

## The Big Train Project Status Report (Part 108)

This month we'll look at a project still in work at the EnterTRAINment Junction (EJ) layout -- lighting the theater sign and marquee on the Middle City's Fox Theater. The EJ building was modeled roughly after the Fox Theater in Detroit, Michigan.

(See <http://buildingphotos.com/venues/fox-detroit.php>, if you're interested.)

When the MVGRS EJ volunteers upgraded the interior lighting of the Fox Theater back in September of 2013, we knew that there was something significant missing (Figure 1). The sign and marquee needed to be lit, but we didn't know how to do that in a sufficiently simple way. But when it came time to upgrade the first floor interior along the main street side of the building, we decided that we could no longer postpone lighting the marquee and sign, lest that unrealistically dark feature would detract even more significantly from the improvements made to the rest of the building.



Figure 1 Fox Theater after Interior Lighting Upgrade (Sep 2013)

We explored external lighting options like spotlights and fluorescent paint, but none were easy enough to implement, and none would be as good as lighting the sign from the inside. Since we didn't know that the interior of the sign was like, we were unsure that it could even be done. The only way to find out was to remove it (and the marquee) to see if it was possible. We knew the sign was held on by two screws. Fortunately it was not also glued in place, so removing it was easy (not so for the marquee). They were replaced by temporary mockups (see report Part 107).

The sign was made of clear plastic, painted on the outside, with a raised border painted gold and with raised letters made of translucent orange plastic, glued in place (Figure 2 left). The interior of the sign had two wooden blocks to receive the mounting screws from inside the building, and it had triangular “frames” to hold its shape (Figure 2 right). The frames were located behind the lower half of each of the letters, and would need to be moved so they wouldn’t interfere with the lighting. We tried to gently remove the letters and were mostly successful (we broke only two of the six, which fortunately were repairable). We found that each letter had an outline scribed into the plastic background to indicate its location. This turned out to be immensely helpful not only for determining where to put the letters back (in spite of paint), but also where the paint needed to be cleared to let the light through from behind.



Figure 2. Fox Theater Sign Lighting Upgrade

We found out that the paint on the background for the letters was not opaque, and any variation would unevenly show-through the light from behind. The background needed to be repainted with opaque paint. The existing paint was cleared from the inside of the scribed lines for the letters; the removed letters were used to trace a pattern on masking tape; the tape was cut slightly inside the pattern to form tape replicas of each of the letters; and the tape was applied “centered” inside the scribed marks. (The reason the replicas were cut slightly smaller was to prevent light leaks around the edges of the letters.) The gold edges of the sign were also masked with tape. Then the background was painted with black paint (it took three coats to ensure that it was opaque – Figure 2 left).

Because the wooden mounting blocks had to be moved away from the backs of the top and bottom letters, a backing board with chamfered edges was made to provide some flexibility in receiving the screws needed to hold the sign to the side of the building. The triangular frames were moved to the spaces between letters so that they wouldn’t interfere with either the light strip or the light they shed on the backs of the letters. The center points of the frames and the mounting blocks were cut out to provide a path for air to flow up through the sign (Figures 2-right and 3-left). It was important to allow for some air flow through the sign to dissipate some of the heat which the LEDs created and so prevent heat buildup which could reduce LED life. The sign would act like a chimney with an upward draft created by the heat from the LEDs. Aluminum tape was added to prevent any light leaks through the central joint at the front of the sign.



Figure 3. Fox Sign Lighting Detail

The LEDs for the lighting were mounted to the back board in sets, one for each of the letters. Each set, in the approximate the shape of the letter, was glued to a wooden strip angled with triangular blocks so that the lights would be parallel to the backs of the letters (Figure2-left and 3-right). The notch filed into the back of the lower mounting block (Figure 3-left) was for routing the wires to a space below the lower block where they all could be connected with wire nuts to the pair of feeder wires. The light sets were made so that each could be removed independently of the others in case replacement or repair was needed. Because it was difficult to exactly position the lights for even lighting of the letters while the back was off the sign, the back board had slots which would allow some sideways adjustment of the light set for each letter. Each set was attached to the back with two screws through their specific slots (Figure 4-bottom).



Figure 4. Light Position Adjustment Detail

So, with the back screwed to the mounting blocks, the position of the lights adjusted for even lighting, and the power connected to the feeder wires, the sign looks ready for mounting back onto the building (Figure 5). That will be done when the marquee and ticket booth are also ready for installation. More on that subject next time. Stay tuned.

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Figure 5. Ta-Da!