

ULTIMATE HARDWARE KIT

For Anders 3D Printed PKD-19 Blade Runner Blaster



Contains full electronics for LED lighting.

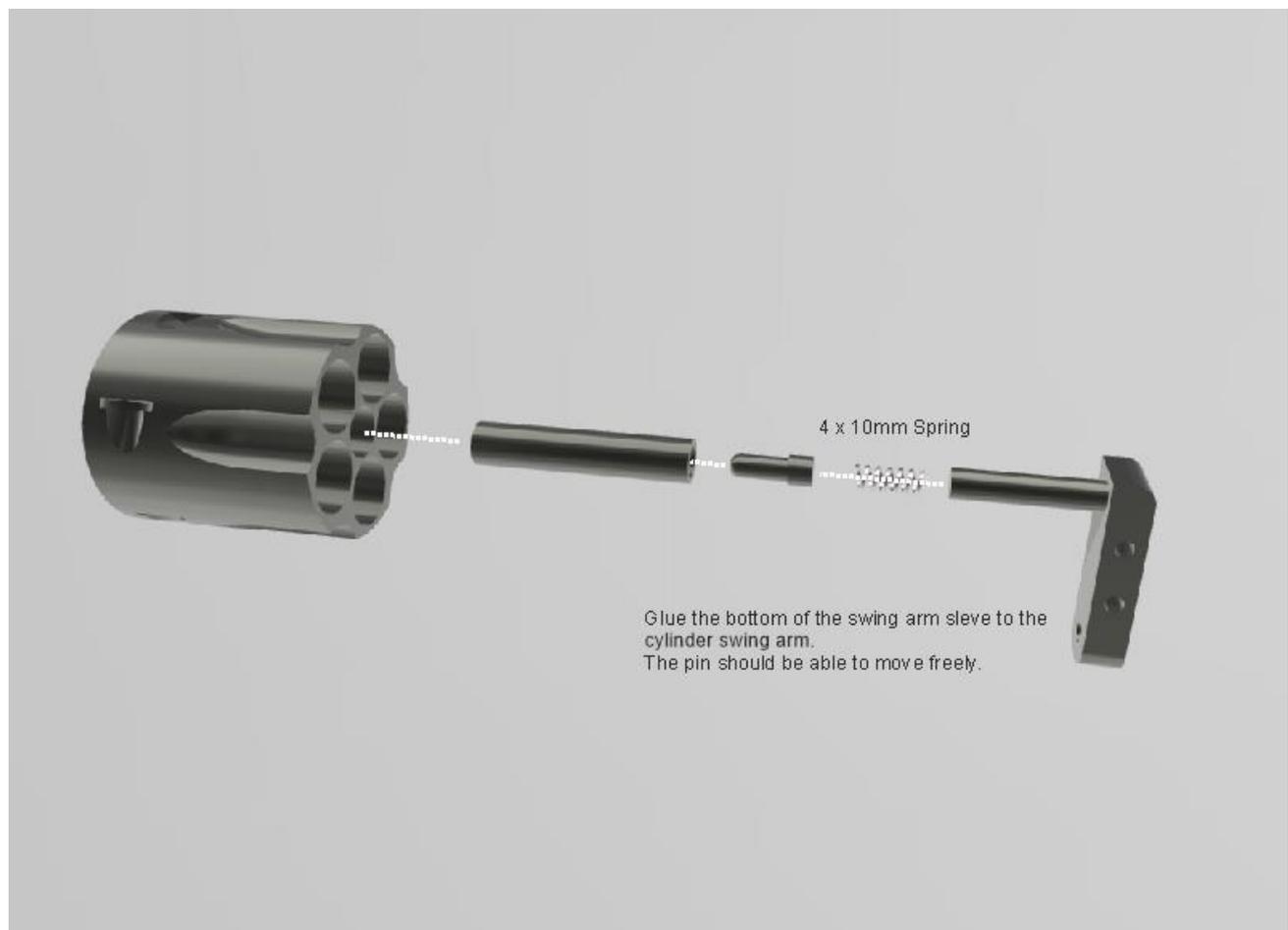
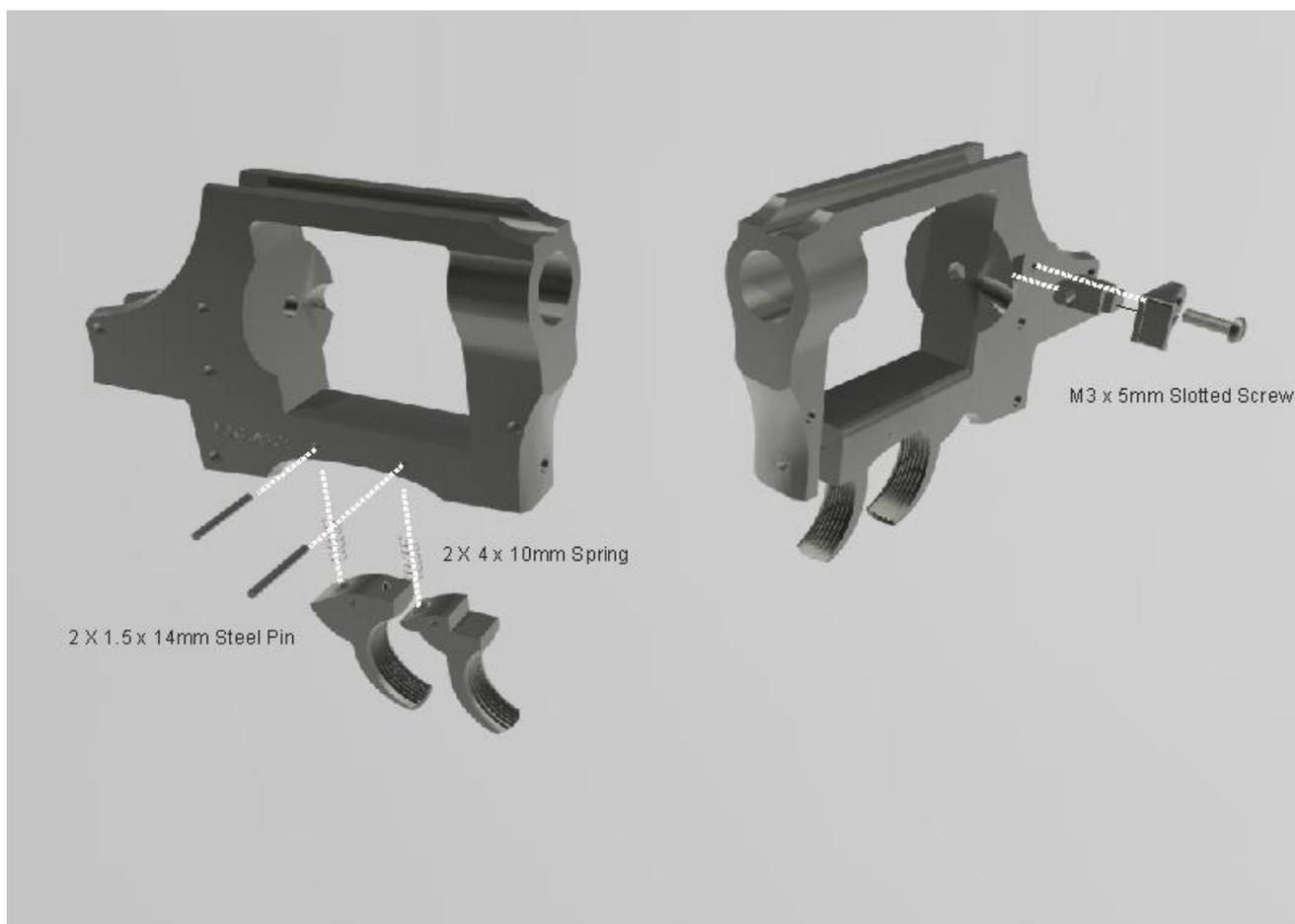
Includes hardware for optional Duplex Designs upgraded blaster parts.



Duplex Designs

IMAGINE - DESIGN - BUILD

Hardware – Assembly





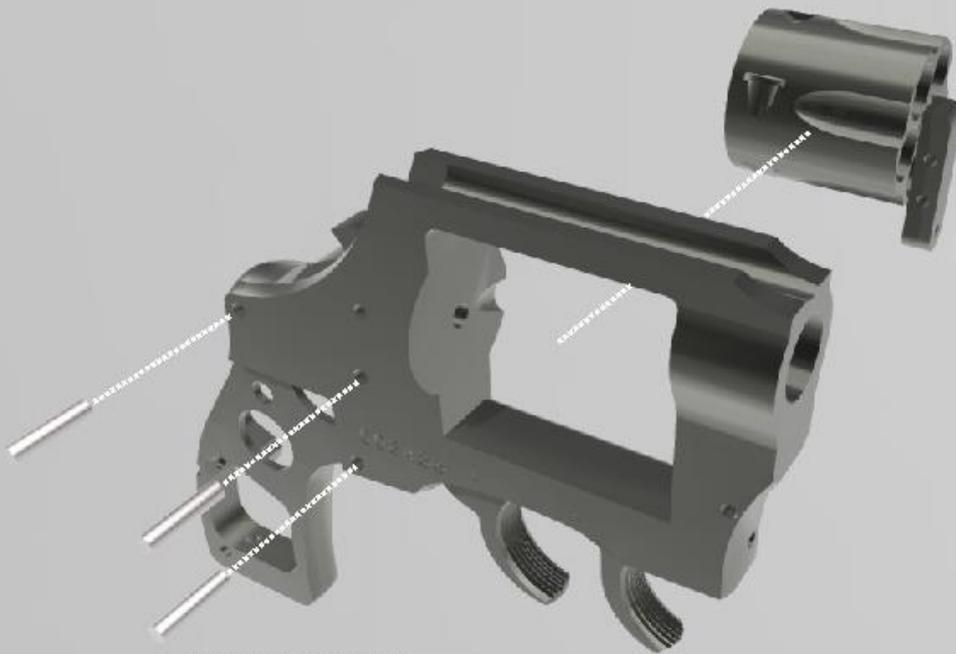
4 x 40mm Spring

Optional parts from Duplex Designs upgraded blaster 3D parts.

Fit spring onto hammer spring guide, place spring guide through guide stop in handle.

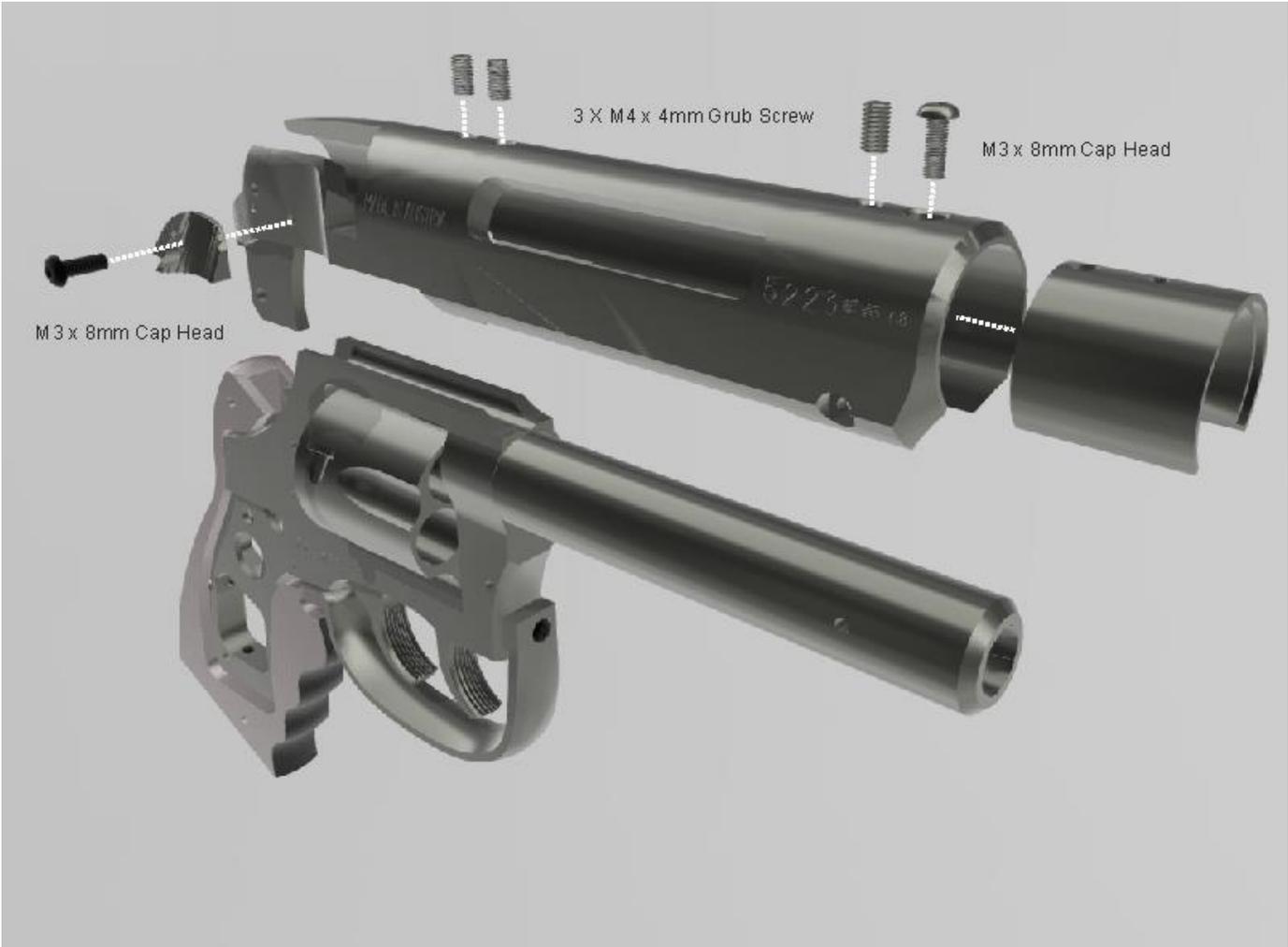
Upper part of spring guide locates in recess in the bottom of the hammer.

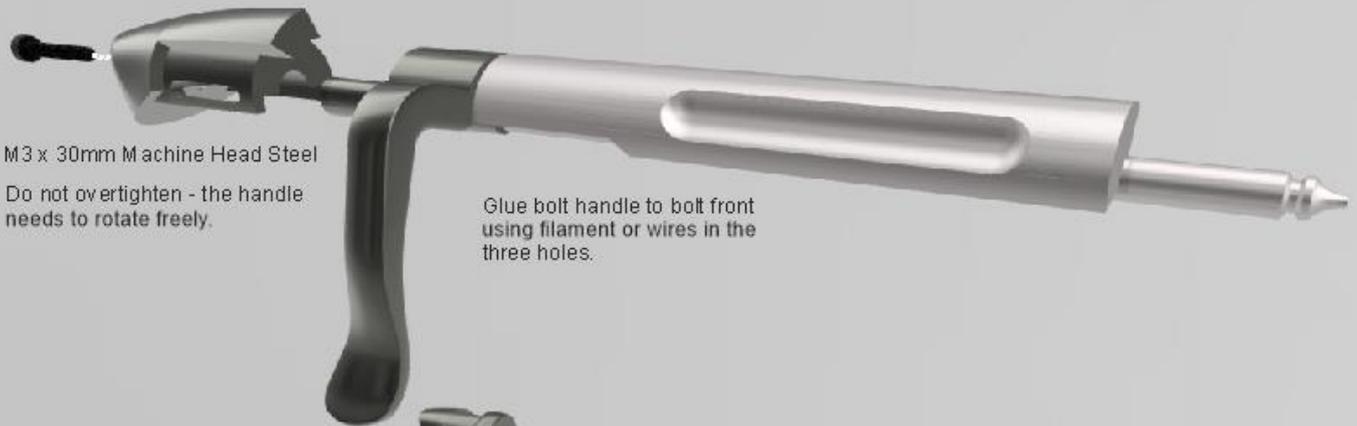
The hammer locates in the receiver using a 3mm x 14mm steel pin.



3 X 3 x 14mm Steel Pin

Note: If hammer is not fitted the centre pin is not required.





M3 x 30mm Machine Head Steel
Do not overtighten - the handle
needs to rotate freely.

Glue bolt handle to bolt front
using filament or wires in the
three holes.

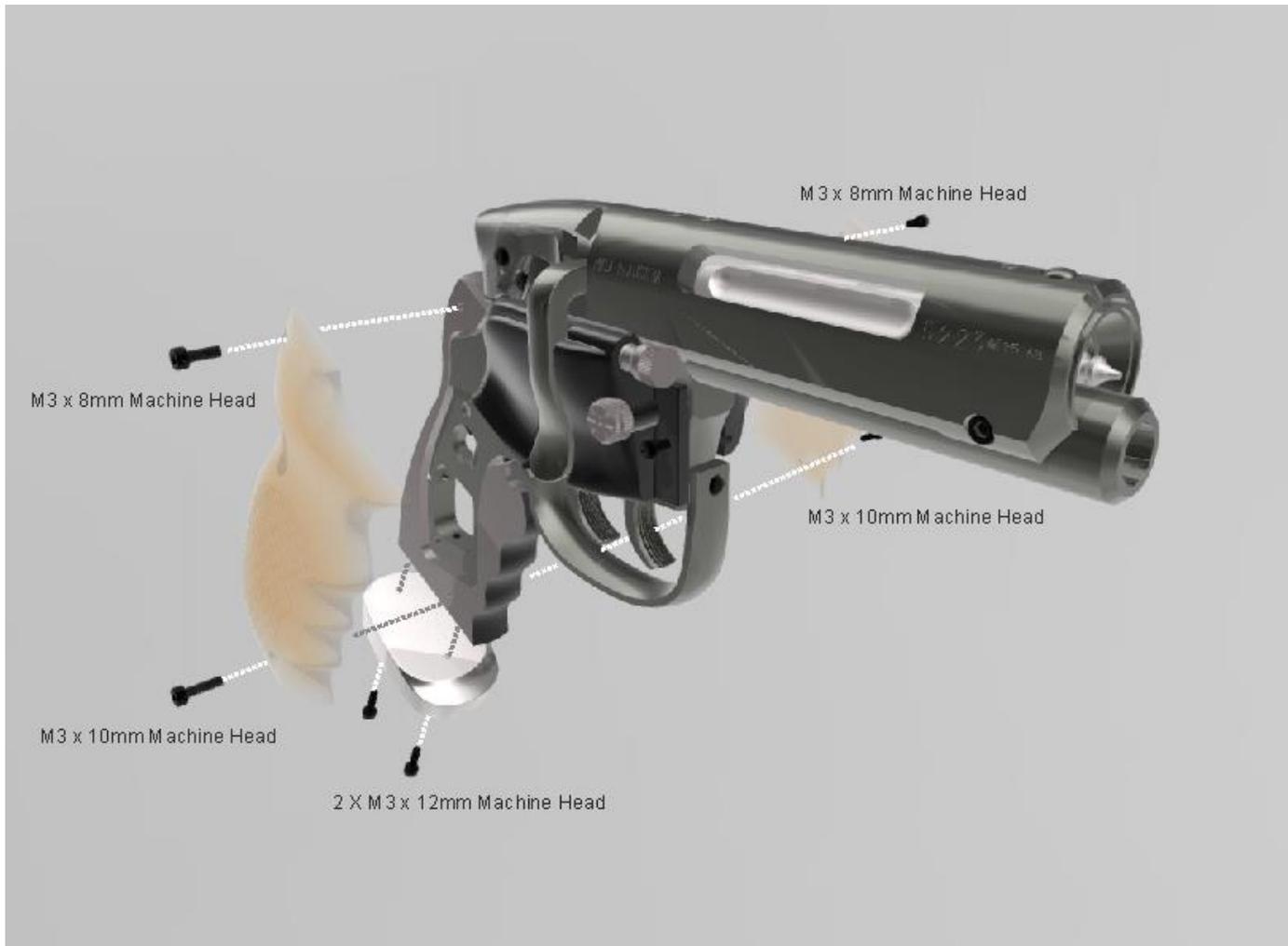
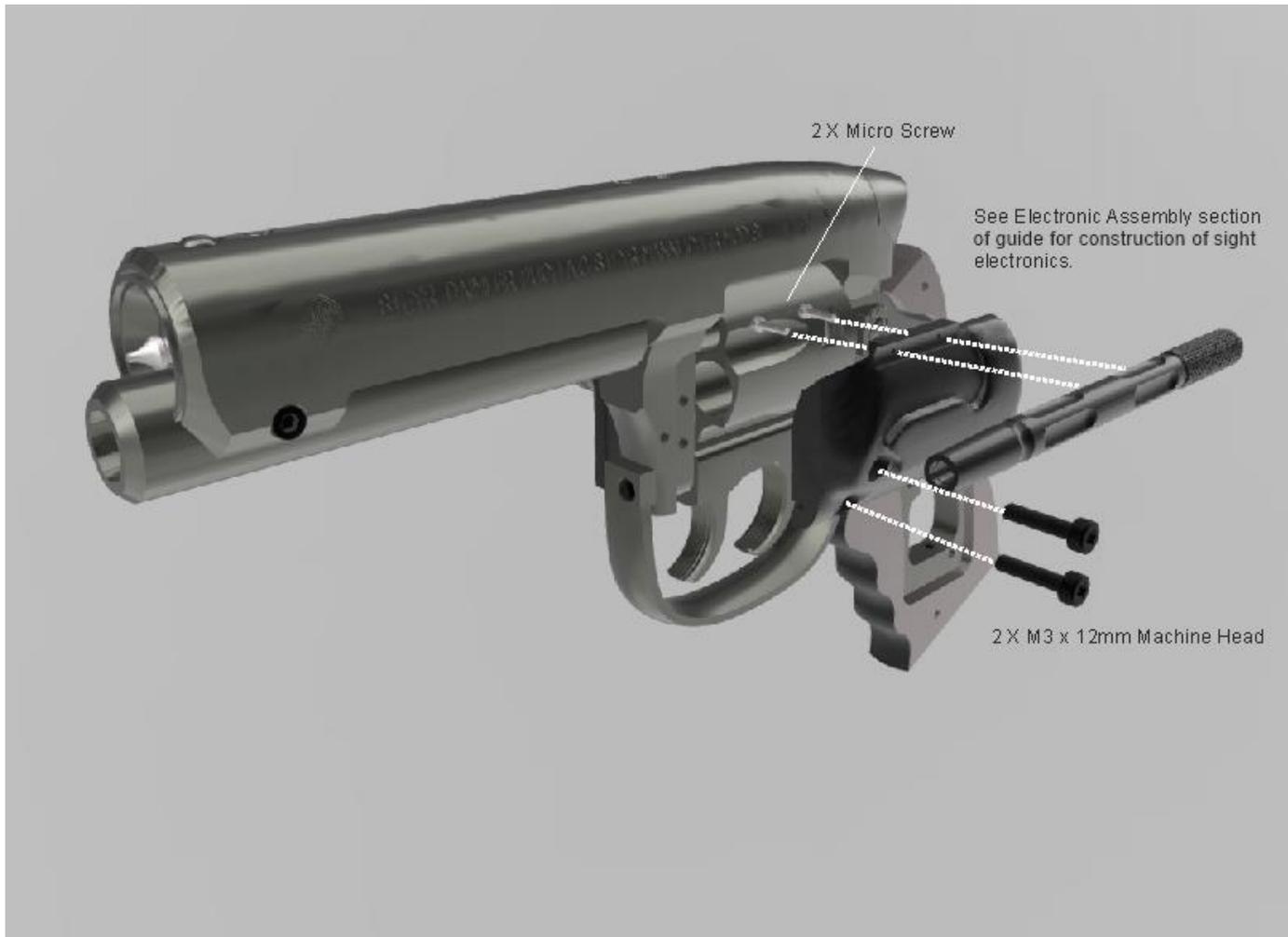


Slide bolt into upper receiver
with bolt handle up.

M3 x 5mm Cap Head
Screw in after bolt is inserted.



M3 x 8mm Cap Head





Electronics – Clip Assembly

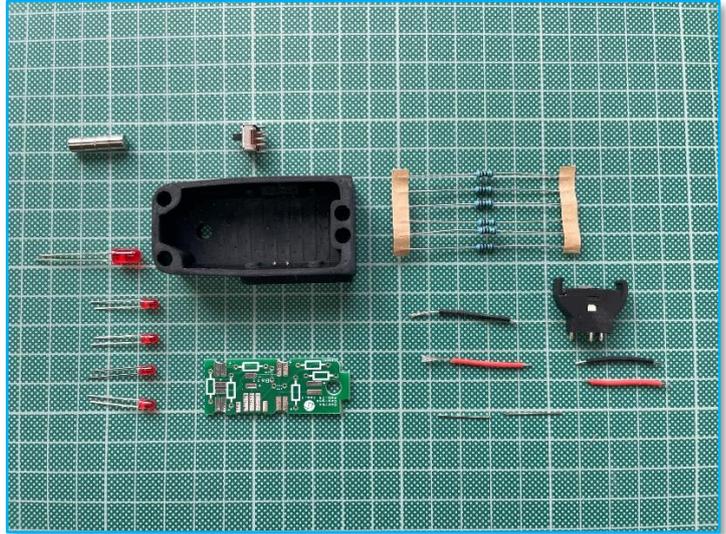
This hardware kit contains a PCB to enable you to construct a neat electronics assembly for your blaster.

Most available electronics kits leave you to solder all the components together with individual wires, but this kit gives a much neater and robust solution and also includes series resistors for the LEDs (Which most kits omit) and this ensures the LEDs are operating with the correct current and will make the battery last longer.

This part of the assembly guide deals with the electronics housed in the clip.

First identify the positive and negative leads of the LEDs.

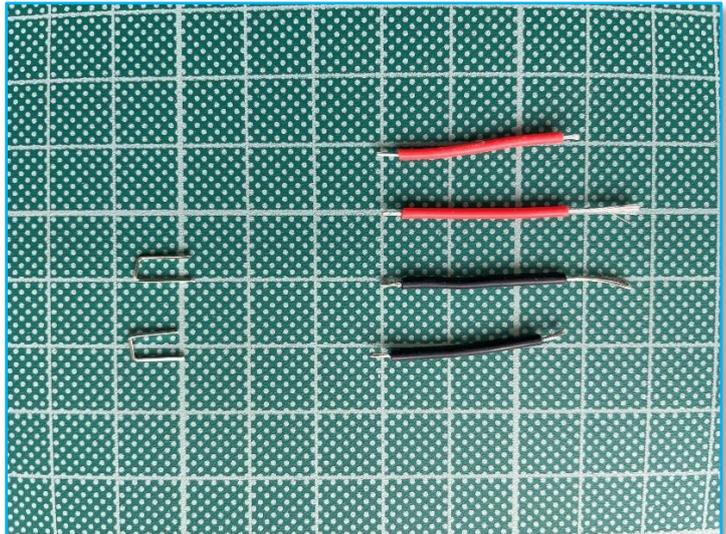
The longest leg is the positive. Because we are going to cut the legs short later it is a good idea to mark the LEDs with a sharpie or marker. In this example the negative (shortest) leads were simply coloured black with a marker.



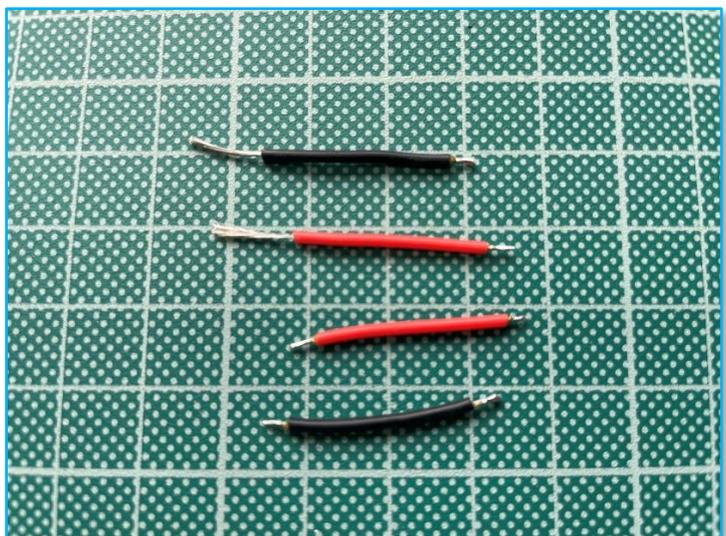
Next prepare the wires. The square markings on the cutting mat are 1cm so these can be used as a visual guide to the wire lengths.

Bend the two tinned copper wires (seen on the left) ready for fitting as links.

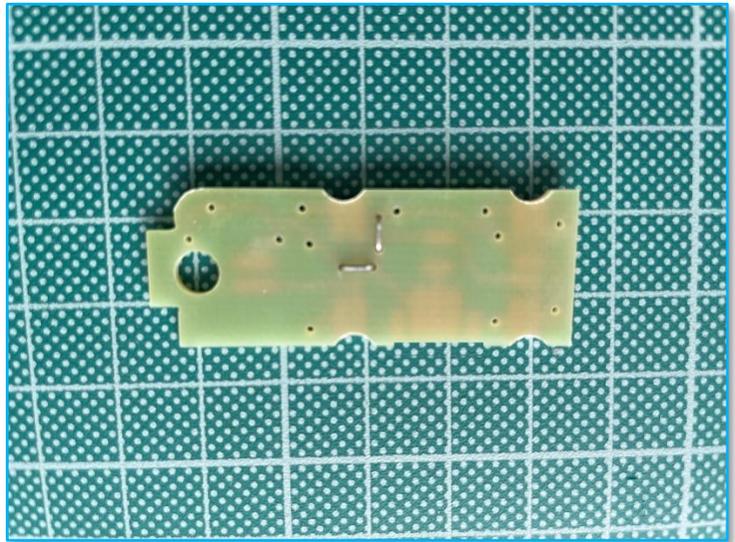
Notice that one each of the red and black wires have one end with much longer bared conductors. These are **not** tinned, see next step.



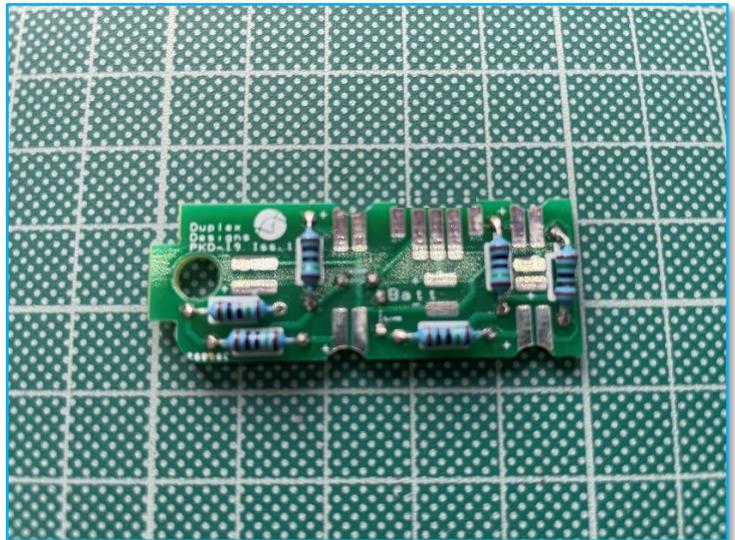
Use the soldering iron to tin all the end of the red and black cables **except** for the two longer length exposed conductors.



Fit and solder the two tinned copper wire links as shown and cut off extra leads after soldering.

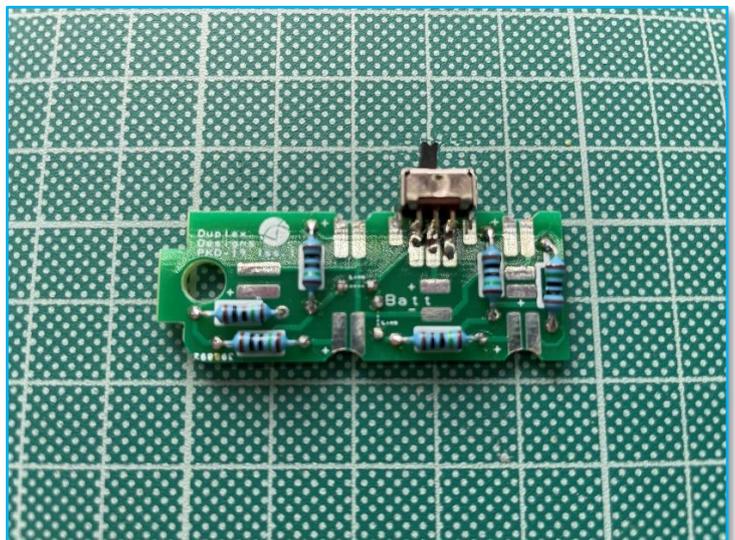


Next fit the six resistors. These are fitted (unconventionally) on the track side of the PCB. Again, snip off extra leads after soldering.



Next fit the switch. It does not matter which way up, but it must be fitted close to the PCB and will sit in the little cut-out. It will be easier if you tin the three switch pins before soldering to the PCB.

Make sure the switch is not crooked and is fitted nice and flat to the PCB.





Now the PCB is slid into the clip. This may take a little finessing, but it will go in.



The next part is a little tricky but take your time and don't force anything.

Cut the four 3mm LED leads to about 8mm length. *This is when it is useful to have marked those negative leads!*

Fit each LED into its side hole ensuring that the correct polarity lead aligns with the correct polarity PCB pad. The positives are marked with a '+' sign on the PCB.

You may need to wiggle the PCB around to make room to slide the LEDs in. It is better to start with those LEDs on the opposite side to the switch.



Next fit the 5mm LED.

Cut and bend the leads (ensuring correct polarity) so that when the LED is pushed through the hole the leads touch the pads on the PCB.

Now solder all the LED leads to the PCB.

Be careful not to hold the soldering iron on the LED leads for too long as excessive temperature can damage the LEDs.



Now it is time to add the wires to the battery holder.

Do not fit the battery as this point!

Solder the red and black wires to the pins shown in the image.

Ensure that the '+' sign embossed in the holder is right side up.

The extra pin can be cut off.



Cut the heat shrink tubing and slide over the wires.

Use a heat gun or hair dryer set to max heat to shrink the tubing to insulate the pins and solder connections.



Now solder the wires to the pads on the PCB marked 'BATT'.

Ensure that the red wire goes to the pad marked with a '+'.
with a '+'.



Now it is time to test the LEDs.

Make sure the switch is set to the 'OFF' position.
Fit the battery to the holder.

The large flat face of the CR2032 battery is positive and should match the side of the holder marked with the '+'.
with the '+'.

Slide the switch to 'ON' and check all five LEDs.

If any do not illuminate check solder connection and LED polarity.

Check for any unwanted short circuits on the PCB due to excessive solder and check that all resistor leads have been soldered.



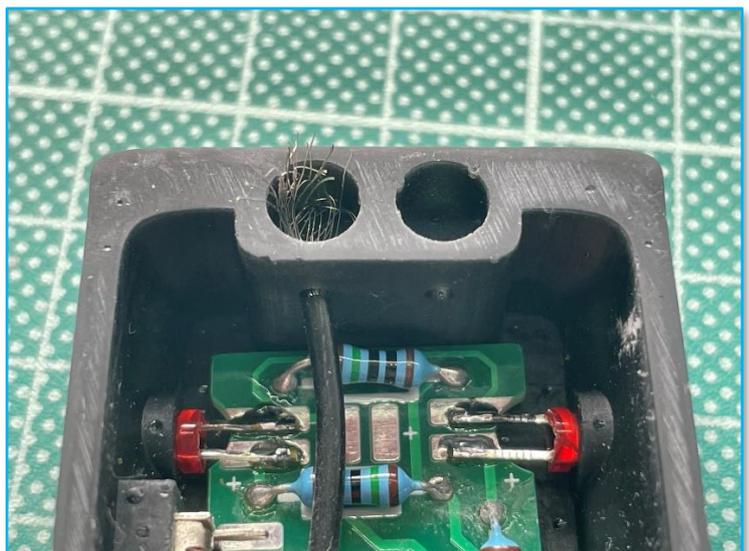
The next stage takes the power to the magnets to enable the sight LEDs to illuminate.

Take the black wire and thread the longer untinned conductors into the magnet hole as shown.

Splay them out a bit to make contact with the magnet when it is seated in its pocket.

Push the wire into the hole so no conductors are present on the inside of the clip.

Put a small amount of superglue in the bottom of the magnet pocket (or on the inside away from the wire conductors) and push the magnet into its pocket ensuring it is left a little proud of the clip surface.

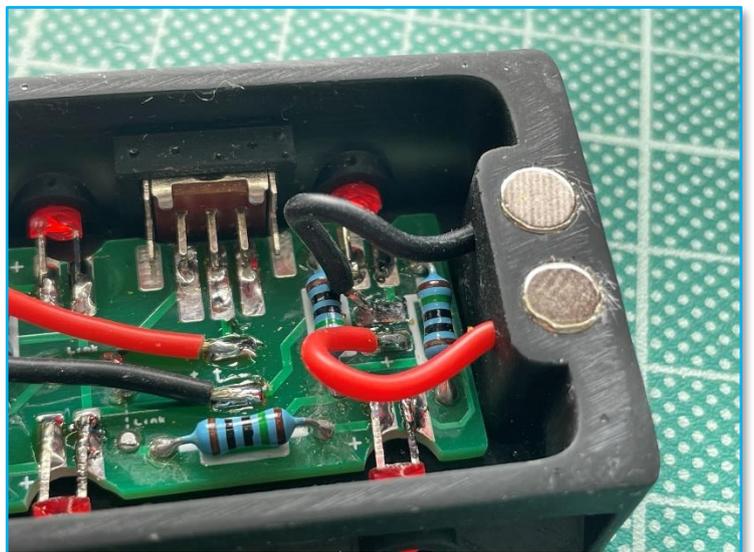


TIP: It is best to insert all magnets with the same polarity. Remember later when fitting magnets to the upper clip housing to orient the correct polarity so they attract, not repel, those fitted to the clip.

Now repeat the process with the red wire. Once the magnets are stuck you can clean up any exposed conductors by cutting them with a craft knife.



Next you need to solder the wires to the PCB pads. Ensure the correct polarity. You may find that tweezers help hold the wires for soldering. It is also advisable to tin the pads before trying to attach the wires.



Test the connections to the magnets by holding a green LED onto the magnets. Ensure that the switch is set to 'ON' and that the long LED lead goes on the magnet with the red wire.

If all is well the LED should illuminate.



Use the same technique, above, when connecting the white figure '8' wire to the upper clip holder. This white wire will route up to the screwdriver/sight rod to power the green LEDs.

Place the supplied insulator (Supplied insulating sheet may differ to that pictured) over the 5mm LED so that it covers the LED leads and surrounding resistor leads. This is to stop the battery holder metal parts shorting onto the PCB components.



You can then position the battery holder.

This could be secured with a small piece of Blu-Tak but remember that you will need to be able to lift the holder again to change the battery.

Fit the other magnets to the clip if not already done.

This stage of the electronics is now complete!

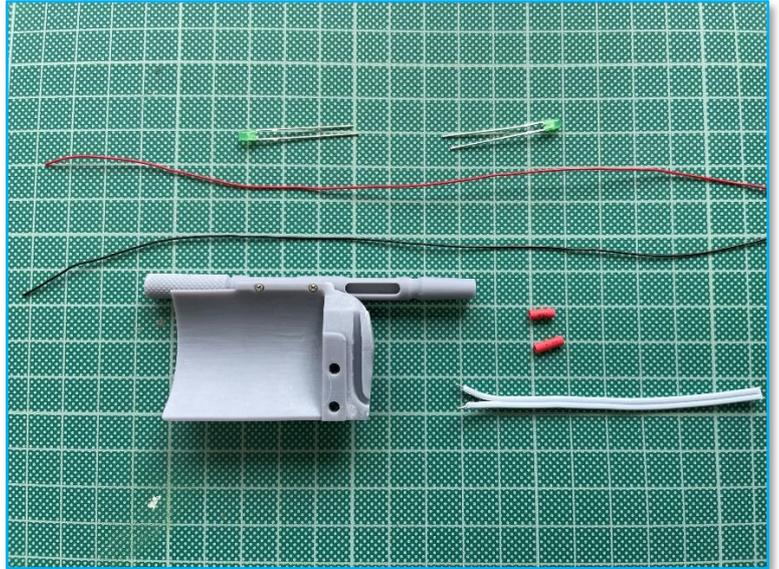


Electronics – Sight Assembly

This part of the assembly guide deals with the electronics housed in the sight rod.

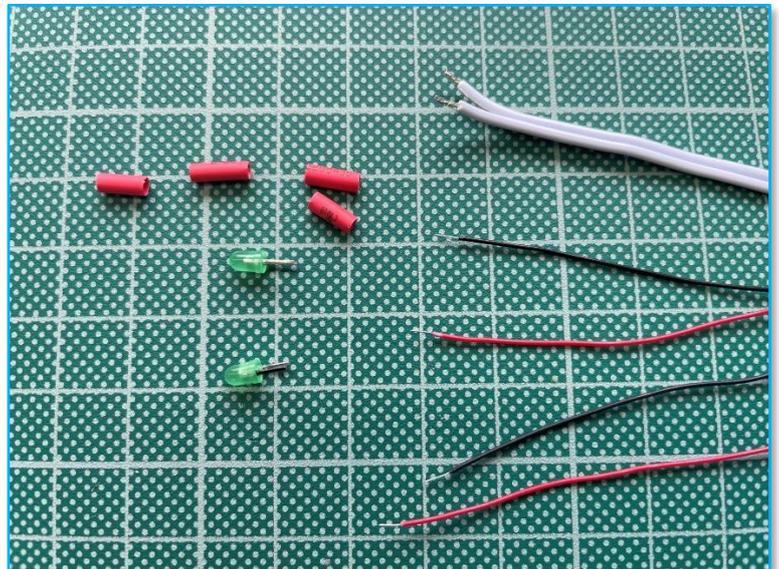
First identify the positive and negative leads of the LEDs.

The longest leg is the positive. Because we are going to cut the legs short later it is a good idea to mark the LEDs with a sharpie or marker. In this example the negative (shortest) leads were simply coloured black with a marker.



Strip and tin the ends of the wire, snip off the leads from the LEDs (Remember to mark the negative lead with a marker) leaving around 6-8mm.

Cut up 4 pieces of heat shrink tubing.

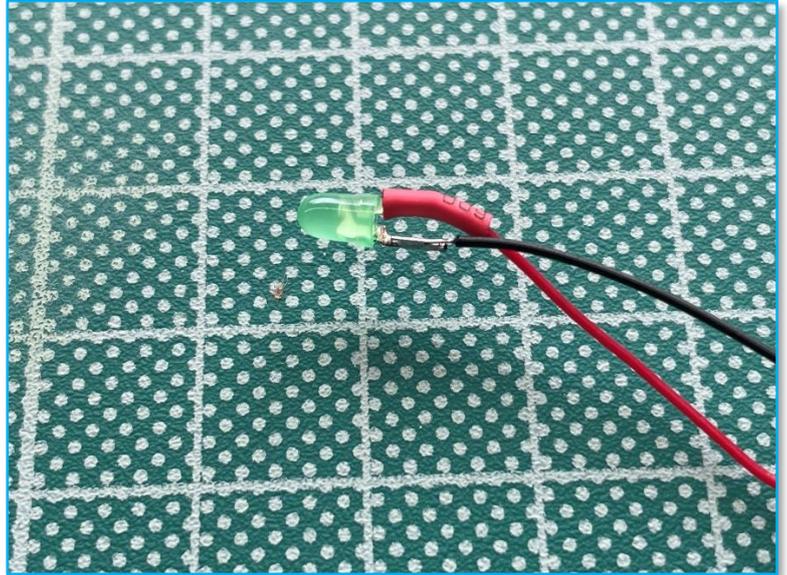


Thread the red and black wires through the sight tube and fit heat shrink tubing over the red wire at each end.



Next solder the wires to the LEDs taking care to get the polarity correct.

Slide the heat shrink tubing over the LED lead and shrink it with a hot hair dryer or heat gun.



Slide the LEDs into the ends of the sight. Note that there is a correct orientation as the sight has a wider part to accommodate the LED leads.

Use a pair of tweezers to grab the wires and pull them out through the access slot.



Now comes the tricky part.

Snip these wires and strip the ends being careful not to pull the wires off the LEDs. Twist together both reds and twist together both blacks.

(Alternatively, the wires to each LED could be cut and stripped prior to inserting into the tube but you will need tweezers to pull them out through the slot.)

Place heat shrink tubing over the ends of the white wires and solder the white wires to the red and black pairs.

One side of the figure '8' white cable has dark printing on, and this can be used to identify the negative when you connect the other end to the magnets in the clip housing.



After soldering, slide up the heat shrink tubing over the connections and shrink with hair dryer or heat gun.

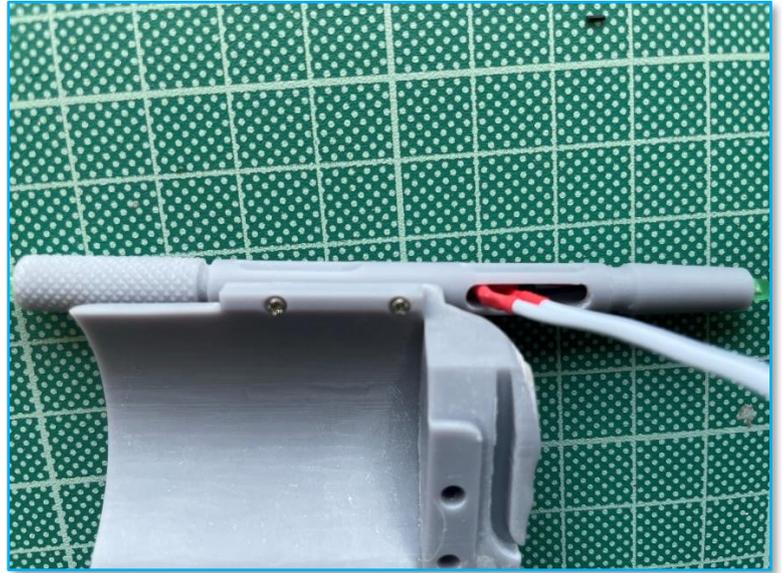
Be careful not to overheat and warp the resin model.

Once that is done you can seat the wiring carefully inside the sight tube.

At this point the wiring can be tested by connecting the other end of the white cable to the power carrying magnets on the clip.

If any do not illuminate check solder connections and LED polarity and connection to magnets is also correct polarity. Check for any unwanted short circuits in the wiring.

If the magnets carrying the power supply do not touch each other when the clip is mated with the clip housing, try building up the height of the problem magnet with a small shim of metal or wire.



Once you are happy everything is working the wires can be glued into the sight tube.

A good method is using UV resin dropped in around the wires.

If you are using the Duplex Design upgraded blaster parts, as shown in these images, the cylinder cover has a groove for the white wire if you decide to hide the wire inside the cover (As real prop was provided pre-production).

Alternatively, route the wire on the outside of the cover (As seen on screen in movie).



Parts List

2	Micro Screws
1	M3 x 5mm Slot Pan Head
4	M3 x 8mm Cap Head
1	M3 x 12mm Cap Head
1	M3 x 20mm Cap Head
4	M3 x 8mm Machine Head
2	M3 x 10mm Machine Head
7	M3 x 12mm Machine Head
1	M3 x 20mm Machine Head
1	M3 x 30mm Machine Head
1	M5 x 25mm Machine Head
2	M3 x 4mm Grub Screw Slot Head
3	M4 x 4mm Grub Screw Slot Head
1	M3 Threaded Round Nut (Brass)
3	3mm \varnothing x 14mm Steel Pin
2	1.5mm \varnothing x 14mm Steel Pin
8	5mm x 5mm Neodymium Magnets
4	3mm Red LED
2	3mm Green LED
1	5mm Red LED
6	160R Leaded Resistors
1	CR2032 Battery Holder
1	DPDT Slide Switch
1	CR2032 Battery
3	4mm \varnothing x 10mm Spring (Triggers & cylinder)
1	6mm \varnothing x 40mm Spring (Hammer)
1	White Figure '8' 2 Core Wire
1	Red Flexible 26AWG Wire
1	Black Flexible 26AWG Wire
1	Red Single Core 30AWG Wire
1	Black Single Core 30AWG Wire
1	Heat Shrink Tubing
1	Tinned Copper Wire (Links)
1	Insulating Pad



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IMAGINE - DESIGN - BUILD

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