mode Button is pressed:**
    1. Press the demo mode button and the whole ship shuts off for 2 seconds.
    2. 2 second mark Navigation lights come on.
    3. 4 second mark Strobe lights come.
    4. 6 second mark the Sequential landing bay lights come on.
    5. 8 second mark the Side Navigational Deflector Dish lights come on, Navigational Deflector Dish Amber bi-color ramps up from off to a half-brightness.

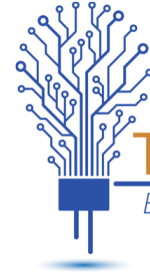
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6. 10 second mark The Pylon Lights (U19) come on.
7. 12 second mark the front nacelle lights (U22) come on.
8. 14 second mark the exterior neck lights (U15) come on
9. 16 second mark the rear nacelle registry lights (U17) come on.
10. 18 second mark the Lower Saucer Dome lights (U21) come on.
11. Navigational Deflector Dish Amber bi-color automatically ramps up to a full-brightness. The Impulse Engines (Red led) start to glow and Impulse Deflection Crystal ramps up Amber (bi-color) from off to full brightness.
12. 20 second mark the Top Bridge lights (U20) come on.
13. 22 second mark the Thruster lights (U27) come on.
14. 24 second mark the neck interior lights (U25) come on.
15. 26 second mark the Sec Hull interior lights (U26) come on.
16. 28 second mark the Saucer interior lights (U6) come on.
17. Navigational Deflector Dish and Impulse Deflection Crystal Amber bi-color LED's automatically ramp down from full-brightness to off, while simultaneously, the Blue bi-color Navigational Deflector Dish and Blue bi-color Impulse Deflection Crystal ramps up from off to full-brightness. The Impulse Engines (Red led) go off. After which, the Nacelle lights (Chiller Grills, Blue led strip) instantly turn on (no ramp up effect). Once the chiller Grills come on, the Thruster lights, Pylon lights, Front Nacelle lights, Exterior Neck lights, Rear Nacelle Registry lights and the Lower Saucer Dome light all shut off.
18. 30 second mark the shuttle bay lights #37 & #40 lights (U23) come on. The Plasma lights on top of front nacelle lights (U16) come on. The interior shuttle bay lights (U24) come on.
19. 32 second mark the Nacelle lights (Chiller Grills, Blue led strip) turn off (no ramp down effect). The Navigational Deflector dish and Impulse Deflection Crystal Blue bi-color LED's ramp down to off.



## FLIGHT MODE MANUAL MODE FUNCTIONS:

1. Power comes on when power switch is put to its ON position.
  - a. Navigation: the usual 1 second on/off function.
  - b. Strobe: the usual 2 flashes per second and the Side Deflector Dish Lights, Top Bridge Registry light, Neck Interior Lights, Saucer Interior Lights, Secondary Hull Interior Lights, Phaser Turret and Plasma lights, Interior Shuttle Bay Lights and Shuttle Bay Landing Assist lights come on.

### \*\*\*\*\* Special Note \*\*\*\*\*

Depending on the type of DC power supply used to power up your 1/350 Scale ship, there could be an issue with the phaser audio sound if you power-up, power-down and then power back up very quickly. If you power-down the ship, wait 10-15 seconds before powering back up. This will allow the dc voltage to decay to a zero value and not hang up the phaser sound chip. This is a heads up just in case you can't hear the phaser sound.

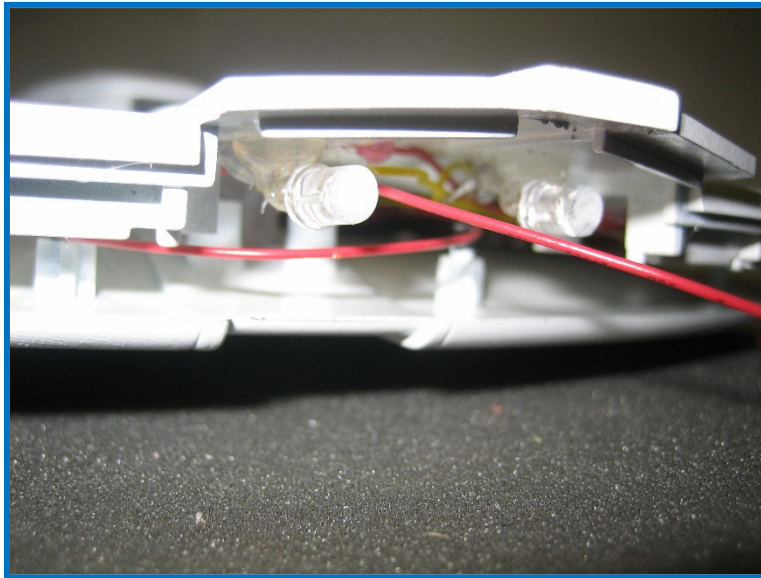


Housing with hole just big  
Enough for the led



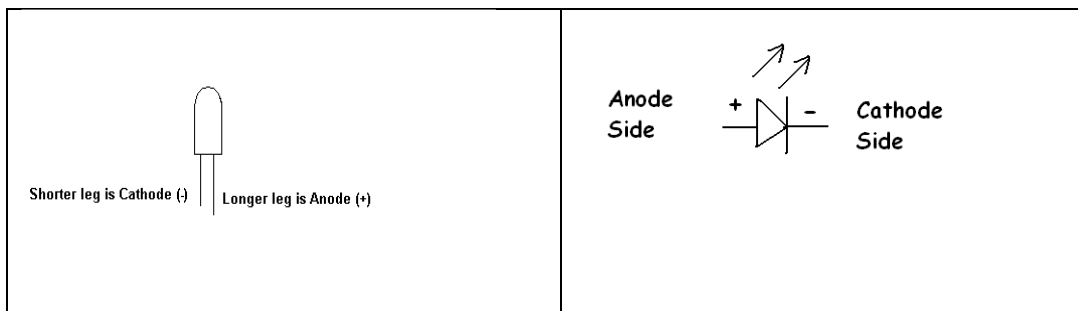
Push the led in from the  
Back and hot glue in place





You can file the top of LED's for a more diffused look for the Impulse Engines.

## How to distinguish a LED:

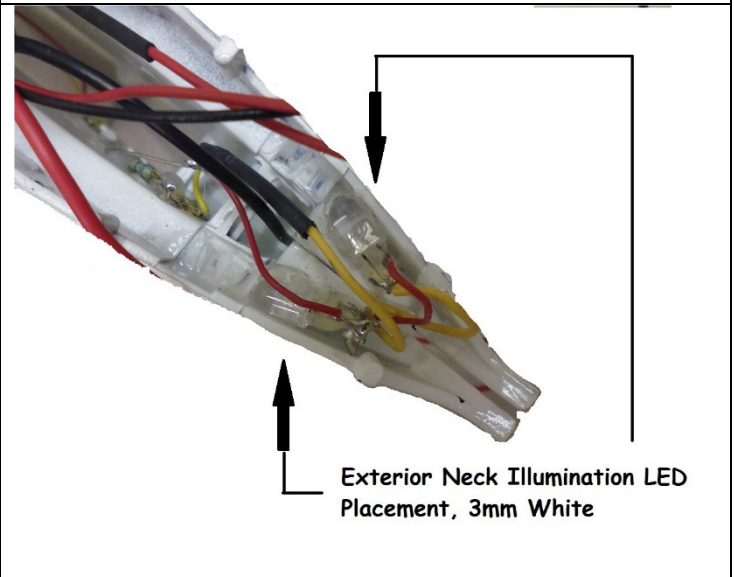
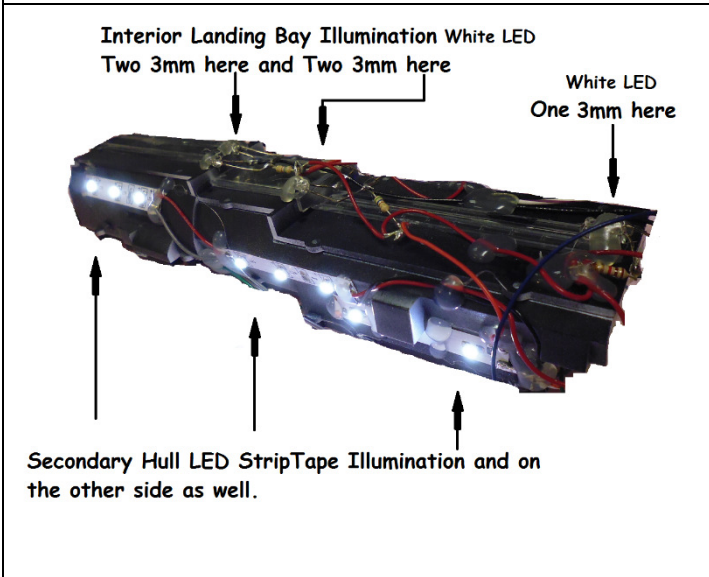
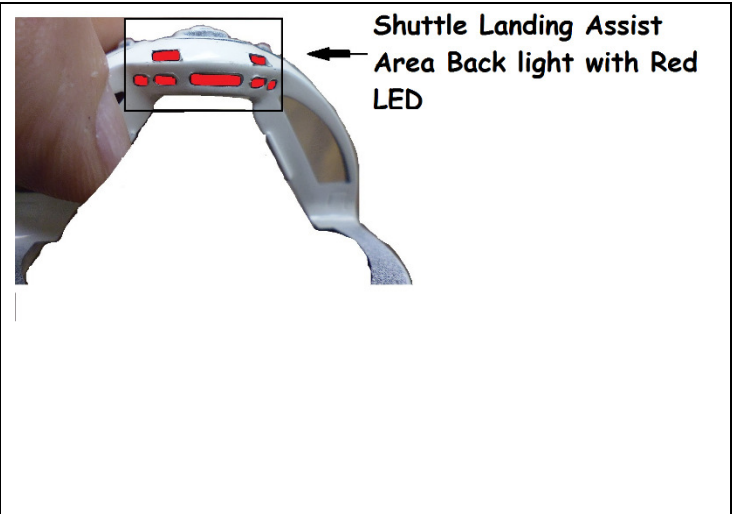
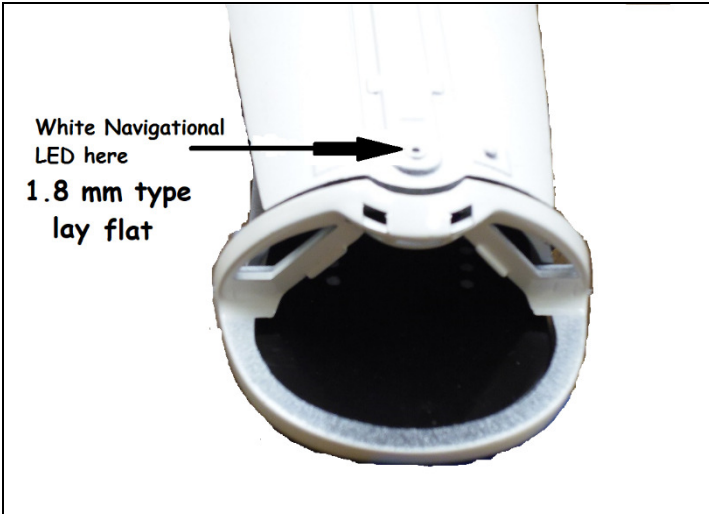


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## LIST OF PARTS AND THEIR USE:

**Momentary Switch:** Five (5) provided for Nav. Deflector Dish, phasor, Torpedo's, Demo Mode and Set Up.

**Speaker:** Two (2) provided for Weapons Sound.

**Bi-Color LED:** Two (2) 5 mm provided for Navigational Deflector Dish and Impulse Deflection Crystal.

**Torpedo LED:** Two (2) provided for left and right Photon Torpedo effect, Red 3 mm.

**Phasor LED:** One (1) provided for phasor effect, White 3 mm.

**LED Tape Strip:** Two (2) provided for lighting the nacelle chiller grills, Blue color. Enough White LED Tape Strip to illuminate the Saucer, Neck, and Secondary hull.

**Shuttle Bay Interior LED:** Five (5) 3 mm provided to illuminate the interior of shuttle bay, all five are White and Resistors.

**Thruster LED:** Ten (10) provided for the thruster locations, Eight Yellow 3 mm, Two Yellow SMD pre-wired and Resistors.

**Shuttle Bay Landing Assist LED:** Two (2) provided for back lighting, Red 1.8 mm and Resistor.

**Aft Main Tractor Beam LED:** One (1) provided, White SMD and Resistor.

**Strobe LED:** Four (4) provided for the Strobe Effect, White 3 mm and Resistors.

**Navigation LED:** Nine (9) provided for the Navigation Effect and Resistors. For color placement see the below Top View of LED Locations and Bottom View of LED Locations. **LED 8 is 1.8 mm type.**

**Bottom Sauce Dome LED:** Three (3) provided for illumination, White 3 mm and Resistors.

**Plasma Deflection LED:** Two (2) provided for illumination on the front top of nacelles, Blue 5 mm and Resistors.

**Side Navigational Deflector Dish LED:** Four (4) provided for illumination of the side thrusters, Yellow SMD pre-wired and resistors.

**Exterior Neck LED:** Two (2) provided for Exterior Neck illumination, White 3 mm and Resistors.

**Raytheon Lighting LED:** Two (2) provided for illumination of the rear Registration on the nacelles, White 3 mm and Resistors.

**Pylon Lighting LED:** Four (4) provided for exterior illumination of the Pylons, White 3 mm and Resistors.

**Front Nacelle LED:** Four (4) provided for illumination of the rear of Saucer, White 3 mm and Resistors.

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## LIST OF PARTS AND THEIR USE: (CONTINUED)

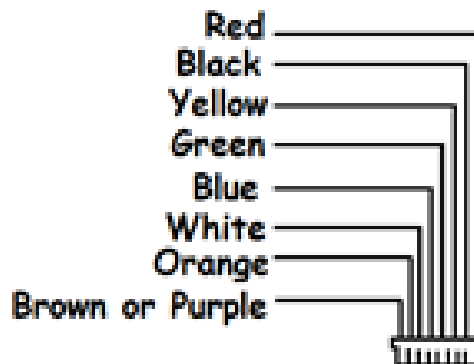
**Bridge Light LED:** One (1) provided for illuminating the front Registry on Saucer, White SMD pre-wired, use the 470 ohm Resistor on this SMD.

**Sequential Landing LED:** Ten (10) provided for the two columns of five rows, White 3mm.

**Impulse Engines LED:** Two (2) provided for the Impulse Engine effects, Red 5mm.

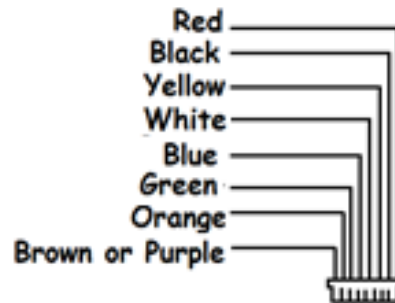
**IMPORTANT.** Different cable companies have swapped the Green and White wires location on the JST Connector. Below are two pictures showing the wires and their locations. When you get your board, you will need to look and see which connector type you received. Use the wiring sheets that are only for connector A or use the wiring sheets that are only for connector B. Sorry for this inconvenience, although this is out of our control.

## Position and Wire colors from Company A

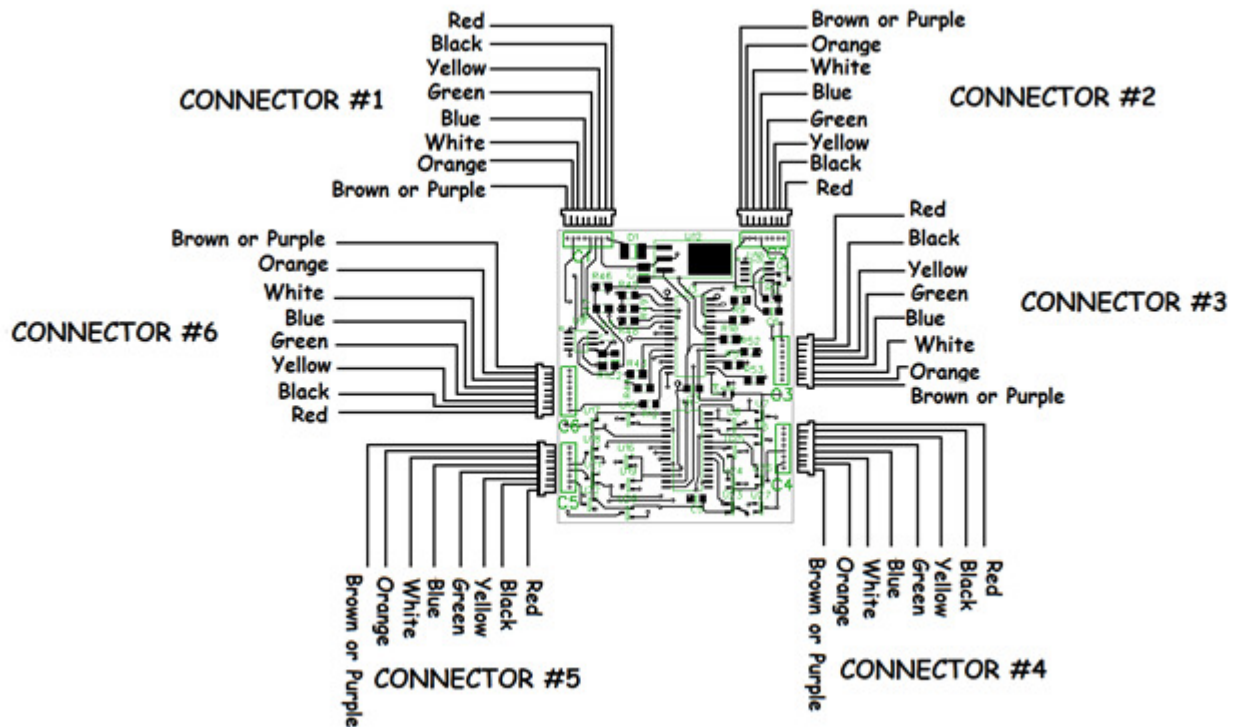




## Position and Wire colors from Company B

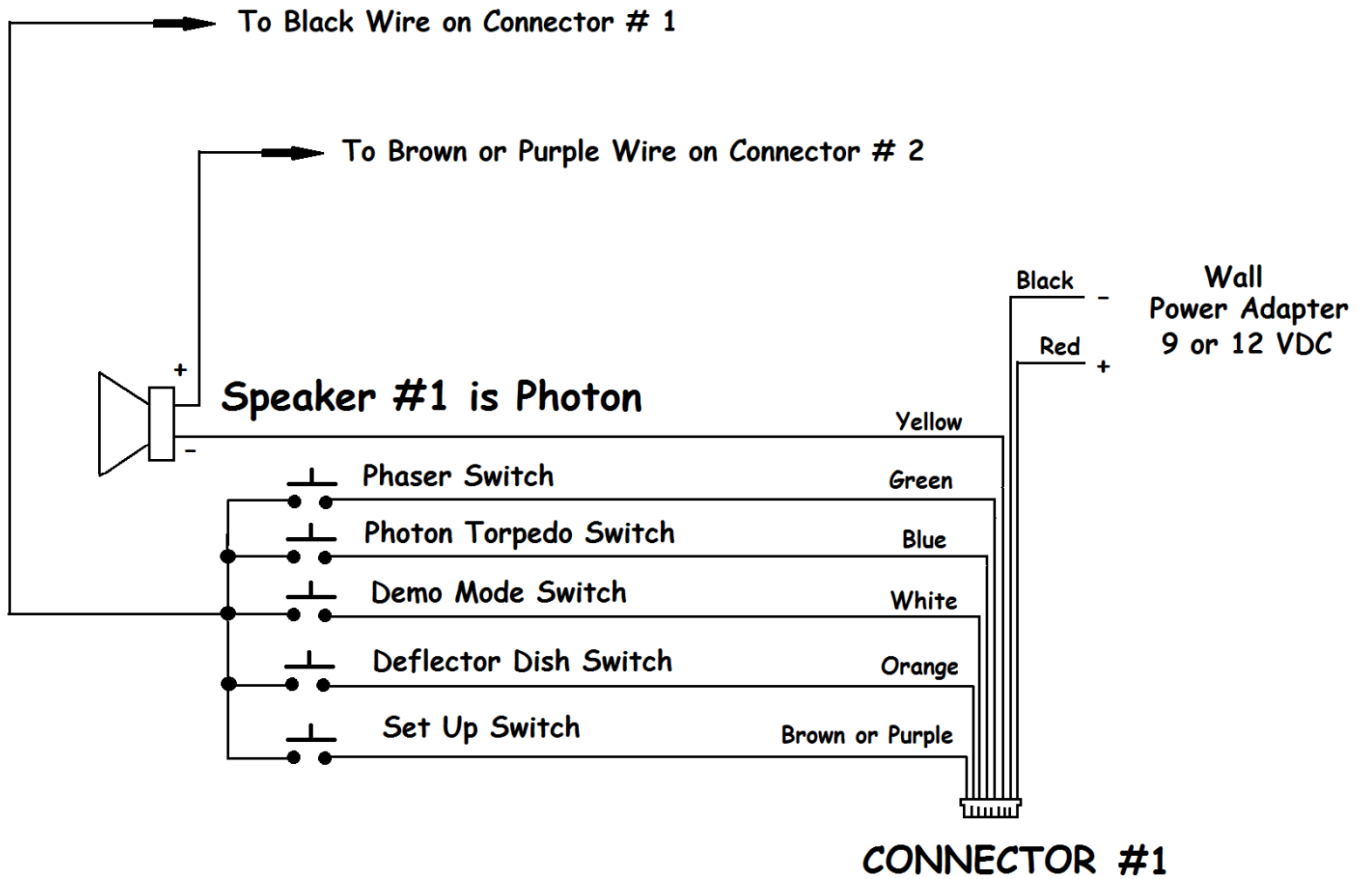


### VIEW OF LOCATIONS CONNECTOR 1 – CONNECTOR 6:





## COMPANY A CONNECTOR WIRING



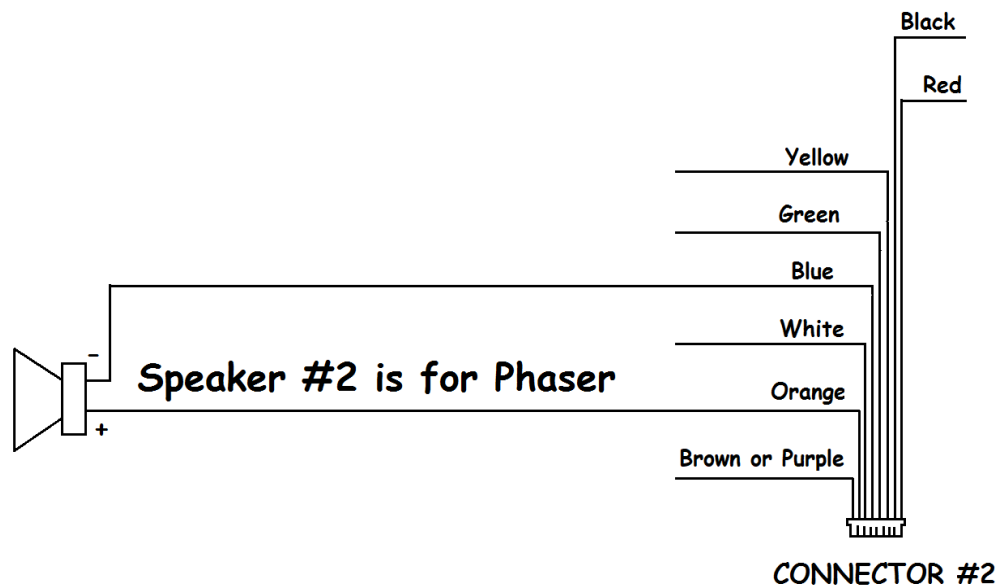
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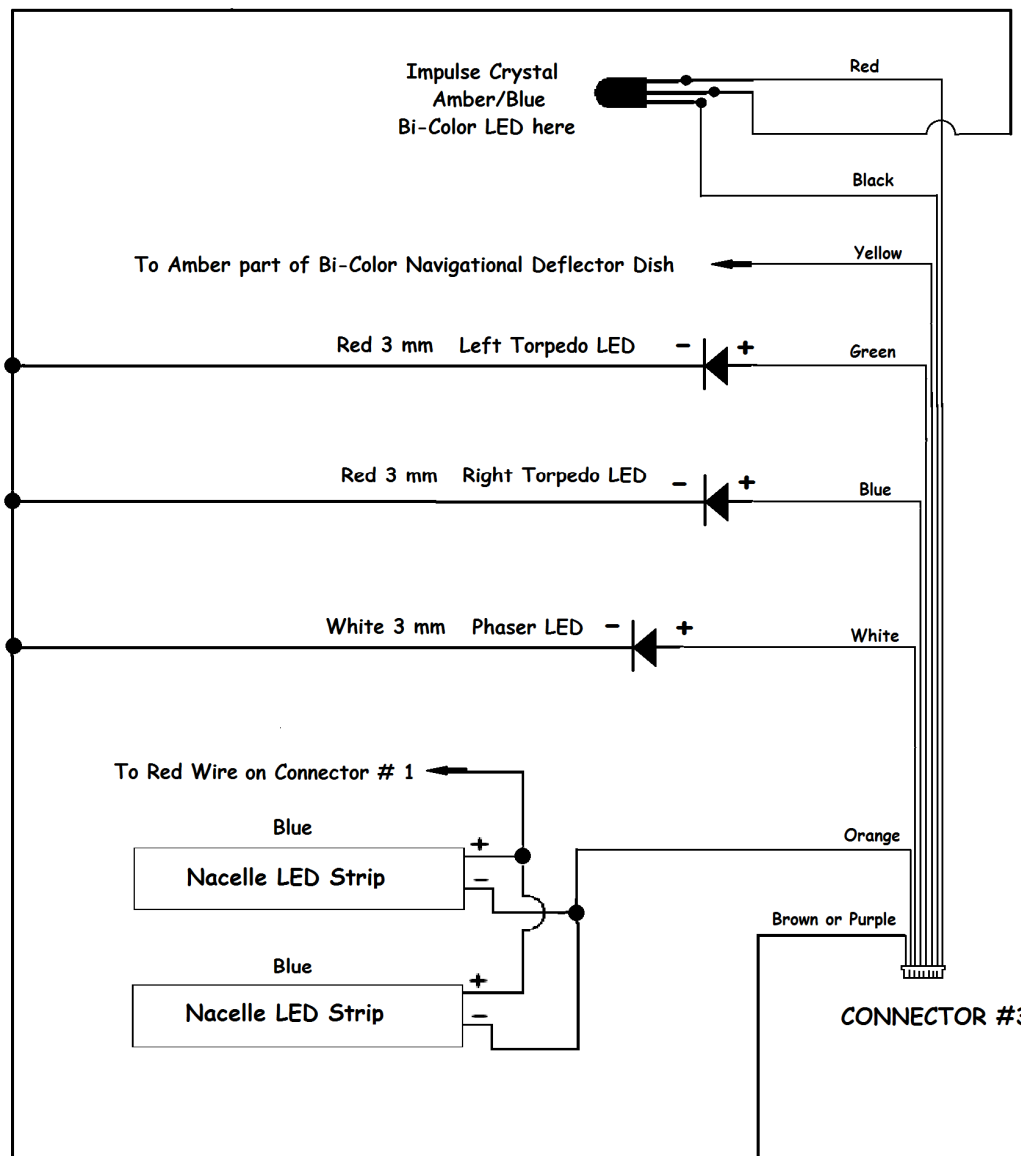
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## COMPANY A CONNECTOR WIRING

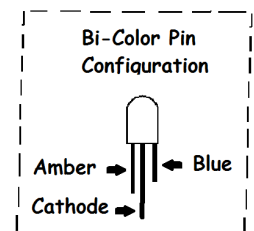




## COMPANY A CONNECTOR WIRING



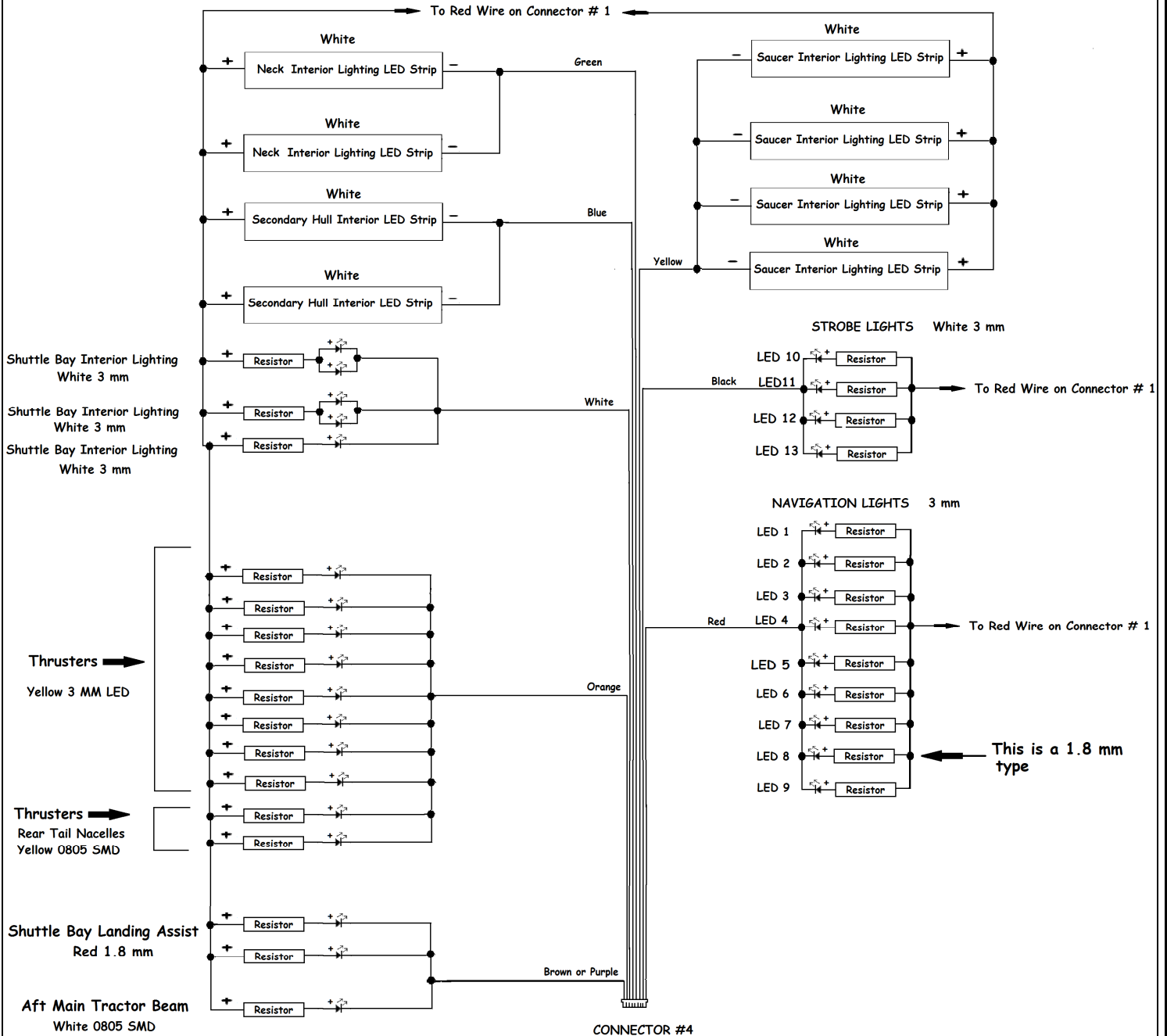
**Important!!!** Pay attention to the pin lengths of the Bi-Color LED. Connect as shown.





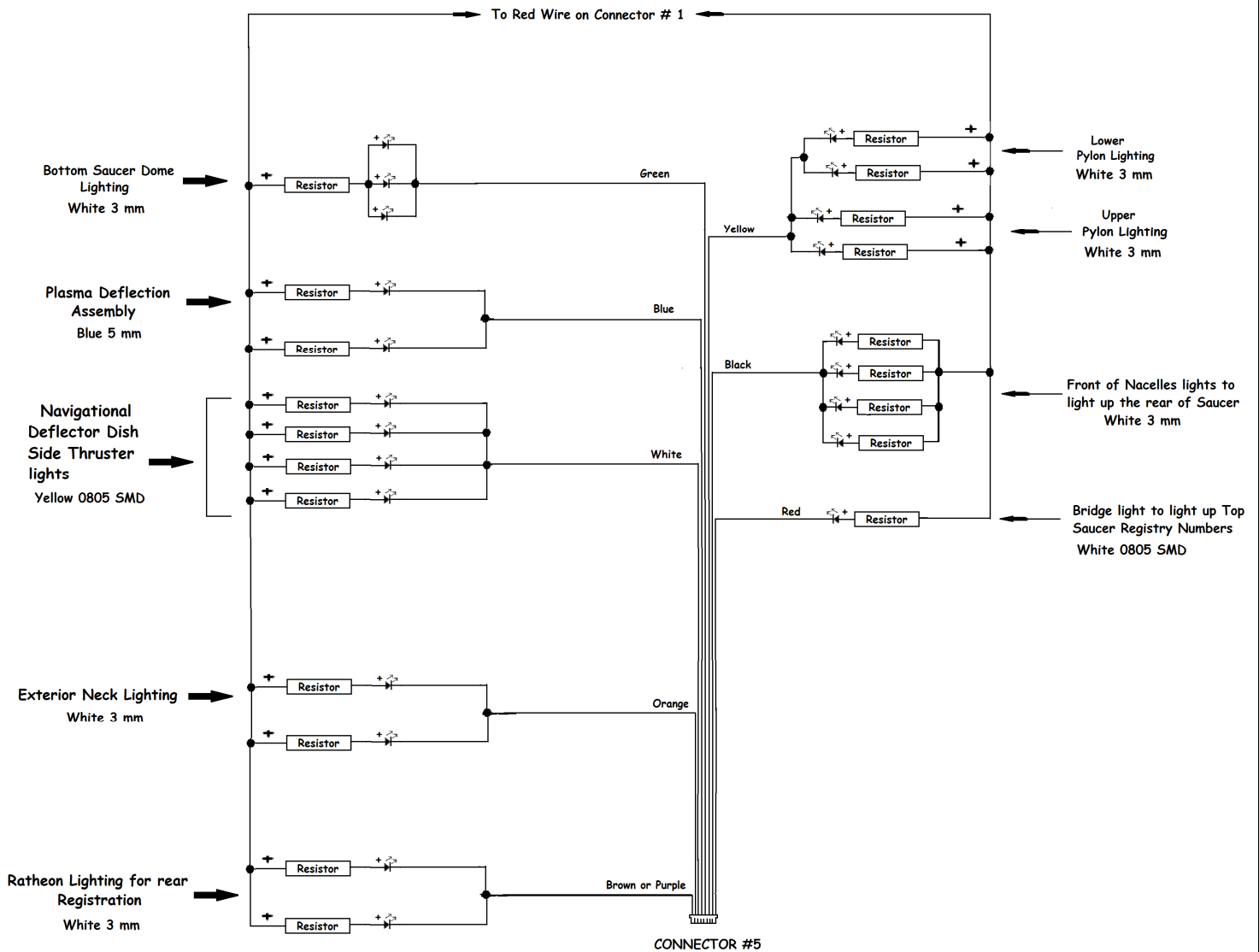


## COMPANY A CONNECTOR WIRING





## COMPANY A CONNECTOR WIRING



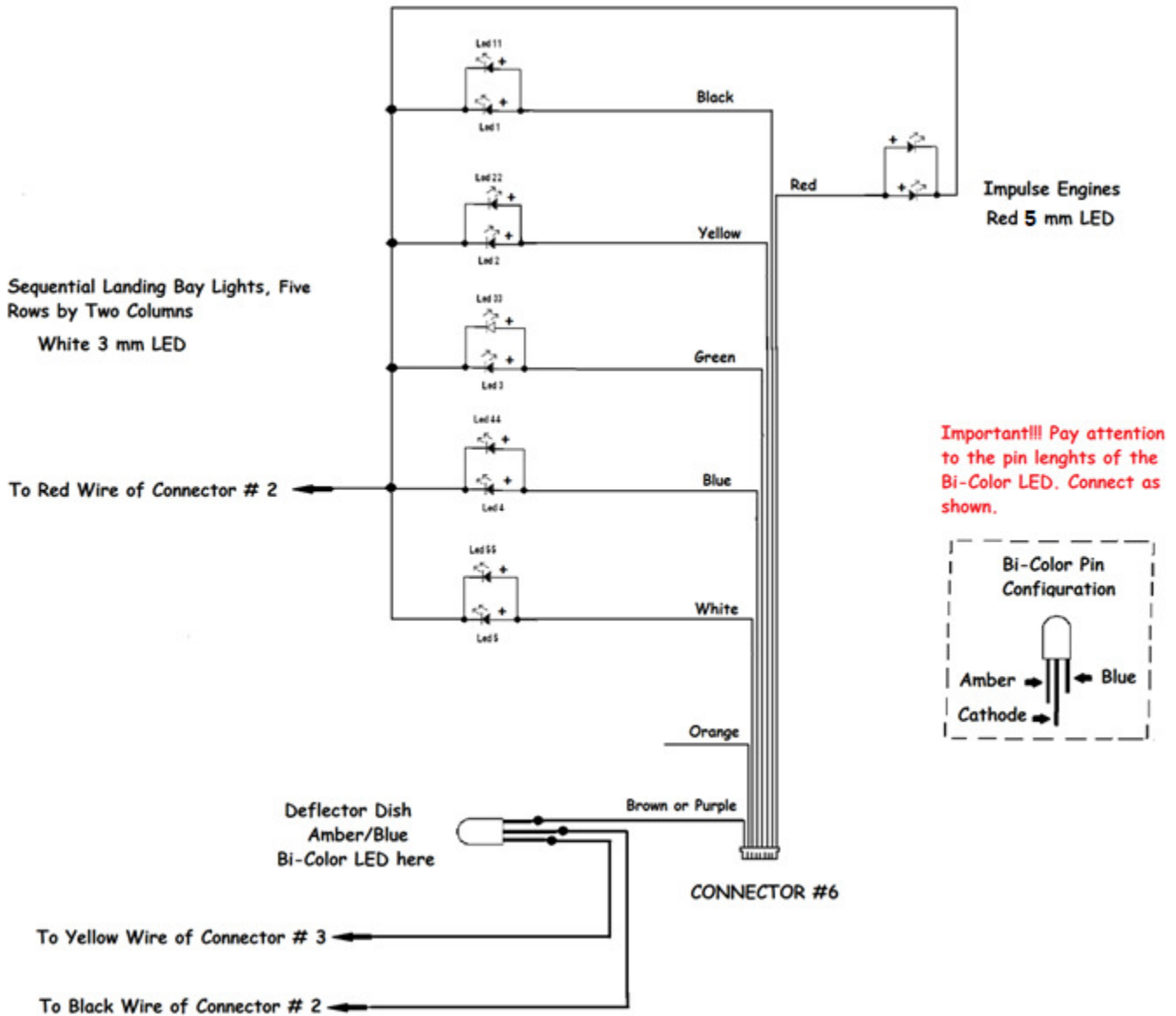
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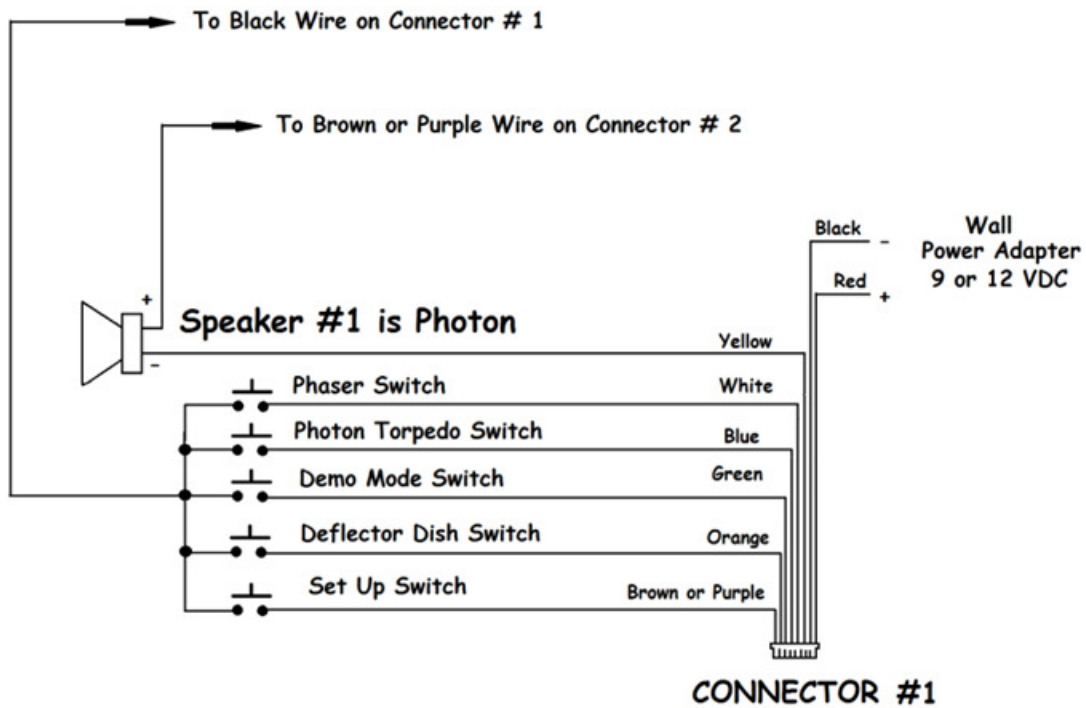
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## COMPANY A CONNECTOR WIRING

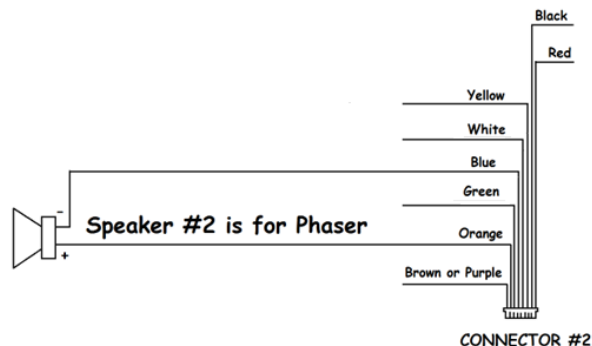




## COMPANY B CONNECTOR WIRING

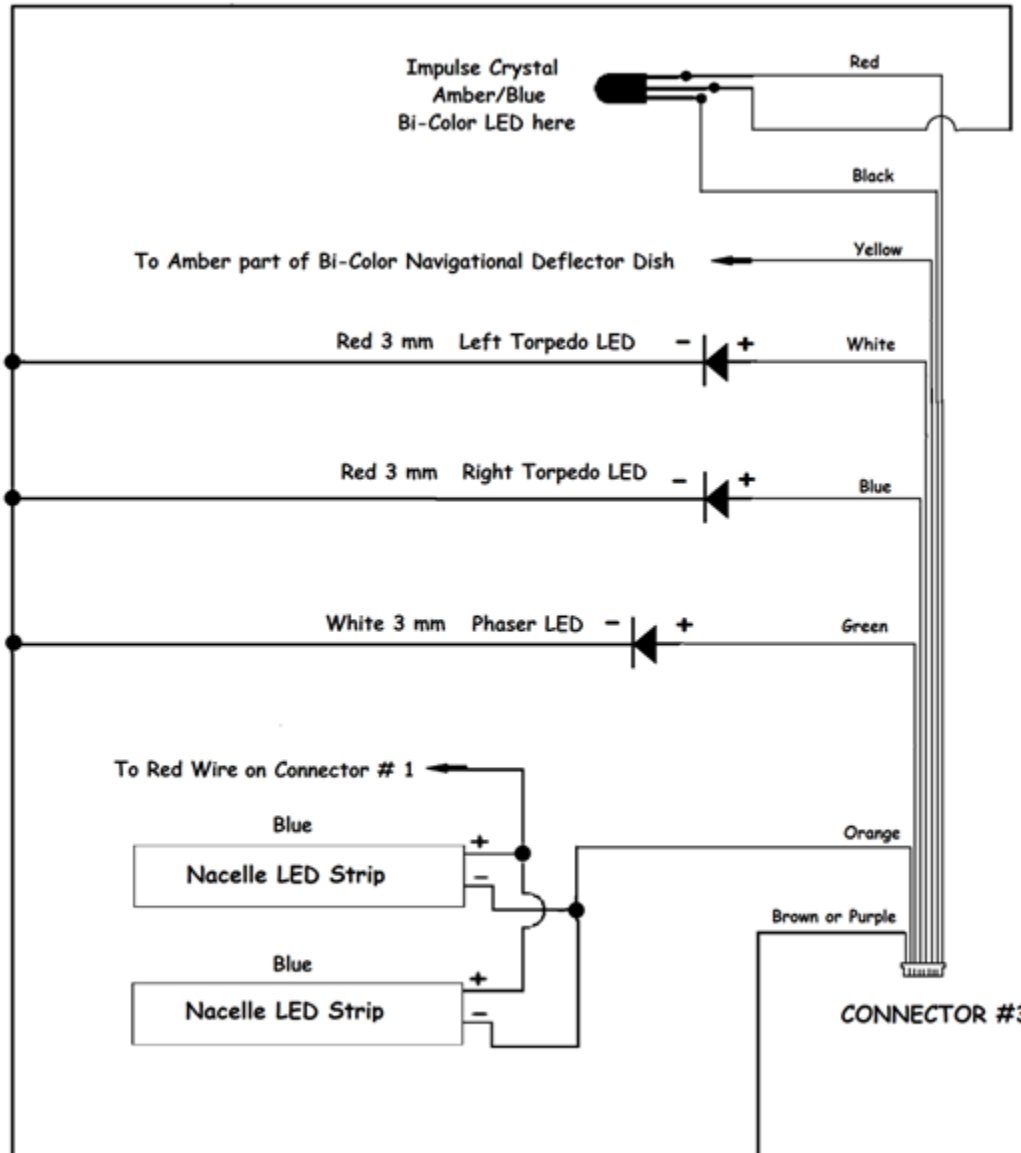


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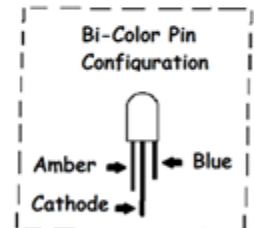




## COMPANY B CONNECTOR WIRING

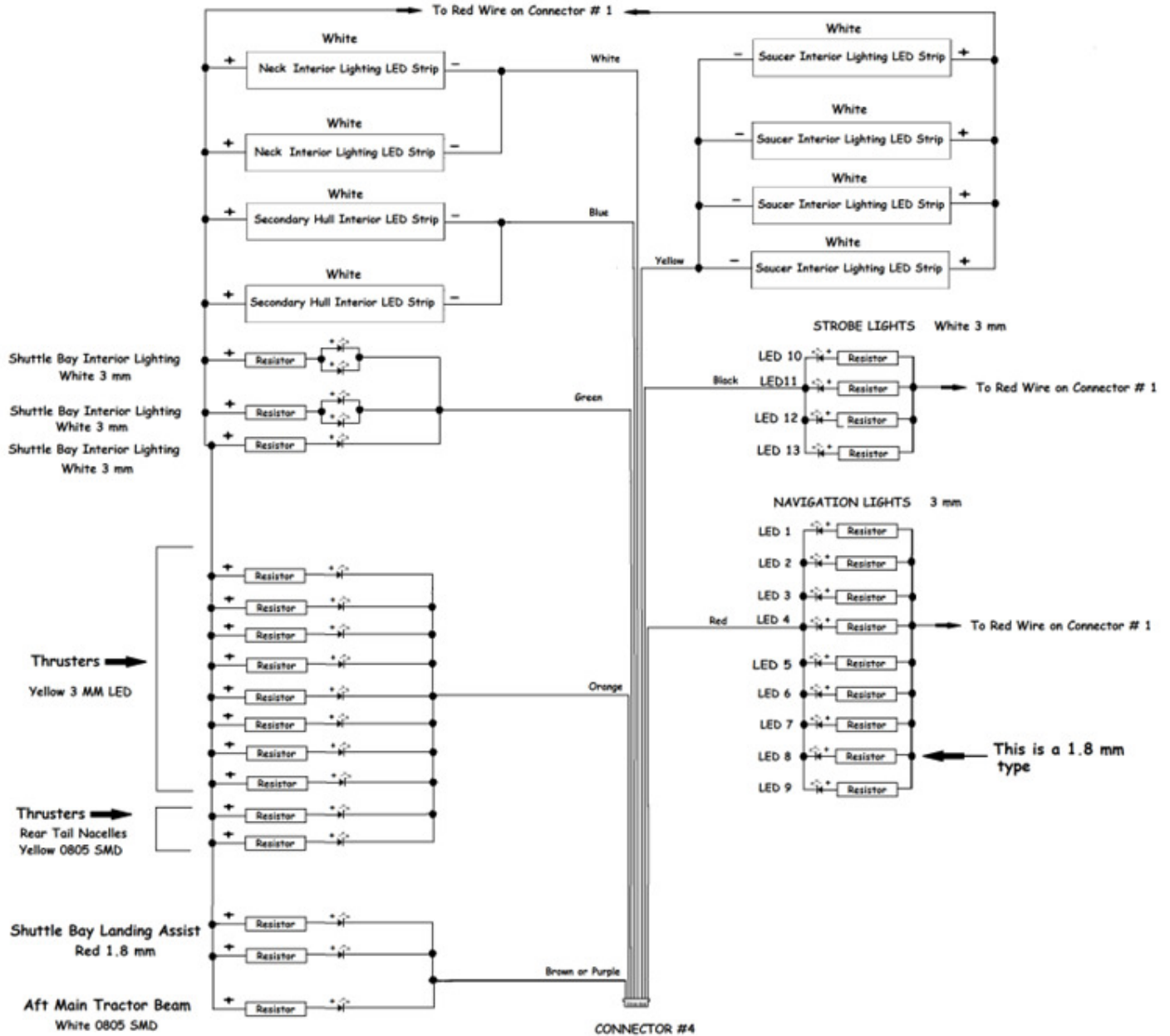


**Important!!!** Pay attention to the pin lengths of the Bi-Color LED. Connect as shown.



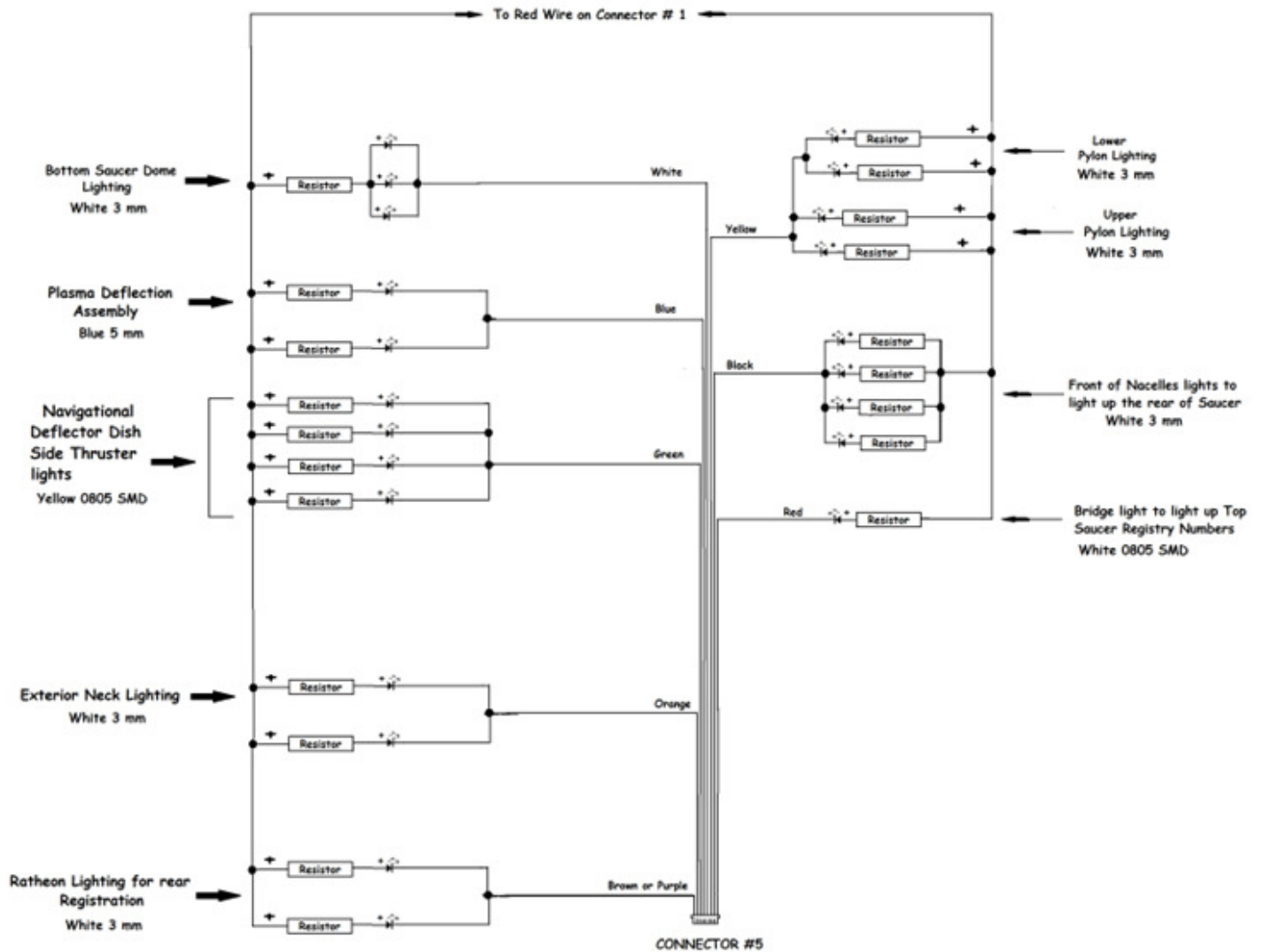


## COMPANY B CONNECTOR WIRING



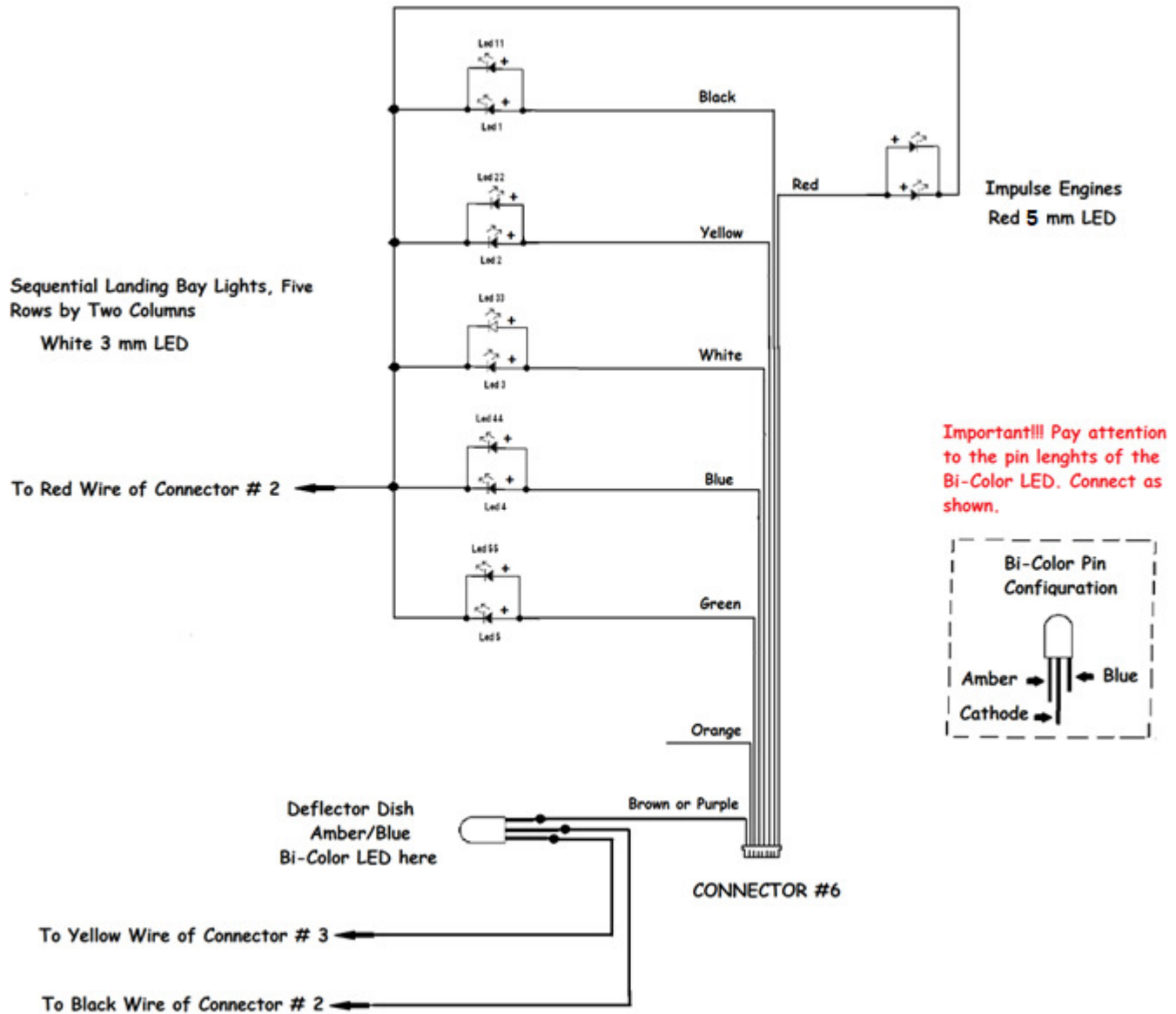


## COMPANY B CONNECTOR WIRING





## COMPANY B CONNECTOR WIRING



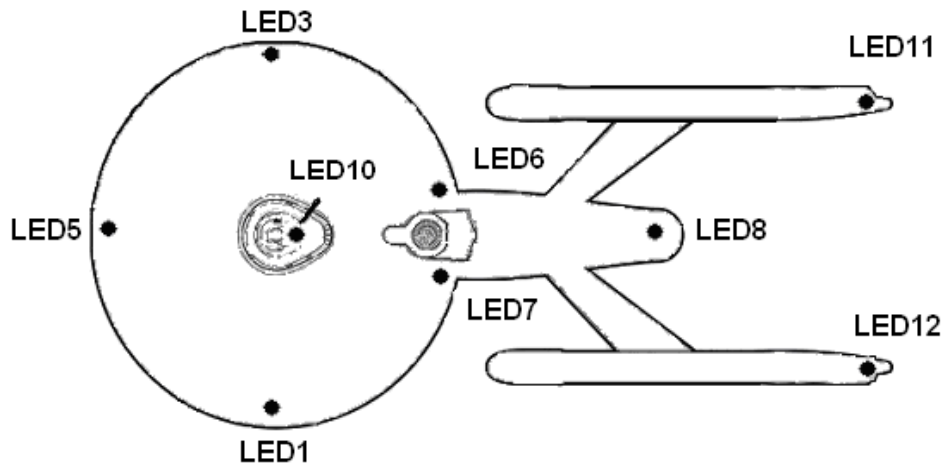




## TOP VIEW OF LED LOCATIONS:

LED1-LED2 ARE RED NAV LED'S, LED3-LED4  
ARE GREEN NAV LED'S, LED5-LED9 ARE WHITE  
NAV LED'S

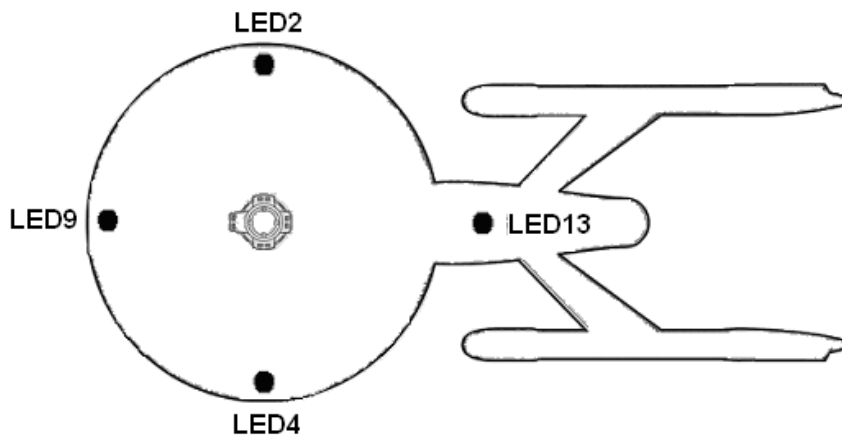
LED10-LED13 ARE WHITE STROBE LED'S



## BOTTOM VIEW OF LED LOCATIONS:

LED1-LED2 ARE RED NAV LED'S, LED3-LED4  
ARE GREEN NAV LED'S, LED5-LED9 ARE WHITE  
NAV LED'S

LED10-LED13 ARE WHITE STROBE LED'S



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## Warranty

TenaControls LLC warrants that the control boards sold meet TenaControls specifications and are adequately contained, packaged and labeled and conform to the promises and affirmations of fact made on the container and label. THE FOREGOING WARRANTIES ARE EXCLUSIVE, AND ARE IN LIEU OF ALL OTHER WARRANTIES (WHETHER WRITTEN, ORAL OR IMPLIED) INCLUDING WARRANTY OR MERCHANTABILITY IN OTHER RESPECTS THAN EXPRESSLY SET FORTH ABOVE AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

In the event that there is a breach of express warranty by the manufacturer made in connection with the purchase of this product, if any, the sole remedy of any buyer shall be to return the product along with original sales receipt, at **buyer's expense** for repair (or replacement of the product if repair is impossible) to 75 Mowry Street, Mendon, MA 01756. Some states do not allow the exclusion or limitation of any incidental or consequential damages, so the above limitation may not apply to you. Nothing herein contained shall be construed to be a waiver by the manufacturer of any of the obligations imposed upon said buyer under the laws of the Commonwealth of Massachusetts except as herein specifically stated.

This warranty is enforceable only by the buyer of the product or a person in the buyer's immediate family. This warranty is enforceable for a period of **FIVE YEARS** from the date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above warranty may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

### Warranty Void if:

- A) Product is altered in any way.
- B) Used for other than its intended use.
- C) Buyer mishandling.