A&O The Fast Clock

Bob #1 February 14, 2016, 10:34pm
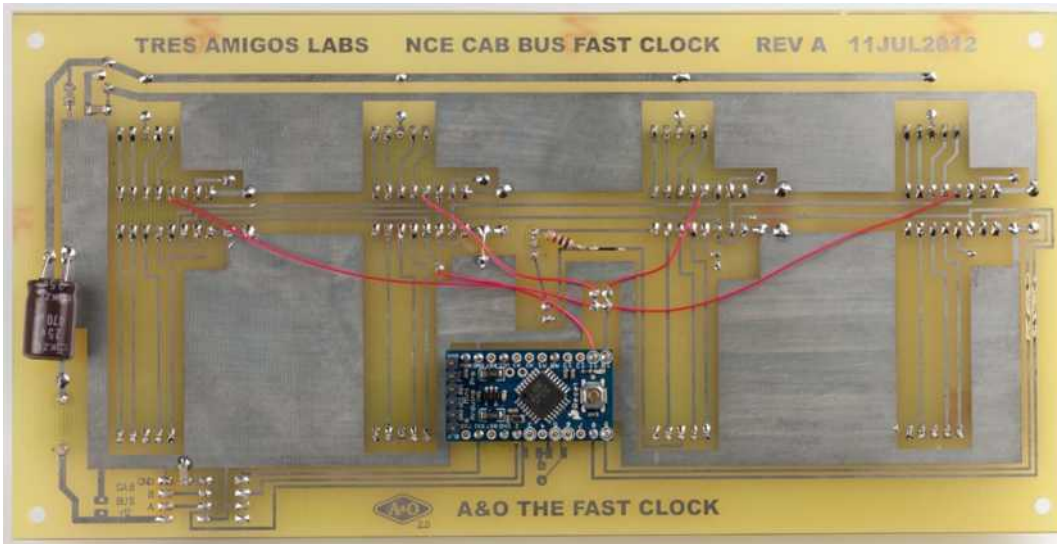
Taking to heart Yogurt's merchandising advice in Mel Brooks movie *Spaceballs* Tres Amigos Labs is pleased to announce

[size=150]**A&O The Fast Clock!**[/size]

This 12/24 hour clock connects to the NCE cab bus and draws about the same amount of power as an illuminated Pro Cab. Numerals are 2.3 inches tall because[size=150] everything is larger in O-scale.[/size] In 12 hour mode, the rightmost decimal point indicates PM. The clock automatically selects 12 or 24 hour mode according to the setting of the NCE command station.

The roughly 4x8 inch board uses an Arduino Pro Mini from Sparkfun in Boulder, CO. There are a few jumpers as this is a home etched single sided board. Source code is only about 100 lines of C++.

A production run of 5 Rev B clocks begins tomorrow. The only planned changes are the addition of a missing trace and pads for the 1K ohm resistor tacked above the processor. The resistor's only job is to shunt current around the colon LEDs to better match brightness to the LED numeric displays.

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rnb3 #2 February 14, 2016, 10:34pm

> Taking to heart Yogurt's merchandising advice in Mel Brooks movie Spaceballs Tres Amigos Labs is pleased to announce"

Sooooo… are you selling some "merchandise"?

Those look pretty cool!

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reecol #3 February 14, 2016, 10:34pm

Now that you're merchandising, can we expect A&O The FlameThrower (kids love it) or A&O The Breakfast Cereal next?

May The Schwartz be with you! (and don't order the Special)

Bob #4 February 14, 2016, 10:34pm

Maybe A&O - The T-Shirt?

The full (and only) planned production run of fast clocks is complete, excepting perhaps an extra and special one for the Dispatcher's office. For that one I hope to use 1960's technology NIXIE tubes (on hand, imagime cold war missile launch controls) for the displays, and some special audio annunciation circuitry.

But at the moment, there is a giant but split staging yard control panel to be designed. The upper part contains pushbuttons and LEDs to control the main Dogtown staging yards. The bottom module powers the turnouts and also powers up relays to deliver DCC to the selected staging yard track. In between the two modules a single CAT5 cable runs 12 volt power and a near maximum-length I2C bus between the two (computer 101.)

Bob #5 February 14, 2016, 10:34pm

I didn't order the Special (thanks for the tip, reecol) but I did install the first fast clock. Here's a photo of the installation. David painted the valence a very dark olive green and the case is black textured ABS, so everything but the numbers visually disappear when viewed from the aisle. LED brightness has been coded in firmware to be quite dim so that the clock doesn't become distracting during night ops. When the NCE system is off, but power applied to the clock, it resets to 12 PM and 12 hour AM/PM format as seen here.

At a recent NCMRC club meeting a member asked why didn't I just order RailLogic clocks. Those are excellent products, but are physically larger for the same size numbers, require a large cutout in the valence, and cost about $110 each. Purchasing 6 of them, and adding perhaps $6 shipping, well, you can do the math. These clocks mount with two #6 sheet metal screws in the valence, and are made incorporating a high percentage of low-cost surplus electronics parts, including the LEDs and cases.

Finally, the surprisingly simple steps of writing Arduino C++ firmware to eavesdrop on the NCE cab bus and read the clock packets was personally rewarding. Sometimes one needs success at an easy job to balance out other jobs that help us learn lots of ways to "not make a light bulb" (paraphrasing Edison here.)

In the photo a single CAT5 cable (to be painted black) exits the right side of the case and disappears through a hole in the valence above the clock. Immediately behind the clock, on the opposite side of the Masonite valence resides a 4 foot fluorescent fixture. Making a cutout through the valence for a RailLogic clock would not be a viable option in this location.

David and I planned the clock locations so that each clock could be viewed from many operating positions.

Jeff_Tague #6 February 14, 2016, 10:34pm

Geez, Bob! You just keep krankin' the stuff out! How does this look from an operator's position? (Wish my electronics went this far!)
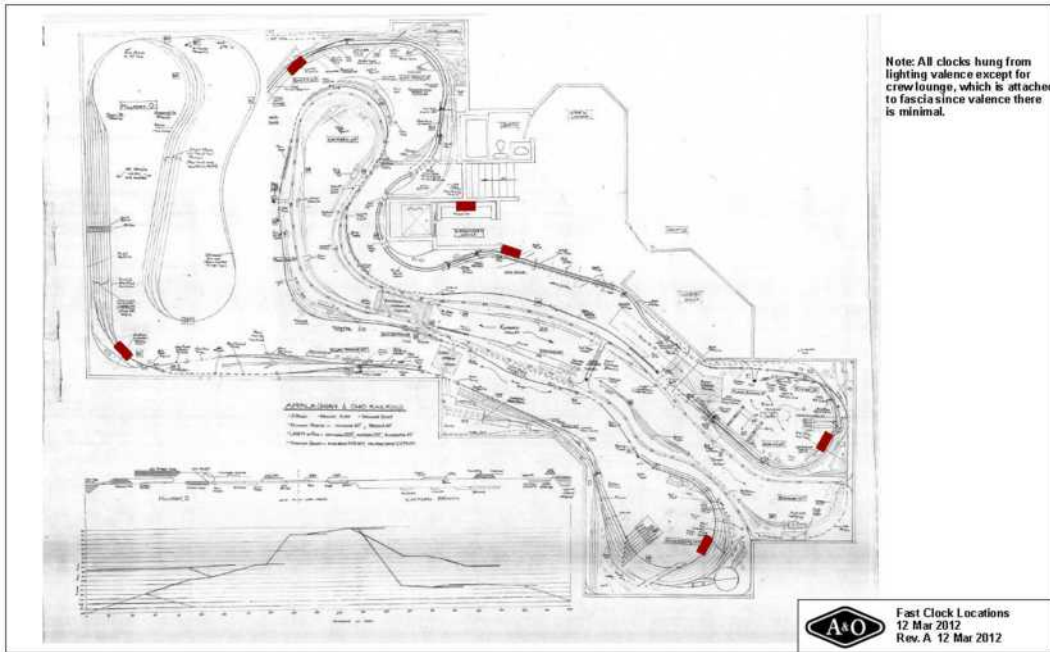
Bob #7 February 14, 2016, 10:34pm

Jeff -
Here's a photo of Vince preparing part of the CMRI system. The clock can be seen on the valence above. I shot this from the south end of the Springs. This particular clock primarily serves the tower operators at Willow Creek (by Vince), CM Tower (off camera to the right) and Havens Yard (behind

Vince.) It is also visible from Sobol Springs and Rock Bottom.

In the plan below, the clock is the leftmost red rectangle. Note that the track plan is now approximate as improvements are constantly incorporated during the build-out.

Jeff_Tague #8 February 14, 2016, 10:34pm

Thanx, Bob. As usual, you deliver more than asked. So I'll respond with another dummy question…
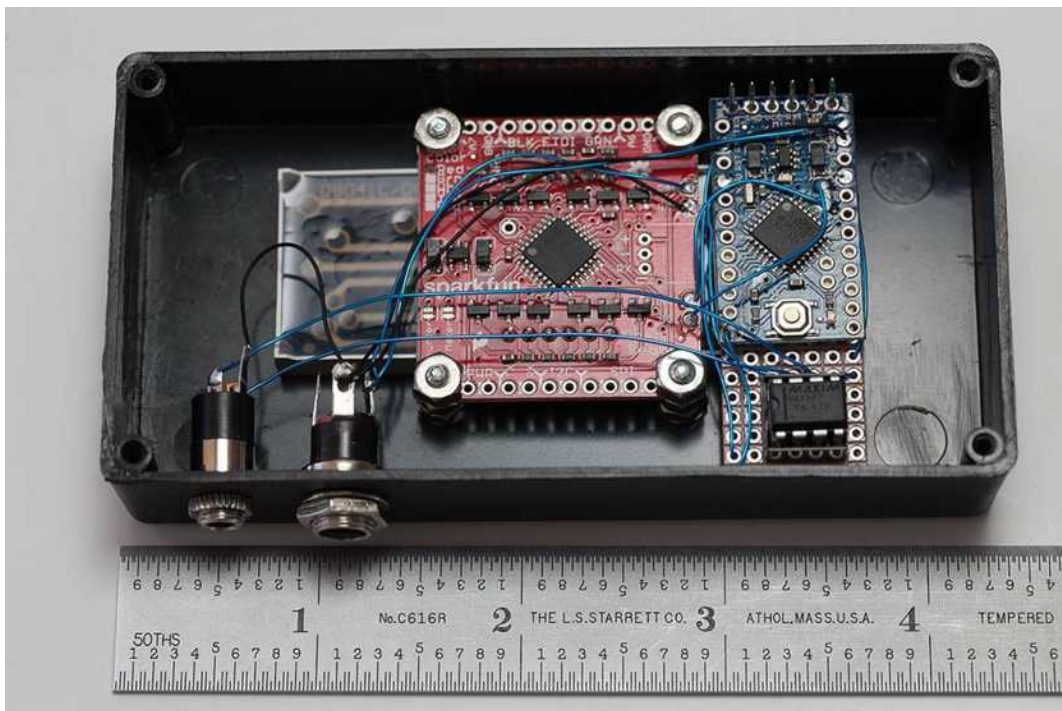No clock in the Kayford lobe as it's train orders setup in Darwin?

Bob #9 February 14, 2016, 10:34pm

You guessed it well! The Kayford branch, which is dark territory, comes into Darwin/Ridge through the
stud wall and into yard limits. Coordination with the Darwin yardmaster is needed to enter the yard.
And of course any yardmaster is glad when a train picks up cars and gets them *"out of my yard!" *
and onto the Kayford branch.

Bob #10 February 14, 2016, 10:35pm

We just ran out of fast clocks. Units built for the dispatcher and crew lounge were relocated into the
Kayford, since there will be passenger service via David's doodlebug running on a regular schedule.
What to do?

Build more. Unfortunately the big, surplus LEDs are no longer available. Sparkfun to the rescue! They sell an inexpensive 4 digit display with serial/SPI/I2C interfaces. Now we have "A&O The Small Fast Clock."

It was not worth etching a circuit board since there is only one extra IC, a Maxim RS485 interface chip. Double-stick tape holds the perforated board and Arduino Pro Mini in place.
The large jack receives a 5 volt DC wall wart for power. A 3.5mm stereo jack attaches brings signals

and ground from the NCE RS485 cab bus.

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jaybarnaby #11 February 14, 2016, 10:35pm

"You guessed it well! The Kayford branch, which is dark territory, comes into Darwin/Ridge through the stud wall and into yard limits. Coordination with the Darwin yardmaster is needed to enter the yard."

I thought maybe it was because time doesn't exist back in the hollers of West Virginia.

" And of course any yardmaster is glad when a train picks up cars and gets them "out of my yard!" and onto the Kayford branch."

And cringes when they come back. My dream is an empty yard.

1400mza #12 August 19, 2016, 4:51pm

Can I transpose this Fast Clock to be used with a Lenz Command Station?

Bob #13 August 19, 2016, 6:55pm

The Arduino programming only understands the NCE cab bus. It synchronizes with the fast clock built into the NCE command station. Long ago I had a Lenz system, but don't remember ever seeing a fast clock on the handheld throttle.

So I'm sorry, but no.