

THE TIME MACHINE

Upgrade Kit Parts List

Enclosed are the additional parts necessary to turn the static Masterpiece Models Time Machine Kit into a functional model. By “functional”, we mean that the dish will rotate and that the lights will work, not that it will actually travel in time. Sorry!

What follows on this page is a list of the parts, media, and components that you will find in this upgrade package. Please take the time to double check that you have everything listed below:

1. A completely new set of assembly instructions, replacing the first set of instructions that come with the static assembly kit.
2. A schematic diagram of how the provided electrical components go together.
3. An inventory list of all required electrical components.
4. A bag containing the required electrical components, motor, switch, wire, and circuit board.
5. Two cast translucent time generator cones which replace the set in the original kit.
6. Two cast translucent time generator cone end caps which replace the set in the original kit.
7. Two cast translucent end caps and special cast clear time key attachment assembly parts to replace the original control panel counterparts.
8. Two specially cast left and right side rail pieces with captured wiring which replace the set in the original kit.
9. One hollow brass 1 1/32” tube to replace the hollow plastic vertical shaft provided in the original kit. This gives more support to the assembly that holds the spinning dish up.
10. Two 3/8” outer diameter bearings to mount inside the spherical shape on top of the time generator assembly.
11. C-clip to permanently attach spinning dish shaft.
12. One small soft black rubber drive wheel and backing plate to go on the motor shaft.
13. One short length of 1/8th” diameter brass tube to extend the motor shaft.
14. One two-part cast battery, interior light mount, and motor mount assembly.
15. Two 1/2” long 6-32 machine screws and matching 6-32 nuts for attaching the left and right light bases to the top of the motor mount assembly.

16. One small length of 1/16th diameter copper rod to go into the end of the time key.
17. One short length of 3/16" diameter styrene tube stock to go under the LEDs on the control panel assembly.
18. Three small brass washers for the LED light cages.
19. A thin walled clear plastic tube section to replace the clear acrylic tube section provided in the original static build-up kit.

THE TIME MACHINE

Original Kit Parts List

In addition to the cast resin parts enclosed in the original static build-up kit, there are also some additional parts needed to complete your time machine scale model. Copies of these also come with the original static build-up kit, but we recommend using this new list to inventory the cast parts needed to make this Time Machine model actually move and light up. **Note: The items shown in red are not used in the upgrade kit.**

1. A small roll of copper wire for constructing the cages around the lights on the dashboard and behind the chair. You will also use this wire to create the coils on the time generator and the straight lengths of wire inside these coils.
2. A length of rod for wrapping the wire around to create the above coils.
3. A fixture for constructing the wire cage around the above-mentioned light behind the chair.
4. A length of rigid rod stock for attaching the head rest to the back of the chair.
5. A small clear faceted bead to attach to the key on the control panel.
6. Four 8-32 screws, washers, and nuts to attach the time generator to the flat base.
7. Short lengths of styrene hex rod stock and 1/16th diameter rod stock for using to add missing rivets on seam lines, to the control panel, and to replace any damaged rivets on the model due to casting.
8. A short length of 1 1/32nd styrene tube to use to build the vertical shaft above the time generator.
9. A small section of clear acrylic tubing with pre-notched quarter section in one end to create the control panel housing.
10. Four small silver screws to attach the arms to the chair.
11. Six sheet metal screws for attaching both the chair and the framework of the Time Machine to the flat base. Only two of these are used for the chair.
12. One small screw and washer to attach the movable disk inside the control panel so that the time key can move.
13. Two sheets of .030" thick styrene sheet.
14. One sheet of .060" thick styrene sheet.
15. One small sheet of .080" thick styrene sheet.

THE TIME MACHINE

1/6th Scale Resin Assembly Kit Upgrade

Upgrade Instructions:

Please note: This upgrade kit for the 1/6th scale Masterpiece Models Time Machine resin assembly kit is recommended model builders with experience in working with low voltage electronic parts. As stated in the provided instructions for the kit, this is designed for model builders with a high level of experience in such detailed assembly work.

Important steps that apply to parts contained in this upgrade kit:

- A. Thoroughly wash all resin cast parts with soap and water. An additional wipe down with acetone or lacquer thinner on a rag also helps cut through any residual mold release which might inhibit the finish when painting cast parts.
- B. Carefully trim away casting blocks and sand parts smooth in those areas and along seam lines. (It is advisable to pre-sand all parts with a minimum of 600 grit sandpaper).
- C. Assemble all parts using the supplied schematic drawing and typewritten instructions for reference.
- D. Fill any seams or scratches with a good quality modeling putty.
- E. Use polycyanoacrylate adhesive (super glue) unless otherwise noted.
- F. Prime parts with a good quality modeling primer. We recommend that you mask and paint the various parts as you are assembling the kit to produce a higher quality and more professional appearing finished model (this is sometimes referred to as the “subassembly method” of model-making). It will take more time, but it will make assembly easier and the finished model will be of a much higher quality.
- G. Solder electronic components together with a fine tipped soldering iron and resin core solder. Do **not** use acid-core (plumber’s) solder. Also be sure to use a clamp or forceps as a heat sink when soldering parts together since some of the provided components in the kit can be damaged by excessive heat.

Good luck and have fun!

Using these instructions to upgrade the Time Machine model:

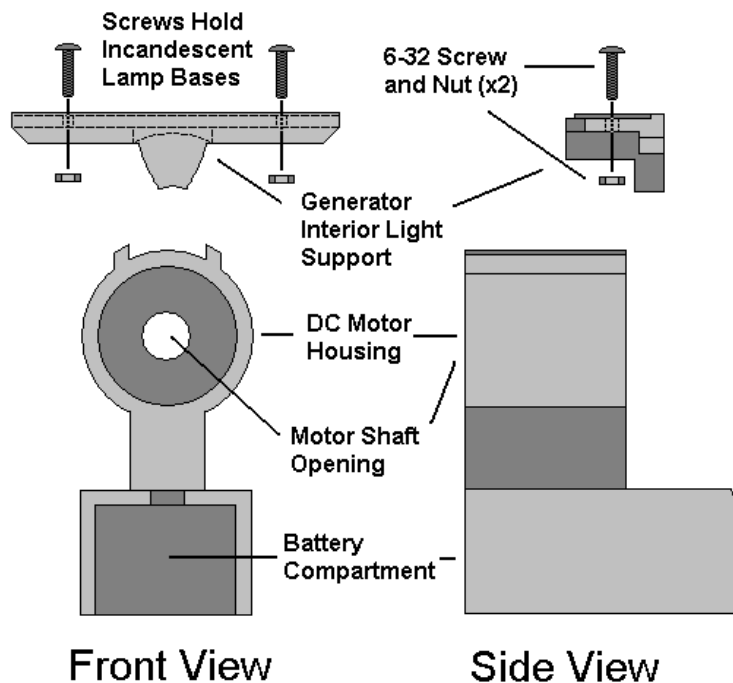
These instructions are to be used **in place** of the set of instructions that are provided with the original 1/6th scale resin assembly Time machine model kit. The only documents that you will need to keep from the original set of instructions are the outline templates for cutting out parts and drilling holes in the base of the time machine model. **One final suggestion that will prevent mistakes is please, please, please take the time to read through these directions before you start to assemble anything.**

(Note: This upgrade kit is designed to be used as you build the kit and not to modify an already built Time Machine model.)

1

The Motor Mount and Interior Light Support:

Motor Mount Assembly:



1. Locate the two provided resin cast parts in this upgrade kit that match the above diagram and sand the shiny sides of the castings smooth. Drill a 1/8" hole through the generator interior light support part wherever you see small circular 1/8" indentations in the castings (There should be 2 of these total). These holes are for the provided 1/2" 6-32 screws and nuts to hold the provided incandescent lamp bases to the top support.
2. We recommend painting these two parts at this point in the construction. A color such as silver or chrome would work best since it will increase the amount of

reflected light inside the time generator. Do not glue later point. The motor mount cannot fit inside the assembled time generator housing with these two parts assembled. Also the angular shape hanging down from the generator interior light support is meant to lock the DC motor in place. Locate the two provided resin cast parts in this upgrade kit that match the above diagram and sand the shiny sides of the castings smooth. Drill a 1/8" hole through the generator interior light support part wherever you see small circular 1/8" indentations in the castings (There should be 2 of these total). These holes are for the provided 1/2" 6-32 screws and nuts to hold the provided incandescent lamp bases to the top support.

3. Attach the two provided metal incandescent light bases to the top of the support facing outward and upward. This positioning is important because it centers the light bulbs inside the two clear cones when everything is assembled.
4. Find the two provided incandescent light bulbs (flashlight bulbs) and tint them red. We recommend using Tamiya brand "clear red" acrylic paint. This will make the two cones on the left and right sides of the time generator glow the proper color and is much easier to do than tinting the inside of the provided clear generator cones red. When you have done this, screw the light bulbs into the incandescent light bulb bases. At a later point, you will also be attaching the large NPN power transistor to the top of this part with hot glue when you reach the electronic wiring steps

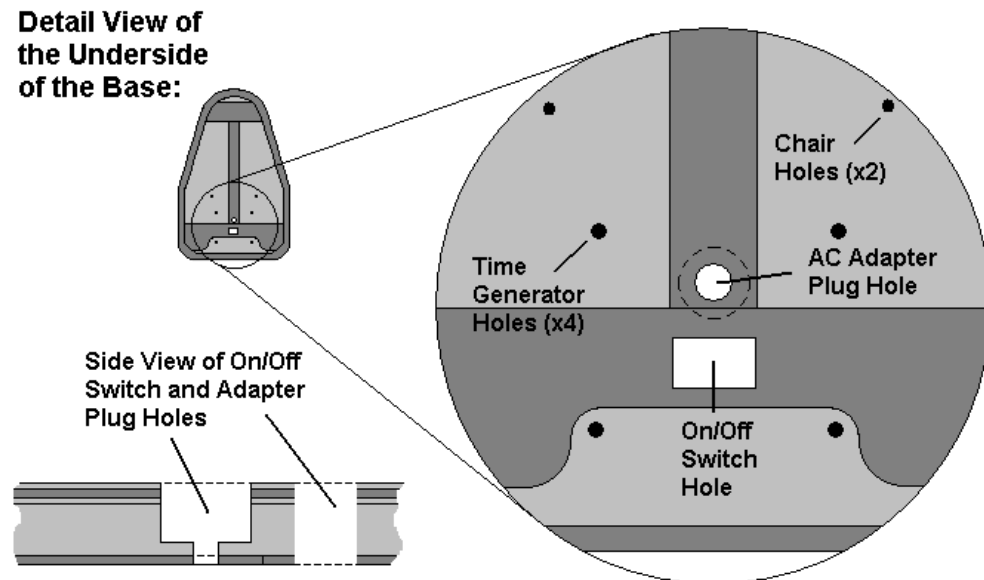
2

The Base:

1. Locate, sand and glue the four legs to the large styrene model base. (Note: Each leg is curved to fit the edge contour at the top so make sure you place them in the correct positions and that you don't sand the tops completely flat.)
2. Drill only the following holes all the way through the base. The upgrade kit does not attach the side rail framework parts using screws through the base since there are lengths of wire running through them. The only holes that are drilled in the base are the four larger diameter holes in the back that are used to attach the time generator and the two smaller holes nearest these that are used to attach the seat. Again, do not drill the four smaller outside holes indicated on the templates. (Note: Use the four-legged cast chair base part to double-check the chair hole locations.
3. The upgrade additionally requires that you drill and file out two more openings through the time machine base to accommodate the master on/off switch and the power supply adapter plug. The best way to create the opening for the switch is to drill a hole first and then file out the corners to fit the small sliding switch provided in the bag of electronic parts. (Note: Solder one 5" length of wire to either one of the leads on the switch and one 1" length of wire to the remaining lead prior to attaching this switch in place. It prevents possible melting of any

plastic parts should the soldering iron slip.) If you want, you can drill two 1/16" diameter holes and use the two provided screws also located in the electronic parts bag to secure the switch in place after the base is painted.

4. Attaching the adapter plug is a little bit trickier. You need to drill two holes to make this part fit properly. From the top of the base, drill a 1/2" diameter hole about three-quarters of the way through the base. Then you need to drill a 1/4" diameter hole exactly in the center of the 1/2" hole all the way through the base. This creates the proper shaped cavity to accommodate the provided 1/8" adapter plug found in the bag of electronic parts. (Note: You will need to solder a 5" length of wire and the negative lead (black) on the 9-volt battery clip to the collar lead on the adapter plug. You will also need to solder the 1" length of wire attached to the sliding switch and the positive lead on the 9-volt battery clip to the tip lead on the adapter plug. Again, we recommend soldering connections prior to attaching this part in place for the reasons previously mentioned.) See diagram that follows for switch and adapter hole shapes and locations.



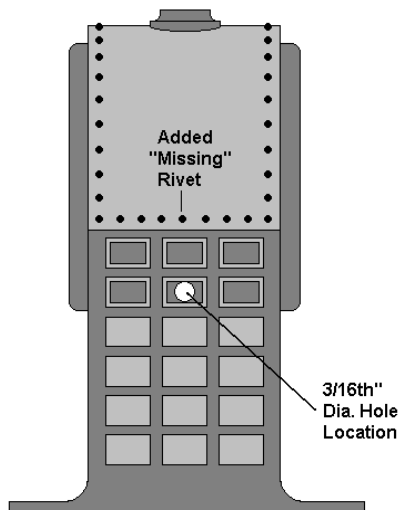
5. Sand the cast riveted front plate flat and glue into place onto the top front surface of the base assembly. Use the provided plan drawing for location.
6. Paint the base subassembly and screw in the adapter plug and attach the on/off switch when paint is dry.
7. Paint the base subassembly. Screw in the adapter plug and attach the on/off switch when paint is dry.

3

The Time Generator:

1. Find the two halves of the time generator and glue them together. Sand the seam line and using the short length of provided 1/16th styrene dowel, create the missing rivet along the back seam.
2. Find the back panel and attach it in the space left in the back of the two halves joined in the above step. (Note: You might have to use a heat gun or immersion in warm water to pull some of the bend out of the parts.)
3. Glue the above assembly to the matching contoured base and sand level. It might be necessary to ream out the four holes in this last part as well.
4. Drill a 3/16th diameter hole through the back panel of this assembly in the location indicated in the diagram below. This hole is for the driveshaft on the DC motor to go through.

Back View of Time Generator Assembly:

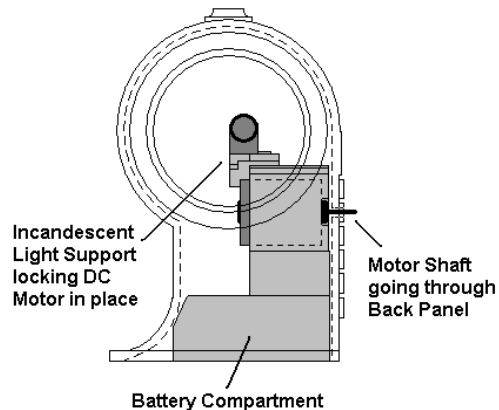


5. Paint the time generator subassembly using the provided color illustration as a guide.
6. Find the painted cast motor mount part you assembled earlier and the DC motor provided in the enclosed bag of electronic parts. Solder two 5" lengths of wire to the two leads on the back of the motor and slide it into the hollow cylindrical opening so that the drive shaft seats through the small round opening on the flat side of this part.
7. Slide this part with the motor in it into the hollow space inside the time generator assembly so that the drive shaft of the motor lines up with the hole in the back that you drilled previously. Set the whole assembly on a flat surface for

alignment and glue the motor mount into place. (Note: It is not necessary to glue the motor itself in place.)

- Now locate the generator interior light support you built previously and glue it into place on top of the motor mount. You will have to spin the DC motor into the correct position to do this since the small curved triangular piece that hangs down from this cast part is designed to fit exactly into the notched back of the DC motor thus locking it in place. (Note: The rubber drive wheel will be attached at a later point in the model construction.) See diagram below.

**Visible Interior View
of Motor Mount, Motor,
and Light Support
Inside Time Generator:**



- Apply the decals to the two opaque cone shapes that are supplied with the upgrade kit. (Note: The curved water transfer decals that come with this kit require a bit of careful positioning work to get them located in their proper places. Keep them very wet until you get them applied correctly and then use any commercially available decal setting solution to make the decals pull tight to the surface of the cones and eliminate wrinkles.) **Do not attach these two parts** until later instructed to in this set of instructions. The wire leads from the various electronic parts need to be soldered together and the cones make access to the interior of this assembly nearly impossible. **Do not use the solid cast part cone shapes** that come with the static build-up kit since they do not transmit light through their surfaces.
- Assemble the “kettle” above the generator base. It comes in three pieces: the curved bottom, the riveted ring, and the sloping top. Glue all of these parts together and then paint this subassembly. When it is dry, glue it into the hole in the top of the time generator base assembly.
- Due to some shrinkage in the cast parts during production, it is necessary to enlarge the hole opening in the “kettle” assembly to the correct diameter. Using an 11/32” diameter drill bit, ream out the hole opening. (Note: We recommend doing this on a small upright drill press if you have access to one because it guarantees true 90 degree positioning.) Find the small length of 11/32” diameter brass tubing included in this upgrade kit. Using any commercially available two part epoxy, glue the brass the into the hole in the “kettle”. (Note: Double check that you have the correct length of rod and it is at the correct height before you

glue it in place. Use the blueprint for reference and remember that there is added length for insertion into the “kettle” and the spherical shape on top as well. Rough up the brass tube at the glue joints with coarse grit sandpaper to strengthen the connection bond.)

12. Paint and attach the six small cones onto the top curved surface of the time generator base assembly and drill a small hole in the center of each one ($1/32$ ” is best). (Note: these parts come attached to a mold block and there should be more than you need to complete this kit. There are twelve used on the model and their locations are shown on the enclosed schematic layout.)
13. Find the two cast parts that form the sphere shape that goes on top of the $11/32$ ” brass rod on the time generator. You will also need to find the two $3/8$ ” diameter steel enclosed bearings. Carefully trim and glue the two halves of this sphere shape together with the bearings seated in the matching cavity spaces inside. (Note: Assembly of this part is very delicate so be careful. Some filling of seams will probably be required. If you find it necessary or would like to rebuild any part of this assembly for looks and personal satisfaction like we do in our built-up kits, all the circular openings on this sphere shape can be reproduced using commercially available diameters of thin-wall styrene tube stock.) Paint this assembly and when it is dry epoxy it onto the top of the $11/32$ ” brass tube. (Note: Again, double-check that you have the correct height before you glue it in place. Use the blueprint for reference. Also, this assembly must be carefully aligned so that the side holes are facing exactly towards the front and the back. Both holes are the same so it will work either way. A technique that works well for us is inserting a $5/32$ ” diameter 6” or so long rod through the holes in the bearings. This acts as a guide for accurate alignment.)
14. Attach the remaining six small cones onto the outside of the spherical shape and drill the centers the same as before. Again, use the enclosed schematic for locations.
15. Trim, paint, apply the decal, and install the cast saucer-shaped part into the hole facing towards the back of the chair and the front of the time generator on the spherical shape assembly.
16. Locate the cast fluted lamp base part. This part needs to be modified to accept the red LED lamp assembly. Drill a $3/16$ ” diameter hole all the way through the central axis of this part. Using progressively larger and larger drill bits ream out the hole until the diameter measures $5/16$ ”. (Note: We recommend enlarging the hole-size by $1/32$ ” each time to keep it centered exactly. Again, a small drill press will help maintain alignment during this process. Also be aware of the fact that by enlarging this hole to this increased diameter, the central shaft on this part will be removed. This is done intentionally to allow attachment of the red LED lamp that goes on top.) Paint this part but do not glue it onto the top of the whole time generator assembly just yet.
17. Apply the decals to both sides of the base of the time generator assembly. (Note: This is done last to avoid damaging the decals from handling during assembly of

these parts.) Set this whole assembly aside until it comes time to hook-up the wiring later on in these directions.

4

The Coils:

1. Use the provided copper wire from the original static build-up kit to connect the six small cones on the spherical shape above with straight lengths of wire. (Note: Most people who have seen the 1960 movie actually fail to catch this small detail found on the full-scale Time Machine prop used in it. Inside the coils there are straight lengths of wire.) **Do not glue the tops of these lengths of wire into the top six cones at this point** because the coils made in the following step need to be lowered down over these straight lengths of wire.
2. Using the provided clear dowel section that comes in the static build-up kit, wrap lengths of copper wire around it to create the energy coils connecting the twelve small cones. Wrap the wire around the rod thirty times for each coil and stretch them to length. Install them by drilling small holes into the side of each small cone and sliding them down over the previously installed straight lengths of wire. (Again, 1/32" is best.) (Note: The coils on the left side wind clockwise and the coils on the right side wind counter-clockwise.) Carefully paint and glue the coils into place.

5

The Generator Lamp Cage:

1. Use the copper wire to build the wire framework around the lamp on the top of the Time generator assembly using the provided fixture. Begin by straightening and sanding the copper wire with a fine grit sandpaper. This is done to remove any coating on the outside of the wire which might prevent soldering. In creating this "cage", we recommend bending the pieces, tacking them into place with glue, cutting away the excess, and coming back and soldering over the glue connections after the part is removed from the fixture. (Note: the cage will have to be made and then bent open a bit to remove it from the fixture and then bent back again. It seems as though every builder has his or her own technique for making this part.) File if necessary.
2. Find the "light bulb shaped" red LED lamp assembly found in the enclosed electronic parts bag. Solder two 6" lengths of wire to the two leads on the LED and feed the wire down first through the hollow opening in the cast fluted lamp

base part modified previously and then through the top of the hollow shaft into the hollow interior of the time generator. Carefully glue the LED lamp to the fluted base. Paint and glue the cage assembly over the LED lamp and fluted base assembly.

3. Find, paint, and glue the small “pawn shaped” detail on the top of the lamp cage to complete this subassembly, but do not glue it in place. Let it hang loosely on the inserted wires for the time being.

6

The Framework:

1. Find and sand the left and right side framework parts cast with lengths of wire in them from the upgrade kit. **Do not use the original left and right side framework pieces** found in the original static build-up kit. Temporarily tack the both the left and right side generator cones into their corresponding recesses in the sides of the time generator assembly. **Do this with masking tape on the inside of the cones.** Place the time generator on a flat surface and line up the two side framework parts with the side of the holes in the small end of the cones. This is done to check the alignment of the side rails since some deformation may have occurred since they were cast. (Note: Be aware that the framework will be hard to align until the control panel and some of the remaining detail parts are installed. It might also be necessary to use a heat gun or warm water immersion to correct more serious misalignment problems. It is very important that you do not damage the wires cast into these parts otherwise the connection might be broken and you will have to get a replacement set from us.) When they check out to your satisfaction, move on to the next step.
2. Find the four curled framework details (Two short parts and two long parts) and using a round file, shape the pointed ends to fit snugly to the larger side framework parts. Glue them in place to both the cast framework parts and fill and sand the seams at the point of connection between these separate pieces.
3. Find and attach the four flat scrollwork details that go between the above parts and the main side framework parts and glue them in place. (Note: Make sure that you put them in the right places. The front and back sets of these parts are different. The cast parts are on mold blocks when they come to you in this kit; be careful when removing them. We cannot stress enough how important it is to compare your work with the provided plan drawing especially on this working upgrade kit. Alignment is everything at this point and careless errors can return to haunt you later.)
4. Once you have made the necessary corrections to the side rails and attached all the scrollwork and ornamental details to them, sand the side rails perfectly smooth and paint these two parts. (Note: It is okay to get paint on the lengths of

wire sticking out of the side rails. Later, these wires will be stripped and soldered anyway and they are not seen. When dry, add the green pinstripe detail. We recommend Chartpak BG3104 green graphics tape for this step. Use the provided schematic drawing and color illustration provided with these kits for locating this detail element.

5. Find the two clear cast ribbed dome-shaped end caps from the upgrade kit. Carefully paint only the raised ribs on these two pieces with several coats of flat black paint to prevent light from “bleeding” through during “operation”. Insert both end caps through the large holes in the side framework pieces until they are seated. It will be necessary to drill two small 1/8” diameter holes into the side of the flange on these end caps that goes into large round hole openings in the side framework pieces. This is done to allow the short lengths of wire that are sticking out of the cast side rail parts to feed into the hollow spaces within the time generator cones. After you have drilled the above holes and you are satisfied that the all the parts fit nicely together, carefully glue the end caps to the side rails. (Note: Double check that the two side framework parts are on the correct sides. Also, for those of you who are big on accuracy, make sure that the raised ribs on these parts match the positioning shown on the blueprint.)

6. Now this next step is a little tricky. Temporarily attach the time generator assembly (with the two temporarily taped on cones) to the completed base assembly using the four 8-32 screws, washers, and nuts found in the original static build-up kit. Because the side rails have wire in them, they are no longer held in place by using screws. You will have to attach them by gluing them into place. First, carefully map out the placement and final shaping of the side rails using the schematic drawing, color illustration, and actual time generator assembly. The side rail framework pieces (from back to front) are located using the following benchmarks: Make sure that the clear painted dome-shaped end caps fit into the centers of the small ends of the two generator cones. The rear downward curling scrollwork details touch the flat base surface at their lowest point of contact. The bottom of the side framework pieces which are about to be glued on sit flat on the base subassembly flat when seen from each side. Check that the two framework rails are symmetrical to each other when seen from directly above. (Note: The front two lathe-turned details on the front of the chair are cut short so that the rails can pass under them. This is another way to check alignment.) In other words, they both jog inwards at the same rate. Next, check to see if the front downward curling scrollwork details also touch the flat base surface at their lowest point of contact. Lastly, check to see if the rounded shapes at the ends both of these two framework parts that hold the control panel in place seem to be about at the same height and the same horizontal distance from the front of the base. If these parts do not seem to line up, it is worth taking the time to correct any problem you find using reshaping methods discussed earlier in this set of instructions. If the two side framework rails meet the above mentioned benchmarks, lightly mark the points of contact with a fine point pencil and carefully glue the two rails in place to the base surface. Do not glue the side rails to the generator cones. (Note: We recommend using small clamps to hold these parts in place while glue is setting.) Apply the green outlining decals to the four scrollwork detail ornaments on both sides.

7. Find, sand, finish, and paint the remaining horizontal framework cast part. When dry, use the color illustration to locate and attach the green pin-striping that goes on this part as well. When finished with this part, set it aside until later told to attach it. The raised centers on the dome-shaped end caps will need to be removed almost entirely. Otherwise they will distort this horizontal framework rail by pushing it dramatically after the cones are attached. They are made this way to allow you to have some control over the fit adjustment of the framework parts.

8

The Chair:

1. Locate the four-legged base to the chair and the three scalloped detail pieces that will become the back and sides. (Note: These three parts are mostly identical except that the back piece has no vertical lathe turned details on the ends.) Make sure the channel detail cast into the back of the three above mentioned parts is free of any casting material defects that prevent a good fit between them and the cast chair base.) After you are satisfied with the fit of these parts, glue the end piece on first by centering the slot on the base in the groove on the part. (Note: This part is designed to fit exactly into the lathe turned contours on the side pieces, so alignment is very important here.)
2. Now glue the side pieces on making sure that the lathe turned details with the bottom round details removed on the ends of these parts are facing forward. These were cut off of the original movie prop chair to allow it to have clearance above the framework attached to the base. So of course, this detail is reproduced on your model.
3. Now glue on the flat curved edge front piece in much the same manner as you did in the previous step. This cast piece does not touch the left and right “scalloped” side pieces. This is done intentionally to create two equally spaced gaps for later attaching the brass-colored “swan” elements which are discussed in a later step.
4. Locate and carefully trim the six carved sweeping ornamental details that hang down from the back and side scalloped detail parts on the chair base. Glue them to their proper places as shown in the provided schematic drawing. (Note: These detail elements mate up to the four lathe-turned details so some sanding to fit might be necessary.)
5. Carefully trim, sand flat, and glue the left and right side cast curved chair rail parts to the top of the left and right side pieces on the base. The flat sides of these castings should be facing inwards and the lower ends of these two pieces face towards the front of the chair.

6. Glue the bottom seat cushion piece into the hollow cavity in the center of the chair with the riveted edge facing forward. It is important that the flat surface on this riveted area on the front of the chair cushion be centered and flush with the flat surface on the front panel of the chair itself.
7. Glue the back of the chair in place by attaching it to the flat inside back surfaces of the two curved chair rail parts. The back is designed to fit snugly against the bottom seat cushion when it is in its proper orientation. It is very important that you achieve the correct alignment of the chair back because when attached to the base, it is virtually touching the curved face of the time generator assembly. (Note: It might help to place the chair on the completed base assembly with the time generator temporarily screwed in place to get the correct position of this part.) When the back is on, this subassembly is ready to be painted.
8. Find and carefully remove the two “swan” detail chair elements from their mold block. Sand and paint these two parts brass and when they are dry, glue them into their proper locations on the front of the chair.
9. Find the two chair arms and glue the small cast support brackets to the underside of each. The two identical short ones are centered in the back of each arm with the rounded end facing toward the rear of the chair. They stick out past the rounded cushioned end of each arm rest exactly $\frac{3}{8}$ ". The brackets in the front of the arms are left and right parts which allow the arms to align with the holes in the top of the heads of the left and right “swans”. (Note: The alignment of these parts is very exact and should be tested out before gluing them to the underside of the arms permanently.) Once you are satisfied with the fit of the arms to the chair, they are ready to be painted.
10. Glue the left and right chair arms in place. Now, drill small $\frac{1}{16}$ " through holes into the points in which the chair arm brackets attach to the chair rails and “swans”. Find the four provided small screws and very carefully screw them into the holes you just drilled. (Note: These screws are just for looks and not to act as real pivot points for the two arms. See the blueprint for the details of this connection point.) Some touch-up will be necessary.
11. Drill two $\frac{1}{16}$ " holes into the top of the back of the chair. These hole locations are indicated by two small divots in the surface of the cast part. Also drill two more $\frac{1}{16}$ " small holes into the back of the chair headrest, which are also indicated by divots in the cast part.
12. Cut the provided $\frac{1}{16}$ " diameter wire into two short lengths and insert them into the holes in the headrest. Since you can use the wire to hold this part, paint the headrest at this point. Then install the headrest into the holes in top of the chair back.
13. Congratulations, you have just finished the chair to the Time Machine. You are now ready to attach it to the base assembly. Find the two sheet metal screws provided with the original static build-up kit. Drill two $\frac{7}{64}$ " diameter by $\frac{3}{8}$ " deep pilot holes into the two back chair legs using the predrilled holes in the base for alignment. (Note: Since these two back chair legs are curved, be very careful

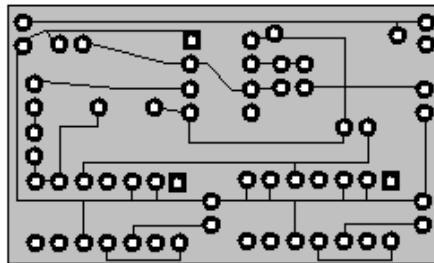
drilling holes into them. Some patching and touch-up painting will most likely be required.) Glue the chair legs to the base and then put the screws in for additional reinforcement.

9

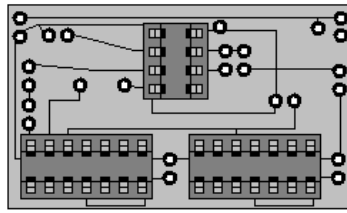
The Control Panel:

The Light Control Circuit Board:

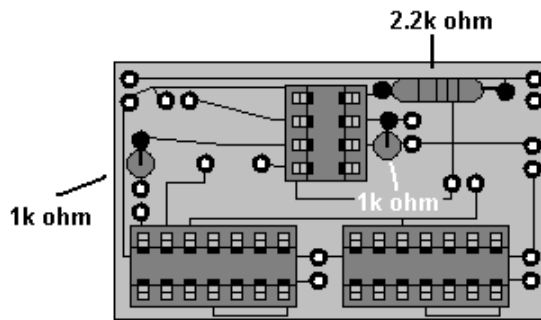
1. If you think it has been hard up to this point, get ready, you haven't seen anything yet. First, you will have to assemble the year, month, and day light control circuit board, which goes into the hollow cavity inside the control panel. Find the bag of electronic components that comes with the upgrade kit and double check that you have all the components listed. We have included a list of parts and some helpful information on understanding the values of certain kinds of electrical components such as resistors, potentiometers, etc.... Keep this information handy during this process.
2. In the bag of parts you will find a green circuit board measuring 1.75"x 1.0625". Place it in front of you so that the pattern that you see on the surface matches the diagram below. This is will be referred to as the "top" of the circuit board.



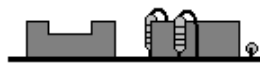
3. Find all the IC microchip sockets and insert them into place. Solder the leads of these components sticking through the circuit board on the other side being very careful not to allow any solder to connect them together. Do not install the IC (Integrated Circuits) microchips themselves until told to do so later on. The top of the circuit board should look like the diagram below when you are finished with this step. Trim any excess length of wire sticking out of the solder connection side on all components you install. **Note the notches on the IC sockets. They correspond to notches on the IC chips and must be mounted in the correct orientation. The 8-pin socket should be mounted with the notch facing up; the 14-pin sockets should be mounted with the notches to the right. See the illustration for Step 8 below.**



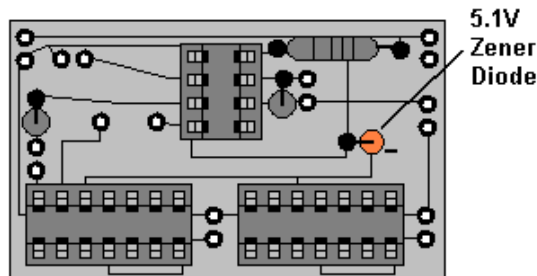
- Now find two 1k ohm resistors (brown, black, red, gold banded) and one 2.2k ohm resistor (red, red, red, gold banded). Look at the resistor color code chart enclosed to verify values. Solder them into the locations indicated on the diagram below. (Note: resistors are not directional components, so they can be soldered in either direction.)



Side View

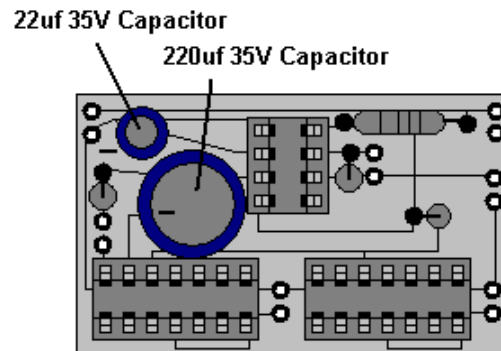


- Next, locate the 5.1volt zener diode (an orange component with a black stripe and two wire leads sticking out of each end). This component is directional, so make sure that the cathode or negative lead (denoted by the black stripe end) is soldered into the hole denoted by the negative symbol on the diagram below. Now locate two 1k ohm resistors (brown, black, red, gold banded) and one 2.2k ohm resistor (red, red, red, gold banded). Look at the resistor color code chart enclosed to verify values. Solder them into the locations indicated on the diagram below. (Note: resistors are not directional components, so they can be soldered in either direction.)

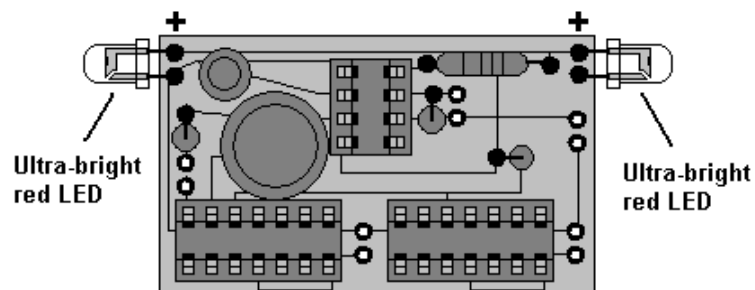


- Find the two electrolytic capacitors (both components are dark blue and have two wire leads coming out of one end). Again, these components are directional, so make sure the leads nearest the side of the negative symbols on these

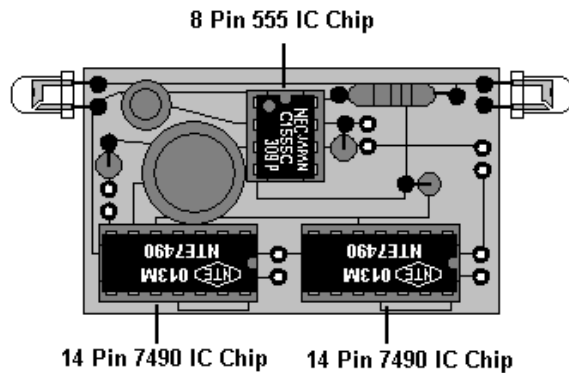
electronic parts are soldered into the holes denoted by the negative symbol on the diagram below. Solder in the larger of the two capacitors first (220uf 35V) and then solder in the remaining smaller one (22uf 35V).



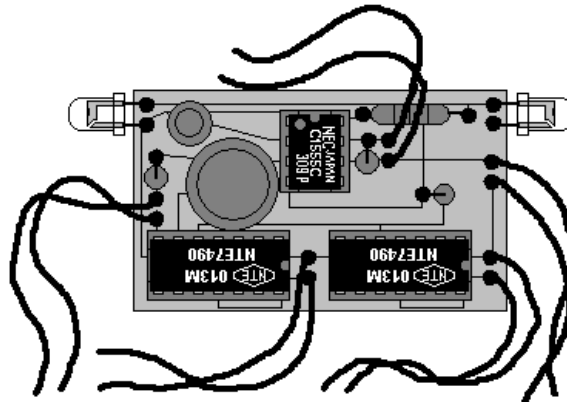
7. Now you are ready to install the two ultra-bright red LEDs that will make the two clear cast end caps on the control panel glow red. When looking for these parts, be aware of the fact that these two LEDs are actually clear when not running. The upgrade kit also contains red LEDs that look red when not in use. These are for other locations on the model not this circuit board assembly. LEDs are directional components, so they need to be soldered onto the circuit board correctly. An LED has two leads coming out of one end and you will notice that they are two different lengths. The longer one is called the anode or positive lead. The shorter one is called the cathode or negative lead. LEDs only light up in one direction, so nothing happens if you get them in backwards. Solder these two LEDs in the places indicated below being sure to put the anode (+) lead into holes designated by the positive symbol. Also be sure to solder them as far off of the surface of the circuit board as possible so that you can carefully bend the tops of these two parts to aim the light produced by these LEDs out the sides of the control panel. You can use a 1.5V AA or AAA battery to determine the polarity and color of the water-clear LEDs, as they are different colors. **DO NOT use a battery of greater voltage as it will destroy the LEDs immediately.**



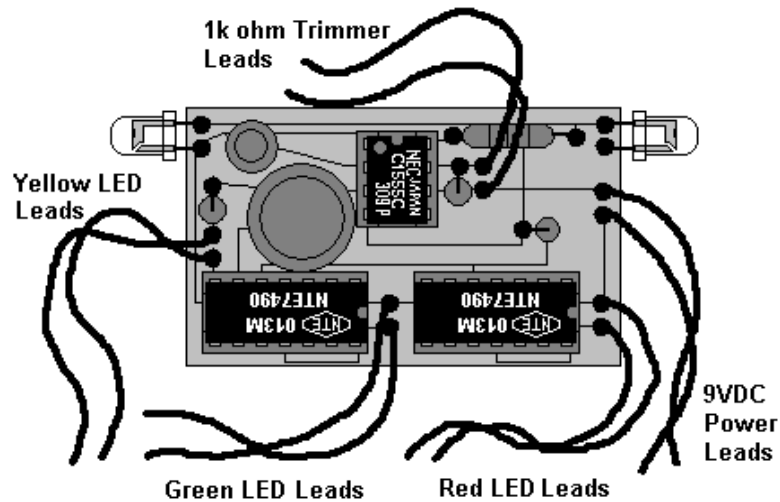
8. Now install the IC microchips into the mounts as shown. Notice that there is a small notch in one end of each IC chip enclosed. **It is very important to match the notches on the IC chips to the diagram.** (Note: The two larger 14 pin IC microchips are exactly the same, so the order that they go into the two 14 pin sockets on the circuit board doesn't matter.)



9. Solder 5 pairs of 2" lengths of flexible wire into holes shown below and temporarily tape each pair together using small pieces of masking tape so that you don't get them all mixed up later on. When you are done with this step, there should be no empty or non-soldered holes on the circuit board any more.



10. It is important at this point to be aware of what each of these pairs of wires are for since you will be installing this control circuit board into the control panel of the Time Machine shortly. One pair goes into the 1k ohm micro-miniature potentiometer/horizontal trimmer (a light gray component with three leads sticking out of one end and a small black 1/4" diameter wheel on the other end) provided with the other electronic parts. Another pair of these wires goes to the two lengths of wire that come out of the front of the left side framework rail. (Note: Left and right sides on the model are denoted by what would be left and right if you were sitting in the chair itself.) This brings power to this circuit board from the time generator cavity. The remaining three pairs of wires go to the yellow (day), green (month), and red (year) LEDs that go on top of the control console. See the diagram below.



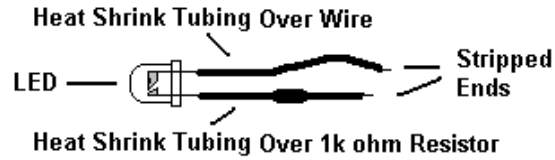
10

The Control Panel:

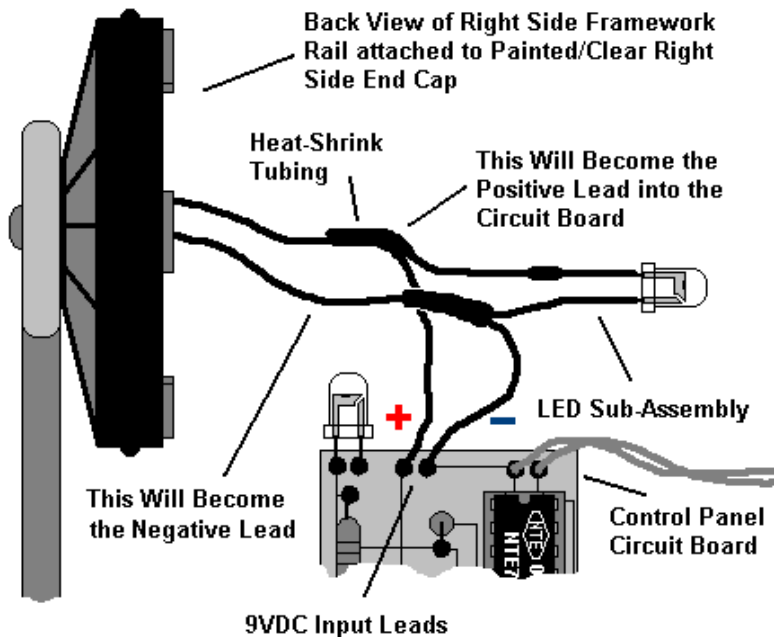
Housing assembly:

1. Locate from the upgrade kit the remaining two clear cast ribbed end cap parts. Finish and paint them in the same manner as you did with the two clear cast dome-shaped time generator cone end caps in step 37. Again, be sure not to get paint in the lower wedge-shaped sections between the ribbing.
2. Drill a 3/16" diameter hole onto the exact center of these two parts to allow the wire lengths sticking out of the side rails to pass through into the control panel interior.
3. Take the left side painted/clear cast end cap and glue it onto the front inside surface of the left side (the side farthest from the time key/ throttle control) framework rail. The left side end cap is the one with the simple large round smooth regular cavity on the inside surface of the part. Be sure to feed the wire on the rail through the hole in the center. (Note: Again, for those who are big on accuracy, make sure that the raised ribs on these parts match the positioning shown on the blueprint when seen from the side.)
4. For the next step you will need to make the following subassembly. Find the ultra-bright clear white LED (which should be included in this upgrade kit in its package) and a 1k ohm resistor (a small component with wire leads coming out of each end marked with black, brown, red, and gold bands). Solder the resistor to the anode lead (the longer one) on this LED. This will protect the LED from being burned out by the 9VDC current coming into the control panel. Solder a short 2" long or so length of wire to the other remaining short lead (the cathode) on the above LED. Cover the solder connection to the wire with a short length of

heat shrink tube. Cover the solder connection and the resistor with a longer length of heat shrink tubing to avoid short circuits. (Note: We recommend covering all soldered wire connections with heat shrink tubing to prevent short circuits that will be extremely difficult to repair later on if they occur. Electrical tape does not have the flexibility found in heat shrink tubing so don't use it. Any area Radio Shack store will carry heat shrink tubing that will work.) When you are through, the assembly should look something like the diagram pictured below.

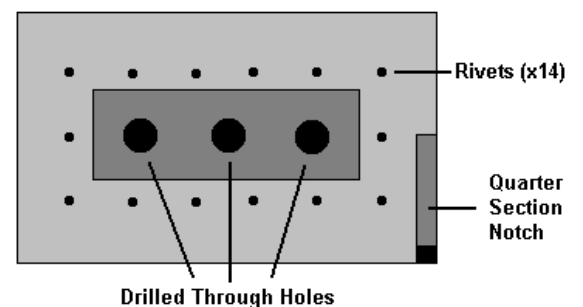
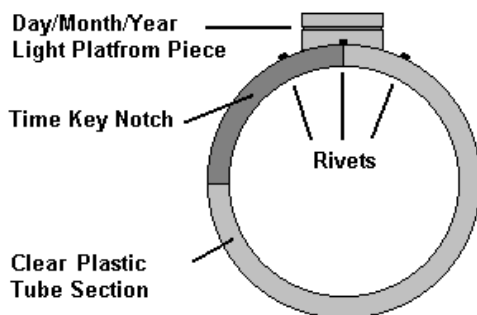


- Now, get the control panel circuit board that you assembled previously. Solder the two lengths of wire that are embedded into above side framework rail part and the two leads of the above LED subassembly to the 9VDC power leads on the circuit board (found on the diagram at the bottom of page15) . The order of this three way wire connection matters so follow the diagram found on the next page exactly. (Note: Remember to cut short lengths of heat shrink tubing and slip them on the two pairs of wires coming out of the circuit board before you solder the connections together.) The LED subassembly is going to be used to light up the day/month/year display on the control panel and it needs to be attached this way because you will need to adjust the positioning of it directly under the display. The two wires coming out of the framework rail will carry power from the hollow cavity within the time generator assembly to both to the LED and the circuit board as well.



6. Locate the provided section of clear plastic thin walled tube stock. Notice that on one end it has a small notch cut out of a quarter section. This is there to accommodate the time key movement which will put it on the left side of the control panel when it is complete. Before you attach this part, you must make some modifications to it. First you must clean up and attach the day/month/year light platform that sits on the top of the control panel. This cast part should sit on the clear plastic tube section as shown in the first of the two diagrams shown below. After it is glued in place, you will need to drill three $\frac{3}{16}$ " diameter holes equally spaced into the top of the platform piece. Drill them all the way through both parts into the inside of the clear tube as shown in the second diagram on the following page. (Note: We recommend doing this operation on a small drill press to achieve perfect spacing and 90 degree accuracy. Make sure you lay out your hole spacing carefully.) Additionally, you will have to glue on the raised rivets that run around the light platform by hand. Use the provided length of $\frac{1}{16}$ " diameter styrene rod that comes with the original kit. Cut the rod into small $\frac{1}{16}$ " sections. Tack them into place by dipping one end in a small drop of Weld-On 3 or similar styrene solvent using the sharp tip of your X-acto knife and then placing them around the platform piece on the clear tube as shown on the following page. (Note: If you think you are up to it, we recommend drilling the locations for these rivets out using a $\frac{1}{16}$ " diameter drill bit. Drill holes about $\frac{3}{32}$ " deep. Glue a longer length of $\frac{1}{16}$ " styrene rod into each hole and trim them to the correct height when dry. This method makes the connection a stronger one.)

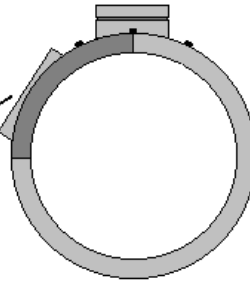
7. Find the short length of $\frac{3}{16}$ " diameter styrene tube provided in the upgrade kit. Cut three identical $\frac{5}{16}$ " long lengths from this tube and paint them red. When dry, insert them into the above mentioned three holes that you just drilled into the control panel light platform. They should only stick out from the surface by $\frac{1}{8}$ " of an inch.



8. Find the ornate control panel display framework piece. You will notice that there are three oval shaped holes in it. This is the reason that the control panel housing is made out of a clear plastic tube section. Carefully glue this cast part into place as shown in the diagram below as well as the provided schematic drawing. Make sure you keep the clear areas located within the oval shaped openings free of any glue residue.

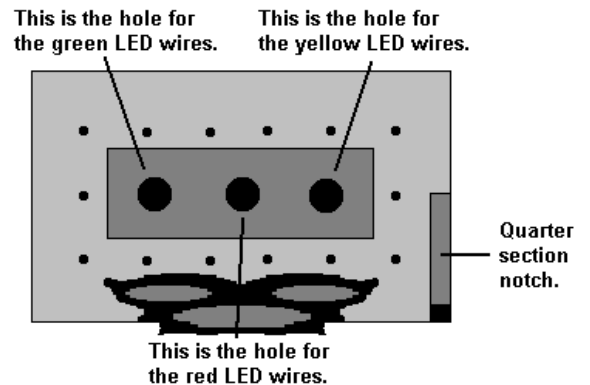
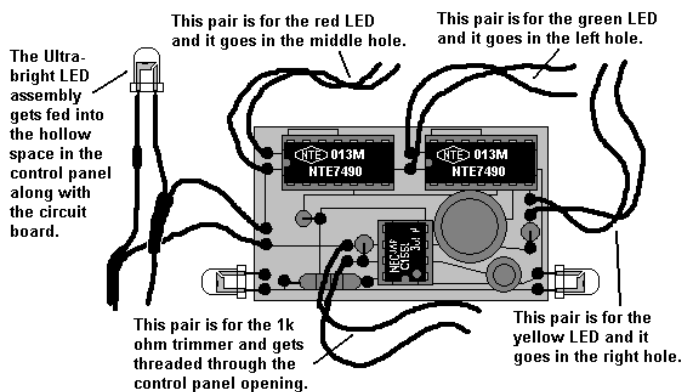
Side View of Control Panel
Display Attachment Angle:

Control Panel Display Frame



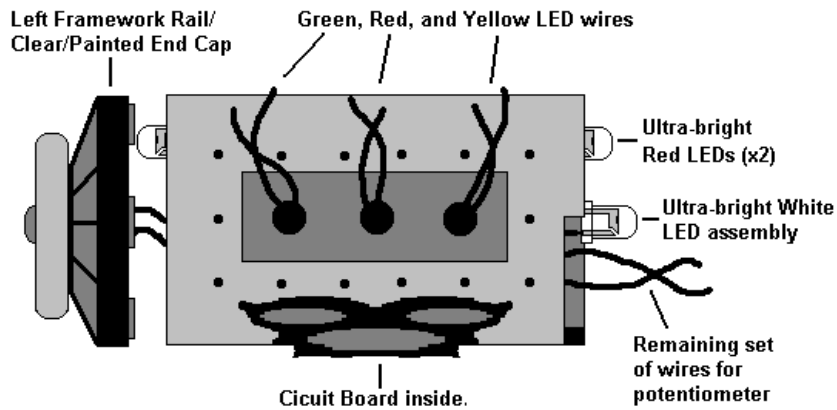
9. Carefully mask off the interiors of the three oval-shaped holes in the control panel display area using a good quality paint resistant masking tape or film. Also mask the inside of the plastic tube section behind these three oval shaped openings. Now you are ready to paint this assembly black. When the black paint dries remove the tape masks and paint the rivets, the control panel display frame, and the control panel light platform gold. (Note: We recommend painting the interior of the plastic tube section silver to increase the light reflectivity within the hollow cavity of this part.)

10. This next step is a tricky one. Take the plastic tube control panel assembly and slide the control panel circuit board into the end without the notch. As you do this, you will need to feed three of the pairs of 2" long lengths of wire on the circuit board into the three holes located in the top light platform. It matters which pairs of wires go into which of the three holes of course, because the proper color LED needs to be located above the matching color graphic on the control panel display. Also the flashing rate is different for each of the three control panel LED lights since they are denoting the passage of days, months, and years. On the following page is a diagram showing which pairs of wires go into which holes. Once inserted into the correct holes pull the pairs of wires through so that they stick out about an inch above the surface of the control panel light platform. The ultra bright LED/resistor subassembly you made earlier and the remaining pair of wires coming out of the circuit board should be fed out through the other end of the plastic tube control panel assembly which has the notch in it. We will be dealing with these later on.

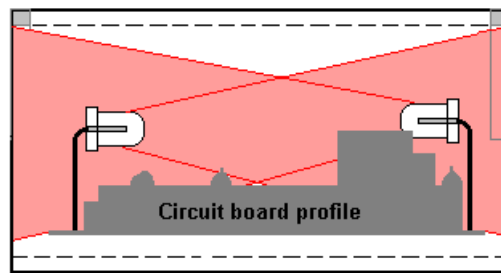


11. When you are through with this step, it should look like the next diagram. You are now ready to solder the red, yellow, and green LEDs onto these protruding pair of wires. The LEDs that go on this control panel display light platform are the ones that appear red, yellow, and green when not lit up. Remember, LEDs are directional components, so they have to be soldered to the pairs of wires in the correct direction. There are three ways to figure this out; you can use the method that you feel would work the best for you. First, you can identify the positive wires by following the pathways on the circuit board both on the real part and using the diagrams in this set of directions. If you do not feel comfortable with being able to correctly identify the polarity of the wires this way, the second method would be to refer to the enclosed electrical schematic that is found at the tail end of this set of instructions. It shows the wiring for the entire upgraded Time Machine model kit. If you are completely in the dark about electrical matters, then I am afraid that you are going to have to perform this step after all the wiring on this model is completed. Don't worry, it is an easy last thing to do. Just follow the following soldering steps the same way, at any point. The LEDs don't need any resistors to protect them from being exposed to too much voltage because the control panel circuit board regulates the power in this case. First clip most of the length off of the leads coming out of each LED before soldering it to the appropriate pair of wires. Don't cut them too short. And don't lose track of which lead is the anode (+) and which lead is the cathode (-) on this component. (Note: It may also be necessary to lose some length on the pairs of wires as well since you will be stuffing the wire back into the holes when finished.) Next, use a pair of tweezers or, better yet, a pair of forceps as a heat sink. LEDs can be burned out if exposed to excessive heat, so you will need to protect the life of this component by using one of the above mentioned tools to channel the heat from the soldering iron away from the component. Now solder the LEDs in place. When you are through, push the wires and LEDs back down into the holes and glue them in place using hot glue. The reason that we recommend hot glue is because in addition to holding the LEDs in place, it also coats the wire connections which will prevent any short circuiting. (Note: If you ever need to replace these LEDs in the future, using hot glue will also allow you to easily release them from their holes by blowing canned compressed air at them. Hot glue loses its adhesion when it gets very cold.)
12. This next step is important. You will need to do a few things before you glue the left clear/painted end cap part to this partially completed control panel assembly. First, since the ultra-bright red LEDs on each side of the control panel circuit board are designed to light the opposing side clear cast parts, you will need to bend them carefully inwards and position them so that they shine over the other circuit board components. Next, you will have to tack the circuit board itself in place by hot gluing it to the sides of the thin walled plastic tube where it touches at the bottom (see diagram). Be sure and push it in as far as it can go toward the left side clear/painted end cap. Lastly, you need to position the ultra-bright white LED assembly attached to the wires coming out of the side framework rail so that it is pointing directly at the back of the clear oval shaped day/month/year windows on the front of the control panel. Tack this in place using hot glue as well. (Note: The hot glue will not damage any of the electrical components. You will not need to use very much just to hold things in place anyway.) Now you can

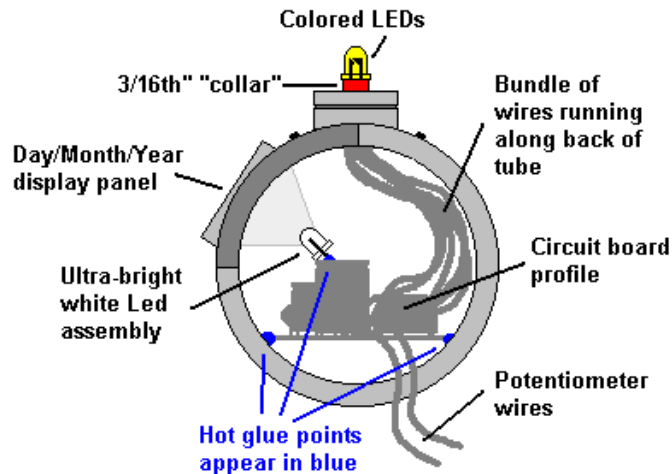
permanently glue the left side clear/painted end cap to the control panel assembly. Finish by pushing all wires to the back wall of the plastic tube.



Ultra-bright LED light diffusion diagram

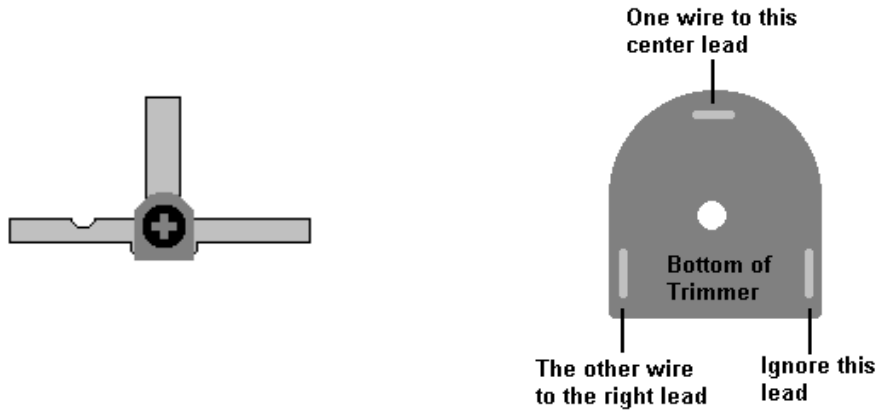


Control panel plastic tube

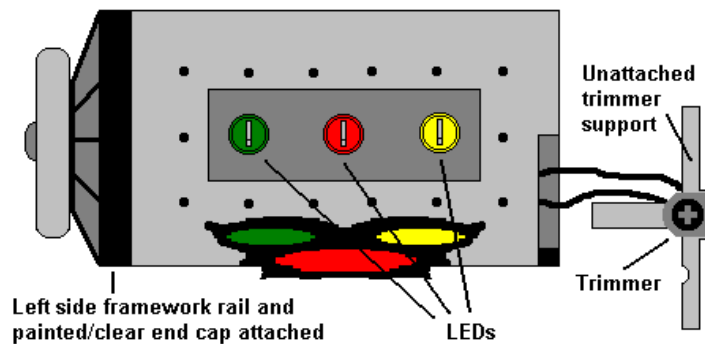


- In the upgrade kit you will find a small clear cast part that resembles the letter T. You will first need to drill one $\frac{3}{32}$ " diameter hole all the way through this part. A small divot found on the center surface indicates the location of the hole. Find the 4.7K ohm horizontal trimmer/potentiometer located in the bag of electronic parts that comes with the upgrade kit. It is a grey component with a black movable "disk" on one face and three silver leads coming out the other. Insert this component's single middle lead through the hole you just drilled and glue it in place. The part must go in so that it matches the first diagram below. Just be

careful not to get any glue on the electrical component itself since this might inhibit its movement.



14. The three leads on the back of the trimmer you will notice form a triangle. Solder the two remaining wires sticking out the open end of the control panel assembly to the middle lead and the left lead only. Ignore the right lead sticking out of the potentiometer. It will remain unattached to any wires. (Note: We recommend clipping this lead off to prevent any short circuiting.) Choosing the correct leads matters since it affects how the light pattern will increase or decrease on the control panel when the time key is moved forward and backward. However, since this part is basically a variable resistor, it does not matter which of the two wires coming out of the control panel circuit board is attached to which of the two appropriate leads. When you are through with all these control panel steps, you should have a part that looks like what is shown below.

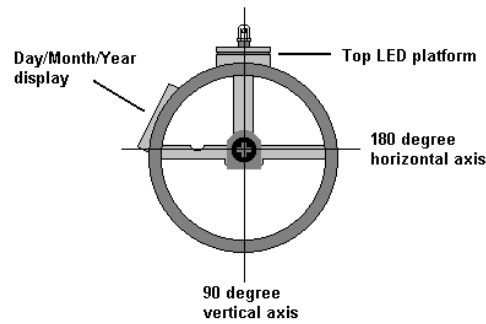


15. Before we finish this control panel assembly, we need to do some work on the right side painted/clear cast end cap. Since the control panel assembly kind of hangs out into space until it is completed, you will need to temporarily prop it up with something until it is finished. We recommend cutting up some foam blocks from bigger pieces of cushioning foam found in any fabric store. We do not recommend using a copy of the original Time Machine story written by H. G. Wells. That would be disrespectful.
16. Find the above mentioned remaining right side painted/clear cast end cap for the control panel. You will notice that it has a different interior contour than its left side counterpart. This is to accommodate the larger 250k ohm potentiometer,

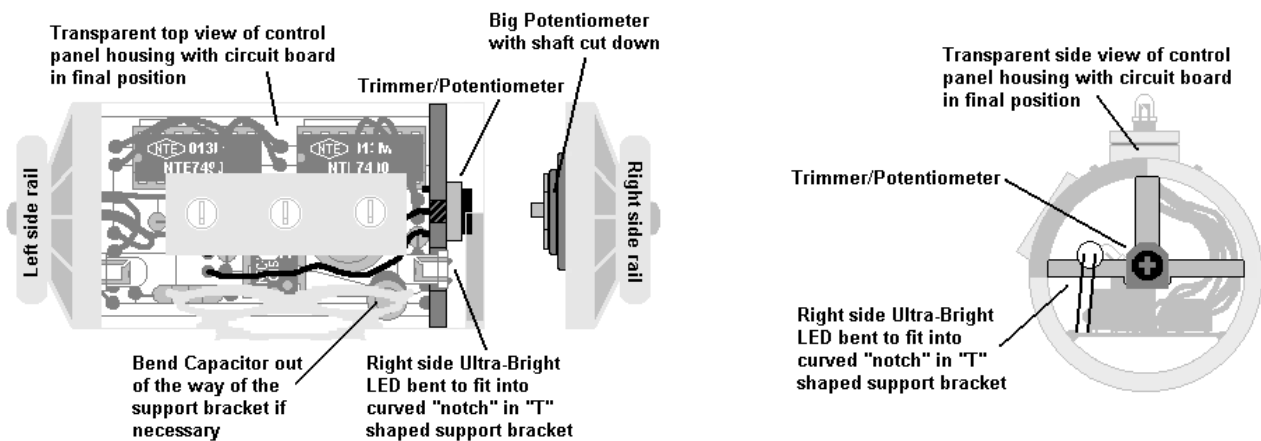
which will regulate the speed of the motor that spins the “dish”. Glue this part to the right side framework rail again making sure that you feed the wires through the hole you drilled in the center of this part. (Note: Again, make sure that the raised ribs on the end cap match both the orientation of the raised ribs on the left side end cap as well as what is shown on the blueprint. The correct positioning of this part will also result in no interior alignment tab supports interfering with the quarter section notch in the plastic tube that makes up the control panel. In other words, nothing blocks the up and down motion path of the time key which will be installed later.

17. Find the larger 250k ohm potentiometer included in the electronic parts bag and carefully cut the center shaft using a small metal hack saw so that the shaft part that turns sticks out only about 3/16”. Strip and cut the wires coming out of the framework rail down and then solder one of them to the center lead on the potentiometer. Then solder the other wire to the lead to the right of that one when looking down on the potentiometer from the top. Once again, choosing the correct leads matters since it affects how the speed of the motor will increase or decrease on the control panel when the time key is moved forward and backward. However, since this part is basically a variable resistor as well, it does not matter which of the two wires coming out of the right side framework rail is attached to which of the two appropriate leads. Now glue the underside of the potentiometer to the bottom of the interior surface of the right side painted/clear cast end cap. You will see that it is shaped to allow the two wires to feed out from underneath the electronic component when the three leads on it are lined up over the specially shaped channel cast into the end cap.
18. Since, by now you are used to tricky assembly steps in this model kit and you have made it this far, you will love this next one. In the upgrade kit you will find a small clear cast part that looks like the diagram below. Drill a 1/16” diameter hole about 3/16” deep into this part from the side indicated, but be careful not to drill all the way through. Also drill a 1/16” diameter hole 1/4” deep on the lower end of this part where indicated.
19. Looking toward the potentiometer that you glued onto the inside of the right side painted/clear cast end cap for the control panel, turn the center shaft on the potentiometer as far to the right as it will go. Now glue the clear part you drilled into in the previous step onto the center shaft of the potentiometer. Make absolutely sure that you have it in the correct position which is determined by touching the end cap rail to the control panel rail to see where the quarter section notch for the time key is located. The clear part that is glued onto the center shaft should line up with the lowest point or bottom of this quarter section notch when the potentiometer shaft is turned as far to the right as it will go. Do not glue the control panel together just yet.
20. You will notice the peculiar pattern located on the top of the clear part that you just glued onto the right side potentiometer shaft. It is shaped to fit into the black moving disk on the small potentiometer/trimmer you were working with in Step 75 and 76 which is now attached to the clear “T” shaped support brace and hanging loose on the two remaining wires coming out of the control panel circuit board. Turn this black “disk” on the potentiometer/trimmer as far to the left as it will go with a Phillips screwdriver. It should now line up with the pattern on the top of

the clear part glued onto the right side potentiometer. By lining up, we mean that the “T” shaped support brace should be in the following position when it fits in place.



21. Now that you have lined up these elements, you are ready to align the “T” shaped potentiometer/trimmer brace onto the inner surface of the painted plastic tube section that makes up the main body of the control panel housing. You will notice that there is a round “bite” taken out of one side of the support arms of the clear brace. This is so that the main body of the ultra bright red LED on the control panel circuit board on the time key “throttle” side is not blocked. Using a pair of needle-nosed pliers, insert the clear brace into the cylindrical cavity of the control panel as shown in the diagrams below. (Note: You may have to kind of bend the components on the circuit board around a little bit to get this to work right.) **Do not glue it in place just yet.**



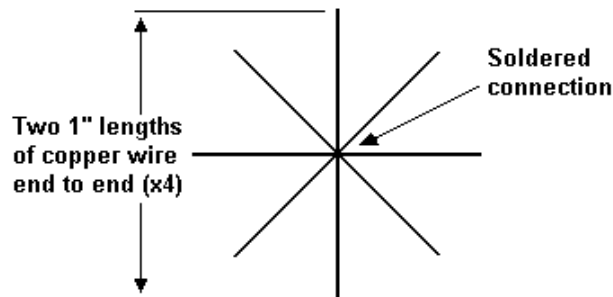
22. Now, you are ready to install the last and most critical piece of the control panel assembly. Up to this point, the main body of the control panel and the right side painted/clear cast end cap are separated. You now need to take the cast part that you modified previously and glue it on to the center post of the potentiometer on the right side rail painted/clear cast end cap. As stated before, you must make sure the potentiometer center shaft is turned all the way to the right before you permanently attach this cast throttle piece. Make sure that you do not inhibit the turning motion of the center shaft when you are attaching the cast throttle part with glue. Also you will need to use the bottom of the quarter section notch opening on the tubular housing of the control panel as a guide to make sure that when the right side potentiometer is turned all the way to the right, the clear cast throttle control is touching the bottom of the notch. Obviously, you will have to

keep holding them together to check for alignment. Additionally, you need to double check that there are no wires or anything in the way of the throttle's movement.

23. You are almost there. On top of the cast throttle piece is a detail element that is designed to fit into the Phillips screwdriver shaped opening in the top of the 50k ohm trimmer/potentiometer mounted on the support bracket inside the main body of the control panel housing. Make sure that the movable disk on the trimmer/potentiometer is turned all the way to the left or it will not line up with the raised detail on the throttle. Because the cast throttle piece has to be pushed tight up against the trimmer/potentiometer inside the control panel, it is very important that the brace that holds this electronic component be attached to the inner surface of the control panel housing at the correct depth to achieve this positive contact. Because the control panel will soon be sealed permanently, a bit of trial and error test fitting is required. **When you are sure that you are sure that you are sure that all these elements are going to fit together in the proper positions**, glue the movable disk on the trimmer/potentiometer to the top of the cast throttle piece. Then glue the three arms on the trimmer/potentiometer support brace onto the interior wall of the control panel housing. You will have to do this at the same time that you glue the right side painted/clear cast end cap in place on the control panel housing. Put glue on both the brace support arms and the end of the plastic tube that touches the painted/clear cast end cap and slide them together all in one operation. Join these parts together with two-part epoxy.
24. Now you can finish painting the control panel exterior. The rivets are to be gold, and there is a small band of dark green that runs around the edge of the control panel LED light platform. You can also apply the decals. Use the 3/4 CAD drawing to locate the positioning of the gold ornamental decal on the front of the control panel. As you can see, the decal sheet we provide you offers you a choice as to what date, month, and year you want showing on the control panel. The dates are of course, the significant ones from the 1960 George Pal movie. Lay the chosen decals into the appropriate elliptical openings in the control panel day/month/year display panel. (Note: We recommend cutting a template out of styrene sheet to establish the correct shape for each of these three ellipses and then using that template to cut the correct profile shape out of the decal sheet with a sharp X-acto knife.)
25. Locate, paint, and attach the thin scrollwork detail element that goes under the control panel housing between the left and right framework rails. (Note: For those of you that are fanatical about absolutely correct detailing, there is additional pin stripping that goes on the top surface of this part as well. See the 3/4 CAD drawing provided.)

The Control Panel Light Cages:

1. In the original Time Machine static build up kit, the three lights on top of the control panel are made out of solid cast resin which you paint the correct colors. They are not used in the upgrade kit because they are being replaced with LEDs. However, the cast pieces make excellent fixtures for bending the wire cages that go over these colored LEDs. Take a 24" long length of copper wire included in the static build up kit and carefully sand the coating off of it so it solders better. Cut this piece of copper wire into twenty-four 1" long lengths and separate them into three groups of eight. Arrange each set into the pattern shown below and solder the ends together. (Note: Use a similar technique to the one that you used when making the larger cage that goes over the red LED on top of the time generator assembly. Use cyanoacrylate adhesive to hold joints into place and then solder them. File if necessary. See diagram below.



2. Now bend these three wire assemblies over the cast light part from the original kit making sure the junction point in the center is located exactly in the middle of the top of the fixture. Now cut all the wires that are pointing down to the correct length which is determined by measuring the LEDs that they rest on.
3. Find the three flat brass washers that are included with the upgrade kit. You will need to drill out the center openings of these so that they measure 3/16th" in diameter and will fit over the LEDs on the control panel. (Note: The best method for doing this is to hold each washer with a small pair of pliers on the outside while drilling down onto a scrap piece of wood. After you have done this, you need to solder them onto the bottom of each wire cage that you bent in the above step. File if necessary. They are now ready to paint gold and attach to the LEDs on the control panel.

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The Time Key:

1. Carefully trim the body of the time key from the casting block. You will notice that there is a small 1/16" diameter plastic shaft cast into the bottom of this part. It is necessary for you to remove it entirely when you are building the upgrade version of this kit. After you have sanded and finished this small part, drill a 1/16" diameter hole about 1/4" deep into the center of the bottom of this part. Find the length of 1/16" diameter copper rod provided in the upgrade kit and glue it into the hole you just drilled. Now cut the length of rod that you inserted down to about 1/4" long and file the end of it so that it is flat and not crimped. This shaft will be inserted into the hole that you drilled into the cast throttle that operates the two control panel potentiometers. The key is designed to remain removable, just as it was in the film.
2. Next, paint this part gold on the top and bottom and "marbleized" blue and white on the shaft. Now, glue the provided clear faceted bead onto the top of the time key. The best method for doing this that we have found is to attach it with any clear two-part epoxy which will fill the hole in the center of the bead as well as hold it in place.

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Final Framework Assembly Details:

1. Temporarily attach the time generator assembly to the base if it is still not already attached. As instructed earlier on in this set of instructions, the two clear cast left and right cones are currently temporarily attached into place on the sides of the time generator assembly using tape on the inside. Leave them that way for the time being. Slip the two dome-shaped painted/clear cast time generator cone end caps into the small round openings in the tapered end of the clear cast cones. If you have not already done so, carefully remove the 1/4" diameter raised center areas on both of the painted/clear cast dome-shaped end caps and just as carefully sand them smooth and paint the newly exposed clear areas black again.
2. Find the horizontal framework rail that surrounds whole Time Machine model. Glue the back points of contact on first. These are located by lining up the two round green cylindrical raised detail elements cast into the back sides of this part over the exact centers of the dome-shaped time generator cone end caps. If the time generator assembly still pushes out too much on this horizontal framework rail, you will have to carefully sand some of the width off of the clear cast time generator cones at the points where they mate up to the central time generator

assembly housing. Obviously, you will have to be very careful about modifying these finished parts so as not to harm the decals that are already applied on the outside surfaces. **Do not glue the cones to either the framework rails or the time generator housing assembly just yet.**

3. It is now time to attach the front of the horizontal framework rail that surrounds the whole Time Machine model to the front of the left and right side framework rails. You will at this point be able to determine the correct point of contact now that the parts are no longer floating unattached in space. (Note: Do not consider pinning these rails together with any kind of rod or fastener because it might damage the wires cast inside the side framework rails.) The framework rails are now done.

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Time Generator Drive Wheel:

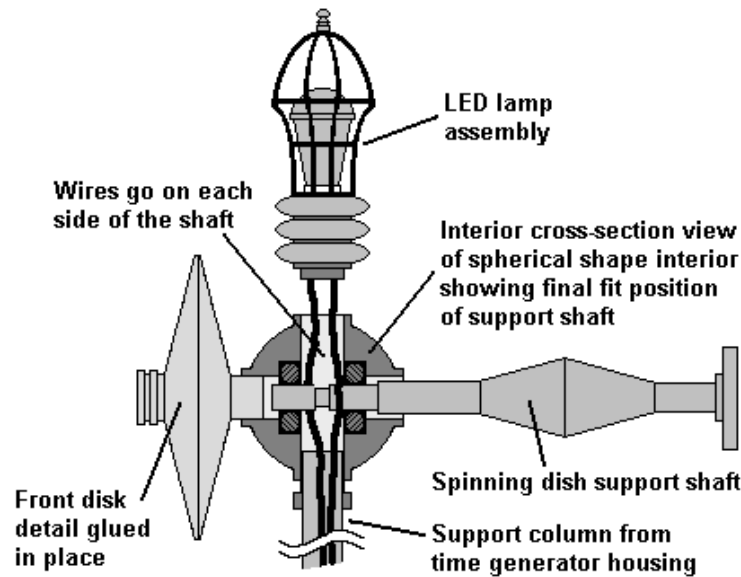
1. Find the soft black rubber grooved wheel among the parts included in the Time Machine model upgrade kit and keep it on hand. There is also a small cast resin central support for this rubber wheel, which you will also need to find and modify. It is a disk about 5/8" in diameter with a central shaft sticking out of one side about 1/2" high and 1/4" in diameter. Sand and finish this part and drill a 1/8" hole all the way through the exact center of the shaft on this part. (Note: We strongly recommend that you use a small drill press to do this step. **It is very important that the hole you drill be straight and exactly in the center as indicated by the divot cast into the top of the shaft on this part.**) When you are done with this part, paint it black.
2. Now glue the rubber wheel onto this painted cast part with the nicer of the two surfaces facing away from the backing plate. It is important to get glue on both the central shaft and the flat surface of the backing plate to properly support the rubber wheel when it spins the dish.
3. Locate the 1/8" diameter hollow short length of brass tube that comes with this upgrade kit and glue it into the center of this rubber wheel/center support shaft assembly with one end of the tube flush with the soft rubber side of the drilled through hole. If you think that it is necessary for the look of the model to paint this shaft black, then do so at this point.
4. This whole assembly should slide right over the axle of the DC motor sticking out of the back of the time generator. At this point, the 1/8" diameter tube section in the center is too long. You will need to do the final adjustment when you have the dish attached. You can cut the brass tube by hanging the wheel end of this assembly over the edge of a table while placing an X-acto knife on the point on the surface of the tube section that you want to sever. Roll the tube section on the table against the knife blade until it is cut. Then glue this wheel assembly onto the shaft of the installed motor making sure that the brass tube in the center seats all the way down over the entire length of shaft.

The Dish:

1. Let's begin by pointing out a little known fact about the dish-shaped part that goes on the back of the Time Machine. Around the perimeter are a series of hex-shaped bolts arranged in what appears to be a random grouping within four radial divisions on the inside back surface of the part. There actually is a pattern present. Each bolt represents one day of the year (365 total) and the four quadrants represent the four seasons. You will need to examine the dish to see if any of the 365 rivets are missing or damaged. If so, then use the provided short length of styrene hex rod provided with the original kit to repair it. Take the time to sand and finish this part smooth, especially on the back, since an improper finish on this part will cause very visible defects in the paint finish that will affect the overall quality of your model's appearance. Another important step to do at this point is to make sure the dish is flat along the edge. The best way to find this out is to lay the dish onto a surface that you know to be flat and see if it touches evenly all the way around the edge. If it is not, you will need to reshape it by putting it in hot water and laying it on a flat surface overnight. (Note: If necessary, put only a small amount of weight on the back of the dish to hold it down. We recommend something like a large bath towel. If you use anything heavier, you run the risk of causing the dish to become deformed in the other direction.)
2. The dish is the most complicated part to paint in the whole kit. With all the other parts, the painting instructions have been noted within each step as they are relevant, but with this part that cannot be the case. It is very important that you take your time masking and painting the areas on the inside surface of the dish since it is such an important piece in the overall look of this model. Use the enclosed 3/4 CAD drawing as a guide to painting this inside surface correctly. The back of the dish is painted gold over the entire smooth surface. When you are through with the painting steps and you have given the paint finish ample time to dry, you will need to apply the water slide decals to the inside surface. (Note: The water transfer decals that come with the kit require a bit of careful positioning work to get them located in their proper places. As suggested previously, keep them very wet until you get them applied correctly and then use any commercially available decal setting solution to make the decals pull tight to the surface of the cones and eliminate wrinkles.)
3. Find the cast part that is the central shaft support for attaching the dish to the spherical shape on the top of the time generator. This part is reinforced with a length of steel rod cast inside of this part, so it is stronger than it looks. Scrape away the paint just around the small raised 1/16th" raised alignment pin located in the center of the inside surface of the dish. It is important that you achieve a strong bond between the center shaft and the dish and it is also important to double check that the shaft is located in the exact center so that it will spin correctly. Check this by putting a ruler at several different points around the dish

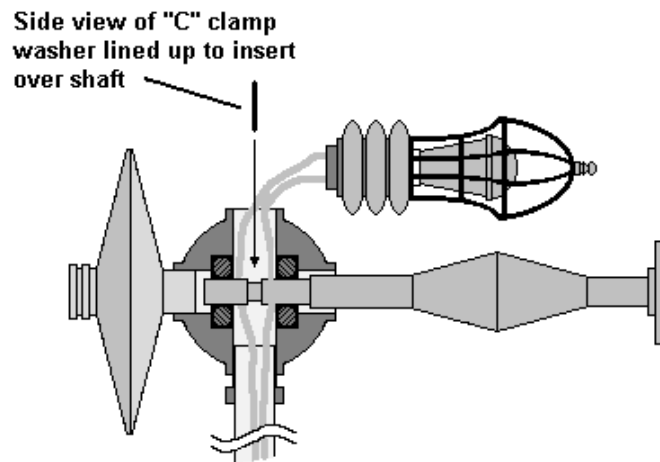
between the center pin and the outside edge. When you are satisfied that everything all lines up correctly, then glue the shaft to the dish.

4. Here comes another set of tricky steps. First, remove the time generator assembly from the base so that it is easier to work on. Also, remove the cones from each side to allow better access into the hollow cavity within this assembly. You were instructed to leave the red LED lamp and cage assembly located on the top of the time generator unattached previously. This is done because the two wires going into this LED lamp assembly need to be spread to the left and right sides of the interior spherical shape cavity so as not to interfere with the motion of the shaft that supports the dish. Carefully push the wires to each side with the end of a small screwdriver or similar tool. See diagram below.



5. Test fit the dish shaft into the opening in the spherical shape supporting it the whole time that you do this operation. It should slide in far enough so that you can see the small thin grooved area on the shaft exactly in the center point between the two enclosed bearings when looking through the top opening. If this does not happen, you might have to sand areas on the shaft to compensate for any fit discrepancy. You are now ready to attach the rubber drive wheel assembly to the shaft of the DC motor on the time generator. Gently spin the dish and you will most likely find that the outer rim rocks in and out a bit. Determine the half way point of this rocking motion which would be the point between the farthest distance from the base of the time generator and the nearest distance from the base of the time generator. Cut the brass tube to length and attach the rubber drive wheel to the axle so that the center of the groove is at this half way point.
6. The dish does not get attached using glue. Instead, a small “C” clamp washer holds it in place. You should find it enclosed in the upgrade kit bag of parts. Insert the dish/shaft assembly back into the spherical shape on the top of the time generator assembly. Bend the red LED lamp assembly out of your way for the moment. Using a set of very fine needle nose pliers, grasp the “C” clamp washer at the top and carefully lower it down through the opening on the top of the spherical shape and push it down over the small diameter groove in the shaft

that holds the dish which should be located right in the center of the two enclosed bearings. This is a little tricky, so take your time. After you have done this, spin the dish a couple of times to make sure everything is functioning smoothly. See diagram below.

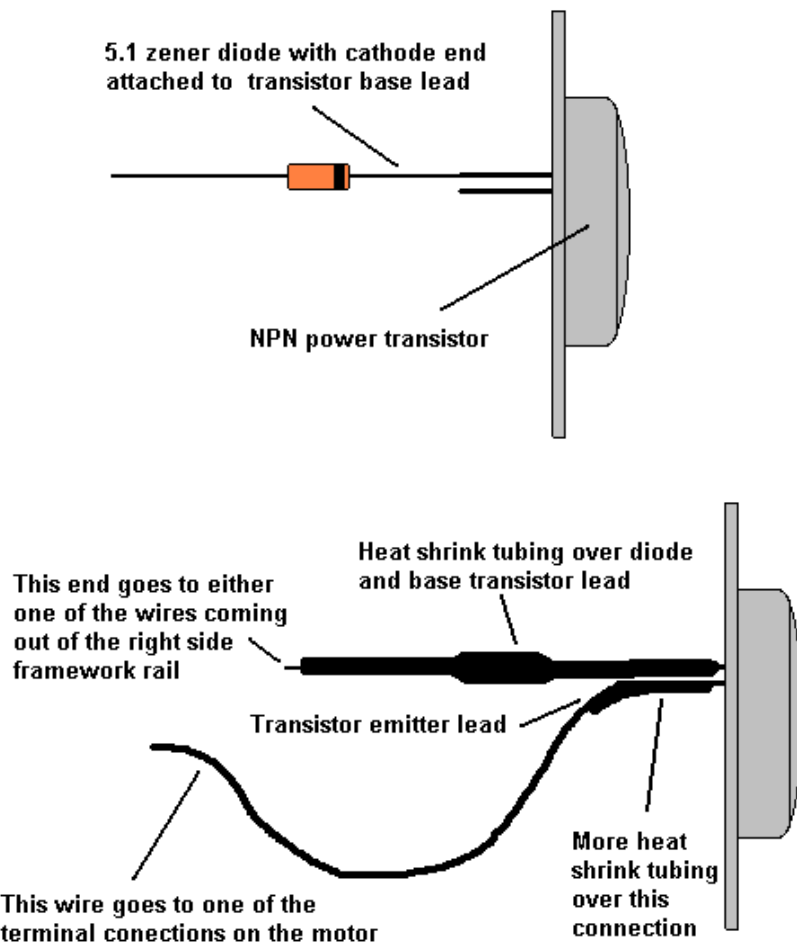


7. When all the above steps are done and the bottom rim of the dish is resting comfortably on the rubber drive wheel assembly, you can glue the red LED lamp/lamp cage assembly into place.

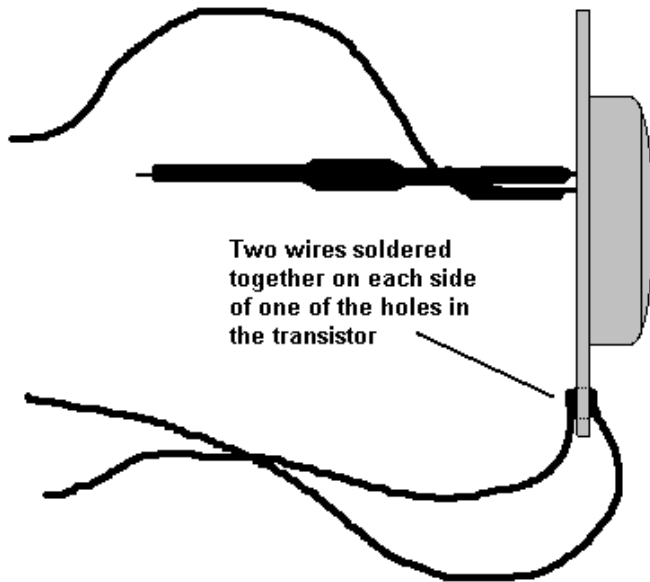
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Transistor Subassembly:

1. If you want your Time Machine to function correctly, then you must perform these last steps very carefully. This is the point where we estimate there will be the most electrical wiring mistakes if the following steps are not done carefully. You will be working inside the hollow cavity of the generator housing to make these connections, so don't let the soldering iron ruin the surface of the plastic parts. First you will need to locate the NPN power transistor in the bag of supplied electronic parts. It is a silver rounded diamond shape component with a dome-shaped housing on one end and two silver leads pointing down out the other end. You will also need to locate the last 5.1 volt zener diode which as you may remember is an electrical component with two silver leads coming out of each end and an orange body with a black stripe on one end. After you have found these, you will also need to consult the CAD electrical schematic drawing and electrical component key found in this set of directions. Using the diagram, locate which lead on the transistor is the "base" and solder the end of the 5.1 volt zener diode with the black stripe on it (the cathode) to this lead on the transistor. When you are done, cut a short length of shrink wrap tubing and shrink it over both the transistor base lead and the main body of the zener diode and solder a 2½" length of wire to the emitter lead on the NPN power transistor. See diagrams below.



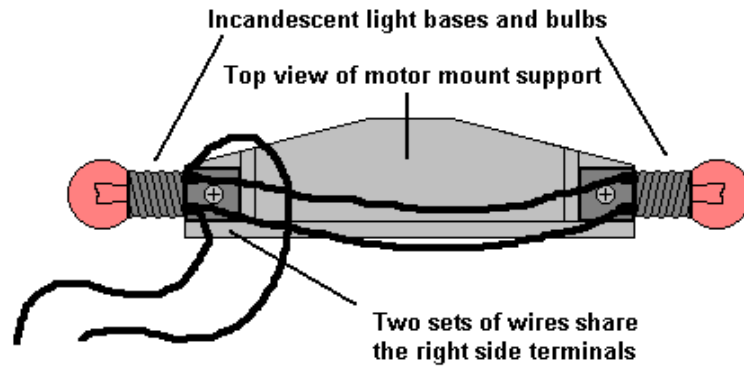
2. You now need to solder two 4" lengths of wire to the housing of the NPN power transistor. The best way to do this is to pick one of the two holes on the flat part of this electrical component and solder the two lengths of wire together one on each side of the hole. You cannot solder to the housing of the NPN transistor since it is designed to resist such things. By using this wire on either side of the hole method, you can make it so that the wires are touching the component as well as each other and they are unable to go anywhere. See the diagram below. Roughing the surface of the transistor where you are attempting to solder assists in bonding the solder to the transistor. When you have attached all the wires to this component, you are ready to begin the final wiring steps that will make your Time Machine come to life.



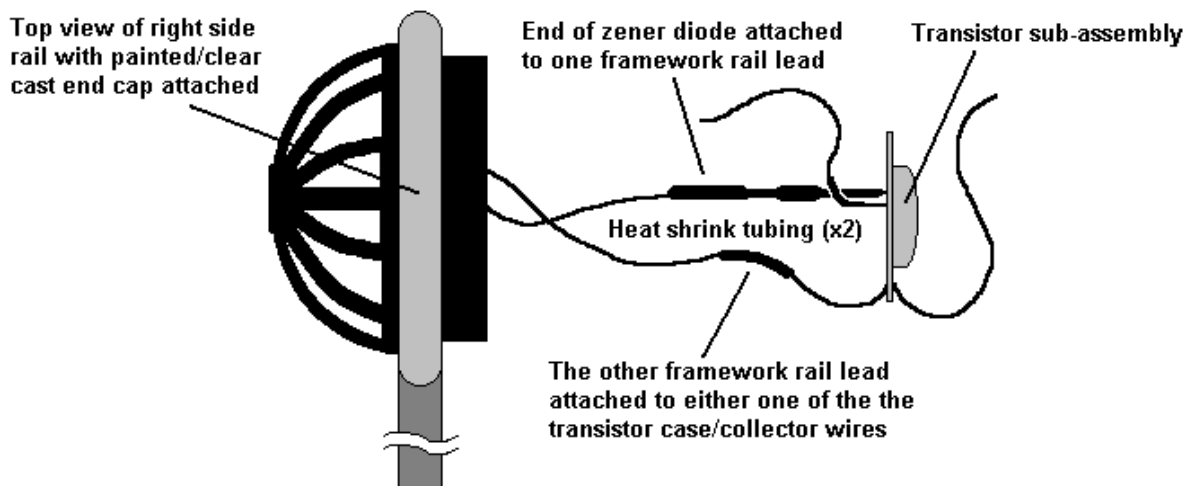
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Final Wiring:

1. For these final wiring steps, you will have to work within the hollow space in the time generator housing. Remove it from the base until told to put it back on. In the following wiring steps, we will refer to each connection area as if they are separate even though they are glued together at this point in the construction of this model. The diagrams will also reflect this abstraction since it helps in sorting out which wire and/or terminal goes to which. First you will notice that on each of the two incandescent light bases screwed to the part attached to the top of the motor mount within the time generator assembly there are two terminal connections (two on each base for a total of four altogether). You will need to wire these together in the following manner. Cut two lengths of wire as long as the distance between the two incandescent light bases. Solder either terminal on one light base to either terminal on the other light base. Repeat this operation with the remaining two terminals. Now cut two more 3" long lengths of wire and solder one to one of the terminals on the right side incandescent lamp base and solder the other one to the remaining terminal on the same right side incandescent lamp base. When you are done with this, you should have the left side lamp base connected to the right side lamp base by two wires and also have an additional set of wires doubled up on the terminals of the right side lamp base.

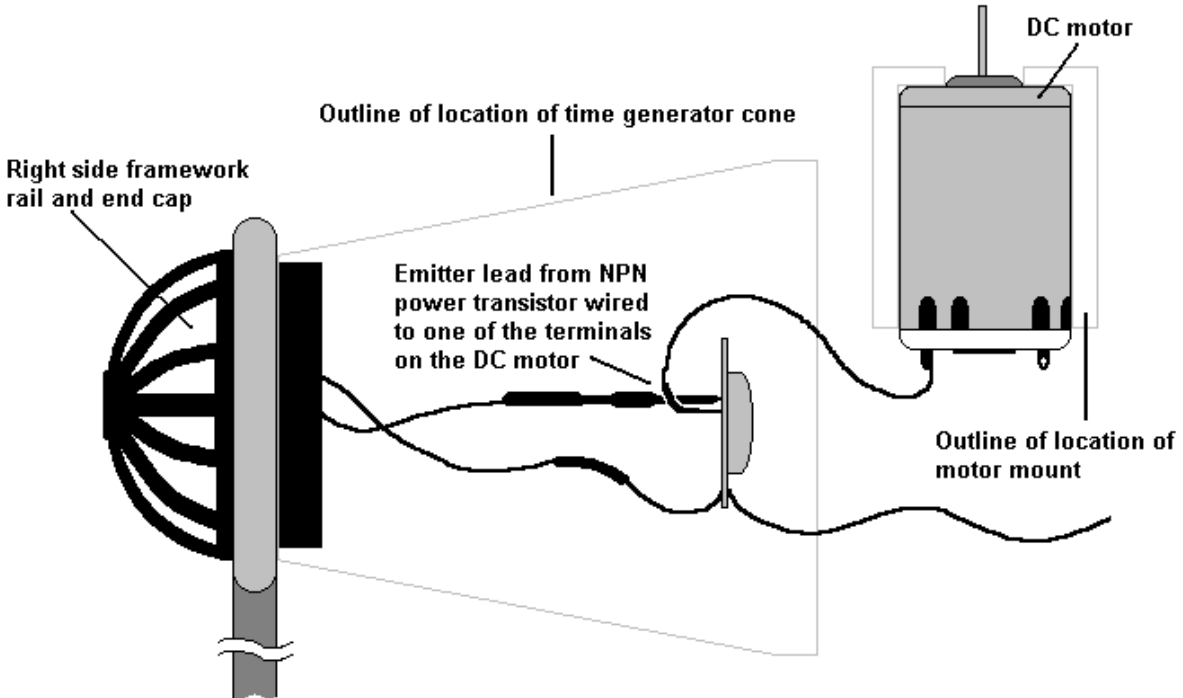


- Take the transistor sub-assembly you built previously. You will need to solder two of the leads from this sub-assembly to the two leads coming out of the right side framework rail in the back. It does not matter which of the two leads that you select emerging from the side right side framework rail since on this side they only lead to the 50k ohm potentiometer inside the control panel. The potentiometer is a variable resistor and is not a directional component in this application. First cut some short lengths of heat shrink tubing to go over the connections that you are about to solder. Remember to slide one of these over one of the two wires being connected before you solder them together. Now solder one of the wires from the right side framework rail to the remaining unsoldered lead (or anode) on the 5.1 volt zener diode attached to the base lead on the NPN power transistor. Now select one of the two wires attached to the housing of the NPN power transistor, it doesn't matter which one, and solder it to the other wire from the right side framework rail. (Note: Keep all the lengths of wire longer than you might think they should be because it makes it easier to attach all these components together and move things around inside this hollow space area of the time generator. You can always stuff the extra length of wire into the hollow cavity when you are finished with these last wiring steps. See the diagram below.

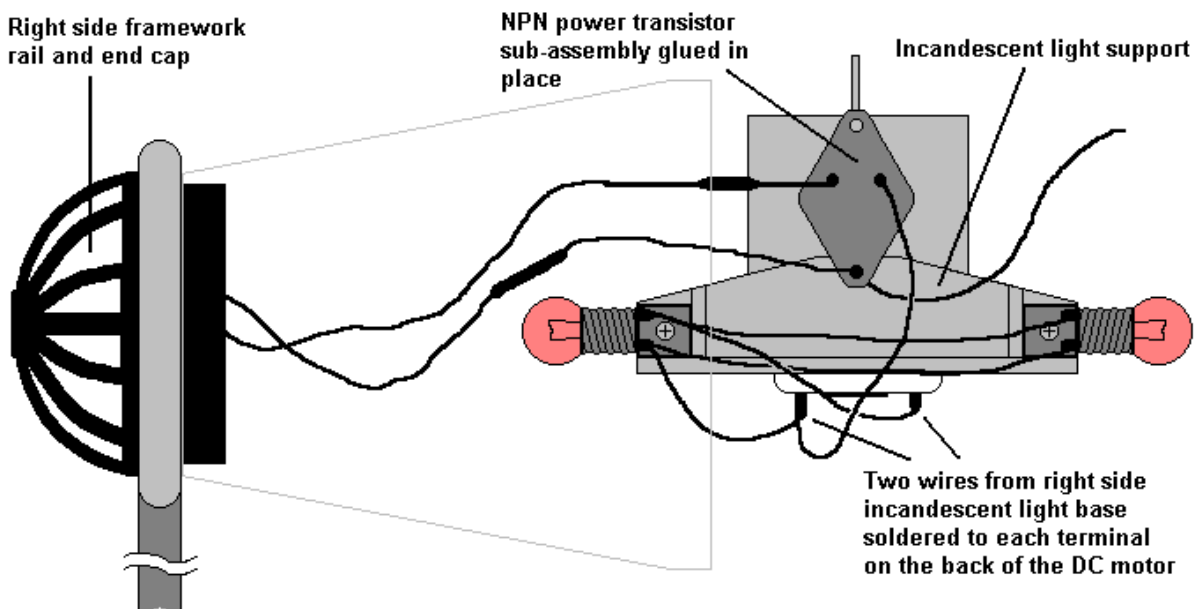


- Next, you will need to slide the right side clear cast time generator cone over the whole wiring assembly that you completed in the previous step. If you do not do this at this point, you will be unable to get it on over the wires in the future. After you have done this solder the emitter lead wire emerging from the NPN power

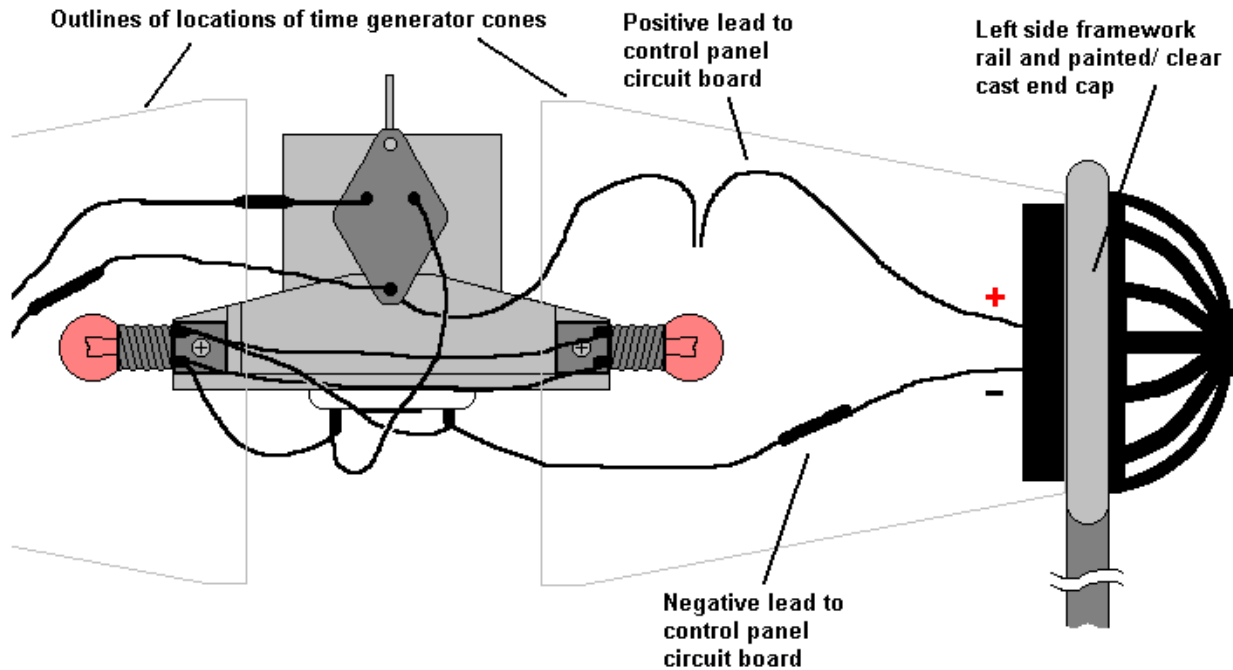
transistor to one of the terminals on the back of the DC motor. It does not matter which one. See the diagram below. Please note that the already attached incandescent light support is not shown in this diagram to make it easier to understand



4. Now solder the two lengths of wire that are attached to the two right side terminals on the incandescent lamp base from Step 101 to the two terminals on the back of the DC motor. One wire to each terminal as shown in the diagram below. (Note: At many points in the final wiring steps, you will find that more than one wire will share the same terminal connection. This cuts down on soldering connections.) To avoid having the NPN power transistor sub-assembly rattling around loose inside the hollow cavity of the time generator, attach it upside down onto the top of the motor mount assembly with a small amount of hot glue.

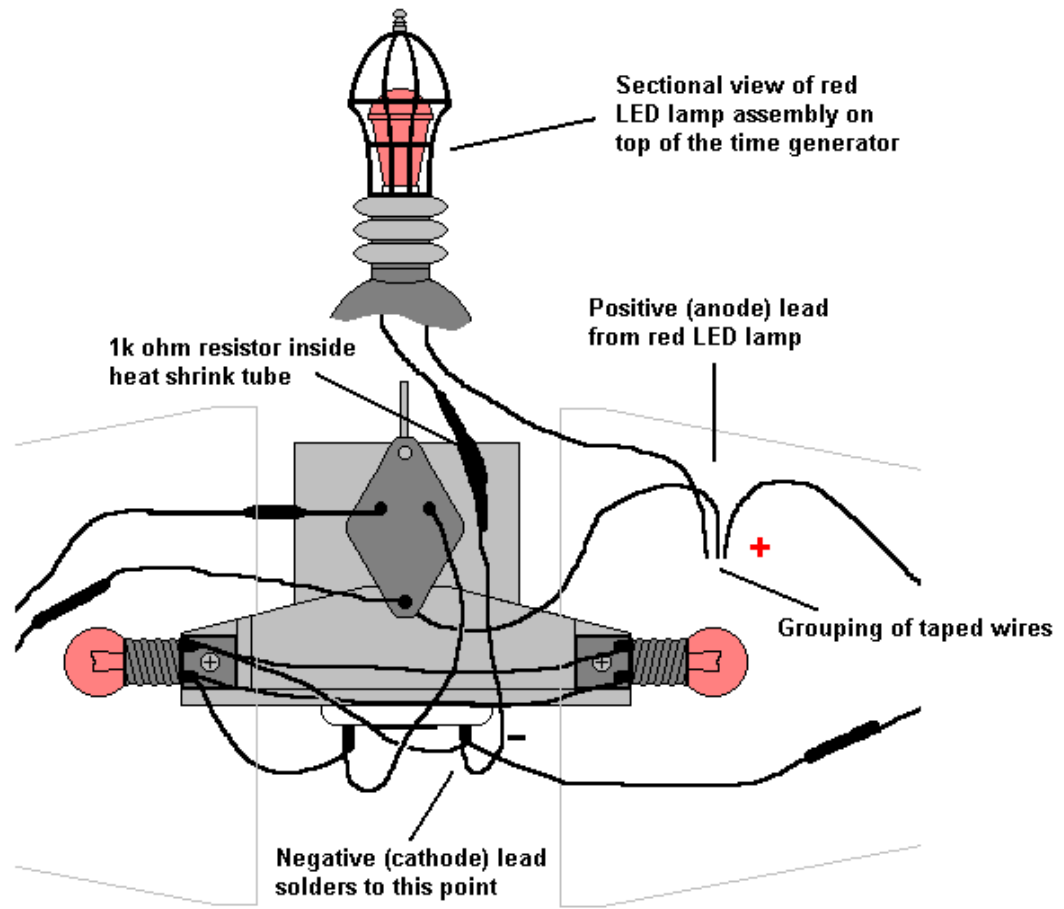


5. Now you are ready to begin wiring the left side framework rail wires. First you will need to slide the left side clear cast time generator cone over the wires or you will not be able to get it on later because the wiring connections will interfere. The order of the wires matters when you solder these connections together. The way to determine the order once and for all is to get a 9 volt battery and touch the two wires to the two terminals. Use the polarity symbols on the 9 volt battery terminals to find out which of these two wires is which. Using an extra short length of wire, solder the negative lead to the terminal on the back of the DC motor indicated below. (Note: It will be the one with only one wire soldered to it at this point.) Temporarily tape the positive lead to the remaining lead wire attached to the NPN power transistor case. We will solder these together in a later step.

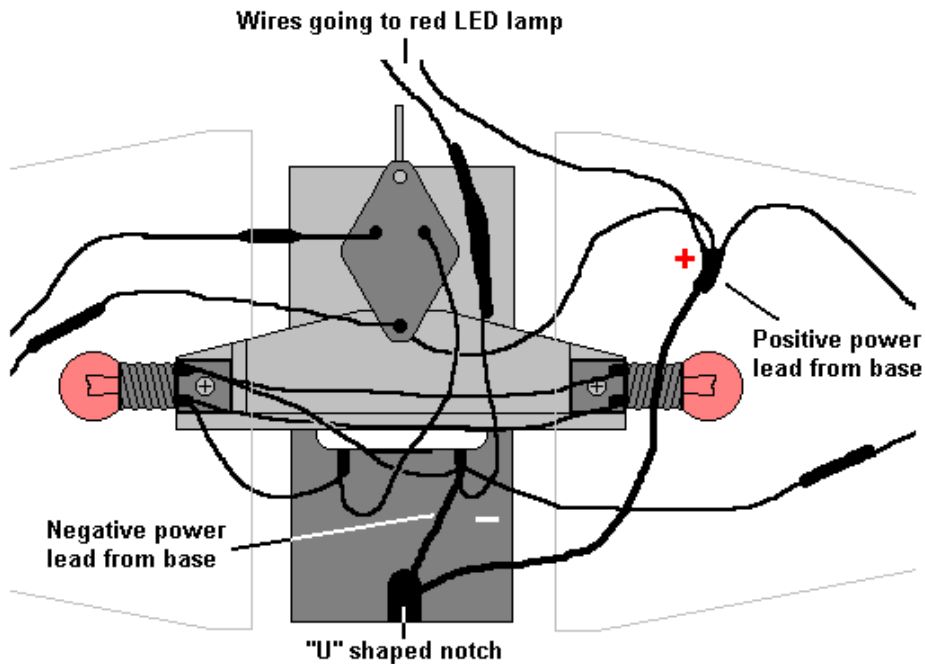


6. It is now time to solder the wires coming down from the red LED lamp assembly on the top of the time generator. First you will need to solder a 1k ohm resistor to either one of the two leads that lead to this red LED lamp. Cover the whole body of the resistor and the connection point to the wire with heat shrink tubing to prevent short circuits. The choice of which wire and the direction of the resistor on that wire do not matter. You will now need to establish which of the two wires is positive (anode) and which of the two wires is negative (cathode). The best way to do this is to again use the 9 volt battery method of touching the wires to the terminals both ways and seeing which way lights the red LED lamp. Solder the negative wire (cathode) to the terminal on the back of the DC motor indicated in the diagram at the top of the next page. Take the other lead (anode) and tape it temporarily to the two taped together leads from the previous step. Again, these will be soldered together in a later step.
7. Take the entire time generator/dish assembly and attach it to the base with the four nuts and bolts provided. If you are going to run your Time Machine with a 9 volt battery, snap the battery into the clip prior to doing this attachment of the two parts. If you are going to purchase the power adapter and run it from wall current then just leave the battery clip inside unattached to anything. **Do not use both**

power sources at the same time! The power supply current could possibly cause the battery to overheat and explode. As you drop the time generator into its place, feed the two wires that you soldered to the master on/off switch and the adapter plug way back in Steps 7-8 up through the pre-cast notch in the front of the motor mount assembly. You should see the two wires appear up inside the hollow chamber of the time generator housing. Remember which wires are which.



8. Solder the negative wire from the base (which is the one attached to the power adapter plug) to the negative leads attached to the terminal plug on the back of the DC motor. Put a length of heat shrink tube over the positive wire from the base (which is the one attached to the master on/off switch) and solder all the temporarily taped together wires to this one. Slide the length of heat shrink tube over this connection to prevent shorts and shrink it. You, my friend, are now done with the wiring. You might want to double check your work with the provided electronic schematic drawing at this point just to make sure everything is correct.



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Final Assembly:

1. Glue the cones on the left and right side of the time generator to the time generator housing. Make sure that the points at which the decals wrapped around the cones are touching end to end are facing down. If you are using a 9 volt battery as a power source, do not glue the left and right side framework rails to the outer ends of the cones. This is done because you will need to be able to lift the time generator/dish assembly of the base a little to replace the battery once in a while. The outer framework rail should help hold the left and right framework rails tight to the outside openings in the two cones. Carefully arrange the lengths of wire within the hollow cavity of the time generator so that they are all out of the way and not seen against the surface of the cones or blocking the incandescent lights inside. If you are only going to run your Time Machine model from the power adapter, then you can glue the ends of the cones to the left and right side framework rails at this point.
2. Insert the time key into the control panel and move it to the most upright position. You are finished! If you want to operate the Time Machine model, turn the electronics on and off using the master switch on the bottom of the base. Moving the throttle forward will accelerate the movement and light activity. Have fun!

Additional Information:

Painting: Please refer to the color art supplied in the ¾ CAD drawing for final painting. Use any good quality model paint. We also recommend that you watch the movie again to refresh yourself with the details of the machine. It is your decision whether or not to weather the finished model.

Decals: The water transfer decals that come with the kit require a bit of careful positioning work to get them located in their proper places. Keep them very wet until you get them applied correctly and then use any commercially available decal setting solution to make the decals pull tight to the surface of the cones and eliminate wrinkles. Apply decals as you would any traditional waterslide decal. We suggest using Microscale Decal Film and following the instructions on the bottle. Use the provided artwork and schematic drawing to determine exact decal locations.

Legal: Masterpiece Models assumes no responsibility for alterations in the time continuum should any of these kits actually work.

If you have any questions or comments regarding this kit, please feel free to e-mail us or call at:

info@masterpiecemodels.com or (360) 836-8569

Thank you for purchasing
The Time Machine Model.
We hope you enjoy it.



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Special thanks to John Geigle and Matt Kilwein for the idea, coordinating, & mold-making, Robert Willard for the masters, circuitry, & media, Chris Perrotta for the drawings & blueprints, and Don Coleman for the decals.

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