Scratch-built HO-scale Exterior Light poles:
Step-by-step Instructions

Step 1 - Drill a 3/64" (0.047") hole* completely through a 4-1/2" long piece of 1/8" OD styrene tubing, ¼"** down from one end. (For a single-light light pole, drill through only ONE side of tubing.) Using a razor saw blade, texture the styrene tubing by holding the blade perpendicular to the tubing and scraping the surface long ways. This will leave long grooves in the styrene material that mimics the grain found in line and light poles. (See photo on pg. 2 for detail)

*Alternative Drilling Method - As the drill bit begins to cut into tubing material, slowly angle the drill bit downward (into the hole) until you achieve a 45-degree angle. Continue drilling until drill bit breaks through tubing wall. This will create an angled hole so that you will only need to feed the bulb wires downward and out the bottom of the tubing, rather than the method described in Step 4 below.

**This measurement is merely a suggestion. Feel free to adjust it to suit your taste and/or era. Below is ½" for a single-light light pole that worked well.

Step 2 - Prime and paint MINIATRONICS HO-scale Brass Lampshades. (*See* Fig. 1 in "External Light Poles - Diagram.pdf" for details)

Step 3 - Remove a MINIATRONICS 1.5V 30mA 1.2mm* OD incandescent bulb from the package, prebend the wires at the specified points (Fig. 2), and apply Cyanoacrylate (CA) adhesive to stiffen them. Once the CA adhesive on the wires is dry to the touch, slip a lampshade over the bulb and glue them together with a thick glue to form a light fixture. (I like to have the bulb protrude just slightly below the bottom of the shade - See Fig. 1) Make sure that the lampshade is level before the glue sets up.

*Alternative bulb size - If using 1.7mm bulbs, CA is not required to hold the bulbs in, as the fitting is snug and should hold them in place by friction. (Obviously, this means that there is also no need for positioning the bulb.) The 1.7mms also give you a choice of voltages: 1.5V or 12V. (If 12V bulbs are used, see Step 12.)

Before proceeding to Step 4, be sure to read "*Alternative Drilling Method" in Step 1 above.

Step 4 - Take the opposite end of the light fixture and feed both wires into the 3/64" hole of the 1/8" OD tubing you drilled previously. The 30 ga. insulated wires that are attached to the light are stiff. So it's best to gently feed the wires up and out the short (top) end of the tubing first then back down through and out the other end of the tubing, making sure to deform the wires as little as possible. Once the light fixture wires are through the tubing, position the light fixture so that it resembles the picture in Fig. 2.

Step 5 - Repeat Steps 3 and 4 for other light fixture.

Step 6 - After positioning both light fixtures, fill the end (top) of the light pole with spackle or squadron putty and let dry. (Fig. 2)

Step 7 - Pair one wire from one light fixture with any of the two wires from the other light fixture. (Fig. 1) (This is done so that the lights can be wired in parallel.) To find which wire goes to which bulb, pull any one of the four wires slightly and observe which light fixture "twitches". Pair the other remaining two wires.

Step 8 - Turn on the soldering iron and allow it to heat up for a few minutes. Slide a 3/8" piece of 3/64" heat shrink over each of the wire pairs. Position each section of heat shrink so that one end is ¼" from the deinsulated end of each wire. (Fig. 1) (This will help keep each pair of wires pressed firmly together while you solder them to each other.) Use the area behind the tip to shrink the 3/64" heat shrink around each wire pair then solder the paired wires together.

Step 9 - Measure the length of wire needed from where the light pole will be situated to where it will attach to the switch, added two inches, and cut to length. Tin and solder one piece of 22 ga. black stranded wire to one light fixture wire and one piece of 22 ga. red stranded wire to the other light fixture wire. Slide a 3/8" piece of 1/16" heat shrink over each 22 ga. wire and position them so that they only cover about ½ of the soldered junction. (Fig. 1) (This will make it easier to go back and unsolder the wires if and when your lights bulbs burn out.) Use the soldering iron to shrink the heat shrink around wires.

Step 10 - Before positioning your light pole onto your layout, prime and paint the light pole and let dry.

CONGRATULATIONS!
You've just completed your first light pole!

Step 11 - Drill a 1/8" hole into your layout base, slide each set of light fixture wires through the hole and affix the light pole to your layout. If your layout base is extruded foam, cut a piece of 1/8" heat shrink, slide it over both sets of wires, and up over the base of the light pole*. (Fig. 1) Use the soldering iron to shrink the heat shrink onto the light pole base. (The heat shrink will tighten up the fit inside the 1/8" drilled hole.)

Step 12 - Attach each wire assembly to your SPST (Single-Pole/Single-Throw OR on/off) switch and wire the switch to a 1.5V transformer. (Or, 12V transformer, if larger 12V bulbs are used.)

Feel free to make modifications to this as you see fit.