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**#PRP1777**

***Star Trek™ V: The Final Frontier***

***Star Trek™ VI: The Undiscovered Country***

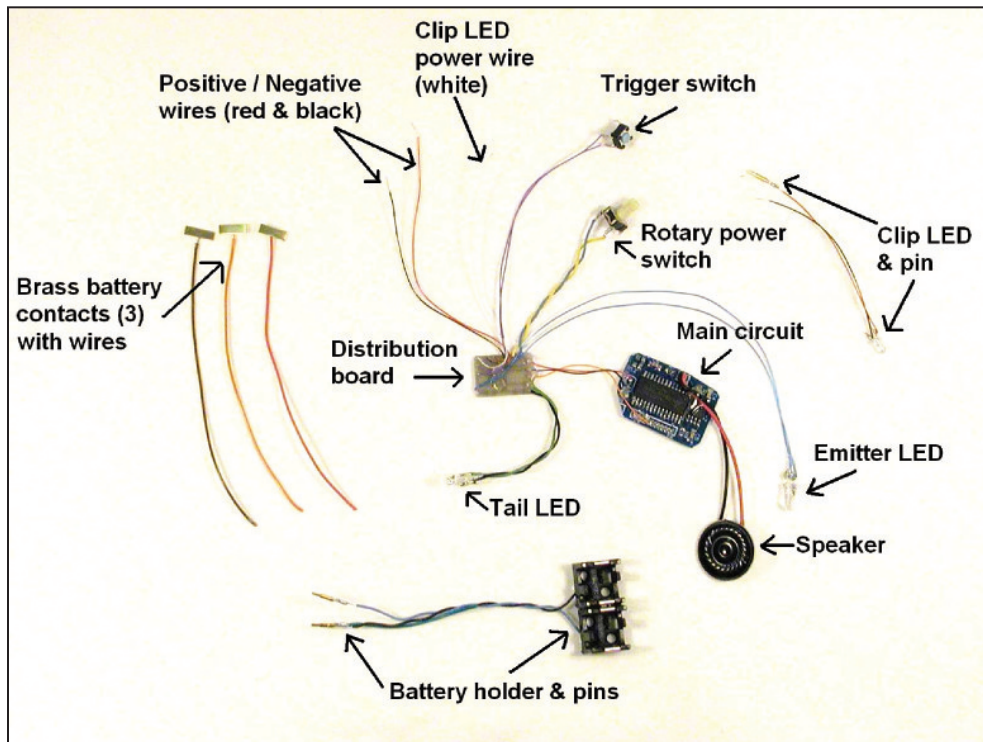
**Assault Phaser Electronic Upgrade Manual**



- **WARNING:** The small magnet used in this kit could interfere with the operation of pacemakers, hearing aids, etc. Please use caution when handling.
- This electronic upgrade requires considerable prop building and soldering experience.
- Please read this manual completely and familiarize yourself with these electronics before attempting to install this upgrade kit.
- Do not attempt to modify the electronic circuits in any way.
- This manual is only intended as a guide for the installation of the electronics. Please use the Assault Phaser prop kit manual for prop assembly.
- Requires 2 standard CR1/3 N batteries (6V) for the power.

## TOOLS REQUIRED:

- Dremel tool (a dremel flex arm attachment is very helpful)
- Power Drill
- Various modeling files
- Hobby knife
- Wire cutter and stripper
- Soldering iron and solder
- Hot glue gun and glue



## EXAMINE ALL PARTS AND READ THIS MANUAL COMPLETELY BEFORE BEGINNING ANY WORK:

These instructions have been written so that when followed correctly, your electronics upgrade will go smoothly and your Assault phaser will look and sound just like the prop in the movies upon completion.

Begin by taking the electronics out of the package and lay them out similar to the picture above.

**Notice that both power wires on the battery holder and the positive wire on the power LED have spring loaded contact pins already solder attached to them. This will save you time and will be explained later during installation.**

To start with, it is best and easiest to prepare for installing the electronics by drilling, cutting, or filling any required holes BEFORE doing anything else. That way you will be familiar with a plan, and also each installation step can be done without having to stop and drill or cut at those points during the build up.

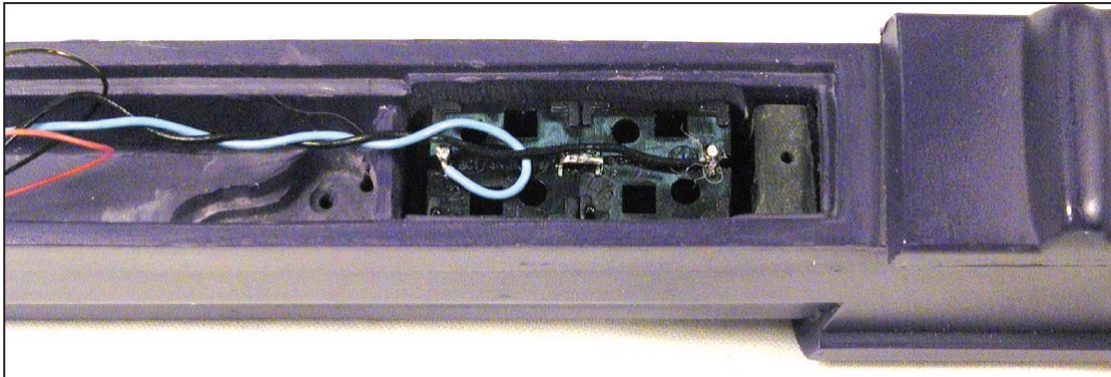
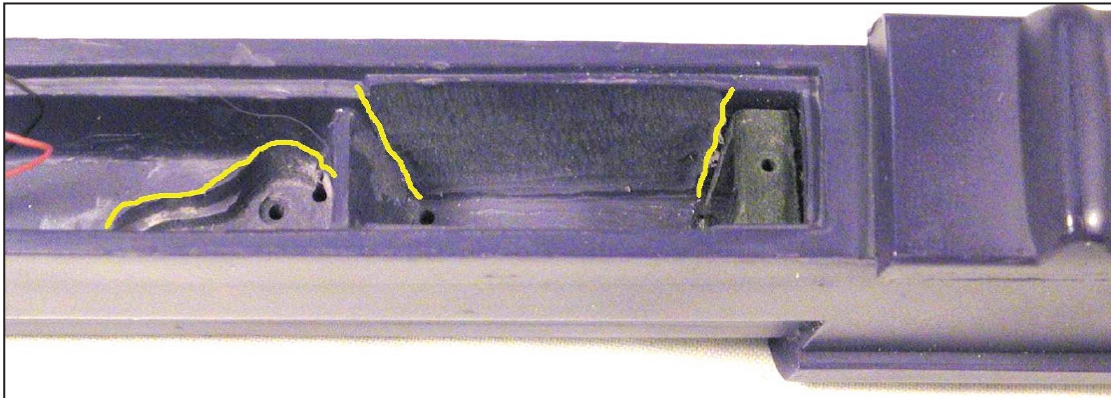
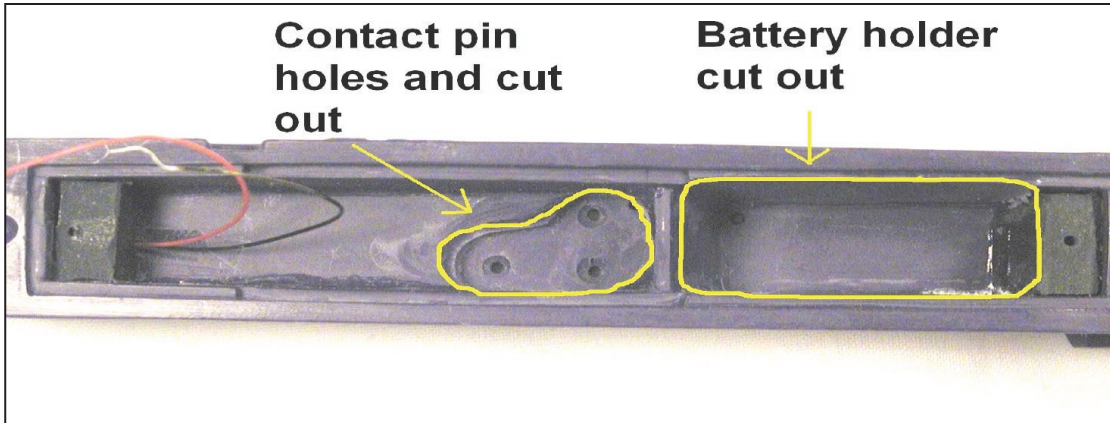
Also, it is always best to “test fit” whenever possible, to ensure proper alignment and that the action of the assembled parts is smooth and without obstruction.

The following steps and pages will go into more detail for electronics installation.

Use the prop building instructions as the “main” source for prop assembly, in conjunction with steps from these manual pages.



## POWER CLIP - BATTERY COMPARTMENT:

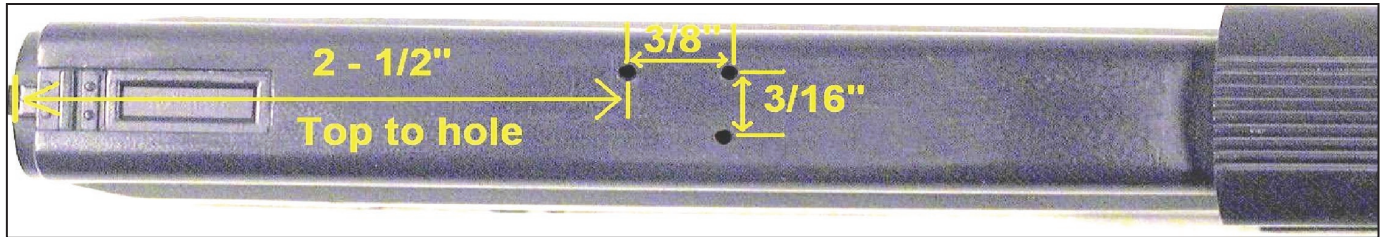


**Step 1:** Begin preparing the clip by using a dremel to carve out the two compartments – starting with the battery compartment, using the yellow lines in the photos as a reference. Notice that the natural tapered shape of the casting goes along with the tapered shape of the battery holder: facing down. Use that as reference also.

Be careful and shave a little bit off at a time, then test fitting the holder each time, until the cut out is just big enough for the battery holder to fit snugly into the compartment, face down with no movement (bottom photo).

Make certain the clip cover fits into place over the holder and the wires with no interference.

## POWER CLIP - POWER CONTACT PIN HOLES:



**Step 2:** Using a tape measure, mark the places for the three (3) contact pin holes to be drilled using the measurements in the photo above for reference, with two holes on one side (positive), with the third hole (negative) on the other side. (Also see the photos on the previous page for other angles of reference.)

Be certain to center the holes on the clip, which will allow equal space on either side for the pins to connect with the provided brass contacts – two in one half of the phaser body and one in the other half.

Test view the marked holes by inserting the clip into each side of its corresponding phaser body half and making sure the holes are well covered. This will also give you an idea as to where the flat brass contacts and wires will be installed into the body halves in the upcoming steps.

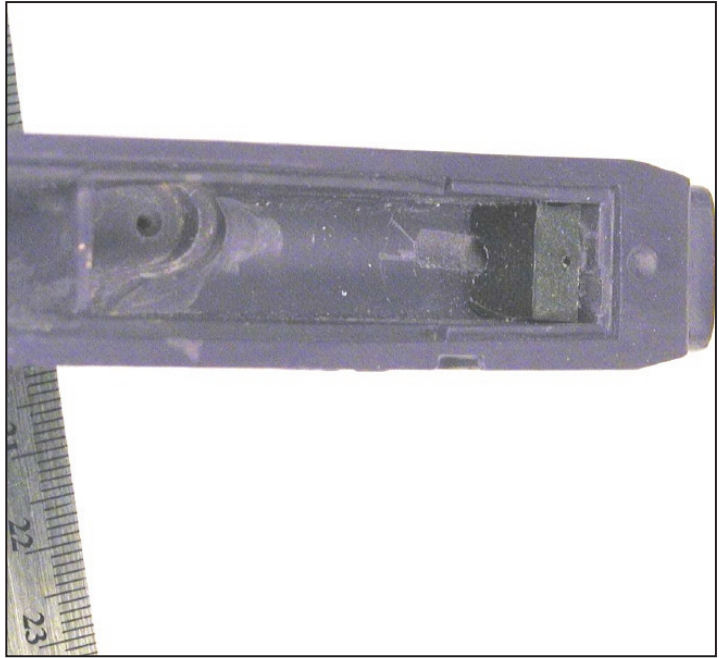
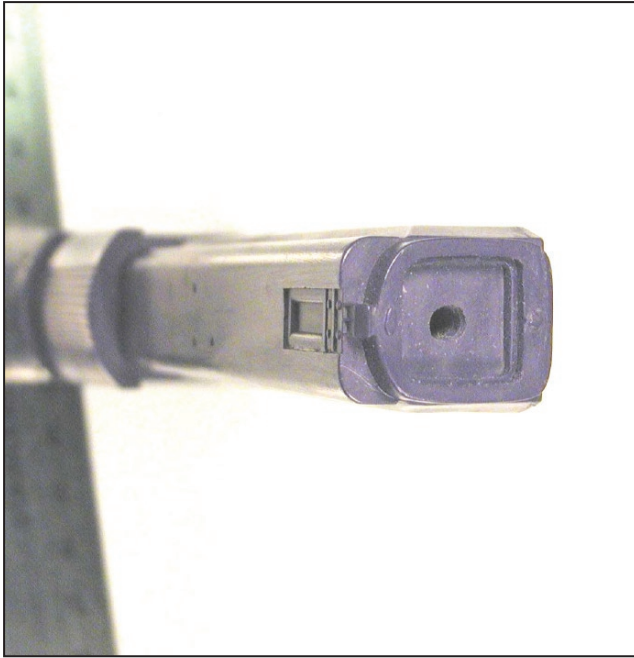
Once you are certain of the location of the hole marks, drill the holes using a 1/16" drill bit. Be certain you drill vertically straight – allowing for the pins to be straight when they are installed later.

Once the holes are drilled, then begin carving out the space inside the clip, allowing for the contact pins to stick out the front of the clip (see the photos on the previous page ). You will need to shave down at least 1/4" on the inside. Again, shave a little each time, and then test install the pins each time. **TAKE YOUR TIME WITH THIS.**

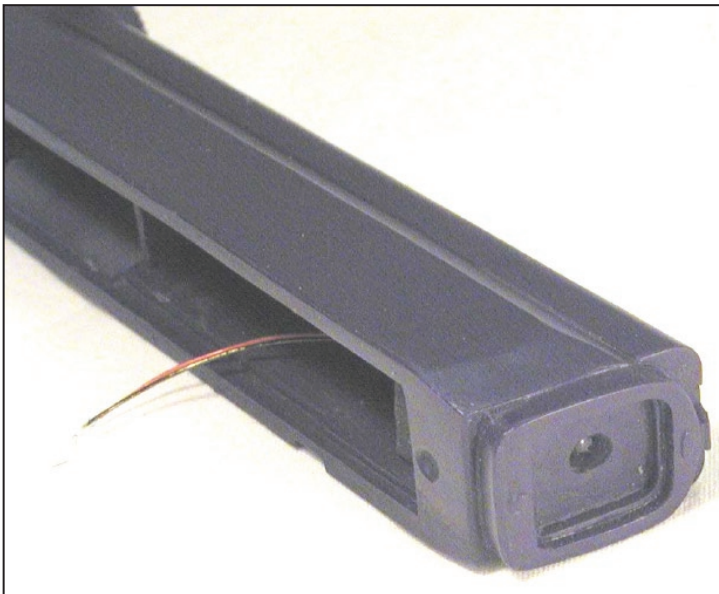
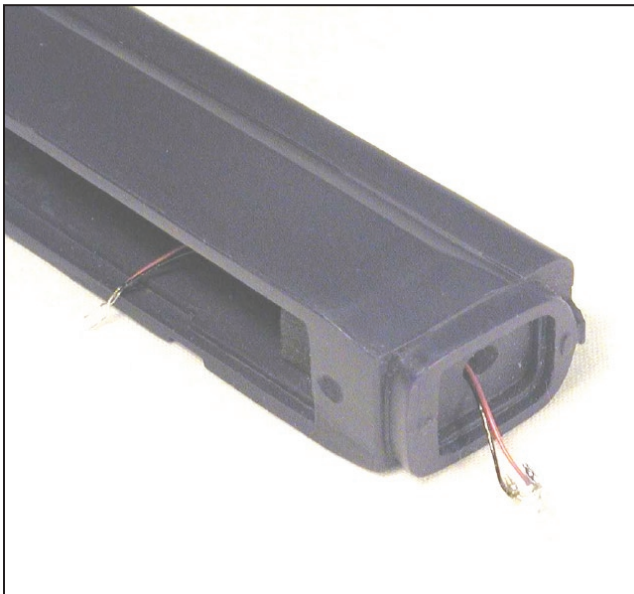
When the correct amount of clip material is removed, the contact pins should each stick through the surface NO MORE than 1/16 of an inch. It is CRITICAL that they do NOT stick out any further.

Prepare all three holes correctly, but do not permanently install the pins yet - you will install them in later steps.

## POWER CLIP - POWER LED:



**Step 3:** For the power LED, drill a hole into the top of the power clip where the indent for the hole is using a 9/64" drill bit (see photo on the left). Be certain to drill the hole straight, and drill all the way through to the inside cavity (photo on the right).



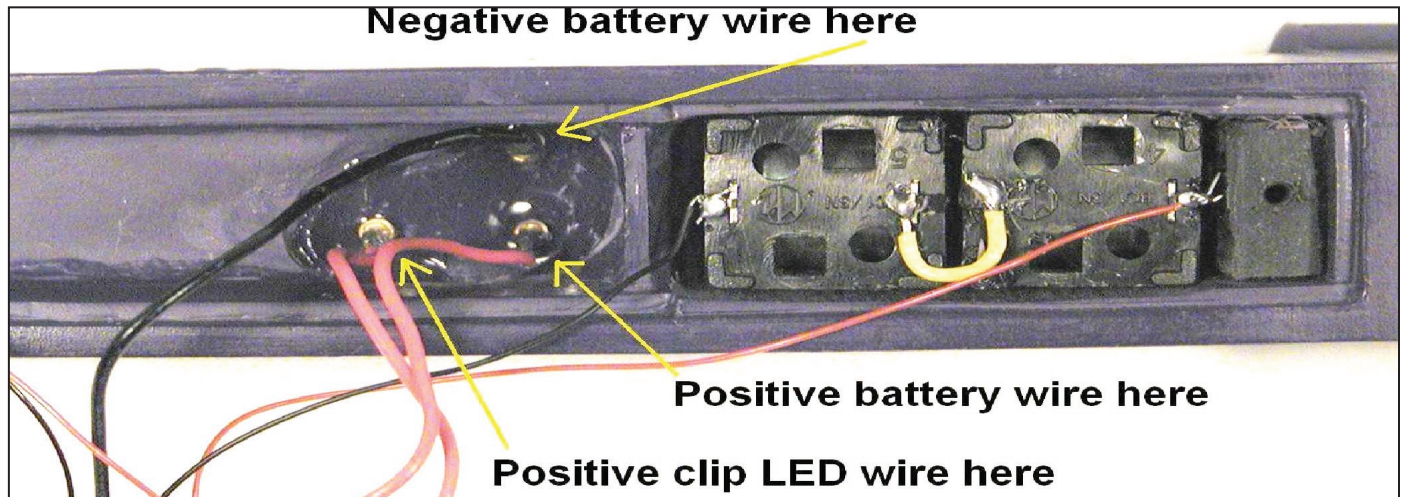
**Step 4:** Next, insert the LED in the hole wires first (photo on the left). The tip of the LED should rest just under the surface of the power clip light cut out (photo on the right). With the LED in place, test fit the white lens that is supplied with the prop kit to ensure everything looks right.

Once you are satisfied, secure the LED into place using hot glue.

## POWER CLIP - POWER CONTACT PINS:

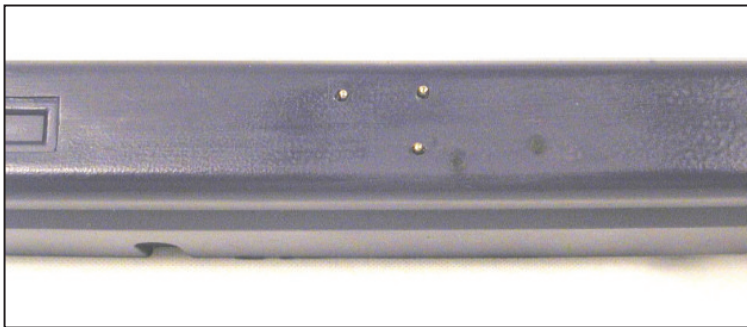
**NOTE:** The correct installation of the power contact pins and the flat brass contacts is **CRITICAL** to the correct and smooth operation of your power clip when inserted into the phaser.

In these next steps, pay extra attention to installing these parts properly, and take your time doing so. The extra time and patience invested will prove very much worth while in the end result.



**Step 5:** Familiarize yourself with the photo above and put the battery holder into it's compartment. This will make it easier to work with the wires.

Next, place the pins (and wires) into their proper locations: the Negative battery pin goes into the single hole side; the Positive battery pin goes into the bottom hole of the two-hole side (next to the Negative battery pin); and the Positive LED pin goes into the top hole.

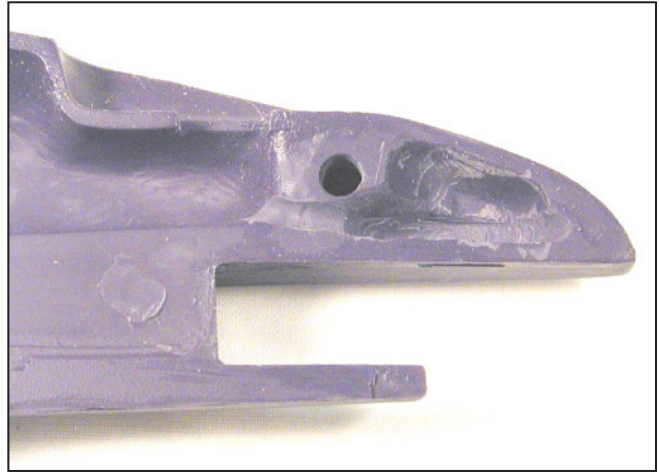
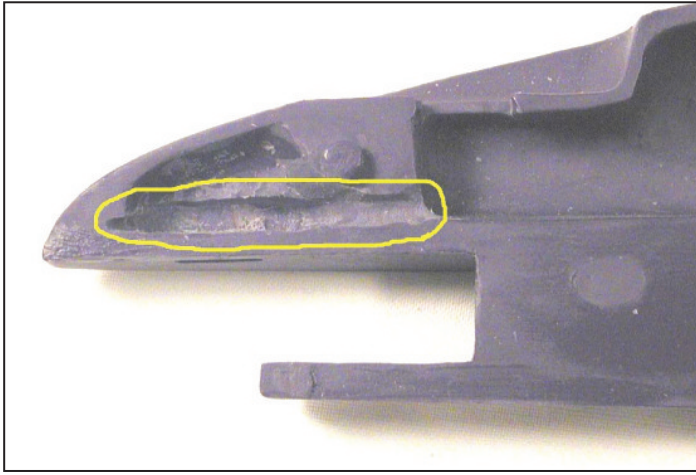


**Step 6:** Once in place, be certain that all the pins are straight and stick out exactly 1/16". Then **CAREFULLY** spot glue them into place by applying a small amount of CA glue to each one on the inside of the compartment. **Be careful not to get any glue on the front of the pins!!**

Once the pins are tacked into place and you are satisfied with everything, use a good 5-minute clear epoxy to permanently glue all the pins into place. Be sure to use lots of glue, completely filling the shaved out portion of the compartment and encasing the pins and wire ends.

Be certain everything is completely and solidly glued into place.

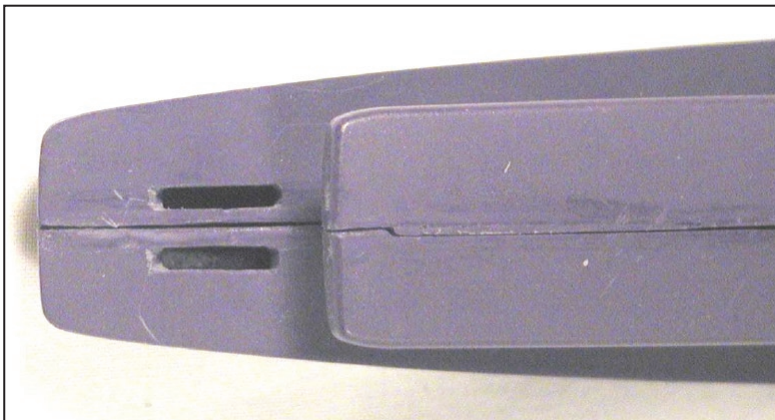
## MAIN PHASER BODY- SPEAKER COMPARTMENT:



**Step 7:** Begin preparing the phaser body for the electronics by using your dremel to route out slots for the speaker and wires in the rear tail compartment of each body half. The speaker will face downward, and as in previous steps, you will want to remove small amounts at a time and then test fit the speaker after each removal.

**Be careful not to dremel out too much and end up going through the exterior body walls.**

When properly done, the two halves will be able to close with the speaker and wire held snugly into place. If you wish, you can attach the speaker to the body using a small amount of hot glue.

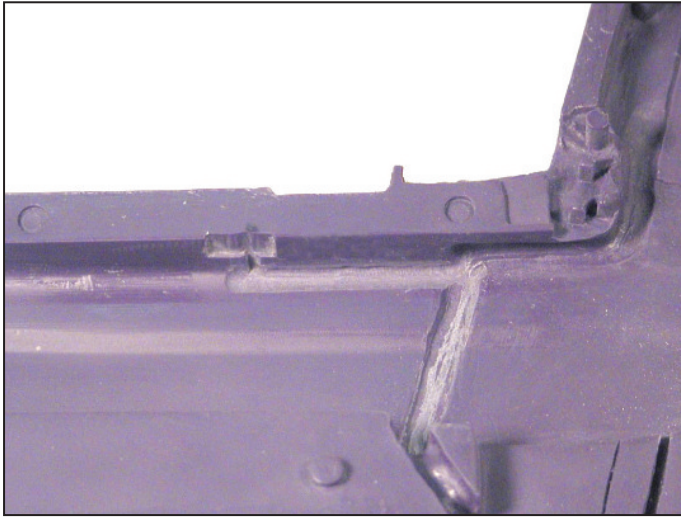


**Step 8:** Next, using a marker, determine the locations under the speaker – one on each body half – and mark the places for two speaker sound slots.

Carefully cut out the slots using a drill hole to start, and then use your dremel to finish them (see photo above).

The slots can be however long you wish but should not be any longer than the width of the speaker. Be careful to make them straight, as this will look better when the prop is finished.

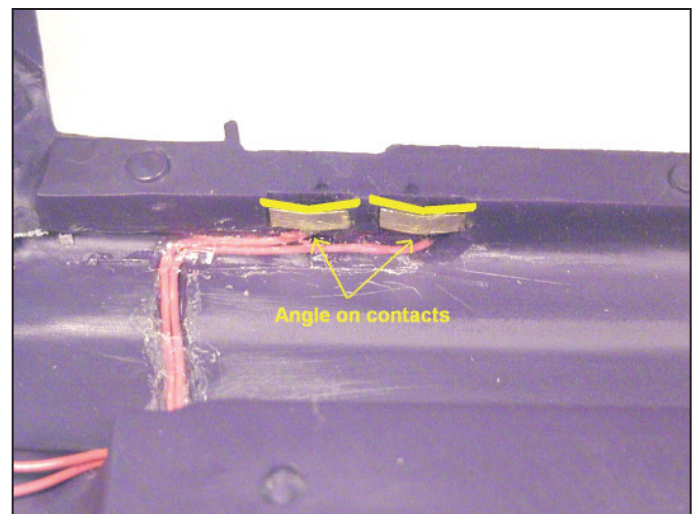
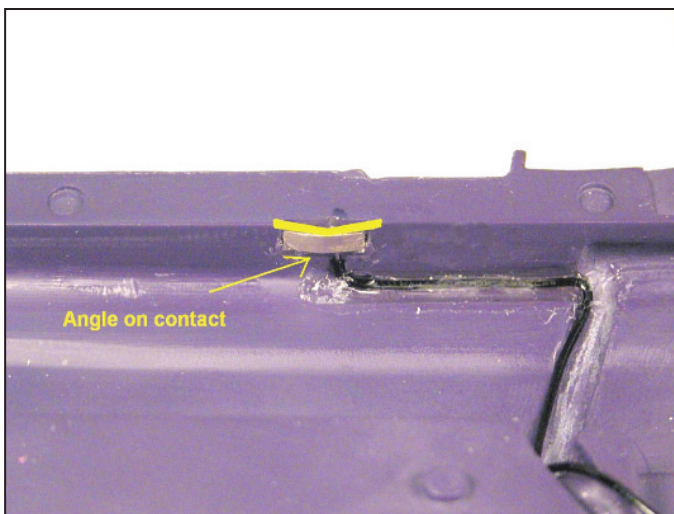
## MAIN PHASER BODY- BRASS CONTACTS AND WIRES:



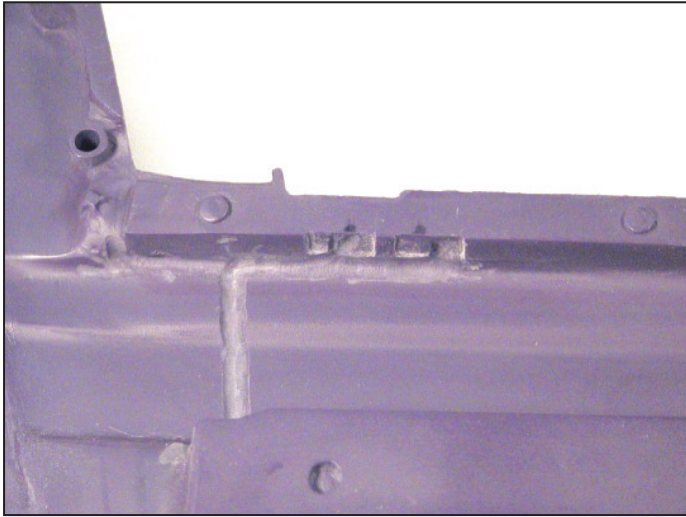
**Step 9:** There are three different colored wires attached to the brass contacts, to help keep them straight when attaching them to the wires of the main electronics. Use them in whatever order you prefer.

Place the power clip with the completed pins into one body half at a time, and mark where the pins are on the body pieces, where you will cut out the spaces for the brass contacts. Then mark a space big enough for the brass contact to be used, with the pin location in the center.

Starting with the negative contact, use your dremel to carefully route out the place for the contact and a path for the wire (see photo on the left). (Make the wire path large enough to also accommodate the main wires later.) When done correctly, both the contact and the wire should lay flat down inside the surface. This will allow for the smooth action of the pin/contact, and the clip not to hang up on the wires when inserting it into the completed phaser.



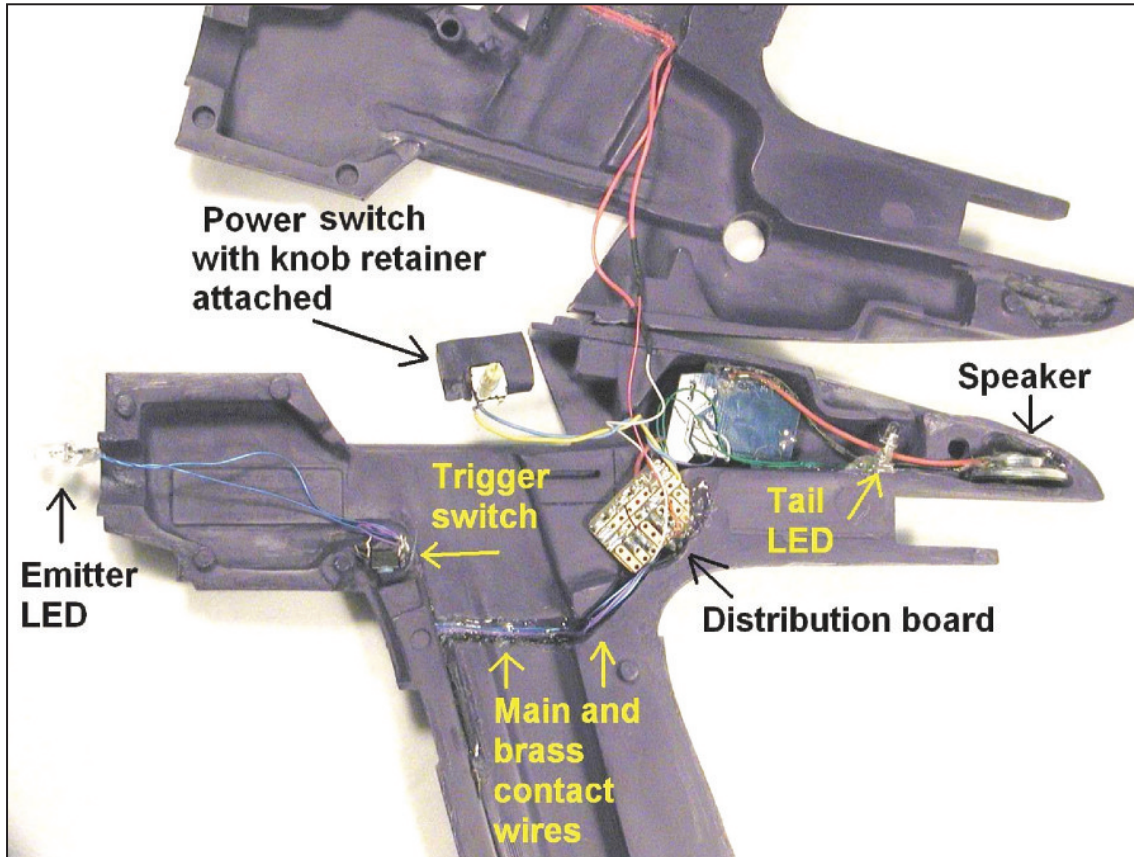
**Step 10:** Once you have test fitted, use a needle nose pliers and form an angle bend in all three of the brass contacts so that the contact is flush with the body on either end while sticking up in the middle. This will allow for strong contact with the spring loaded pin contacts in the clip. **THIS IS IMPORTANT.**



**Step 11:** Now glue the brass contact into place using 5-minute epoxy. Make sure the contact remains flush while the glue sets. Then test slide the clip into the body half to ensure good connection between the contact and pin.

Repeat these steps for the positive contacts, making sure that everything stays flat and flush while the epoxy glue sets up.

## MAIN PHASER BODY - MAIN ELECTRONICS:



**Step 12:** Once all the brass contacts are securely in place, permanently solder and shrink wrap the contact wires to their designated wires from the main distribution board, with wire designation is as follows: contact negative to main negative (black); lower contact positive to main positive (red); and upper contact positive to power clip LED wire (white).

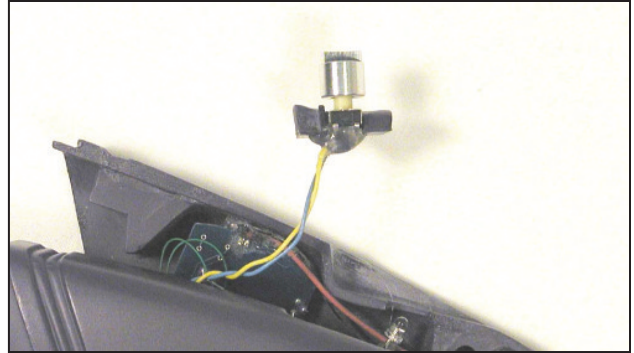
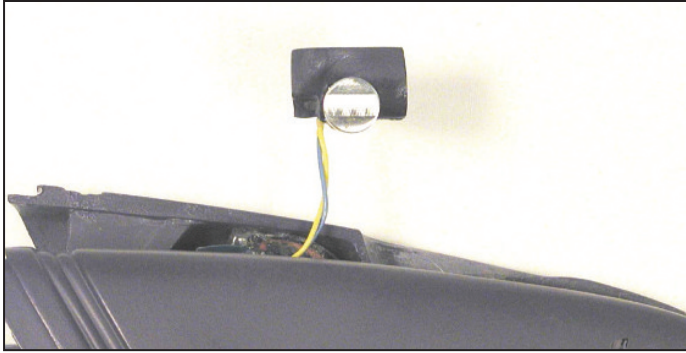
Next install the main electronics into the right phaser body half as shown in the photo above. Use small amounts of hot glue – being especially careful around the trigger switch area so as not to interfere with the smooth operation of the trigger. Test fit the trigger once you have installed the switch.

The tail LED should be mounted so the white lens provided with the prop kit will fit over it without obstruction. Be certain that the distribution board is mounted so it is clear of the space needed for the power clip (magazine) catch.

Next, test align the power switch into the retainer provided with the prop kit and then use a small amount of hot glue to hold it in place. Hold and center the retainer to the back of the phaser body with the rotary knob sticking through. Move the switch/retainer until the knob is centered in the hole with the retainer securely against the body. Once this is accomplished, take away the body half and carefully add enough hot glue or epoxy to permanently attach the switch to the retainer.

Be certain that when the retainer is glued to the inside body, the knob will remain centered in the hole of the body (see above photo).

Hot glue the wires into place on both body halves so they lay flush inside the wire paths.



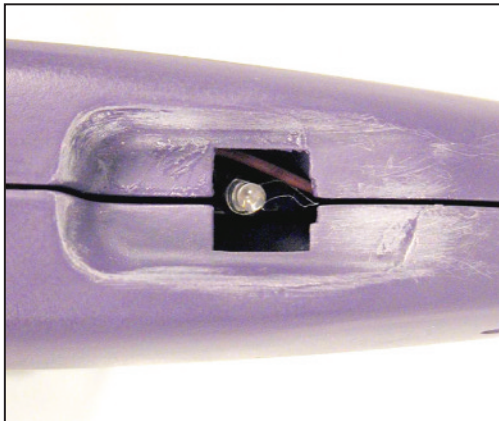
**Step 13:** Permanently attach the side knob provided with the prop kit onto the rotary switch using epoxy. Make sure that with the switch in the off position, the knob is horizontally level and pushed all the way down onto the rotary switch knob.

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**Step 14:** Next, permanently attach the completed switch/knob assembly to the inside of the phaser body, following the instructions listed in the prop kit instruction manual. Test the action of the switch to verify smooth operation.

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**Step 15:** Next, install batteries into the clip, and test fit the two phaser body halves together. Verify the tail LED location and angle. Tape the two halves together tightly, and slide the power clip (magazine) into the phaser. (You must have the magazine catch already installed in order to properly check that the clip will sit in the correct position and help provide the power connections between the pins and brass contacts. Then power up and verify that everything functions before you permanently glue the two halves together.

Once you are satisfied with everything, follow the prop instruction manual and complete your phaser prop. Enjoy!!