



Korber Models

Scale Model Railroad Structures

165 E Main Street,
Atlanta, IN 46031 USA

765-292-2044

www.korbermodels.com

Model 110 HO Scale General Light & Power Substation Instructions

Compiled by: Rich Redmond

Introduction

Congratulations, you have purchased the Korber Models #110 General Light & Power Substation. The GL&P Substation is one of the classic Korber HO Scale kits. This structure represents buildings all across the country that power companies uses in cities and towns to house electrical grid equipment. Structure measures 8"x6".

You can follow the simple, step by step instructions outlined in this document to easily assemble this great looking addition to your layout. We have covered not only the required key steps to build the building so you can get it on your layout the quickest, but have also included several optional steps to enhance the appearance.

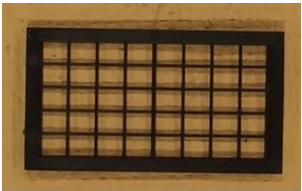
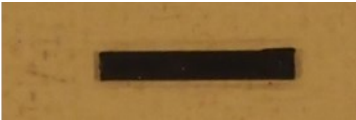


Before you start you may want to read through the instructions to get a feel for the things you will be doing, and the basic order in which they will be done. You are on your way to adding a centerpiece to your layout, so let's get started!



Parts list – (What's in the box)

Take a few minutes to locate all the parts in the box to make sure you have all the pieces you will need and that the quantities are right. You may also want to spread these parts out so that you have a small separate stack of each part and make it easy to find each as you start the assembly process. If you are missing anything, please contact us so we can get you any of the missing items.

Qty	Description	Qty	Description
1	Front Wall with 2 windows and double door	1	Back Wall with 2 windows
1	Side Wall with 1 window offset right	1	Side Wall with 1 window offset left

Qty	Description	Qty	
12	Injection molded windows 5x8 panes 	6	Injection molded window strips 1.25" 
1	Roof material 5 5/8" x 7 1/2" 	1	Sheet of clear plastic "Window Glass"
6	7 1/2" 1/4x1/4 roof & corner supports 		

Materials needed – (What else might I need that is not included)

The Korber #110 GL&P Substation, like any kit, requires a few additional items to complete the construction. We have included a list here, with some color and brand suggestions based on our experience; however you may use any product that fits the function. Please also note that some items are listed as options such that they either make assembly simpler, or are needed only for optional steps

- Flat paint, choice of colors, for doors, windows, trim
 - "Red" automotive primer spray paint to cover all molded brick surfaces such as Krylon Ruddy Brown
 - Antique white craft paint or Roberts Brick Mortar for cement lines
 - Light grey or cement color paint for cement accents on the roof line, side walls and foundation
 - RustOleum camouflage flat spray paints work well for painting window frames and doors
- Small paint brushes
- Paper towels or soft cloth rags
- Medium grit sandpaper or emery board
- Cyanoacrylate (CA) glue. Also known as Super Glue, Gorilla™ super glue works well
 - We really like the new Gorilla brand super glue because it is thicker than most super glues, and allows you to put in on a seam and does not run. This glue is available at most retailers.
- CA glue accelerator (optional) turns any CA glue into quick set glue
- Testor's Dull-cote™ (optional)
- Small clamps (optional)
- Flat black or grimy black spray paint (optional)

1 - Parts Preparation & Painting

Look over all the molded parts and remove any flashing that might be left on them. Flashing is the thin pieces of the molding material that may be left in widow openings and along edges in the molded parts. This can quickly be removed with a razor type knife, a small file, or an emery board.

The parts in the kit will need to be painted to the final colors you select, and it is much easier to do this step before you assemble them. All the wall sections are colored in a brick red and are ready to use, however many modelers find a light coat of flat red auto primer spray paint gives not only a great look, but also makes it easier to add the mortar color lines to the walls later on. In a well ventilated area (outside is good) apply a coat to the inside (smooth side) of all the brick wall sections first; once dry, do the same to the other side. By painting the back side first you avoid any marks that might appear on the brick textured side.

If you elect to paint the window frames, please follow the clean-up instructions in step 2 to trim windows prior to painting. Use a similar process as the walls for the window frames, and doors if you spray paint them. You may want to paint these the same color to create a theme for your #110 GL&P Substation structure. The internal wooden pieces do not need to be painted as they are for structural support only.

Option

An optional step that adds a great deal of realism to any model of a brick building is to add the mortar lines to contrast with the red brick color. The ability to lay the wall sections on a flat surface, when done prior to assembly, makes this detail step simpler. There are several ways to do this, including use of water-based paint (Antique White or Light Grey latex well diluted with water until the consistency is as thin as milk), some commercially available products, and the use of light spackling compound to fill mortar joints. In all of these approaches the general concept is to spread the white product you are using over the brick walls, filling in the mortar line groves in the wall section, and then removing the excess from the top of the bricks. We will walk through the water based paint method.



One simple method we have used is to dilute some water based antique white or light grey craft paint to create a soupy like consistency.

- Cover entire wall section with diluted white paint, letting it settle and collect in the mortar lines
- Wait a few seconds and lightly wipe off excess paint using a slightly damp paper towel or soft cloth until paint is removed from the brick surface, but not the mortar joints
- Keep flat and let dry before moving so the paint in the joints does not run
- To remove haze from brick surface, apply a thin layer of Dull-Cote and wipe gently
- It may require several applications to achieve the mortar line that you want
- A finish light coat of Polly Scale Grimy Black done with an air brush will tone down the grey wash and give it an aged look. (Apply lightly and highlight the area where you would expect dirt to collect flat black spray paint can also be used)

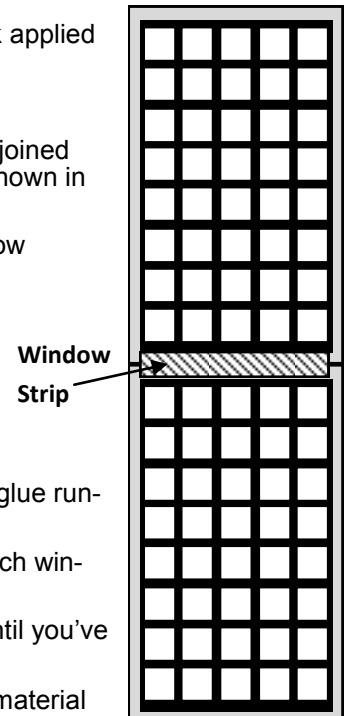
The good news with this option is that if you don't like it, the paint is water based, so you can get it wet, remove it, and start over.

Once dry, this area should be washed using a mix of either watered down black paint, or alcohol and India ink. The purpose of the wash is to settle the black color in the groves/joints around the rocks and give definition. The wash should not be so dark as to overpower the cement/light grey color.

2 - Assemble & Install Windows

The windows are made from injection molded plastic and will have a clear plastic sheet stock applied over the opening from the inside of the model to simulate a finished window.

- Carefully remove any flashing from the window frames
- Each window frame on this kit holds two of the injection molded windows which must be joined together on the ends using the provided small windows strip which is glued in place as shown in the diagram to the right. Repeat to make 6 sets of windows.
- If the window frames have not been painted, and if you would like to do so, paint them now and let them dry before moving to the next step
- Place the walls to which you want to add windows brick side down on a flat surface
- The windows are designed to overlay the window opening from the back, or inside of the building, and will not fit inside the window opening if installed from the front
- Apply a small amount of glue around the edge of the frame and insert over the openings on the wall sections
- Let the glued windows dry before moving the wall sections to a vertical position to avoid glue running or the windows falling out
- Prepare to cut and glue small pieces of window clear plastic material over the back of each window. Consider the following two window detailing option for the windows:
- If you want the window panes to have a hazed affect, lightly sand the window material until you've achieved desired haze effect prior to cutting into small window pieces
- You may also detail the windows with shades by covering the top portion of the window material with masking tape

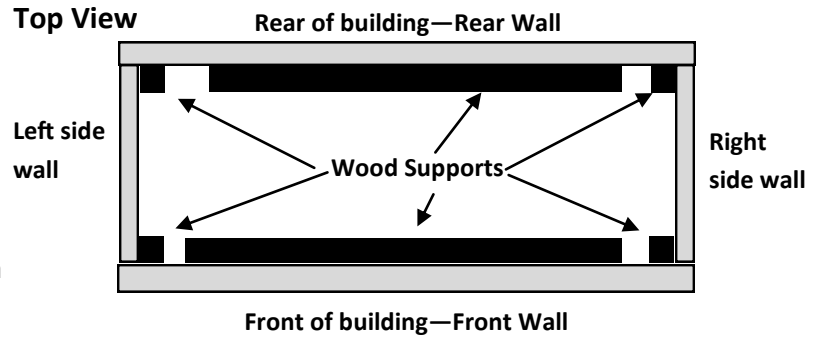


3 - Assembly of Main Structure

The assembly of the main structure is based on making a simple “box” when viewed from the top. There are four walls, two long ones in the front and back, and two shorter ones on each side. 1/4” square wood is used to add strength to the corners, and provide a lip or cleat for the roof section on the top. Below is a top-down view drawing of the relationship of the wall sections and the wood support pieces.

Placement of brick walls

- Take one sidewall and the front wall and line them up to make a right angle. The use of a small square is helpful. The front wall should overlay the edge of the side wall. Glue the two wall sections together, and add the corner wood support piece in the inside corner to add strength and to create a solid right angle
- Some sanding may be necessary. Rough up edges only where you need to glue
- Repeat the last step using the other sidewall, and finally repeat using the other front/back wall to complete the “box”, optionally use clamps as necessary to hold pieces together
- Glue the remaining two 5-3/4” long 1/4” square wood pieces horizontally, **1/4”** down from the top of the front and back wall sections as shown on the drawing above. This will create a cleat to rest the roof on in the next step.
- The black roof material measuring 5 7/16” x 7 9/16” is designed to fit inside the four walls and rest on the two wood roof support pieces. You can glue it in this place. You may want to paint the upper inside section of the walls black to match the roof material.



4 - Final Detailing – Weathering

Your Korber #110 GL&P Substation is now assembled and ready for placement on the layout. You may wish to provide some additional weathering before you install it, as a building next to the tracks would be a heavily used structure with a layer of soot, and would rarely look brand new.

To add a weathered look, spray the entire model with flat black from a distance. This will give a sooty look to the building. Once done you can spray the completed structure with Dullcote to remove any gloss or shine.

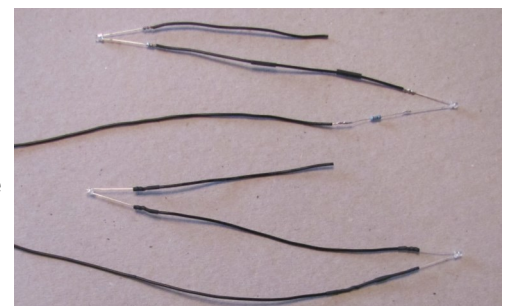
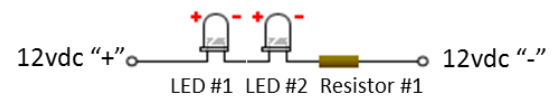
If you choose not to detail the inside of your structure, or light it, an effective and quick way to make a good looking building is to cover the widows with black construction paper from the inside. This creates a dark building look that is more desirable than the view in to an otherwise empty shell of a building.

Option – Lighting

Interior lights add more realism to this great structure. Following the few simple steps outlined here you will be able to add this improvement to your model. Although we outline using individual LED's for the lights, many use incandescent bulbs, or the LED's that come on a role pre-wired work well too. Remember that LED's need 12VDC and are not designed to work directly from track power or another AC source.

The 3mm flat-top white LED's work well as they spread light over a 120-150 degree angle as opposed to the 30 degrees or so that the dome-top LED's give providing an even light inside the building.

This simple diagram shows the basic electrical circuit. The value of Resistor #1 (R1) depends on the LED's used. You can find a good on line calculator and more information on LED's at <http://led.linear1.org/led.wiz/>.



The photo shows how a harness for 2 LED's was made. On top are the LED's and a current-limiting resistor (value depends on what LED's you're using) soldered to black wires. On the bottom, shrink tubing has been added to hide the resistor and the solder joints prior to assembly. You need to be careful to keep the polarity correct on the LED's (don't get the "+" and "-" wires mixed up). Make up and test each harness prior to installation. Once the harnesses are assembled (you may need several for the size of the building), glue them in place on the inside roof and wall of the structure.