

It's great to live in the PCR! The people are great and the talent pool is fantastic. Let me tell you a story about a project I just completed on my Union Pacific in Niles Canyon layout. My prototype, the UP's Oakland Sub from Niles Jct to Radum and the Milpitas Sub, was fully signaled in my era (1999). I've been working on implementing signals and a modern form of Centralized Traffic Control (called Digicon) with fellow modeler Steve Williams taking the lead in implementing a JMRI application called CATS. By early summer of 2010, Steve had CATS working fairly well and we decided it was time to start experimenting with signals. Unfortunately no one was manufacturing an accurate model of the Union Switch and Signal (US&S) type H2 searchlight signals with the correct ladders and bases for the former WP 1st sub, although BLMA has indicated they would be available in 2011 [now Spring 2015]. I didn't want to go to the expense of good quality layout signals if they were not accurate and I didn't want to wait either. So we decided we'd need signal repeaters above the layout in any case and we could implement the signal system with the repeaters and install the layout signals when BLMA released them. [In the end I contracted with ISS to make the correct bases and masts and kit them with BLMA US&S H2 heads]

So what is a signal repeater and why would you want them? They are extra signals that are mounted above the backdrop so they can be seen even if: the primary signal is on hidden track, the primary signal points in a direction that can not easily be seen by the operator, another operator is standing your line of sight, and since we used color light signals for the repeaters (stop light or "Type D" signals,) color blind operators can follow them (unlike searchlights). The signals do not look like the prototype, they are schematics on faceplates with LEDs mounted in styrene boxes. See Fig 1

Why does living in the PCR matter? Because a group of us meet at the Chili's in Santa Clara every Friday at 11:45 for lunch and to talk trains. I mentioned my project to fellow "DCC luncher" Dave Falkenburg and he offered to design a small circuit board for me that would provide a mounting for the LEDs and resistors for the "Control Point Triad" of three signals seen at each end of every CTC controlled siding (a high double signal, a high single signal and a low single signal). The board would be reversible so by flipping it over and stuffing from the back it would handle either end of a siding. By Sunday Dave had completed the preliminary design and emailed it to me for review. I made some minor changes and Dave had the final design by mid week. Dave then combined my design with a board he was doing for the Silicon Valley Lines club and sent it to a short-run circuit board fabrication house. In another two weeks I had my boards for about \$20 ea, [today this would be about \$3ea] less than the cost of building them from perf board and much easier to build.

I fabricated the boxes out of .040 Evergreen styrene purchased at the Train Shop but I was having trouble getting my faceplates drilled with enough accuracy to assemble well. I was stumped until I remembered that Coast Division AP chairman Kermit Paul had given a clinic on laser cutting. I called Kermit and asked if my problem could be solved with a laser cutter and asked if he could recommend a laser cutting service. His answers were, "Yes", "I have a suitable laser cutter" and "when do you want to come by?" My answer was: "Next Tuesday!"

The following Tuesday I stopped by Kermit's well equipped machine shop and we discussed materials (we settled on a two layer plastic which allowed us to engrave the legends through the white top and also cut precise holes in base dark material). A quick trip to the plastic supply house with a stop at Just Trains on the way back and we were back at Kermit's. He set me up with a graphics program (Corel Draw) and I was able to transfer the faceplate design in a few minutes. Happily Kermit had a template which made short work of determining which lines were cuts and which were engravings. \$15 of materials provided enough for my 13 faceplates plus a few extras that become necessary as the project continued. My layout was signaled and running under CTC even though the BLMA searchlights are still months away. Only in the PCR!

Captions:

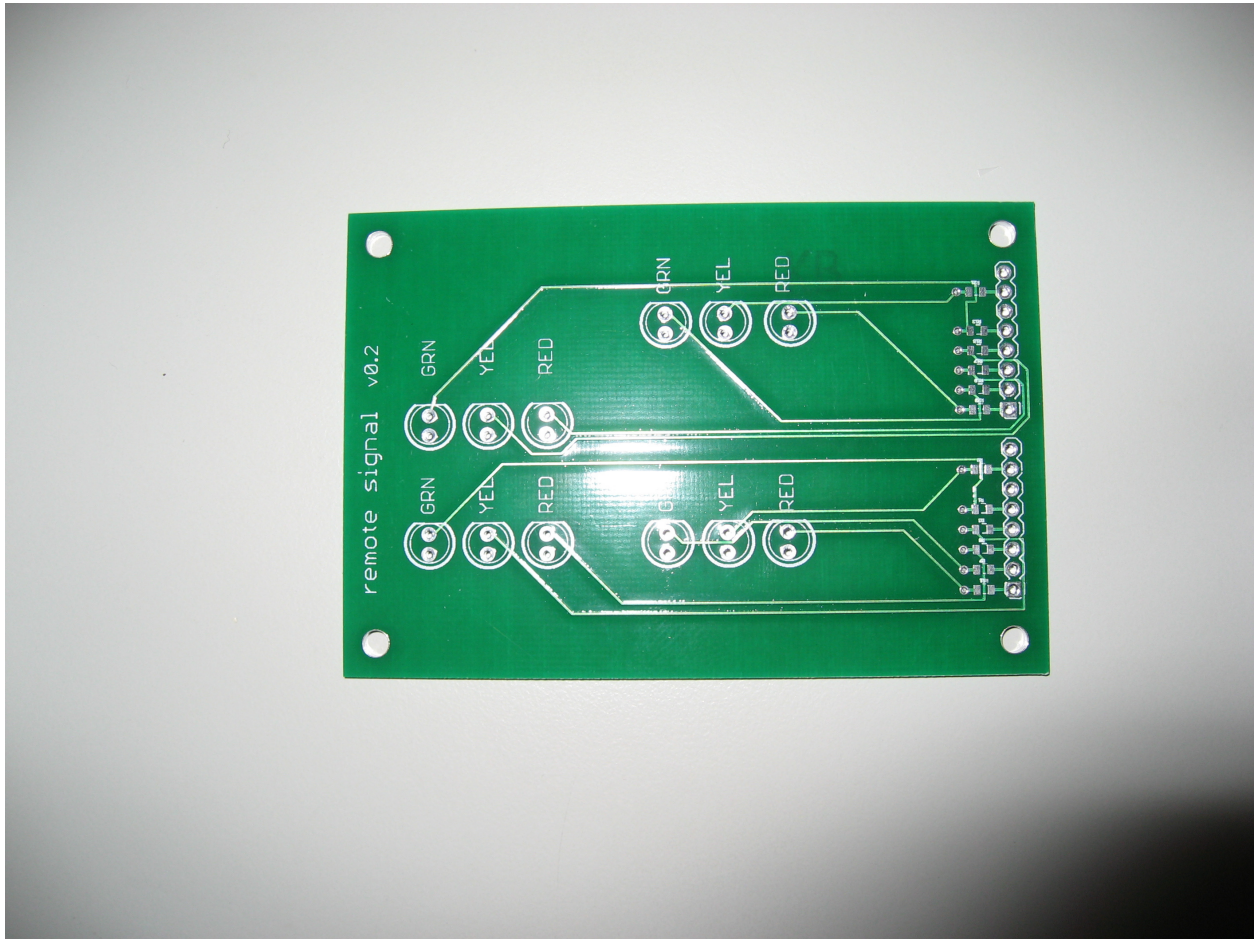


Figure one shows the front side of an unstuffed circuit board

Figure two shows the styrene box, assembled circuit board, and laser cut and engraved face plate

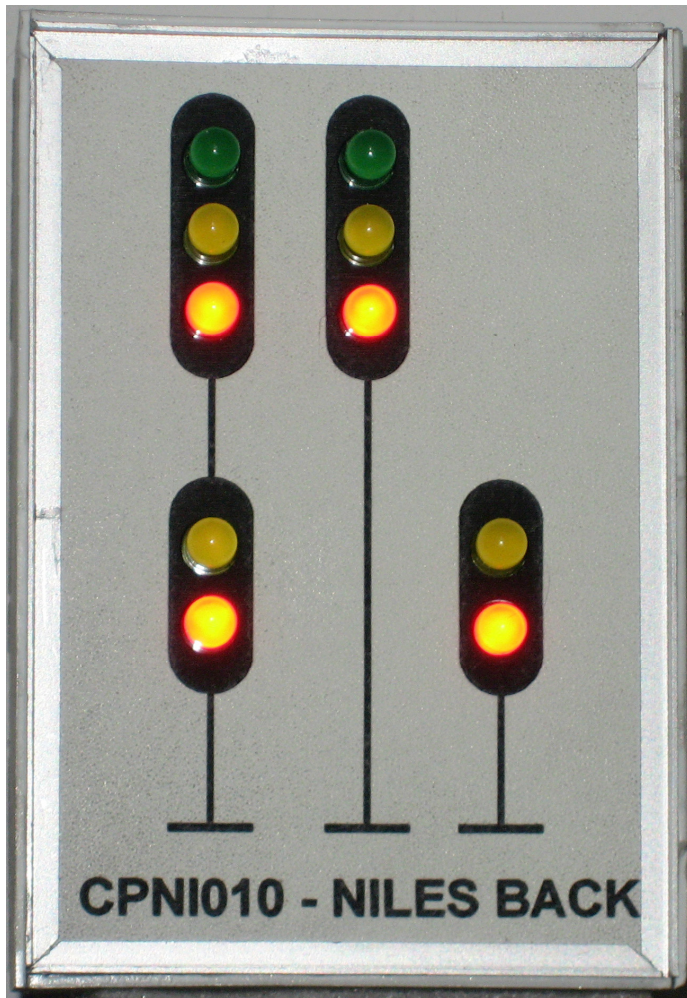


Figure three shows a repeater in service. Note the trim made out of Evergreen 294 angle cut with a NWSL chopper. The red lights are all lit indicating that no route has been cleared through the interlocking.