

BANTRAK News

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The Engineer's Cab: Chris Quinlan

Team BANTRAK,

I hope everyone enjoyed a happy, safe, and healthy holiday season! At midnight on New Year's Eve, LeRoy's time as the BANTRAK President concluded. I know we expressed our appreciation to him at our pizza party, but I would like to say it one more time. LeRoy, thanks for all your time and efforts. You guided us through a difficult period, and I think we all became a little more tightly knit as a club along the way. Now you get to rest for a season... but only a short season! Haha!

I am honored and humbled to be BANTRAK's next President. I started in N-Trak and N-Scale as a 13-year-old middle school student with the New Mexico Railrunners in Albuquerque just under 30 years ago. Since that time, the Air Force has carried us all over and we've been in clubs in St. Louis, Colorado Springs, and of course, Baltimore. BANTRAK is the first club where I've had the opportunity to be part of a club leadership team. I have learned a lot over the last four years in the Vice-President roles, and I know there will still be things to learn, but I'm excited for the opportunity to be here.

I think we have a great year ahead of us. Our first show will be on February 5th and 6th at Timonium. After missing out on our regular exhibit at the B&O Museum, this should be a blast. As our show coordinator, Tim is working hard to ensure we have the correct number of people for the right sized layout to maximize our enjoyment and not overburden our members with set-up/tear-down operations.

I look forward to seeing everyone at our next meeting on January 16th. It will be at my house (500 East Maple Road, Linthicum Heights, MD 20109). If you haven't been to an in-person meeting for a while and are comfortable doing so, we would love to have you come and enjoy the time together. I can't wait to see what everyone got for Christmas!

Chris



Low Cost Station Stop Circuit : Bob Bunge

In 2021, we started work on a legacy four foot N-trak module that modeled a Traction/Trolley museum. As we looked at the state of the module, the plan changed from just a clean up to almost to wood rebuild. Taking advantage of the fact that traction equipment can make very tight radius curves and a desire to make the module as interactive as possible, we decided to include a closed operating loop using 4-inch radius turns.

Having grown up spending many of my weekends at a 1:1 Traction/Railway museum, I had fond memories of a station being the centerpiece of activity, so it only made sense the model museum should include a station. Ok, then, would it be nice if the trolley running on the loop made a brief, automated stop at the station?

A look into possible solutions showed they would cost on the order of \$120 and still require a good bit of integration, from wiring sensors to power supplies, so I decided to explore other options. Many years ago, I had built a basic integrated circuit to manage stepper motors for a telescope. Being a geek technologist, I had also played briefly with an open source software based microcontroller called an Arduino a few years back. Today, many high schoolers use Arduinos in STEM classes to control robots.

In this case, a microcontroller is an integrated circuit that is designed to control or govern the operation of a physical device. More often than not, they are designed to perform a specific purpose. An example is the Circuitron AR-2 unit I have used on a city module that automates the start, stop and reverse motion of a trolley in a street scene. Another example is a DCC decoder in a locomotive.

In 2005 a group in Italy teamed up to design a software-based microcontroller that would use open source hardware similar to a personal computer. This would allow others to manufacture the microcontrollers and pay a royalty to the original group, now under the name of Ardurino. This approach would keep the cost of the controller low yet make it very versatile.

At the core, C computer code runs on the Ardurino in a continuous loop, monitoring voltage of input pins and adjusting voltage of output pins. The code is written within a program that runs on a Windows/Mac/Linux computer and once compiled

is uploaded to the Ardurino via a USB cable. As soon as it is uploaded, the program runs and does its thing.

The pins on an Ardurino operate at either 3 or 5 volts. This makes them perfect for LED lights and similar devices like light detectors, but that isn't enough voltage to run a train in DC. So for this project, I use a light detector between the tracks (just like the AR-2), the Ardurino, an electro-mechanical relay that uses 5 volts to flip a relay to on/off 12 volt DC coming from a normal power pack, and a low cost 6-18 AC Volt (this is the Brown wire) to 5 volt DC downstep to provide power to the Ardurino. A break out of the components and their sources are in the table.

Component Source Cost:

Arduino Nano	Ali Express Website	\$3.26
Photosensitive resistor	Ali Express	\$0.25
1 Channel Relay Module	Ali Express	\$0.66
AC/DC to DC Step Down Buck Converter	Amazon	\$14.99 (4 pieces)

Shipping added another \$13 to the total. The parts from Ali Express arrived in about 2 weeks, about 2 weeks sooner than they estimated. I found it interesting they were air expressed from China to a location in New York City where a new USPS shipping label was slapped on with my home address.

In a nutshell, when a trolley goes over the light sensor, the software detects the voltage from the sensor as dropped. The software then drops voltage going to the relay, which kills the track power to the section of track in front of the station. All this takes a couple of milliseconds. The software then pauses for a few seconds and then raises the voltage to the relay, which starts the trolley.

To get started, a Google search found a number of websites & YouTube videos that provided examples of projects using a light sensor to manage power through a relay. I zeroed in on one video that included a link to a project website that included the basic C computer programming code. Even though I'm not a proficient C programmer, it was an evening's project to get the sample code to successfully compile, do what I wanted, and upload to the Arduino. From there, it was a question of laying out the wiring and soldering it up. I actually jumped over a normal step for projects like this, using a "breadboard" to mock up and test the wiring. In the future, I won't skip



Low Cost Station Stop Circuit : Bob Bunge

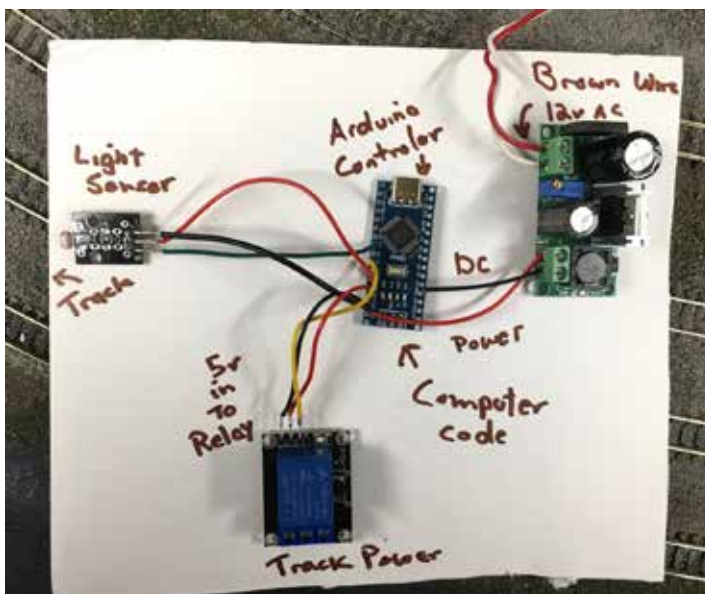
this step. If I were to start over, I would use some adaptor sockets that would allow me to skip hard soldering and instead use pin connectors which will allow easy removal of components in case of failure or any change in architecture.

One nice thing is the relay module can be wired so track power is on all the time by default, including when the Arduino is unpowered. This will allow the loop to operate even if there is no brown wire power available.

Yet the real advantage to using the Arduino is in the future. Since I've used only a few of the input/output pins and it is software driven, additional functionality in the future can include:

- Turning a signal light by the station red/green using LEDs powered direction from the Arduino;
- Addition of a 2nd station stop on the opposite side of loop;
- Keep a trolley at a station until a trolley at the 2nd station is released, etc..

Physically, the components will be mounted on a piece of thin plywood that will be attached to the bottom of the module with screws, allowing for easy removal. My intention is to also attach a micro SD storage card with the operational computer code so one day when the module is passed along, a future owner will have the full kit.



Sample Computer Code

```
-----
int light_intensity;
#define PhotoresistorPin A3
#define TrackpowerPin A5

void setup() {
  pinMode(TrackpowerPin, OUTPUT);
  pinMode(PhotoresistorPin, INPUT);
}

void loop(){
  light_intensity=analogRead(PhotoresistorPin);
  if (light_intensity > 300) {
    digitalWrite(TrackpowerPin,HIGH);
    delay(7000);
    digitalWrite(TrackpowerPin,LOW);
    delay(10000);
  } else {
    digitalWrite(TrackpowerPin,LOW);
  }
}
```

2022 N Scale Convention :

20th Annual

N Scale
ENTHUSIAST

2022
**National
N Scale
Convention®**

Pre-Convention Trip - Tuesday June 14th
Convention - Wednesday, June 15 to
Sunday, June 19, 2022

Sheraton Music City
777 McGavock Pike
Nashville, TN 37214
615-885-2200

**Make
Plans
Now**



NASHVILLE

Pre-Convention
Tuesday, June 14th

**TENNESSEE
RAIL ROAD**



CHATTANOOGA, TN

**NATIONAL
- N - SCALE
CONVENTION**
JUNE 15-19, 2022



BANTRAK 2022 Calendar

February 6, 2022

Newsletter content deadline

We need content please submit your articles by the deadline.

January 16, 2022

Club Meeting

Location: Chris Quilan's House,
500 East Maple Road, Linthicum Heights, MD 20109
2-5 PM

February 5&6 2022

Great Scale Show

Location: Timonium Fairgrounds
Setup: Friday the 4th

BANTRAK Membership: Al Palewicz

BANTRAK does a significant amount of charitable activity, although we rarely think of it that way because we get pleasure out of it. When you think about it, that is as it should be with all giving from the heart.

What is our charitable activity? Our major participation is in the B&O Museum's (which is a charitable organization) Annual Festival of Trains. Our display has been a major draw for people to come to the Museum for many years, both recent and in the past. There are plenty more examples, this is just one.

Please contact Treasurer [Tim Nixon](#) for more information regarding your membership status and roster questions or contact [Al Palewicz](#) with general questions.

Member Benefits:

- Sharing of your knowledge (railroading and modeling) with others of similar interests
- Access to railroading and modeling knowledge of other members
- National exposure and recognition of your endeavors in modeling
- Hands on activities: Club modules - track, wiring and scenery. Raffle layout - track and scenery Members' layouts
- Recognition as being part of a Nationally known club.



Train Spotting: Ed Kapuscinski



Chasing the Wilmington & Western

BANTRAK was founded in 1983 as the Greater Baltimore N-Scale Associates. Begun as a “round robin” group to share skills and experiences, we have expanded our focus to include participation in many diverse activities to promote model railroading in general and N-Scale model railroading in particular. Activities include participation in local, regional and national shows, meets and conventions. BANTRAK membership includes membership in the national NTRAK organization.

The BANTRAK Newsletter is the official publication of Baltimore Area N-TRAK (BANTRAK), Inc. This is **your** newsletter! Please send articles, photos, and suggestions to newsletter@bantrak.net
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