Thank you for your purchase of “The Works” lighting kit.

Each LED spotlight draws approximately 1 amp (therefore 3 amps per wingtip) and uses a collimator to focus the light into an 8° beam. Three Cree XHP35 LEDs produce 3600 lumens of light per wingtip. Each LED is driven with a linear power supply for simplicity and to eliminate intercom noise.

These lights may only be used with a 12 volt system.

The position/strobe boards are supplied to you slightly oversized and need to be final fit to suit your wingtips. Note that the final shape of the boards may end up being slightly different between the left and right wings, due to manufacturing tolerances in the fibreglass wingtips. We’ve found that the cutout shape can be quite different from left to right wings.

The wing boards are made from fibreglass with a thin layer of copper on either side, and then a coating of paint. When shaping the boards use the same tools and safety precautions you would for any other fibreglass work.

**Landing light board assembly**

Seeing as how you’re an expert riveter, we thought we’d give you just a few more to do! Attach the nutplates to the landing light boards as shown. These boards are made from 1.6mm thick aluminium and you may substitute countersunk or pull-rivets if you feel the need. Be careful not to damage the LEDs and other components on the boards.

Note that the hexagonal board has two possible locations for the double lug nutplate. These boards were designed to be the same size as Van’s lighting kit parts, but for “The Works” Flyleds kit use the inner location as shown. It is highly likely that you will need to trim the hexagonal board up to the edge of this nutplate to enable it to fit in the smaller wingtips, and to assist with any interference issues as shown here.
Next fit the lens holders onto the light boards. Note that the holders have two tabs in their base. These fit into the small holes above and below the LED, and will locate the holder and lens in the optimum focal point for the LED.

(There are extra holes in the boards shown that we made to suit another lens style. In a shootout this one was the clear winner!)

The small tube of heatsink plaster will contain enough glue for six heatsinks. Squeeze a small amount on the base of the heatsink and spread it out into a thin layer. The photo on the right shows that we avoided the screw holes, but this is not critical.

Fit two M2.5 machine screws into the holes in the lens holder and attach the heatsink to the board. The screws should be done up ‘tight enough’ (that’s a technical term!) by hand. The glue takes a full 24 hours to set, so you have plenty of time to work with the assembly.

Easy!

Repeat the process for the other boards.

The collimators have four notches around their edges, but if you look and feel closely two of them are just a slot, while two of them also have a tab that will lock the lens in place.

Please take care with this step! The LED needs to sit inside the hole at the base of the collimator and be surrounded by it. If you lock in one side and then try to lock in the other as demonstrated here, you risk sideswiping and damaging the LED. Instead, locate the lens directly above the holder and you will see the centre of the lens change colour from the yellow LED below. This indicates that the LED and lens are close to being in the correct location. Push the lens in gently until it locks into place under the tabs at the top and bottom of the holder.

Repeat for each light.
Module assembly

Don’t get too carried away with fitting and adjusting the assembly together at this stage! The main boards need to be mounted to the wingtips with appropriate mounting hardware, and you will probably find this easier to do without the landing lights attached. If you haven’t done so already, shape the main circuit boards to fit your wingtips, and then complete the assembly instructions to solder the strobe and position LEDs and other components on the main boards.

The landing light boards are mounted behind the main position/strobe board using MS51957 stainless steel screws. Compression springs keep the light boards in place, and the screws allow the lights to be aimed later on.

Note the orientation of the light boards as shown here:

Separate the 3D printed ABS spacers tubes and trim away the moulding tabs.

Fit a spacer to each screw as shown.

The screws along the lower edge of the wingtip will have their springs compressed the least, so begin fitting these 1.5” long screws, shown in the main diagram in blue, first. Insert them from the front of the board and fit a compression spring over the screw shaft, then engage the screw a few turns into the nutplate on the light board. Repeat for the other 1.5” long screws.

The shorter ¾” screws (shown in green) screw into one top corner of the dual LED board, and the outer corner of the single LED board. These do not have a spring fitted behind them. They form the pivot point for each board.
Wiring the landing lights

The landing lights simply operate as a drop-in replacement for a 12 volt halogen bulb. They may be operated independently of the Flyleds controller if required. If you have a system on board that automatically controls the wigwag function, such as a Vertical Power VP-X, Advanced Control Module from Dyon/AFS, or a Garmin GAD27, then please wire the landing lights directly to it!

18AWG wire should be used for the landing lights. The lights may be grounded locally at the wingtip. There is no need to run a wire back to your avionics ground.

The light boards have easy to use push-fit power connectors on them. Strip ¼” of insulation from the wire and simply push the wire home into the socket. It’s not coming out!

Should you need to release the wire, push down on the tab above the wire using a small screwdriver and the wire can be pulled from the socket.

The dual LED board has two wire entry points marked +12v and two marked GND. These provide you with a simple way to loop together both boards, as shown below. It does not matter which wire hole you use first.

Rather than trying to juggle your wingtip, and manipulate a small screwdriver in a tight space, you may wish to fit an inline plug and socket in the power wires in order to be able to remove your wingtip at maintenance time.

Wiring the main boards

Ribbon wire has been supplied to interconnect the two wing boards. You may substitute your own 18 or 20AWG wire if you feel the need.

For those readers upgrading their existing Flyleds kit, you will note that the four pin socket for the wiring loom is now on the bottom of the new forward-facing board. The existing socket on the outwards-facing board will interfere with the fit of the two boards. You will find de-soldering the old socket difficult to do without the proper tools, so in this case feel free to get the dremel out and trim the plastic surrounds of the socket down. Be safe!

Note that we have provided a hole for a zip tie to be used to secure the wiring loom cable to the board.
Fitting

Your wingtips will need to have clearance holes cut into them. Cutting templates are available from our website. These should be used as an approximate guide only.

We have supplied nutplates and screws to mount the forward facing board to the wingtip. The large black blocks marked in the diagram show some suggested locations for screws. Five screws are not necessary!

Note that for the RV-10, RV-9 and ‘batwing’ kits, the single hexagonal board spotlight sits very close to the outside corner of the wingtip. If you are building from new and have the choice, to avoid interference issues as shown in the picture at the bottom of page 1 you may be better off fixing the forward facing board to the wingtip in the screw locations suggested directly above and below the spotlight instead of using the corner position.

For the outward facing board, double sided automotive trim tape works extremely well. Otherwise two screws will suffice, and you'll have spare hardware for the forward facing board...

You may choose to use other screw locations to mount the board to the wing. Feel free to drill anywhere through the area above and below the square strobe LEDs, and if you look closely at the board you will also find areas of either no circuit pattern, such as the solid blocks shown above, or larger areas of solid copper that you can drill through.

Avoid drilling through the circuit tracks that connect between the position LEDs, or between one area of copper and another, as demonstrated at left with the red dots. Green is good!

Please send us some pictures of your installation! We appreciate your feedback.