



**STELLAR EFFECTS MODELING SOLUTIONS PRESENTS:**  
**THE REFIT SIGNATURE SERIES**  
**LIGHTING EFFECTS SYSTEM**



**MODEL BY: NEIL SMITH USED WITH PERMISSION**

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# INTRODUCTION

Welcome to Stellar Effects Modeling's lighting kit harness for the Refit Signature Series lighting effects board for the PL 1:350 scale USS Enterprise 1701 Refit Starship model kit! In purchasing this kit and the effects board it is designed for, it can be assumed you're building a very serious model requiring countless hours of work and planning and building and, most of all, FUN! And you're likely looking for a very accurate representation of the beautiful Enterprise as she appeared in the movies or, in some cases, your own version of the Grand Lady! We're here to help you in the process so you can hopefully have less aggravation and more "WOW!" as you assemble this wonderful model.

This model kit is one of the most challenging and involved kits a modeler can face, especially when it comes to lighting, so make sure to follow all steps carefully and test all connections as you go.

The manual that follows is designed to help you easily install and connect all the lighting you need to make your model stand out. We've taken great consideration to make this kit as simple to install as possible.. (Particularly if you're modifying your build for custom lighting options and effects) Basic soldering skills are assumed with this kit, but if you need help or are not as experienced, feel free to contact us at Stellar Effects and we'll do our best to assist you! We are confident that anyone can learn the skills necessary to make this lighting kit work for your build and we'll help you in any way we can!

This manual is intended to be a usable reference for how the lighting kit is designed to work with the Refit Signature Series effects board. It is not the ONLY way to do things and you, as the builder, are perfectly welcome to deviate and experiment with your own version of lighting the Big E. (ONLY recommended for experienced builders) However, we do caution against using other materials (such as LED's, wires, resistors, power supplies, etc) not included with or recommended for this kit as you may damage the lights you're using or, worse, the board itself. Stellar Effects Modeling Solutions claims NO RESPONSIBILITY for any damage caused by incorrectly using the supplied products or any damage caused by using materials other than those included in this kit.

\*Note: using materials or components other than those included in this kit may void your warranty on your Refit Signature Series or other product!

# HOW TO USE THIS GUIDE

This guide is presented in a format intended to be easy to decipher for the intermediate to advanced model builder who is passably familiar, at least, with lighting diagrams and electrical current flow. For the beginner, this kit is certainly usable! But you might want to take some time to gather some information and familiarize yourself with basic terminology and knowledge on electrical diagrams and current. This is especially true if you intend to deviate at all from the instructions for this kit.

The guide is presented in an “easy-to-read” format where the builder can simply take the string of lights, as marked, and connect them to the terminal points, as marked. However, to ensure better connections, it is **HIGHLY RECOMMENDED** that the model builder solder the connecting wires together whenever possible! Terminal connections may not always be absolutely secure. Twisting the ends of wires together may also create some issues getting good connections. It is much more preferable to solder the end connections together whenever possible before inserting the wires into the corresponding terminal points.

Ultimately, it’s up to you, the builder, to choose how best to secure your wiring. We’ve made every possible attempt to make this process as simple as possible for builders of all levels. But you must choose the most secure method you prefer for your building style to ensure the best, lasting connection. We will make suggestions in the guide to help whenever possible/necessary.

There may be some times when a group of wires do not easily fit into a terminal, particularly on the secondary board. You may choose to make a “pigtail” by bringing together all the wires for that terminal and soldering them together or using a wire nut with a short additional wire leading out which will connect to the terminal and supply current to all the connected wires. Instead of, say, 4 wires going into one terminal, you now have only the one.

*A note on magnet wire: Many of the solutions used for wiring LED’s in this kit involve the use of magnet wire, a form a thin, highly conductive wire used to reduce the visible profile of standard 24-28 gauge wire inside the model. Magnet wire is wonderful stuff! But, it’s also thin and potentially fragile. Pieces prewired with magnet wire (red and green in this kit) should be handled delicately so as not to damage the connections. Also note that, while all magnet wire pieces included have been prepared for connection, magnet wire can be a bit challenging to “strip” to prepare for proper connection. If your prewired LED’s with magnet wire don’t seem to be functioning, please double check to make sure the colored wire shielding has been stripped away at its connecting point and, if not, carefully use a #11 hobby blade to scrape away any shielding to expose wires as necessary.*

# GETTING STARTED

So you're ready to embark on your mission? Ok, the first step is to check the contents of the kit to make sure you have all included parts. There are some modifications necessary to the model kit to accommodate lighting and wires you will need to make before completing installation. You will need different tools to complete the various modifications. We recommend using a rotary tool such as a Dremel for the majority of them, but you will also need a drill or pin vise and a jeweler's file.

## **WE STRONGLY ADVISE SEARCHING YOUTUBE VIDEOS FOR REFERENCE** **INSTRUCTIONS FOR PERFORMING THESE ALTERATIONS!!!**

There are numerous demonstration videos, including a series by TrekWorks™ and Starfleet Model Academy that demonstrate the following modifications. We also have some kit-specific videos on our Stellar Effects Modeling YouTube Page. It's worth your time to do a search and watch them for reference to help you learn how to perform these techniques!

Before we show the alterations you'll need to perform, here is a useful chart for non-metric drill bit sizes to accommodate standard size LED's:

**1.8mm/2mm LED = 3/32" Drill bit**

**3mm LED = 1/8" Drill bit**

**5mm LED = 13/64" Drill bit**

***WE ALSO RECOMMEND MARKING THE INSIDE OF THE MODEL DESIGNATING WHERE YOU WILL BE INSTALLING LED'S AS SHOWN IN THE PICTURES.***

***(hint: use lighting diagrams for reference!)***

The next sections will describe the areas and techniques used to prepare your kit for lighting. The sections covered are:

- Upper Saucer
  - o Edge windows and Navigation/RCS Thruster Lights
  - o Bridge raising \* (recommend SFX resin part replacement)
  - o Bridge area
- Lower Saucer
  - o Planetary Sensor Array
  - o Neck Hole For Primary Wires From Board
  - o Phaser Banks for Lasers
- Secondary Hull
  - o Pylon Spotlights
  - o RCS Thrusters/Deflector Housing
- Nacelles
  - o Pylon Pin Area Wire Grooves
  - o RCS Thruster Holes

# LIGHTING MODIFICATIONS

## UPPER SAUCER AREA

### SAUCER RIM/EDGE WINDOWS AND NAVIGATION/RCS THRUSTER LIGHTS

The windows along the edge of the saucer section and the areas around the navigation lights and RCS thrusters must be modified by removing a large amount of plastic material along the inner rim of the part where the edge pieces attach to the placement pins. DO NOT REMOVE THE PINS! Also, be VERY CAREFUL when removing this material to avoid accidentally damaging the visible areas of the saucer. Work slowly. Precision isn't necessary for the material removal, just caution to protect the visible material.

It's recommended that you mark the specific areas where you want to remove material with a permanent marker to help you know exactly what material to remove. We recommend using a rotary tool with a sanding or grinding bit for the larger areas as well as a smaller 3mm grinding bit for the areas where you will be installing the RCS Thruster lights and Navigation lights.



*Black lines along edges are places material should be removed. Note other markings for LED placement. You'll need to remove or drill holes for the Nav lights and RCS thrusters as marked as well.*



*Areas marked along edge to show where material should be removed. Note the center dot which is the hole area for a Nav light.*

## BRIDGE MODIFICATION

The bridge for the kit is, unfortunately, inaccurate and also does not allow for lighting of the forward saucer registry spotlight as offered in the kit part. We recommend purchasing a resin corrected bridge replacement part from Stellar Effects Modeling Solutions as a quick, effective solution for solving the issue. The piece is not only pre-designed to accommodate up to a 1.8mm LED for ease of installation of lighting, it is also carefully designed to reflect the on-screen appearance of the bridge deck and slotted windows as well as the sloped area at the base of the bridge where the windows are. You can also choose to purchase other third party corrected bridge modules or to modify the kit bridge piece yourself by installing a 1-2mm styrene riser strip along the base of the piece (depending on what size LED's you use to light the registry) and cutting out the areas for the windows. You can refer to online videos as well as the blog at [www.stellareffects.com](http://www.stellareffects.com) for instructions on how to do this modification.



Kit part unaltered



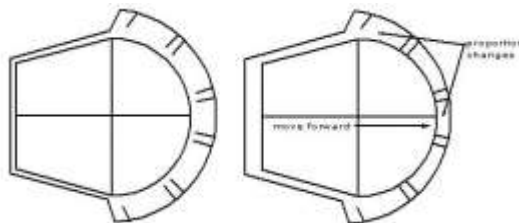
Studio Model Bridge



Studio Model Bridge Closeup



Stellar Effects Modeling Corrected Bridge



Bridge moved forward to correct position

## BRIDGE BASE/BC DECK MODIFICATION

In addition to raising the bridge, you must also sand or file down the ridge on the upper saucer bridge foot area and remove material as marked below to allow light to come up into the bridge unit to light the windows. The bridge unit itself must also be moved forward a few millimeters to sit in the accurate position and allow the proper angle for the forward spotlight.



*Black lines are the ridges that must be filed or sanded down. BE CAREFUL not to remove or damage the other raised detail in this area!!! You can use masking tape to help somewhat. Area in center marked with an X should also be carefully removed with a rotary tool sanding or grinding bit. DO NOT GO PAST PRE-DRILLED HOLE AREAS!!!*

## LOWER SAUCER AREA PLANETARY SENSOR ARRAY

The planetary sensor array presents a few challenges to modify for lighting and offers several options to do so. One such option is shown below. Also, you may wish to drill a hole for a 5mm LED in the center which can offer some ambient light into the planetary sensor array. (optional)



*Carefully remove **HALF** of each pin as shown to allow for lights/wires to pass through for planetary sensor spotlights*



## NECK HOLE FOR SAUCER WIRE CONNECTION TO BOARD

A hole must be made where the neck connects to the lower saucer to allow for the JST Connectors and wire from the harness to come up from the secondary hull into the saucer. Refer to the picture below for details.



*Hole depicted in neck connection area should be cleared to accommodate the saucer connectors. Only one at a time needs to pass through. Also note that a center hole in the planetary sensor area may be drilled to accommodate a 5mm LED for ambient light*

## PHASER HOLES FOR LASERS

Holes for the optional phaser lasers may be drilled into any phaser bank you choose to mount lasers. You can mount lasers for a single bank or for all of them if you choose. You must drill 3/32" holes angled the same direction you want to aim the lasers, if using them, from the banks you mount the phasers. You should file or sand down the turret nibs for each phaser bank you'll be installing before drilling the holes. A pin vise may give you more accurate angles as well.

Please note that the use of lasers, especially lasers not purchased with the Stellar Effects Refit Signature Series Lighting and Effects Kit, may be dangerous. Avoid shining lasers directly into the eyes of any person or animal as some lasers may damage the eye. (\*red lasers sold with the SFX Refit Signature Series are generally considered safe, but we still recommend avoiding direct contact with the laser beam to any eyes!) Stellar Effects is not responsible for any damages caused by the use of lasers, whether included with the kit or purchased from a third party vendor.

## SECONDARY HULL AREA

### PYLON SPOTLIGHTS

The Enterprise kit does have holes already in place where the pylon spotlights shine up on the pylons from the side walls. However, the pre-drilled holes angle straight out, which do not allow the spotlights to shine up to the pylons at the proper angle. The simplest way to fix this is to fill the holes with putty and carefully redrill them at an angle in the desired direction with a pin vise and a 1/16" or 3/32" drill bit. The spotlight holes are designated in the picture below. Dry fitting the pylons in place while installing the lights will greatly aid in getting the proper spotlight direction. LOW TEMP hot glue should be used to secure the LED in place once the light is aimed.



### PYLON WIRE GROOVES

Grooves must be made where the two pylon pieces come together and join to the secondary hull to accommodate the ribbon cables to the nacelles. The best way to make these grooves is a flat sided jeweler's file. Use the included pylon harness to mark off the size to file, then carefully file the areas shown below on each pylon piece (both sides) to make room for the wires. BE CAREFUL to avoid removing too much material (cut too deep) or to damage the pylons themselves in visible areas! Removing too much material may weaken the pylons causing a droop or break later!



**\*A NOTE ON PYLON PINS\***

While not a specific lighting issue, it should be noted that the model kit has a challenging fit issue where the pylons mount to the secondary hull. The pylon pins do not go into the holes correctly, which causes the pylons not to seat where they're supposed to causing fit issues and gaps. This can be corrected by altering the pylon pins slightly. Refer to YouTube videos for more information or contact us and check the website blog at [www.stellareffects.com](http://www.stellareffects.com) for specific instructions.

## **DEFLECTOR HOUSING/RCS THRUSTERS**

The deflector housing incorporates a bi-color LED for the main forward deflector. This lighting kit is designed for a specialized NEOPIXEL LED depending on what's included. If using a 5mm LED, you will need to increase the hole size in the center of the deflector housing to accommodate a 5mm LED. (Use previous chart for non-metric conversion bit size)

Additionally, you will need to drill 4 holes in the RCS thruster areas to allow light from the LED's to shine through. Use a 2mm or 3/32" drill bit to give you the proper size to install the RCS thrusters.



*There are 4 of these areas around the deflector housing. Each must be drilled.*

## NACELLES

The only area on the nacelles that requires a modification is the outer piece at the rear fin area to allow the RCS Thruster light to shine through. Use a 2mm or 3/32" drill bit for a 1.8mm LED or a 1/8" bit for a 3mm LED to accommodate the LED you choose to install. (refer to your lighting kit part) Hole must be centered perfectly in the ridge, then light blocked on both sides to prevent light bleed!



*A second option is to remove the tab on the fin part and increase the hole already drilled where the fin would have joined the nacelle. Either way is effective.*

## MOUNTING POLE HOLE

A hole must be drilled in the area where the mounting post attaches to the model (newer Round 2 release) or the second deflector housing piece to accommodate the main power cable from the board. Remove the material leaving enough for the pole to keep from passing too far into the model, but allowing for the wires to go through the pole into the model and secondary board.



# SOLDERING AN LED

We realize not everyone has experience with electronics and, in particular, using a soldering iron. So the Stellar Effects team thought it would be a good idea to include a little basic tutorial here to make this process simple for you. With just a little bit of practice, you can solder an LED like the pros! Let's check it out... (if you're familiar with this technique, feel free to skip to the next section)



Obviously, the first thing you'll need is an LED and a resistor. For this example, we're using a 5mm Cool White LED and a standard 470 or 560 ohm resistor, like most of the resistors included in your kit. These resistors are designed for a 9V or 12V power source. Use a resistor calculator (or "Ohm's Law") for help in finding out which ohm rating you need for your power source if using something different. Your kit comes with appropriate resistors for the included power source. (Deflector/Impulse resistors may be different as those effects connect to a 5V terminal instead of the higher 9V or 12V)

Notice on your LED that each has a long metal lead and a shorter one. In almost all cases, the longer leg is positive and the shorter leg is negative. Also, on 3mm and 5mm LED's, there is a noticeable indentation on the very low ring around the base of the bulb on the negative side. These will help you know which lead is which.



The first step is to wrap one metal lead (leg) of the resistor around one lead (leg) of the LED. NOTE: It does not matter which leg of the resistor goes on the LED leg as resistors are not polarized. Also NOTE: The resistor can be put onto EITHER leg of the LED. However, we strongly recommend always choosing the same one. (we tend to choose positive, as shown, because that's how we were each taught, but it doesn't matter) The reason to always use the same leg is so that, once you clip off any excess metal on the leg of the LED, you'll still know positive from negative.

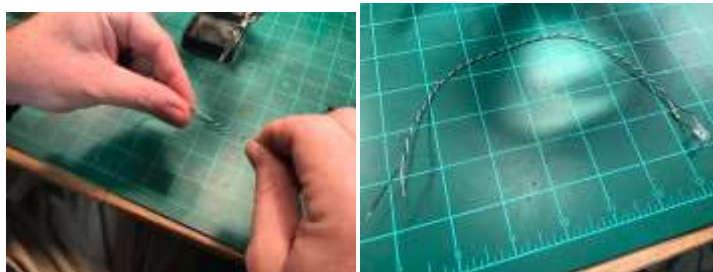
## SOLDERING AN LED [PG2]



Next, slide the coiled resistor up the LED leg a bit and apply the solder by touching the iron and the tip of the solder coil to the wrapped resistor. For most LED's, you should keep your soldering iron from 335°C to 400°C. Leave just enough solder to secure the two wire leads together. Then trim the excess wire from the LED leg and the resistor leg, making sure not to cut into the solder itself and separate the two again.



Next, repeat the same process with the wire by coiling about a cm of exposed (stripped) wire around the other end of the resistor and adding solder the same way. Then repeat this step for the negative wire and LED leg. (NOTE: you only need a resistor on one LED leg. We recommend keeping it consistently on either the positive or negative side for all of your LED's so they're easy to identify if you trim them and aren't sure which side you used) Again, trim off any excess LED leg metal.



Finally, twist your attached wires tightly for a tidy finish, strip off a little shielding at the end of the wire, and you should be done! Test your LED by connecting the negative wire to negative on your power source and positive to the positive. (in this case, 9V-12V) If you see light, you've got it right!



# SOLDERING AN LED STRIP



LED strips are convenient for several lighting needs! They are prewired with resistors to operate at 9V – 12V and may be cut every third LED into smaller strips. However, when cutting the LED strip, you must add solder to the connection points on the strip. This process is actually fairly simple and, since you don't need a resistor for the strips themselves, it is a fast and easy process.



Notice that at the connection points, there is a positive side and a negative side. This is where we will add some solder before attaching the wire. (called "tinning" the solder point) Again, touch the solder coil and soldering tip together to the copper solder points, not just the iron tip with solder on it. "Drag" the melting solder from the solder coil onto the copper pads. You should have a small bead of solder at the point when finished.



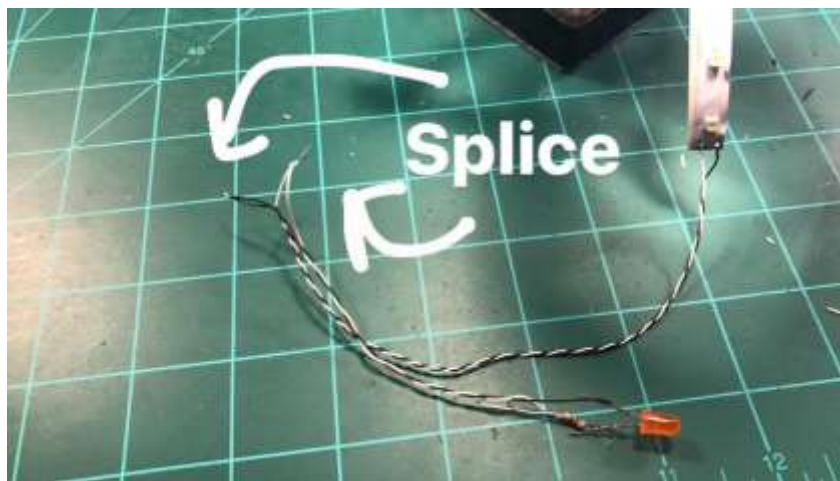
Next, strip off only about a half a millimeter of wire to attach to the points. Simply touch the iron tip to the solder point to re-melt the solder and slip the exposed wire into it and remove the iron, holding the wire still a second or two until the solder hardens. Repeat the process for both positive and negative contact points. That's it! It's wired!

# WIRING TIPS AND TRICKS

“How do those pro and advanced builders get such tidy wires without a rat’s nest?” We hear this question a lot. The trick is learning to be efficient with your wiring. It’s also important to understand current, voltage, and terms such as “common ground,” “common positive (hot),” and other terms and concepts such as voltage drop. For our purposes, we’ll focus on “common” connections. This concept basically uses the idea that you can connect either a positive or negative leg of one LED (with proper resistors) to another one on the same wire and terminal and they’ll share the terminal’s function. For the Refit Signature Series kit, most of the effects terminals, except the deflector terminal, are negative. (you’ll connect the negative wire of the LED’s to this terminal to get the effect and the positive to the 12V terminal) This means that, while different LED’s in one section may all be on separate effects, they can share one common 12V positive wire. Therefore, if you plan out your wiring carefully, almost all the LED’s in, say, your saucer section can have one positive wire spliced from each LED and strip to the next with only a single positive wire having to go back into the harness 12V terminal instead of all of the positive wires from each LED. Talk about a space saver!

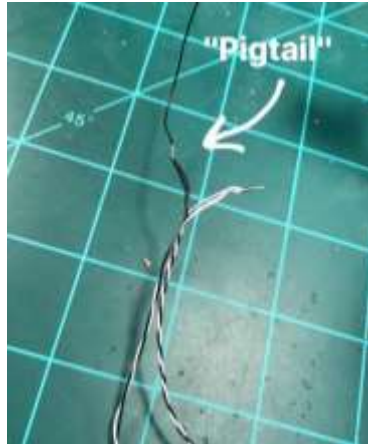
The negative wires will each go to their respective effects terminal. But you can share the wires from each effect as well if multiple LED’s have the same effect. For example, each NAV light can share one negative wire. Then you can do the same for shared strobe (STR) lights, for instance.

To achieve this “common” wiring, you will need to learn how to make a “splice” and a “pigtail” with your wires. A splice is simply twisting two exposed sections of wire together and soldering them together. You can also twist the two wires together, then around an LED or resistor leg to have two wires attached to that leg, one that can go back to the terminal and the other to the next LED or strip. (NOTE: Each LED will still get its own resistor!) That basically makes it where the two wires are joined together to become one common wire. You’d simply connect the positives of each splice to the next LED positive leg and splice another there to go to the next.





A “pigtail” is similar to a splice except, in this case, we’ll twist multiple (common positive, for example) wires together from several LED’s with one additional wire attached to go back to the terminal. That way, instead of trying to fit 10 wires into one terminal, you can simply have one. You will likely want to cover up the splice point of the pigtail with electrical tape or shrink tubing to avoid any possibility of crossing other wires and causing a short.



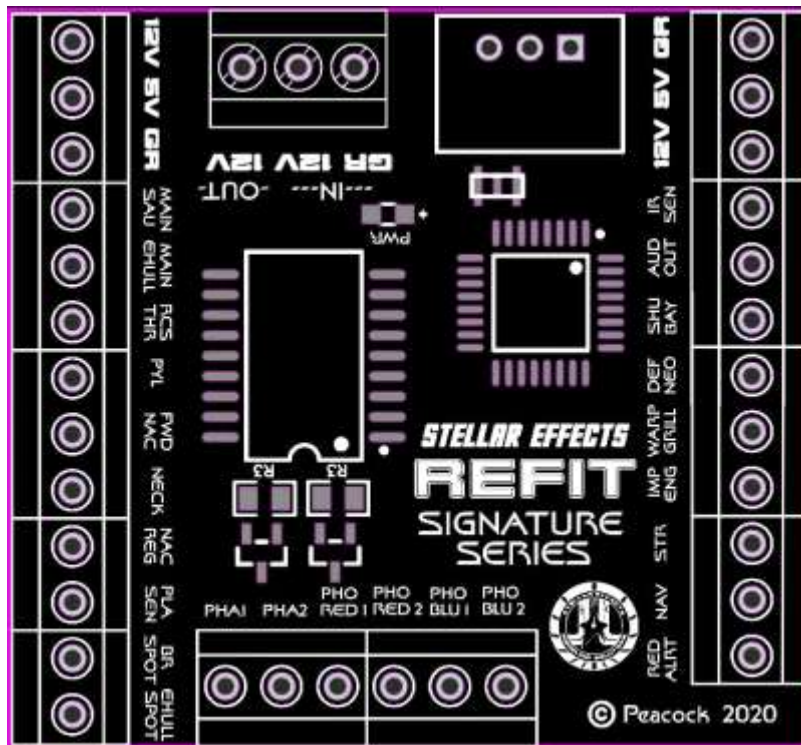
One more trick is using LED strips as a contact point for other LED’s. (as long as either the positive or negative wires or both connect to the same voltage and/or effects terminal) In the picture below, you can see where an LED has been attached to the LED strip on the contact points opposite of the wire end. The attached LED will behave with the same effect and button functions as the LED strip it’s attached to.



We hope some of these tricks make sense and help you with your wiring to keep things neat and tidy! Feel free to practice with spare LED’s and strips, if you have some. The more you do these steps, the easier it gets!

# THE STELLAR EFFECTS REFIT SIGNATURE SERIES MAIN CONTROL BOARD

Let's take a look at the layout of the primary control board for the SFX Refit Signature Series  
*Lighting and Effects kit.*



**SFX REFIT SIGNATURE SERIES MAIN CONTROL BOARD**

You will notice that there are green terminal blocks with screws on the tops of each terminal. These terminals are where your wires will connect. Each terminal is marked both on the primary board and with a color-coded label on the front face where the wire is inserted. To connect a wire to a terminal, simply loosen the top screw, insert the wire with about 5mm of exposed wire on the end into the terminal in the front edge, and tighten the top screw back down. TIP: if you only have one wire inserted into a terminal, it may not allow the screw to tighten onto it enough to hold it in the terminal. To fix this, make a “hook” on the exposed wire (bending it back on itself) so that it will hold better. If you are using the included wire-wrapping wire, it is easily stripped with a 28 or 30 AWG wire stripper or by just using your fingernail.

The color-coded labels will help you to determine which wires will connect where on the board as the effects terminal label colors will match the same color as the wire to LED or other effects component. There will be some repeated colors, but the harness is designed to help reduce the number of repeated colors in any one area of the ship. Where repetition of wire colors was unavoidable, wires should be twisted together such that no colors are reproduced in one grouping. For instance, if you have a harness grouping of four different color wires twisted together, avoid twisting another group of wires with the same four colors so that you can identify the wires by the groups they're in.

Let's take a closer look at each terminal and its function:

## MAIN POWER IN/OUT:



**GR** – This is the main GROUND (Negative) input from your main power supply wire

**12V**- This is the main 12V Positive input from your main power supply wire

**12V(out)** – This is an additional 12V Positive output terminal if needed.

## PRIMARY INTERIOR/EXTERIOR/STARTUP LIGHTING SIDE:



**12V**- This is a 12V Positive output terminal. Use for any 12V positive (WHITE wire) component connection. Except the positive wire from the Neopixels for the Forward Deflector and Impulse Crystal and the positive wire from the lasers for the Phasers, (if using lasers) all other positive wires for components will connect to one of these 12V output terminals using a WHITE wire and proper resistor. (Included)

**5V** – This is a 5 Positive output terminal. Use for any 5V positive (RED wire) component such as lasers for the phasers and Neopixels for the deflector and impulse crystal. No additional resistor is needed for those components if connecting to 5V.

**GR** – This is a GROUND (Negative) output. You should only need this for the Neopixels for the deflector and impulse crystal. Additionally, you can use it for any light you want to be on constantly, but understand that any lights connected (other than the Neopixels) will also be on before the startup and initialization sequences as well as if the rest of the ship is fully shut down. It is not recommended to use this terminal for anything other than the Neopixels.

**MAIN SAU/MI** – This terminal is where the negative wire (GRAY) main interior lights for the saucer will connect. It is interchangeable with and will function the same as the MAIN EHULL terminal, but it is best to separate the two sections due to the amperage requirements for the LED strips. If you are using the SFX Refit Signature Series lighting harness, the GRAY wire from the B and D harness tethers will connect here.

**MAIN EHULL/M2** – This terminal is where the negative wire (GRAY) main interior lights for the secondary E-Hull will connect. It is interchangeable with and will function the same as the MAIN SAU terminal, but it is best to separate the two sections due to the amperage requirements for the LED strips.

**RCS THR/RCS** – This terminal controls the yellow RCS thruster lights at various points throughout the ship. You will connect the negative wire (YELLOW) from the RCS thruster LED's and/or the harness tether wires from the Nacelles and Saucer B tether here.

**PYL/PY** – This terminal controls the pylon spotlights in the secondary E-Hull. Connect here with an ORANGE wire connected to the negative leg of the components.

**FWD NAC/FN** – This terminal is for the Forward Nacelle Spotlights on the front side of each warp nacelle. Connect the negative leg of the LED's to this terminal (or the harness terminal) with a GREEN wire.

**NECK/NK** – This terminal is for the Neck Spotlights in the E-hull. Connect the negative leg of the LED's to this terminal with a BROWN wire.

**NAC REG/RN** – This terminal is for the Nacelle Registry Spotlights in the aft section of the nacelles. (For tips on how to illuminate the registries, see the section on Raytheon lighting) Connect the negative leg of the LED's to the terminal (or harness) using a PURPLE wire.

**PLA SEN/PL** – This terminal controls the spotlights in the Planetary Sensor Array at the bottom of the saucer. Connect the negative leg of the LED's to the terminal (or harness terminal) using a YELLOW wire.

**BR SPOT/BR** – This terminal is for the forward registry spotlight from the Bridge that illuminates the ship's main registry markings on the top of the saucer. Connect the negative leg of the LED's to the terminal (or harness terminal) using an ORANGE wire.

**EHULL SPOT/EH** – This terminal is for the side E-hull registry spotlights. Connect the negative leg of the LED's to the terminal using a YELLOW wire. (For tips on how to illuminate the registries, see the section on Raytheon lighting) If using the Shuttle Bay Board, the rear Raytheon light attached to the board there can also be connected to this terminal with a YELLOW wire. If you are not using the SFX Shuttle Bay Board, you can connect a standard LED here with a YELLOW wire to the negative leg to illuminate the aft registry beneath the bay doors.

## WEAPONS LIGHTING SIDE:



**PHA1/PH1 and PHA2/PH2**- These terminals control the phasers. The negative side of the components you use (Lasers or LED's) will connect here (or to the harness terminals) with PURPLE wires. If you are using lasers, no resistors will be needed. You may connect as many phaser ports as you wish to these terminals. Phasers will alternately fire from PHA1 to PHA2. It really doesn't matter which side fires first, but you are free to decide on your own if it is important.

**PHO RED1/TR1 and PHO RED2/TR2** - These terminals control the red photon torpedoes. The negative side of the components you use will connect here with RED wires. Note that all modes use the red parts of the torpedoes. For TMP mode, the torpedo tubes will ramp up red and fire with a blue flash. The other two modes will ramp up red and fire with a red flash. Torpedoes will alternately fire from PHO RED1 to PHO RED2. It really doesn't matter which side fires first, but you are free to decide on your own if it is important. Just make sure the blue flash matches!

**PHO BLU1/TB1 and PHO BLU2/TB2** - These terminals control the blue flashes for the photon torpedoes in TMP mode. The negative side of the components you use will connect here with BLUE wires. Note that all modes use the red parts of the torpedoes. For TMP mode, the torpedo tubes will ramp up red and fire with a blue flash. The other two modes will ramp up red and fire with a red flash. Torpedoes will alternately fire from PHO BLU1 to PHO BLU2. It really doesn't matter which side fires first, but you are free to decide on your own if it is important. Just make sure the red 1 and blue 1 flash matches! (If you want the torpedoes to fire red in TMP mode as well, connect the red side of the bicolor torpedo LED's to both PHO RED and PHO BLU terminals. But the torpedoes will not be able to fire blue in TMP mode again if connected this way)

## EFFECTS AND SOUND LIGHTING SIDE:



**RED ALERT/RA-** This terminal controls the Red Alert Mode. The negative side of the components you use will connect here (or to the harness terminals) with PURPLE wires. You can place Red Alert LED's anywhere inside the ship to be visible through the various window ports. Main lighting will reduce when in Red Alert Mode to help them be more visible. Use of red LED strips may help visibility as well.

**NAV** - This terminal controls the slower flashing Navigation Lights along the saucer edges and beneath the shuttle bay. The negative side of the components you use will connect here (or to the harness terminals) with GREEN wires.

**STR** - This terminal controls the faster flashing Formation Strobe Lights atop the bridge and aft nacelles and on the bottom of the secondary E-hull. The negative side of the components you use will connect here (or to the harness terminals) with BROWN wires.

**IMP ENG/IMP** - This terminal controls the Impulse Engine Lights to the rear of the saucer. The negative side of the components you use will connect here (or to the harness terminals) with ORANGE wires.

**WARP GRILL** - This terminal controls the Warp Chiller Grill Lights inside the nacelles. The negative side of the components you use will connect here (or to the harness terminals) with BLUE wires.

**DEF NEO/DEF**- This terminal controls the Deflector and Impulse Crystal Lights. This terminal is designed to send the control data to the special Neopixel LED's for the Deflector. ***\*Standard LED's will NOT work with this terminal!*** The BLUE wire from your prewired Neopixels will connect here. (RED wire from the Neopixels connects to 5V and BLACK wire to GR)

**SHU BAY/SB** – This terminal controls the lighting for the shuttle bay and power to the Shuttle Bay Board running lights, if used. Note that the shuttle bay interior lights, if connected to this terminal, will only be “on/off” and not adjustable with the rest of the interiors. If you want the shuttle bay interiors to adjust brightness with the rest of the ship, connect them to the MAIN EHULL terminal instead. But leave the Shuttle Bay Board connected to this terminal. Connect the negative side of the components for the Shuttle Bay and the Shuttle Bay Board to this terminal with a GREEN wire.

**AUD OUT/AUD** - This terminal controls the SFX Audio/IR Board sound card. Connect the BLUE wire from the AUD terminal on the Audio/IR Board here.

**IR SEN/IR** - This terminal controls the SFX Audio/IR Board infrared remote sensor. Connect the ORANGE wire from the IR terminal on the Audio/IR Board here.

**12V**- This is a 12V Positive output terminal. Use for any 12V positive (WHITE wire) component connection. Except the positive wire from the Neopixels for the Forward Deflector and Impulse Crystal and the positive wire from the lasers for the Phasers, (if using lasers) all other positive wires for components will connect to one of these 12V output terminals using a WHITE wire and proper resistor. (Included)

**5V** – This is a 5V Positive output terminal. Use for any 5V positive (RED wire) component such as lasers for the phasers and Neopixels for the deflector and impulse crystal. No additional resistor is needed for those components if connecting to 5V. Try to limit

**GR** – This is a GROUND (Negative) output. You should only need this for the Neopixels for the deflector and impulse crystal. Additionally, you can use it for any light you want to be on constantly by connecting a light with the negative here and also connecting it to 12V on the positive side. But understand that any lights connected (other than the Neopixels) will also be on before the startup and initialization sequences as well as if the rest of the ship is fully shut down. It is not recommended to use this terminal for anything other than the Neopixels.

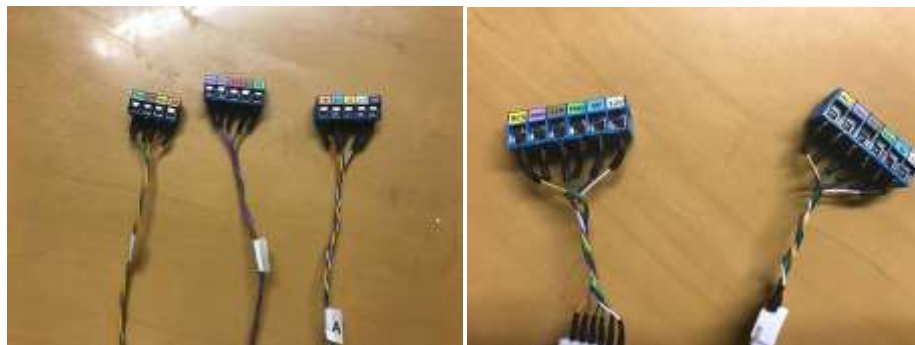
# THE STELLAR EFFECTS HARNESS

The Stellar Effects Modeling Solutions Refit Signature Series Harness is designed to make connecting your lighting much simpler and to aid in the construction of the entire model. There are four harness tether cables for the saucers and one each to the nacelles. The wires for each are color-coded and the terminal block labels, also color-coded to the wires, are labeled to match the Refit Signature Series/Refit Signature Series B effects board to make things simpler.

Simply connect the harness tether wire to the corresponding terminal on the main board and the terminals on the other end in the nacelles or saucer will act the same as the effect on the board. (Note: Make sure the end of the wire is stripped so that about 5 mm of wire is exposed before connecting to the terminal.) To connect a wire to a terminal, use a jeweler's screwdriver to loosen the terminal on top, then insert the wire/wires to the front side of the terminal, then tighten the screw down to secure the wire into the terminals. Note that wires may easily come out of the terminal blocks, even when they are screwed down tight. To fix this issue, make a "hook" on the exposed end of the wire so that you are inserting the bend of the hook into the terminal instead of a straight wire. This helps greatly in securing the fine wires into the terminal.

The harness tethers can then be disconnected using the easy connectors to help in model construction and testing. Be careful when using the connectors not to pull on the wires themselves when disconnecting the cables. You can break the wire or damage the connector itself in doing so. Instead, gently work the connector apart at the connector point.

The following sections will detail the wire colors and terminal connections. Terminal layouts are detailed and the polarity of the terminal is shown to assist in avoiding shorts. (do not connect negative wires and diodes to positive terminals and vice versa) Read each section carefully and double-check each connection before powering up the main board!



Saucer and Nacelle tether terminal blocks.



# UPPER SAUCER SECTION CHECKLIST

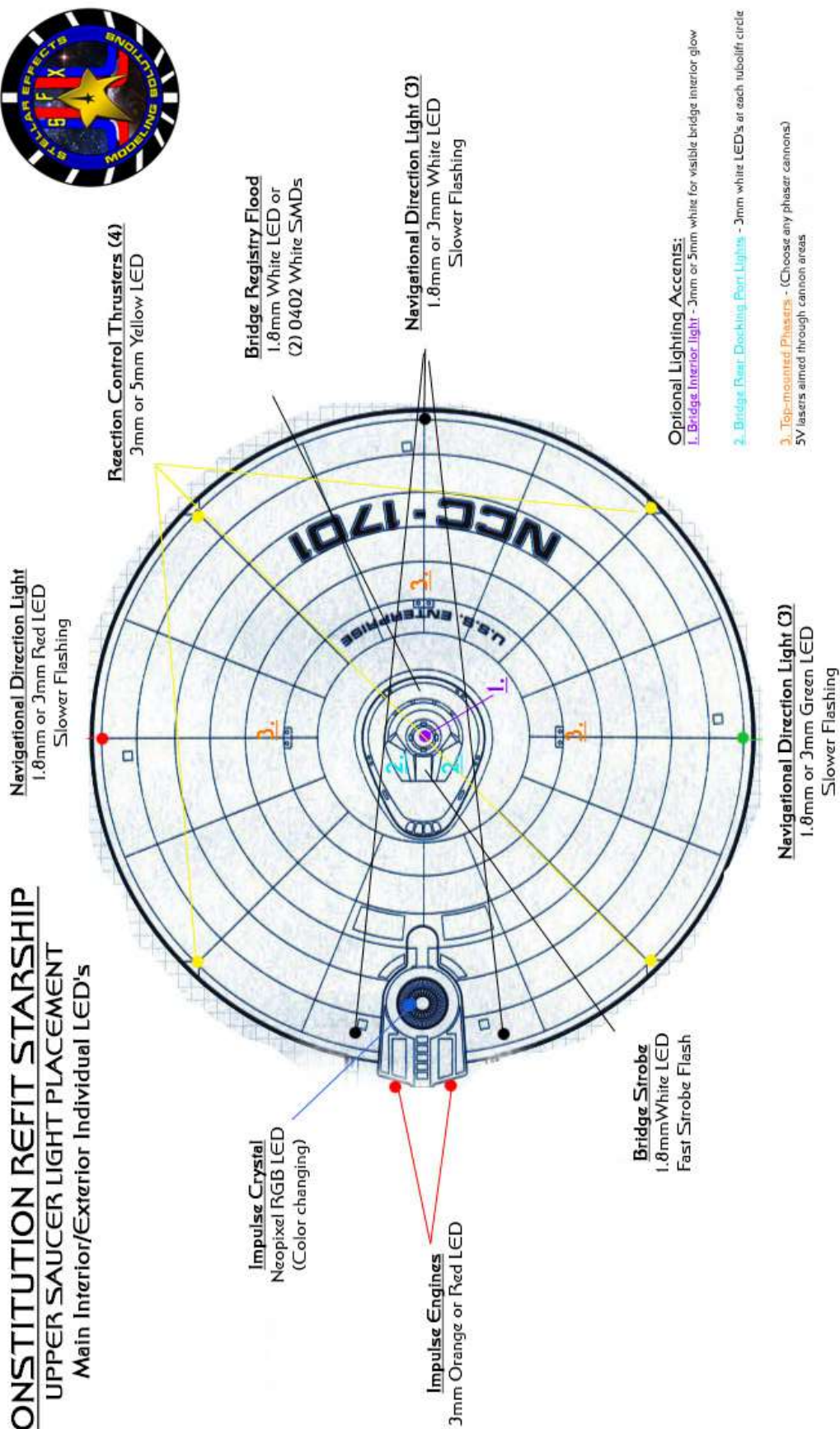
Kind	Quantity	Wire 1	Wire 2	Wire 3
Navigation Port (Left) 1.8/3mm LED Red	1	Green NAV	White 12V	
Navigation Starboard 1.8/3mm LED Green	1	Green NAV	White 12V	
Navigation Fore plus Impulse Deck Navigation 1.8/3mm LED White	3	Green NAV	White 12V	
RCS Thrusters 3/5mm LED Yellow (diffused)	4	Yellow RCS	White 12V	
Impulse Engine 3 or 5 mm LED Red/Orange	2	Orange IMP	White 12V	
Impulse Crystal Neopixel	1	Black GR	Blue DEF	Red 5V
Officer's Lounge Raytheon 3mm LED White	1	Brown M1	White 12V	
Officer's Lounge lights 5mm LED White	2	Brown M1	White 12V	
Bridge Flood 1.8mm LED White	1	Orange BR	White 12V	
Bridge Strobe 1.8mm LED White	1	Brown STR	White 12V	
Interior Bridge Ambient/Docking Port 5mm LED White	1	Gray M1	White 12V	
LED Strip Lights	8 outer ring 3 double inner ring	Gray M1	White 12V	

*Dark boxes indicate LED's may be grouped together on one string of lights*

*\*=option depending on personal choice*



# **CONSTITUTION REFIT STARSHIP** **UPPER SAUCER LIGHT PLACEMENT** Main Interior/Exterior Individual LED's



# LOWER SAUCER SECTION CHECKLIST

Kind	Quantity	Wire 1	Wire 2	Wire 3
Navigation Port (Left) 3mm LED Red	1	Green NAV	White 12V	
Navigation Starboard 3mm LED Green	1	Green NAV	White 12V	
Navigation Fore 3mm LED White	1	Green NAV	White 12V	
*Phasers* 5V Red Lasers Or 3mm Red LED's	2	Purple PH1	Purple PH2	Red 5V
Planetary Sensor 1.8mm LED White	4	Green PL	White 12V	
LED Strips Interior Lighting	3	Gray M1	White 12V	

*Dark boxes indicate LED's may be grouped together on one "string" of lights*

**\* NOTE: EXTREMELY IMPORTANT TO CONNECT PHASERS TO  
CORRECT 5V POSITIVE!**

***Failure to do so will damage the lasers and could damage your  
board!***

***\* Use only included lasers! These lasers are relatively safe and will not produce excess  
heat if connected properly. Avoid looking directly into the laser beam as prolonged  
exposure of the eye to a laser may cause corneal damage! Most red lasers in this  
voltage range are safe, but take precautions to ensure you and others around you  
(including kids and pets) are safe!***

# CONSTITUTION REFIT STARSHIP

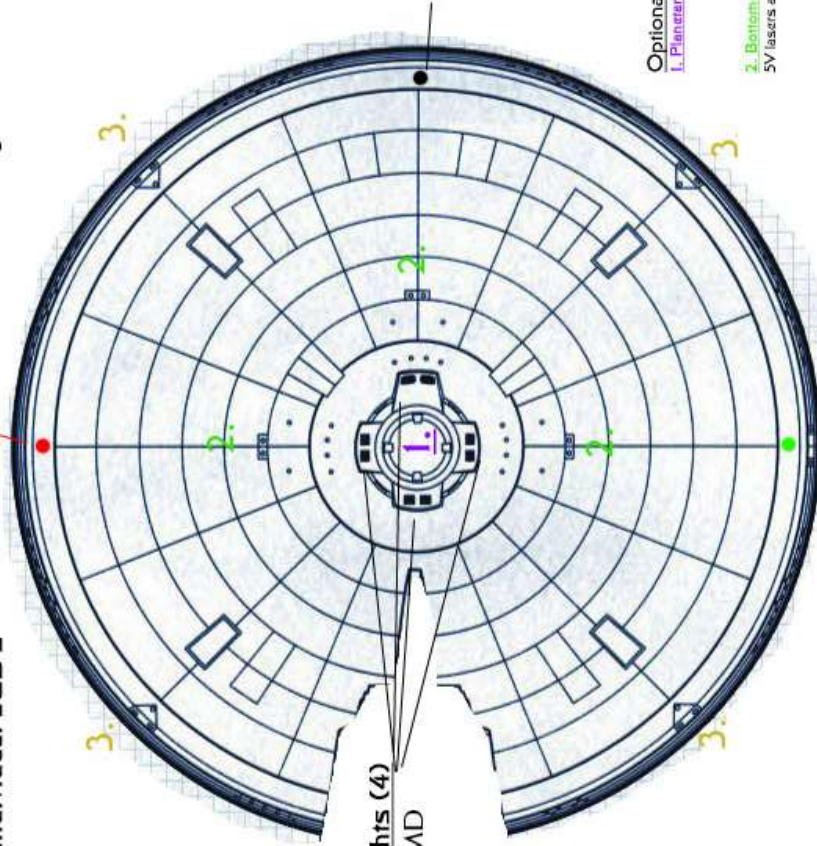
## LOWER SAUCER LIGHT PLACEMENT

Main Interior/Exterior Individual LED's

## Navigation Direction Light

1.8mm or 3mm Red LED

Slower Flashing



## Planetary Sensor Floodlights (4)

1.8mm LED or 0805 SMD

## Navigation Direction Light

1.8mm or 3mm White LED

Slower Flashing

## Navigation Direction Light

1.8mm or 3mm Green LED

Slower Flashing

## Optional Lighting Accents:

1. Planetary Sensor Interior Light - 3mm or 5mm white for visible bridge interior glow

2. Bottom-mounted Phasers - (Choose any phaser cannon locations)  
5V lasers aimed through cannon areas

3. Optional Phasor Control Thruway supplemental lights  
(Not necessary as top saucer LED's illuminate entire housing)

# SAUCER TERMINALS

## TERMINAL A [UPPER SAUCER]

<b>5V</b> 5V Positive	<b>DEF</b> Impulse Crystal	<b>GR</b> Ground	<b>IMP</b> Impulse Engine	<b>RA</b> Red Alert
<b>RED</b>	<b>BLUE</b>	<b>BLACK</b>	<b>ORANGE</b>	<b>PURPLE</b>
<b>+</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## TERMINAL B [UPPER SAUCER]

<b>M1</b> Main 1 Interiors	<b>BR</b> Bridge Flood	<b>STR</b> Strobe Formation Lights	<b>NAV</b> Navigation Lights	<b>RCS</b> Reaction Control Thrusters	<b>12V</b> 12V Positive
<b>GRAY</b>	<b>ORANGE</b>	<b>BROWN</b>	<b>GREEN</b>	<b>YELLOW</b>	<b>WHITE</b>
<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>+</b>

## TERMINAL C (LOWER SAUCER)

<b>PH1</b> Phaser 1	<b>PH2</b> Phaser 2	<b>5V</b> 5V Positive (for phasers only!)
<b>PURPLE</b>	<b>PURPLE</b>	<b>RED</b>
—	—	+

## TERMINAL D (LOWER SAUCER)

<b>M1</b> Main 1 Interiors	<b>PL</b> Planetary Sensor	<b>NAV</b> Navigation Lights	<b>12V</b> 12V Positive
<b>GRAY</b>	<b>YELLOW</b>	<b>GREEN</b>	<b>WHITE</b>
—	—	—	+

Terminal blocks should be placed to the rear of the saucer between the Rec Deck window and B/C Deck. (be sure not to block the Raytheon) Simply connect the color tether wire to its corresponding color terminal on the main board or, if using, the secondary board. Terminals should be marked the same by effect and wire color.

## NECK AND E-HULL HULL CHECKLIST NECK

Kind	Quantity	Wire 1	Wire 2	Wire 3
Photon Torpedo1 2x3x4mm LED Red/Blue	1	Red TR1	White 12V	Blue TB1
Photon Torpedo2 2x3x4mm LED Red/Blue	1	Red TR2	White 12V	Blue TB2
Raytheon spots 3mm LED White	2	Brown NK	White 12V	
Neck Spotlights 0803 SMD White	2	Brown NK	White 12V	
LED Strips Interior Lighting	2	Brown M2	White 12V	

## SECONDARY E-HULL

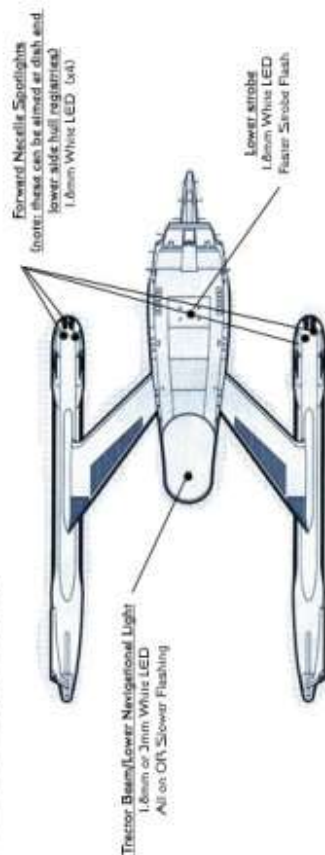
Kind	Quantity	Wire 1	Wire 2	Wire 3
Deflector Dish 3mm/5mm bicolor LED Blue/Amber	1 diffused	Black GR	Blue DEF	Red 5V
RCS Thrusters 1.8mm LED Yellow	4 diffused	Yellow RCS	White 12V	
Pylon Spots 1.8mm LED White	4	Orange PY	White 12V	
Belly/Aft Strobe 1.8mm LED White	2	Brown STR	White 12V	
Rear Belly/Nav 1.8mm LED White (For TMP, connect to M2 as it was always on, but it flashed in other films)	1	Green -M2(TMP) -NAV (TWOK+)	White 12V	
Aft Shuttle Bay 3mm LED White	2	GRAY M2	White 12V	
LED Strips Interior Lighting	2 (x12) sides 1 (x6) lower Shuttle Bay Arboretum	GRAY M2	White 12V	
*Side E-Hull Raytheon spots (optional) 3mm LED White	2	Yellow EH	White 12V	
*Opt Rear Raytheon Spot 1.8mm LED White	1	Yellow EH	White 12V	
*Optional SFX Shuttle Bay Board w/Rear Raytheon Spot	1	Green SB	White 12V	Yellow EH



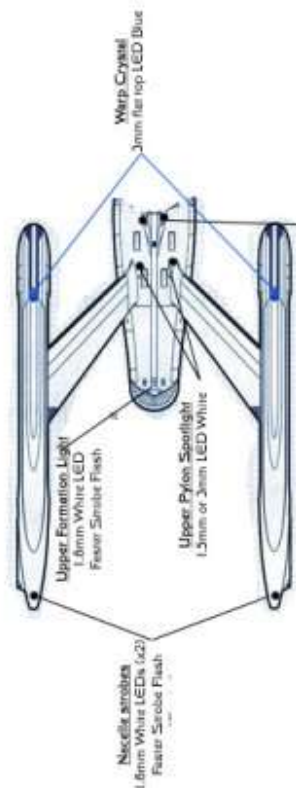


# **CONSTITUTION REFIT STARSHIP** **1:350 Refit - Secondary Hull Light Placement** **Main Interior/Exterior Individual LED's**

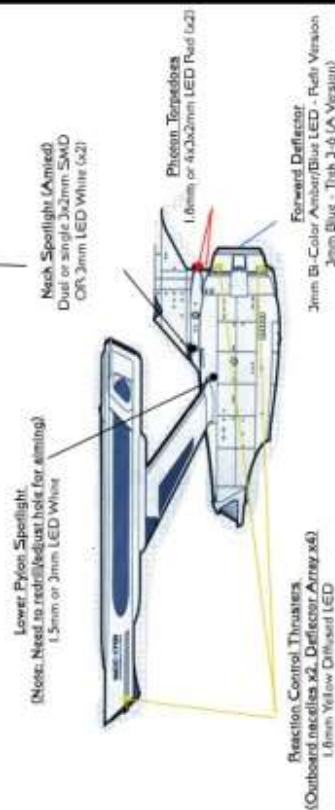
## **BOTTOM VIEW**



## **NACELLES**



## **TOP VIEW**



## **SIDE VIEW** (all lights repeated on opposite side)

## NACELLES CHECKLIST

Kind	Quantity (each nacelle)	Wire 1 (Connector)	Wire 2 (Connector)
RCS Thrusters 3mm LED Yellow (diffused)	1	Yellow RCS	White 12V
Nacelle Strobe 1.8mm LED White	1	Brown STR	White 12V
Rear Raytheon Spots 3mm LED White	2	Purple RN	White 12V
Forward Nacelle Spot 1.8mm White	2	Green FN	White 12V
Outer Chiller Spot 1.8mm White	1	Green FN	White 12V
Warp Chiller Strip 12 LED Strip Blue or Violet	1 (x12)	Blue W	White 12V
Warp Crystal 3mm LED Blue	1	Blue W	White 12V

## NACELLE TETHER TERMINALS

<b>RCS</b> Reaction Control Thrusters <b>YELLOW</b>  <b>-</b>	<b>RN</b> Rear Raytheon (Nacelle) <b>PURPLE</b>  <b>-</b>	<b>STR</b> Rear Nacelle Strobe <b>BROWN</b>  <b>-</b>	<b>FN</b> Forward Nacelle Spots & Outer Chiller Spot <b>GREEN</b>  <b>-</b>	<b>W</b> Nacelle Chiller and Crystal <b>BLUE</b>  <b>-</b>	<b>12V</b> 12V Positive <b>WHITE</b>  <b>+</b>
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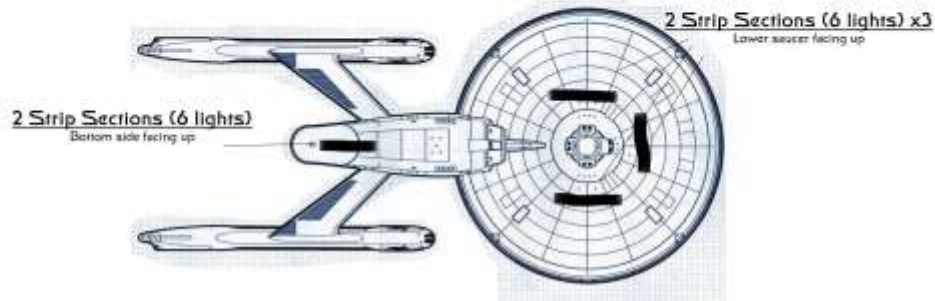
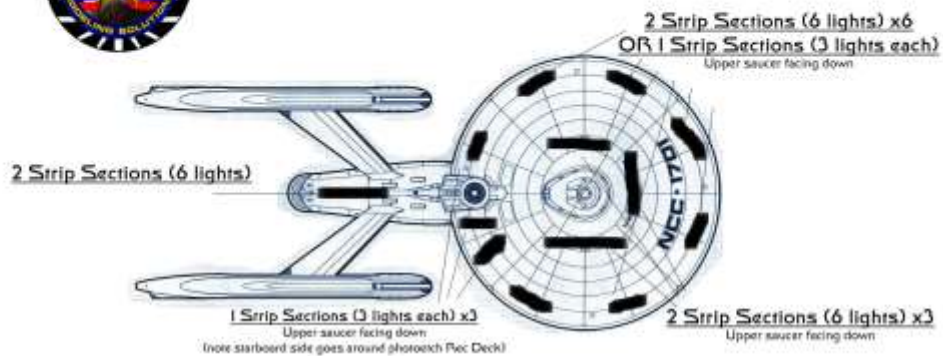
### NOTE:

Simply connect the pylon tether wires to the Primary Board by matching the color wires to the corresponding terminals as marked. Connect the lights to the terminals using the color wires and terminals as marked in the chart above.



# LED STRIP LIGHTING PLACEMENT

## CONSTITUTION REFIT STARSHIP STRIP LIGHT PLACEMENT



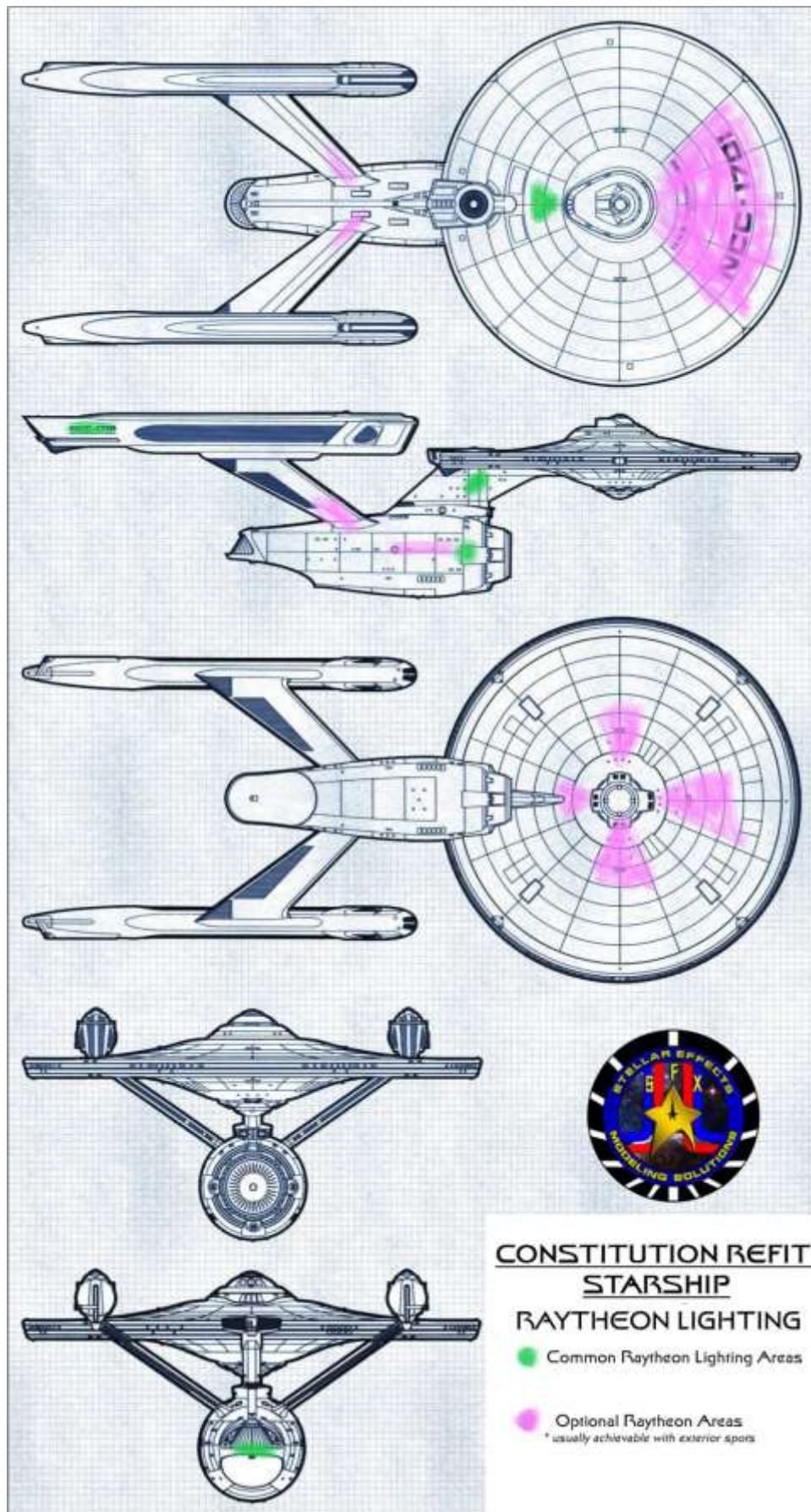
# RAYTHEON NOTES

The “Raytheon” effect is a means of lighting by which a modeler can use interior lighting to simulate exterior lighting. In other words, the plastic is intentionally not light blocked in specific areas to allow the light to shine through the plastic as “bleed” in order to give the illusion of exterior lighting in those areas. The technique is fairly simple. When preparing your model for lighting by light blocking the inside or outside of the model using paint/primer/or tape, simply mask off the plastic in the shape you’d like the light to appear on the model in that section so that shape will not be light-blocked.

The Enterprise Refit and 1701-A has several sections where the model has lights in the movies that are simply not achievable from exterior lights. Most notably, the rear of each nacelle where the ship’s registry number appears has lights in the movie, which were actually achieved using spotlights away from the model. These lights are supposed to come from the ship, but there is, in reality, no way to accurately use exterior lights on the model to light these areas. A good alternative is to use the Raytheon effect here. The Refit Signature Series lighting kits come with Raytheon shapes to install inside the model in the specified areas to help the modeler achieve the desired shape and effect. Simply install the shape pieces where desired before light blocking, then proceed as normal with light-blocking procedures and light installation. Included Raytheon pieces have convenient pre-sized holes for easy LED alignment and installation.

Please use the diagram to assist in choosing where to place the Raytheon lights.

NOTE: The lights marked “optional” are typically for those that prefer to use no exterior flood lighting at all. They are not intended for those that plan to use mounted spotlights.



# **STELLAR EFFECTS REFIT SIGNATURE SERIES**

## **OPERATIONS AND REMOTE CONTROL FUNCTIONS**

### **POWER UP AND MODE SELECTION**

When you power up your SFX REFIT SIGNATURE SERIES effects board, you will hear the introductory music and a prompt from the computer to choose your desired movie mode. To choose which mode the model will function in, select from the three buttons at the top left of the remote control. You may choose from any of the first three films in the franchise that feature the original version of the 1701 Enterprise Refit. (No other buttons will operate at this point) Each mode will feature a unique start-up sequence timed and designed to emulate the ship startup scenes seen in the chosen film. All of the music and story functions will also be from the film of the selected mode as will some of the individual effects. You may cycle through the modes.

Once you've selected the movie mode you wish to have the model emulate, you must initiate the model by pressing the "A" button at the top right.

This will "lock in" the chosen mode and engage the pre-start mode. The interior and shuttle bay (if installed) lights will come on and intro music from the selected film will play, letting you know the ship is ready for the startup mode to be engaged. At this point, you can adjust the brightness of the interior lighting, turn off/on the shuttle bay lighting, (if installed) and adjust the volume as desired. All other functions are inoperable until the ship has fully completed the startup feature.

NOTE: Once the movie mode is locked in, the only way to change it is to either turn off the main power from to the model and turn it back on again or to go through the startup sequence (see next steps) then power down the ship (see "SHUTDOWN" instructions) and reselect the desired mode from the power up mode.

To begin the startup mode, press the "A" button again.

## STARTUP MODE

Once the startup mode is engaged, the ship will begin powering up all of the lights and functions through the startup sequence designed and timed to emulate the on-screen version from the movie mode selected. Each startup sequence is several minutes long and **MUST BE COMPLETED** before any remote button functions can be used. Here is a list of some of the features of each startup mode to look for:

**TMP MODE** – The start sequence for this mode is designed to time in sync with the scene from the first film. Note that, upon initiating the startup, the shuttle bay lighting automatically shuts off in preparation for “launch.” (It may be turned back on after the startup sequence has completed except in warp mode) All exterior lighting will come on in the exact sequence with the original film scene. The thrusters initialize at  $\frac{1}{4}$  power until the captain gives the order to engage the thrusters and move forward, at which time, the thrusters will increase to full. At the appropriate time, when the engineer gives the green light for impulse power, the impulse engines will engage to “warp .5” power. (or,  $\frac{1}{2}$  impulse power) After the completion of the startup sequence, the ship will accept commands from the remote control. It will be set with a copper deflector with thrusters set to full and impulse engines set to  $\frac{1}{2}$  power.

**TWOK MODE** – The start sequence for this mode is designed to time in sync with the scene from the second film. Note that, upon initiating the startup, the shuttle bay lighting automatically shuts off in preparation for “launch.” (It may be turned back on after the startup sequence has completed except in warp mode) All exterior lighting will come on in the exact sequence with the original film scene. The thrusters initialize at  $\frac{1}{4}$  power until the captain gives the order to engage the thrusters and move forward, at which time, the thrusters will increase to full and the impulse engines will engage to  $\frac{1}{4}$  impulse power. until the helmsman is allowed to “indulge,” when the impulse engines will increase to full power. After the completion of the startup sequence, the ship will accept commands from the remote control. It will be set with a copper deflector with thrusters set to full and impulse engines set to full power.

**TSFS MODE** – The start sequence for this mode is custom designed to sync with the startup scene from the third film, yet show some effects not shown in the movie. The deflector comes on blue, as shown in spacedock in the film, and the bridge flood light comes on to simulate the only other light coming on in the beginning of the scene in the film. Also, the interiors are all on at a lower setting to emulate the idea that the ship is vacant and automated except the bridge crew. (it can be adjusted during the prestart or after startup is complete) The exterior lighting comes on when the captain gives the order to engage auto systems and the impulse power comes on at  $\frac{1}{4}$  power upon command. Impulse power then increases to full upon command from the captain. Warp then engages at the captain’s order to escape the pursuing Excelsior. A few moments afterward, the ship will automatically drop out of warp and enter impulse mode, at which time the ship will be ready to accept commands from the remote and will be set with a blue deflector with thrusters set to full and impulse engines set to  $\frac{1}{2}$  power.



## OPERATIONS AND FUNCTIONS




Pictured, you will see the layout of your remote control for the SFX Refit Signature Series Effects Kit. Once the ship has completed the startup sequence and entered “cruise mode,” the buttons on the remote will operate as marked. Here is a summary of the control functions as well as a couple of features to notice when operating the ship controls:

**TMP/STORY** – Before the startup has been initialized, this button can be pressed to select the TMP MODE for the ship. Once the startup has completed, the button will play various clips from whichever movie mode was selected prior to startup. If you selected TMP, all of the clips will be from the first film. If you selected, TWOK MODE, the clips will be from the second film and same for TSFS mode.

**TWOK/MUSIC** - Before the startup has been initialized, this button can be pressed to select the TWOK MODE for the ship. Once the startup has completed, the button will play various music from whichever movie mode was selected prior to startup. If you selected TMP, all of the music will be from the first film. If you selected, TWOK MODE, the clips will be from the second film and same for TSFS mode.

**TSFS/SOUND FX** - Before the startup has been initialized, this button can be pressed to select the TSFS MODE for the ship. Once the startup has completed, the button will play various sound effects from the various films at random. Movie mode has no bearing on these sounds.

 - Before the startup has been initialized, this button will initialize the ship in whatever movie mode was last selected and then, when pressed again, enter the ship’s startup feature. Once the startup has completed, this button will enter the shutdown sequence feature of the ship and reboot the board so another mode may be selected.

**IMP ENG -/IMP ENG +** - While in IMPULSE MODE, these buttons will control the impulse engines on the ship. There are five settings for the impulse engines. OFF, 1/4, 1/2, 3/4, and FULL. Use these buttons to cycle the intensity of the impulse engine effect. NOTE: Impulse engines are automatically turned off while the ship is in WARP MODE and these buttons will not be available.

**WARP** – This button will engage and disengage the WARP MODE for the ship. Once warp mode is engaged, the deflector will automatically adjust from whatever setting to blue “Active Mode” (if it’s not already blue) and the impulse engines will ramp down from their current setting (if they’re on) before the ship enters warp mode. If it is the first time the ship enters warp after the startup sequence is complete, the ship will enter the “Long Warp Sequence” with narration from the helmsman. After the ship has completed its warp sequence, the next press of this button will disengage the WARP MODE and return the ship to IMPULSE MODE. (warp engines will ramp down and the impulse engines will ramp up to 1/2 impulse power) Pressing the WARP button again will return the ship to WARP MODE, but with a shorter warp sequence with no narration until the board has been reset.

**DEF MODE** – This button controls the mode of the forward deflector and impulse crystal. During the startup sequence, the deflector automatically comes on in “Standby Mode” in a copper color. (Except in TSFS mode where it begins in the blue “Active Mode” as seen in the film) After the startup is complete, the deflector can be cycled through “Standby” and “Active” modes with a color transition by pressing the DEF MODE button. After two cycles, the deflector will ramp down to off and reset the sequence again.

**RCS THRUST -/RCS THRUST +** - After the startup sequence has completed, the RCS Thrusters will be on at full intensity. This button is used to adjust the intensity of the RCS Thrusters at the various locations around the ship. As with the impulse engines, there are 5 settings to choose from.

**SHUT BAY** – This button toggles the shuttle bay lights and running light board. (If installed) These are automatically turned on when the ship is initialized and automatically turned off again when the ship goes into its startup sequence. They are also turned off automatically when entering WARP MODE but may be turned back on while in WARP MODE after the Warp Sequence has completed.

**BRIDGE SOUND** – This button allows you to turn on/off the ambient bridge sound at any time when not in a timed effect sequence. The ambient bridge sound lasts roughly 15 minutes if left to play.

**RED ALERT/”0”** – This button will activate the ship’s emergency alert system. Upon first press, the ship enters “YELLOW ALERT MODE” and it will play a Yellow Alert Sound. The second press will enter the ship’s “RED ALERT MODE.” This will automatically dim the ship’s interior lights (the interiors can be adjusted again while in RED ALERT MODE

by using the MAIN LIGHTS buttons) and engage the Red Alert pulsing lights throughout the ship. Note that the RED ALERT MODE sound is slightly different for each movie mode. Press this button again to stand down from RED ALERT and return the ship to normal.

**PHAS** – This button will fire the ship’s phasers in an alternating two light pattern. Lights or lasers\* may be installed at any ports desired, but all linked to PH1 and PH2 will fire together simultaneously respectively.

**PHO TORP** – This button will fire the ship’s PHOTON TORPEDOES. If in TMP MODE, the tubes will ramp up red and fire blue torpedoes as seen in the film. (Wormhole sequence) If in the other modes, they will ramp up and fire red as seen in those movies.

**DESTRUCT** – This button will engage the ship’s AUTO DESTRUCT mode, so it should be avoided unless there are no other alternatives. Once pressed, you **MUST** enter and **complete** the proper code sequence to complete the AUTO DESTRUCT function. (Hint: if you don’t know the proper sequence, watch the third film or the TOS episode “Let That Be Your Last Battlefield” then look for the remote button with the “number” also shown on it. “Destruct” button also works as part of the code...) Once the code sequence has been properly given, the ship will begin the AUTO DESTRUCT sequence. (yes, it’s supposed to be humorous... can’t actually blow up the model, after all! Just enjoy the show!) Once the AUTO DESTRUCT sequence has completed, the ship will reset and return back to the POWER UP/MODE SELECT menu and you can choose which mode you want to restart the ship in. Once you press the DESTRUCT button, you MUST complete the code and go all the way through the AUTO DESTRUCT sequence, so only press this button if you wish to see the sequence and “blow up the ship!” ☺

**E-HULL** – This button toggles the exterior spotlights off/on in the engineering hull (secondary hull) of the ship.

**NACELLE** – This button toggles the exterior spotlights off/on in the ship’s nacelles.

**SAUCER** – This button toggles the exterior spotlights off/on in the ship’s saucer. (primary hull)

**NAVS** – This button toggles off/on the ship’s navigation and formation strobes.

**MAIN LIGHTS -/MAIN LIGHTS +** - This button will decrease/increase the brightness of the ship’s interior lights. You may adjust this setting at any point after the first initialization of the MOVIE MODE, even if before the ship’s startup sequence begins, so the ship will start with the interiors at your chosen intensity. This function is particularly useful when it may be preferable to reduce the LED intensity for photographing your model.

**VOL -/VOL +** - Use these buttons to adjust the volume of the sound from the sound card. Note: these buttons will not be available while the ship is in a timed effects sequence.



# SUBASSEMBLIES

This lighting kit is designed to encourage the modeler to more easily build and light the model in “subassemblies.” Subassemblies are merely entire sections of the model that can be completed and “closed up” separately for ease of painting and construction before putting each of these together to complete the model. Here is a list of recommended subassemblies and how they should be set up for final assembly:

**NACELLES:** Install all lighting and parts into the nacelles. Make sure connector is at the appropriate base of the nacelle where the pylon connects and that there is some slack (about 1 cm) in the wire where the connector can be accessed outside the nacelle. The connector will connect to the pylon ribbon cable.

**SAUCER SECTION:** Completed in two subassemblies by wiring the upper section completely to the terminal connector and then to the lower section. Once those are complete and tested, the saucer sections can then be combined to one subassembly by securing all connections, making sure the umbilical connectors are run out of the neck connection area. You should have 1 to 2 inches of slack for the connectors.

**SECONDARY HULL/NACELLE PYLONS:** There are several steps to constructing this section. Each of these subassembly steps will go together to form the main secondary hull subassembly.

**NECK/SECONDARY HULL TOP:** This section can be completed in two subassemblies. First, the neck and top of the secondary hull. Install all lighting in the neck using the diagrams and checklist and test. Before gluing the neck together, run all saucer section connectors through the neck carefully avoiding blocking windows. Connectors should come out of the top of the neck to connect to the saucer connectors.

Once the neck is completed, install all the strip lights and nav/strobe lights in the top piece of the secondary hull. Carefully attach the neck and top of the secondary hull. You will need to carefully shave the pins from the neck to insure a proper fit into the pin holes. You will also need to carefully shave down the pins on either side of this piece where the nacelle pylons will be placed or the pylons will not fit properly. Once the neck and top of the secondary hull are glued together, set aside for next step of secondary hull assembly.

**DEFLECTOR HOUSING:** Install all RCS wires into the deflector housing. Also, connect the main Neopixel LED to the internal board at this point.

**SECONDARY HULL BOTTOM/PYLONS:** This section is the most important as it will also contain the main Refit Signature Series board, if you decide to keep it inside the model. Do NOT close this section completely until all connections have been properly tested!!! Install all lighting into place, then glue together the bottom part of the secondary hull in three pieces. (bottom and two side walls) Next, install the arboretum windows and arboretum. Then insert the Refit Signature Series board below the shuttle

bay in the slotted area directly aft of the arboretum. You may have to remove some plastic material inside to accommodate the wires to the board.

Next, install the pylon harness cables by placing the wire flat to the pylon wall of one side with the connectors at the “top” (wider end) of the pylons. Again leave a small amount of slack at the connector point so the connector is “loose” outside the pylon. (about 1 cm of wire should be plenty) You will need to “notch” the pylons at the point they connect to the pins in the secondary hull to allow for the wires to come through. This is best done with a small file. You will also need to carefully shave the pylon pins on the inner wall of the lower secondary hull to ensure a proper fit for the pylons. Once the pylon wires have been run through the pylons, attach the two pylon pieces together as shown in the kit instructions. Then, attach the pylons into their proper tabs in the LOWER secondary hull subassembly and secure with adhesive. For extra support, you may choose to add epoxy or JB Weld to the interior around the tabs. Be sure avoid getting it on the top tabs so the upper secondary hull/neck piece will fit properly. Connect all pylon wires to the internal effects board. Connect the deflector housing RCS and Deflector Neopixel LED wires to the main board. (You don’t have to glue the deflector housing on just yet) Also, connect the upper secondary hull/neck wires at this point, but do not glue the pieces in place yet.

If using the placing the main board in the base instead of in the model, all of your main wires should be running out the base stand mounting hole at this point. If not, ensure that they are! It might be a good idea to go ahead and run the wire through the base pole at this point as well, if you haven’t already. It’s likely a tight fit, but if you run the wire properly, it will fit. For easier identification on the other end of the pole, twist groups of wires together with different groupings of colors, carefully ensuring no colors are doubled. (except torpedoes or phasers) For instance, group some of the saucer wires together and make sure there aren’t two yellow wires that go to different effects (such as RCS and Planetary Sensor) in the same grouping so you will know which yellow wire is which. Make sure you have enough slack at the base of the pole to get to the board in your base stand.

Make sure all wires for the Refit Signature Series main board power and sound card are also running through the base pole mount hole now.

Next, install the shuttle bay. If installing shuttle bay running lights, make sure those are connected properly when installing the shuttle bay.

## **TEST ALL CONNECTIONS AT THIS POINT!!!**

The next step will effectively close off the secondary or primary effects board where you will no longer be able to adjust your connections inside the model!

Once proper connections are assured, attach the deflector housing in place with adhesive. Then attach the upper secondary hull/neck in place with adhesive.

You should now have four separate pieces ready for final assembly.

- Nacelles (2) with connectors accessible from the pylon mounting holes
- Saucer Section with connectors accessible from the bottom (4)
- Secondary hull with connectors accessible out of the neck (4) and each pylon as well as all wiring for internal board coming through the mounting hole.

You are now ready for final assembly.

Simply connect the appropriate connectors as you connect each subassembly to the secondary hull.

It is recommended at this point that you determine a way to steady each section for attachment to the secondary hull. A jig or some other method constructed with PVC or even Legos™ works great for stabilizing the subassemblies while the adhesive cures. TAKE YOUR TIME!

Once everything is secured, you should be ready for the finishing touches of paint and decals and then your masterpiece is ready!

We hope this manual and lighting kit have helped the process and you are satisfied with the results! For any questions at all, please feel free to contact us through our website at [www.stellareffects.com](http://www.stellareffects.com). We also suggest you refer to the numerous Trek Modeling Groups on social media, particularly Facebook. Links to those and other resources may also be found on our website. We look forward to seeing your completed models! Please feel free to send any pictures to us through our email on the site! We love to see our products help your masterpieces come to life!

Thanks again for using Stellar Effects Modeling's light kit products to create your model! We hope your results are amazing and you'll be satisfied for years to come and we hope we can be your modeling source for making your models come to life!