

# USING LED's TO LIGHT HELIUM WINGS

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and

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PRESENTATION TO PPSS CLUB MEETING

on

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(Sources can be found on last page)

## SHOW A WING WITH EXTERNAL LED'S

SHOW TAIL LED COMPASS

SHOW FIXTURE FOR SOLDERING LOW DRAG EXTERNAL LED'S

DISCUSS + AND - LEADS OF THE LED\

SHOW LED SPECIFICATION

SHOW 2 CELL, 3 CELL, AND 4 CELL HOOKUPS

SHOW 1LED, 2LED'S, AND 4LED CONNECTIONS

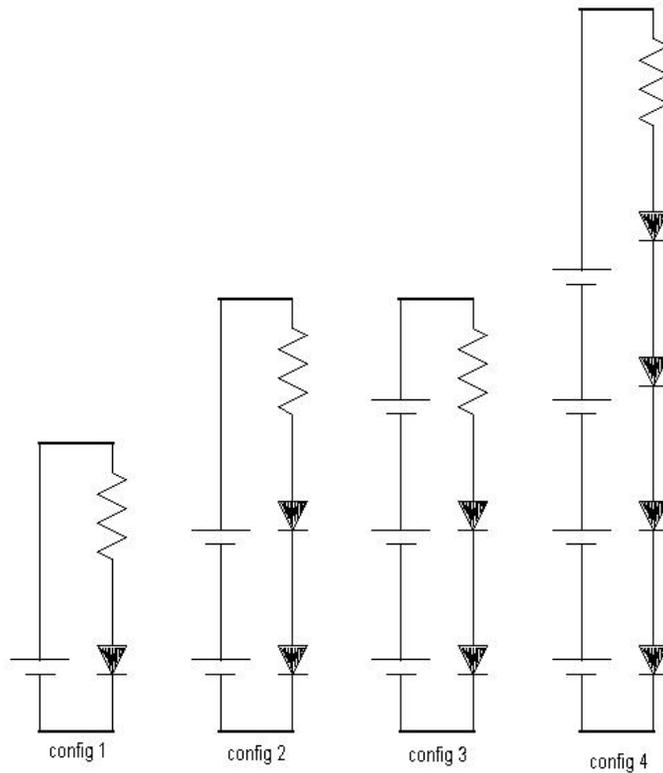
DISCUSS CANDEL POWER AND MCD

### LED 5000 MCD specification

Voltage at .02 amps (20 ma)	3.3 volts
Resistance at .02 amps	163 ohms
5000 MCD power	.066 watts
Beam width at 5000 MCD	20 degrees

### Performance at .01 amps

Voltage at .01 amps	3.15 volts
Power at .01 amps	.03 watts
MCD at .01 amps	2272 MCD

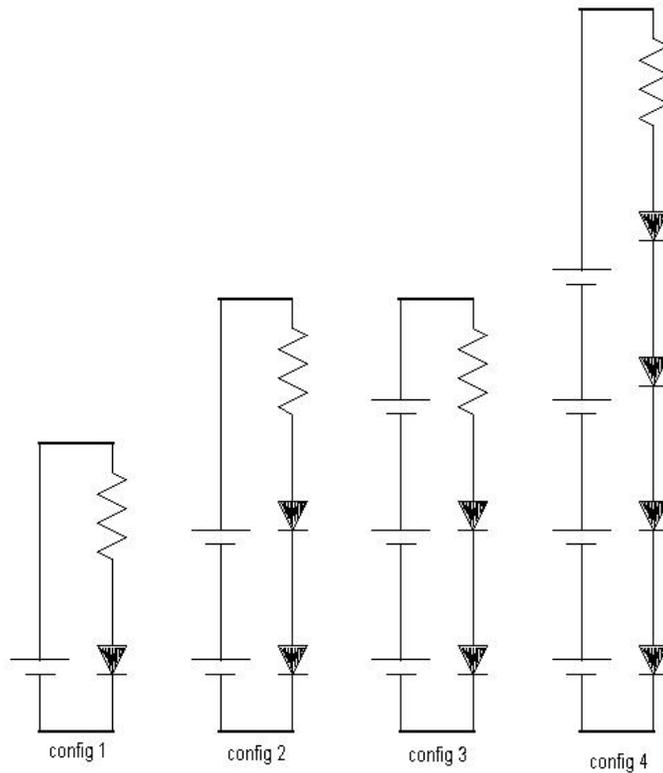


RESISTOR SIZE = (SOURCE VOLTAGE-TOTAL LED VOLTAGE)/LED CURRENT  
 CONFIG 1  
 SOURCE VOLTAGE = 1 LIPO FULL CHARGE CELL VOLTAGE  
 SOURCE VOLTAGE = 4.2 VOLTS  
 TOTAL LED VOLTAGE = 1 LED VOLTAGE  
 TOTAL LED VOLTAGE = 3.3 VOLTS  
 LED CURRENT = .02 AMPS

THEREFOR R=  $(4.2 - 3.3) / .02$   
 $.9 / .02$   
 45 OHMS

CONFIG2 = SOURCE VOLTAGE = 2 LIPO FULL CHARGED CELLS  
 SOURCE VOLTAGE =  $2 * 4.2 = 8.4$  VOLTS  
 TOTAL LED VOLTAGE =  $2 * 3.3 = 6.6$  VOLTS  
 LED CURRENT = .02 AMPS

THEREFOR R=  $(8.4 - 6.6) / .02$   
 $1.8 / .02$   
 90 OHMS



RESISTOR SIZE = (SOURCE VOLTAGE-TOTAL LED VOLTAGE)/LED CURRENT

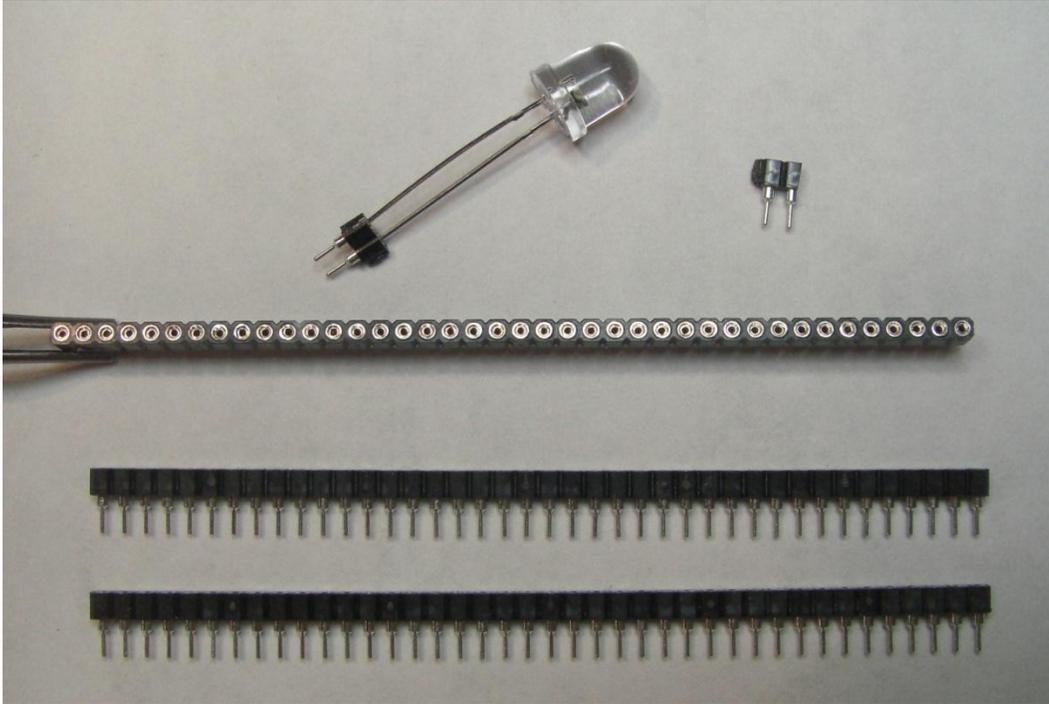
CONFIG 3      SOURCE VOLTAGE = 3 LIPO FULL CHARGE CELL CELLS  
 SOURCE VOLTAGE = 3 \* 4.2 = 12.6 VOLTS  
 TOTAL LED VOLTAGE = 2 \* 3.3 = 6.6 VOLTS  
 TOTAL LED VOLTAGE = 6.6 VOLTS  
 LED CURRENT      = .02 AMPS

THEREFOR R=            (12.5 – 6.6) / .02  
                                  5.9 / .02  
                                  295 OHMS

CONFIG 4      =      SOURCE VOLTAGE = 4 LIPO FULL CHARGED CELLS  
 SOURCE VOLTAGE = 4\*4.2 = 16.8 VOLTS  
 TOTAL LED VOLTAGE = 4\*3.3= 13.2 VOLTS  
 LED CURRENT      = .02 AMPS

THEREFOR R            = (16.8 – 13.2) / .02  
                                  = 3.6 / .02  
                                  = 180 OHMS

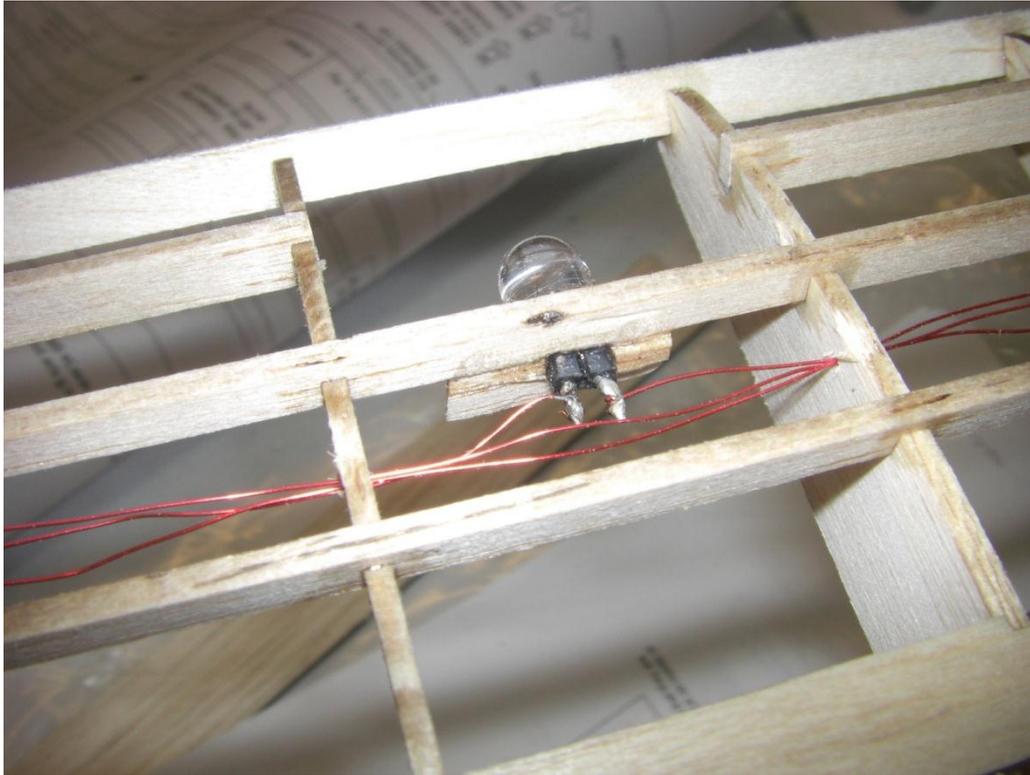
SINGLE IN-LINE PINS (SIP) FOR CONVENIENT MOUNTING OF LEDs



LEDs INSTALLED IN WING (12 FACING FORWARD, 6 FACING REAR)



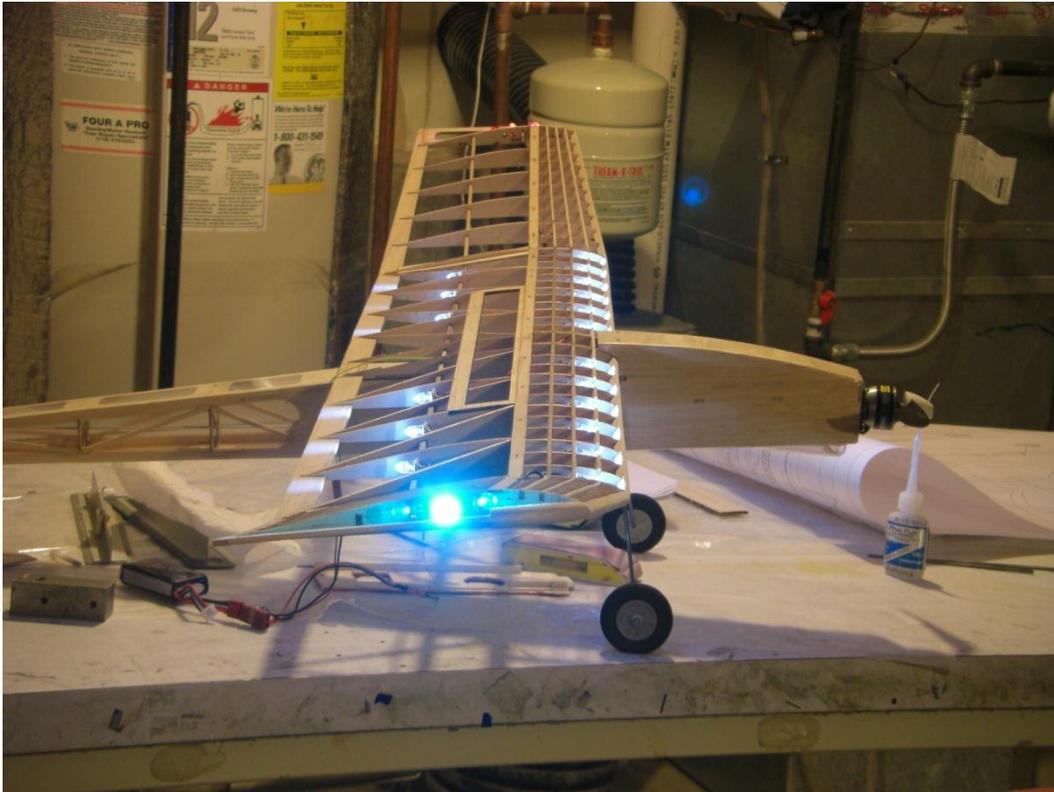
FORWARD LEDs MOUNTED UNDER CENTER TURBULATOR, NOTE THE FIRST TURBULATOR IS REMOVED FROM THE BAY. USE MAGNET WIRE FOR CONNECTIONS



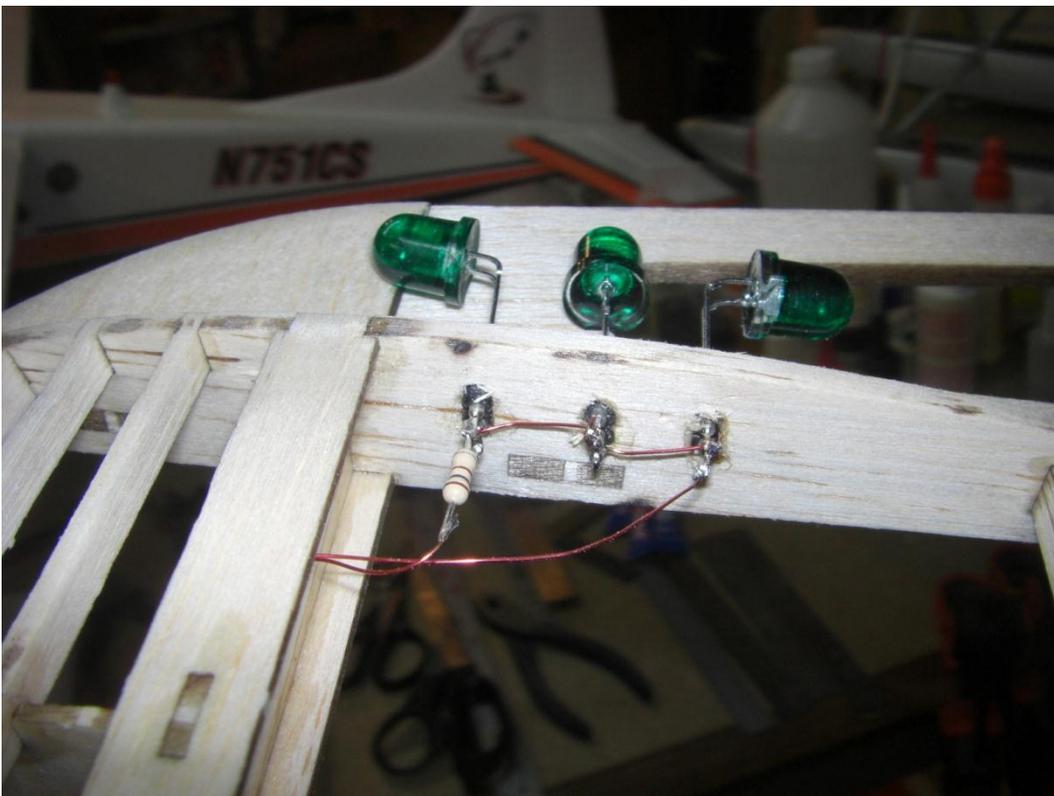
MOUNT REAR FACING LEDs ON TOP OF SUBSPAR



SIDE VIEW OF LIGHTED WING



MOUNTING OF WING TIP LIGHTS



## SOURCES

- 1) Helium Motor Gliders

<http://www.stevensaero.com/Soaring-p-1-c-292.html>

- 2) LEDs

[http://www.ledssuperbright.com/index.php?main\\_page=advanced\\_search\\_result&search\\_in\\_description=1&keyword=75000](http://www.ledssuperbright.com/index.php?main_page=advanced_search_result&search_in_description=1&keyword=75000)

<http://tomsha.com/shop/index.php?cPath=2&osCsid=5914b4b0ad52b7ebed087db856f98f0e>

- 3) LED resistor size calculator

<http://www.laureanno.com/RC/LED-calc.htm>

- 4) SIPs (For mounting LEDs)

Centennial Electronics  
2324 E. Bijou  
Colorado Springs, CO 80909  
Phone: (719)-633-4666

- 5) Resistors and magnet wire

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