



HO Scale Structure
**NORTHERN LIGHT &
POWER SUBSTATION**

933-3025

Getting power from the generator to the customer involves all types of specialized equipment and one of the most important is the substation.

To transmit electricity over long distances, the amperes are reduced and the voltage is increased, using transformers at the power plant. For safety, this high voltage is handled on high-tension power lines, strung on tall towers.

In principle, the substation works much like your power pack, by taking high voltage and reducing it to a safe level. This is done with large transformers, which take their power from the high-tension lines. A series of switches route the lower voltage into service lines, which connect various customers. (Before reaching the customer's home or business, the voltage is dropped again, using a smaller transformer located on the power pole).

Although substations were only fairly close to each other, technological advances have made it possible to transmit high voltage electricity over very long distances. As such, one power plant may serve a large number of substations, which can be miles away, and are remotely operated by a dispatcher.

Being in close proximity to overhead lines and equipped with various steel fixtures, substations are frequent targets for lightning, especially in rural areas. Each substation is protected by lightning arrestors, which are mounted in a high location to make them a better target. Each is wired to provide a ground for the bolt, drawing the immense surge of current safely away from the equipment.

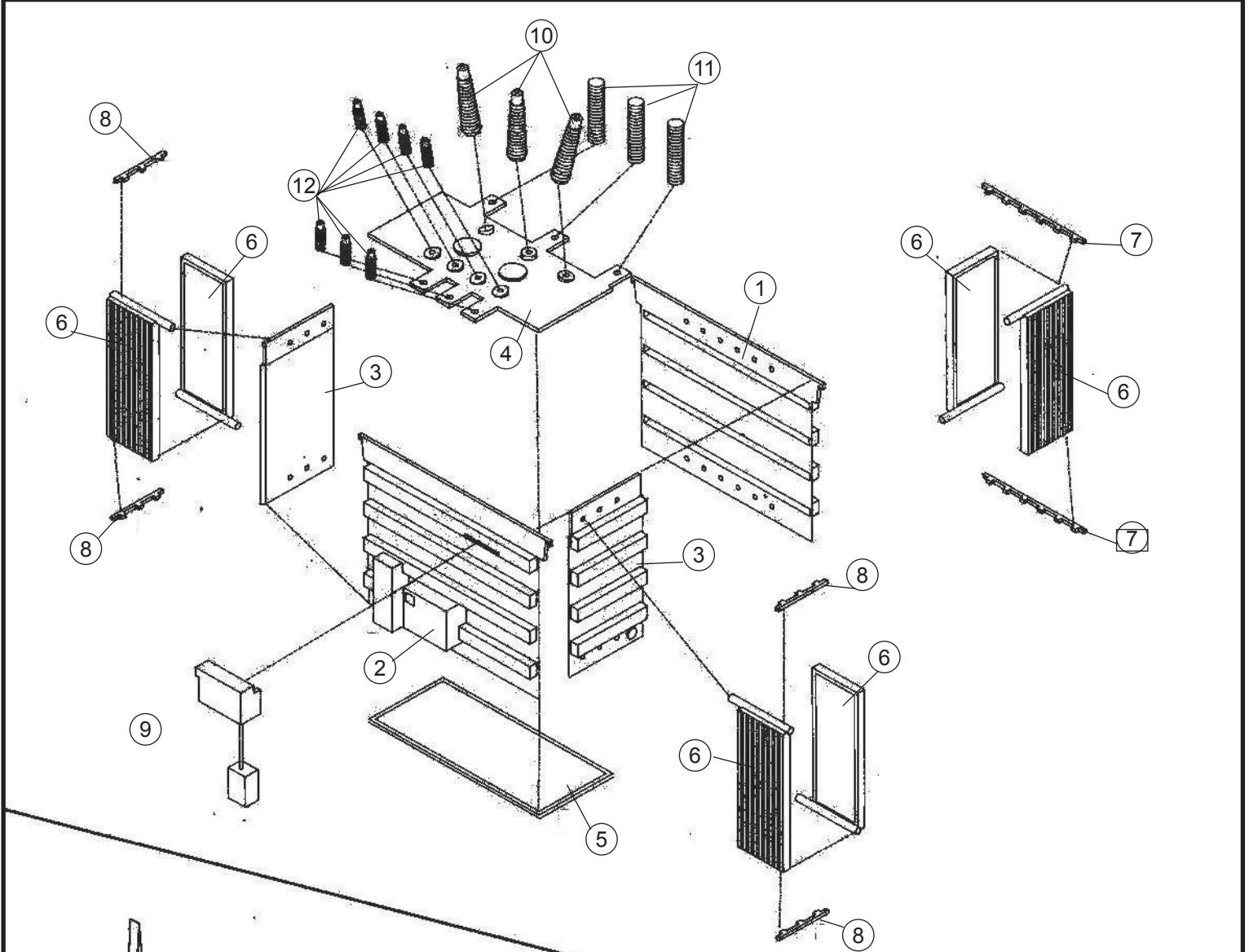
Substations can be found in almost any location, from a wide-open rural setting to a congested industrial park. With the ever-present danger of electricity, these facilities are carefully fenced and most are brightly illuminated at night.

This kit is perfect for use with the Northern Light & Power Station (933-3021) to model a large industrial powerhouse or public utility company. By shortening the base plate (use the cut line on the underside) and installing the appropriate details, this kit can be used to model a typical step-up transformer, where the switchgear would be installed inside the Powerhouse.

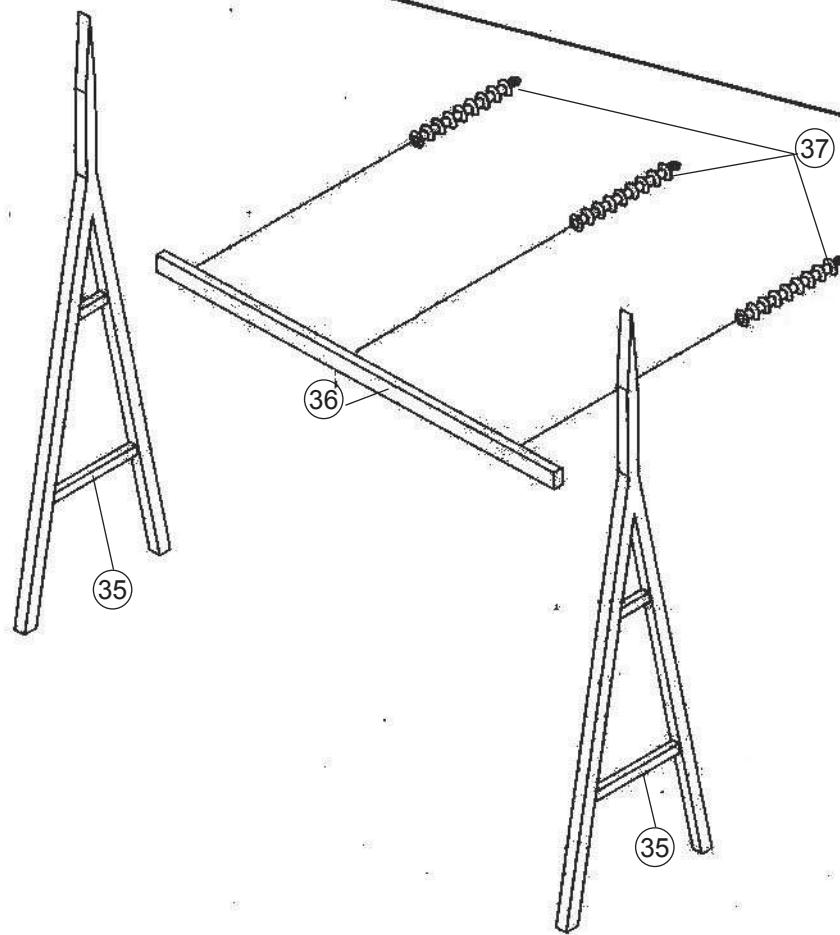
By combining the complete kit with the High Voltage Transmission Towers, (933-3121) and Electric Utility Pole set (933-3101) you can build a highly detailed substation, suitable for use in any location along your railroad.

GENERAL ASSEMBLY INSTRUCTIONS

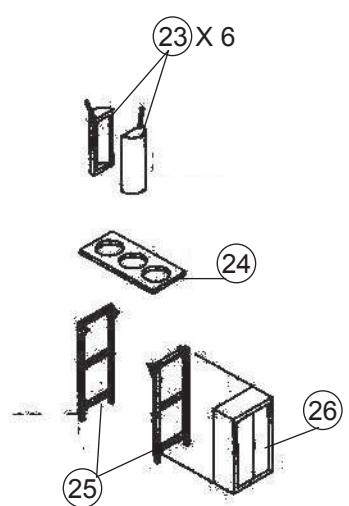
1. All parts should be test-fit before actual assembly. Any flash, molding gates or other extra material that interferes with a tight fit should be removed with a hobby knife or file.
2. If you intend to paint the model, painting should be done before assembly. Windows and doors are most easily painted while still attached to the sprue. Decals do not adhere well to bare plastic. If not painted, surfaces to which decals are to be applied should be sprayed with a clear semi-gloss finish. After the decals are dry the entire structure can be sprayed with a clear flat finish to protect the decals and eliminate plastic "shine"
3. Wherever practical, gluing should be done by holding the parts in position and applying liquid plastic cement to the joint with a small brush. Wall joints should be glued from the inside. If parts have been painted, best results are obtained if the paint is scraped from the joining surfaces.



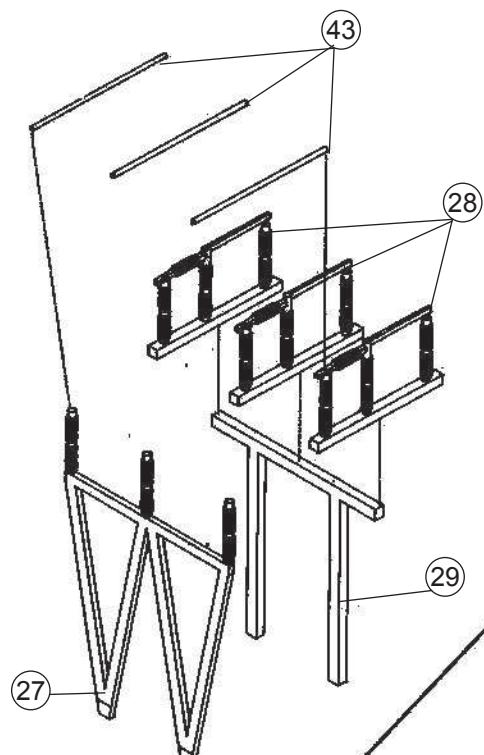
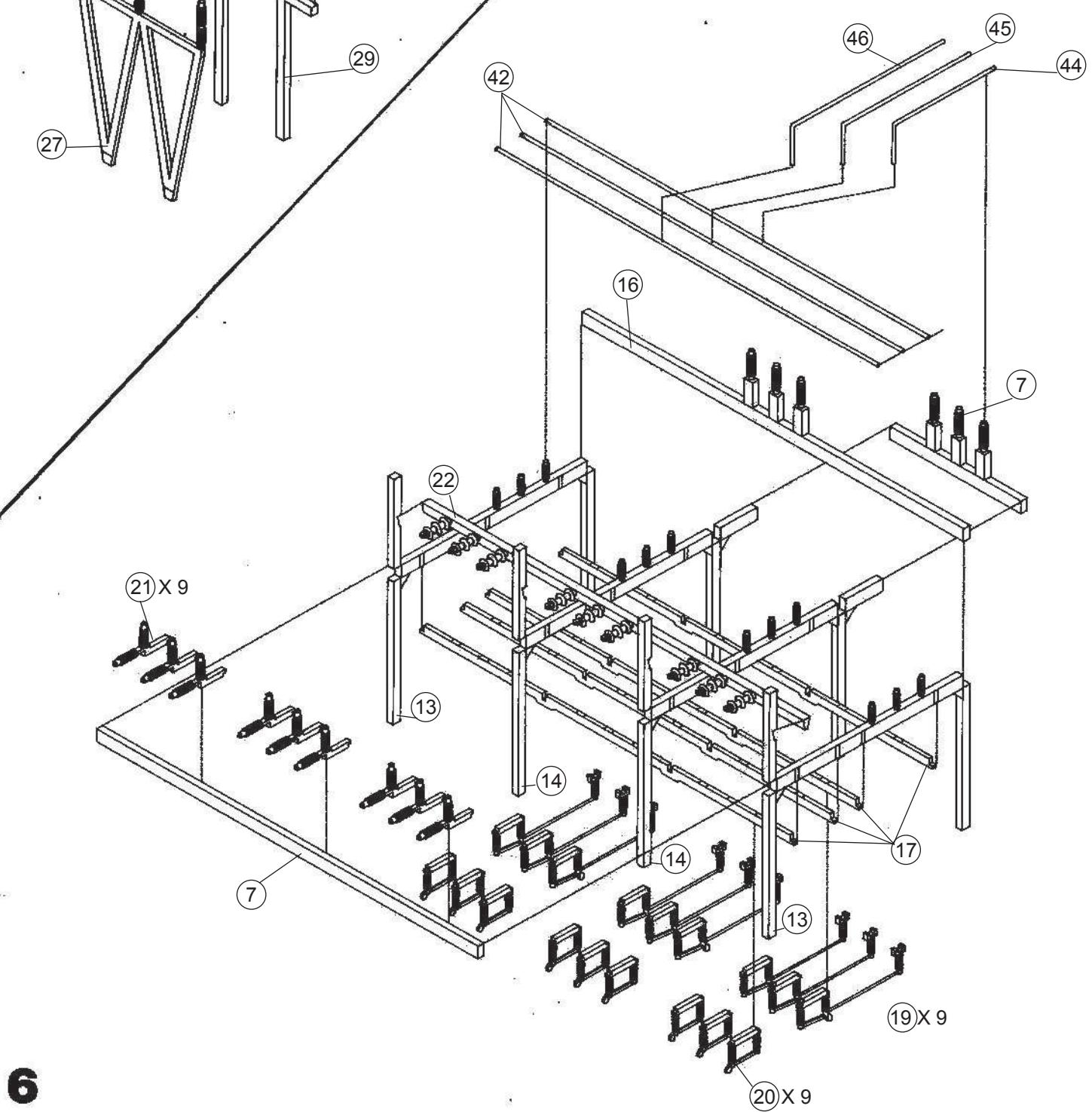
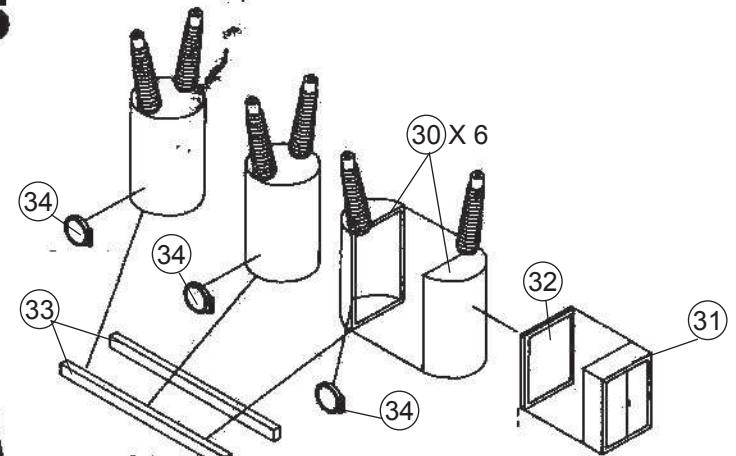
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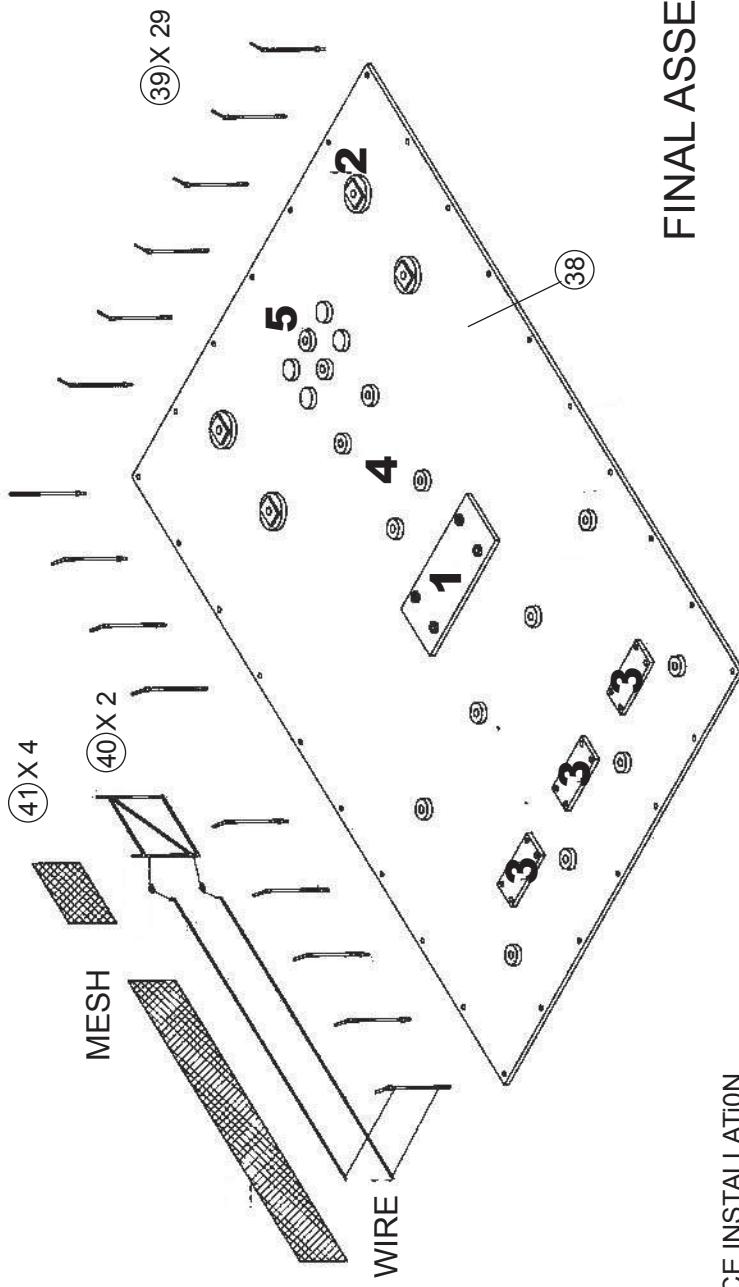


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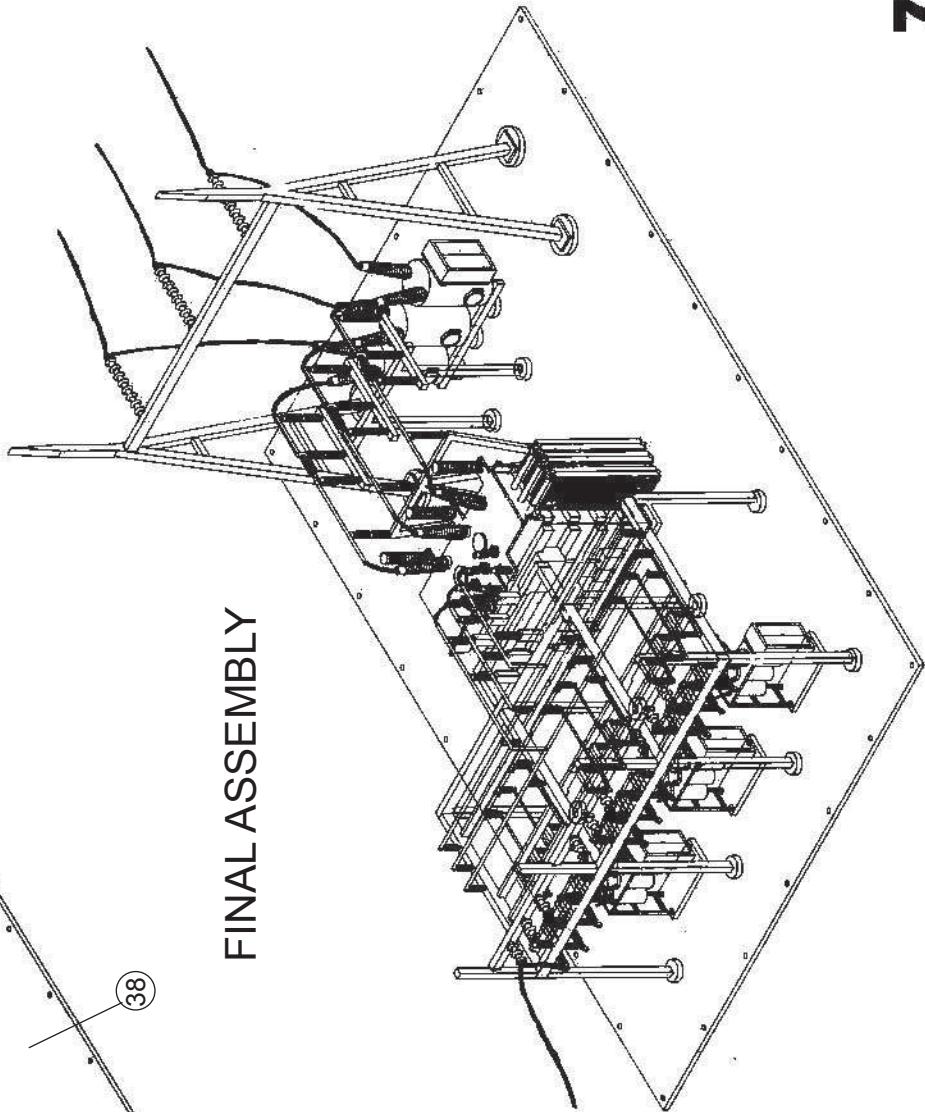
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DECALING

1. After cutting out the decal, dip in water for 10 seconds, remove and let stand for 1 minute. Slide decal onto surface, position and then blot off any excess water.
2. Lightly brush Micro Sol® on top. This will soften the decal allowing it to conform to irregular surfaces. **DO NOT TOUCH DECAL while wet!**
3. When the decal is thoroughly dry, check for any trapped air bubbles. Prick them with the point of a small pin or hobby knife blade and apply more Micro Sol®.



FINAL ASSEMBLY



FENCE INSTALLATION

1. Trim bottom of posts, leaving $1/16$ " below "collar".
2. Install posts in holes around edge of base, with angled top leaning outwards. Leave out the center post on one of the long sides, for the gateway.
3. Cut wire to length and glue to the outside of the posts. The lower wire goes on top of the bottom "collars" on the posts and the upper wire goes underneath the top "collars".
4. For the gate side of the substation, measure from the corner posts to the gate posts and add about $1/8$ ". Cut four wires to this length and bend the last $1/16$ " of each at a right angle (one end only). Glue the wires in place with the bends pointing upwards about $1/16$ " beyond the posts. CA type cement works best.
5. Glue the hinge pieces (part 41) to the gates, pressing the open ends onto the vertical bars of the gates. Make sure the spacing of the hinge pieces matches the spacing of the wires. When dry slip the hinges onto the upward bends on the wires.
6. Cut the mesh material into strips $15/16$ " wide and glue to the wires using CA type cement. Painting using spray aluminum color is best done before attaching the mesh to the wires. Mounting the mesh onto contact paper makes it easier to cut it without distorting it.