Signal Garden Notes

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These notes reflect our meeting of July 26, 2003

Development environment.

The source code is written and compiled on a deskside tower PC, and the hex/binary file is transferred to a laptop. The laptop is connected to an EPROM programmer. EPROMs have to be erased with a UV eraser; they aren't like EEPROMS or flash memory.

Programmable Logic Controllers (PLCs)

Barry also told us about his research into Programmable Logic Controllers (PLCs), which would be easier to program. The Idek Smart Relay costs $112 for a 4 input, 4 output device. Expansion (4 input, 4 output) costs $54.

Backup for Barry

He could provide a list of the hardware and software (PC, programmer, eraser, compiler, and so forth), and the C source files. We wouldn't have to buy anything unless Barry became unavailable, but we'd know what we might need in the future.

V20 Out-of-Sequence Colors

When the V20 I going through its Red-Yellow-Green sequence, it briefly shows colors out of sequence. Gene added a circuit to prevent this. The root cause of this problem appears to be that one relay is slower to pick up than the other. Barry's solution is to use a Gray code for the two-wire, four-aspect encoding. With Gray code, only one relay is being changed for any given step of the sequence.

Relay A	Relay B	Aspect
Down	Down	Dark
Down	Up	Red
Up	Up	Yellow
Up	Down	Green

Expansion

The controller doesn't have enough outputs for all of the future signals. We could double up, so that one output pair drives two signals. Each pushbutton for the two signals would activate both.

Controller Case Rework

It would be easier to work on the controller if it were mounted vertically so that the connection terminal were facing the maintainer instead of pointing down (the labels would also be easier to read). The controller could be remounted on the back of the door, with stainless screws through the door front, into the mounting plywood.

The current wiring could be neater; the case should be completely rewired.

Power Supply

The current power supplies may not be large enough to handle the load of all of the signals. A lamp draws 2.5 amp; a wig-wag is estimated to draw 5 amp. The supplies are good for around 4.5 – 5 amp. This could account for sluggish signals like the Lower Quadrant Wig-Wag. Barry may have a 50 amp supply; if not, we should buy one.

Cox Bell

This bell can be quite irritating to people working nearby, or to the public during RailFest or Thomas. It should be activated for a shorter time and the intensity should be less.

General Time Intervals

The consensus is that the various time periods for signal display and pushbutton lockout are too long. The Cox Bell is the most obvious example, but many others need changes. We should revise the device summary to include all devices, present and future, and to have the proper timings.

It's been suggested that the searchlight be activated continuously, to attract visitors to the garden. A timer or photocell could be used to do this only during the day.

Future Signals

A crossing gate, two dwarf signals, and the banjo have been identified as future additions to the garden. We should plan for them now.

Next Meetings

On Sunday, August 22, at 9:00 am, we'll meet to discuss the requirements for programming changes to the controller. In September, Barry will bring the new program and show us how it's compiled and written to the EPROM. In October, we'll remount the controller and redo the case's wiring.