

# Rallec Railroad

*"Where Technology Meets the Hobbyist"*

## New LED project – Follow along

Rallec Railroad is a true adventure at night. I use LED lighting to create a mystical environment that is a joy to the visitor. There has been some problems with the lighting inside the buildings though. I have been using tape to secure the LED's. Using tape allows the precise location to make the desired effect by changing locations of the LED within the building as I step back and ponder the visual effect that I was looking for.



**Fig 1. Shanty house used by a Rallec Railroad worker to live in. This Structure is over 20 years old and has been subjected to hot, cold, children, dogs, cats and an occasional Raccoon.**

But now, after many years in the environment, the tape is starting to fall off and let the LED go where it wants ruining the effect that was desired. Now I am doing something about it along with a few other shortcomings that I have discovered.

*(continued on next page)*

## Note:

This is not a complex electronics project but since we are dealing with Li-Ion batteries, safety is of major concern here. Li-Ion batteries are known to explode or catch fire if not handled properly. I urge everyone that is thinking of using Li-Ion batteries in their next project, read up on how to use these batteries safely. There are many web sites to help you.

## NGRC 2021 - Nashville

The convention in Nashville was fun, exciting, and full of new items as most of national conventions tend to be.

For those of you who could not make the convention, it was held at the Opryland resort in Nashville, TN. The resort is huge with lots of things to see and do. Hope to see you next year in Denver.

If you discover grammatical or spelling errors in This newsletter, please accept my apologies and please remember I was an Engineering major not an English major.

## Metric and scale

Metric measurements have been around for a long time. I have used it for decades both professionally and as a hobbyist. My brother noticed something very interesting about the 20.32 (F) scale. If you take your measurement divide it by the scale and multiply by 25.4 you will get the measurement in millimeters. For example:

$$1'' \\ \text{-----} * 25.4 = 1.25\text{mm} \\ 20.32$$

For example:  
 $5'' * 1.25 = 6.25\text{mm}$

So if you have a metric ruler, take the prototype measurement and multiply by the constant 1.25 and you will get the measurement in millimeters. Or you could just use a scale like the one on our website.

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**Fig. 2** Damage inside the house due to the environment.

As can be seen in Fig. 2, everything is a jumbled mess inside the house. I am glad that the house insides were checked because water and Lithium can react together to create an explosion and a very hot fire. (So hot it can melt glass!) There are pieces of tape floating around, and a jumble of wires. This needs to be cleaned up so it works properly and is safe in the yard.

### **Problems/Design objectives:**

1. Original problem: Tape is not holding LED in place. The board should integrate the LED and the charger. This will result in a higher level of integration thus will only need six wires to be attached: two for the battery, two for the thermistor and two for the solar cell. This will result in a more compact design that can be Velcroed anywhere desired.
2. LiION 18650 cells are dying early because of the excessive temperature that we have in Southern California. When a cell gets too warm, that is not the time to charge them. Li-Ion chargers (1s – one cell in Series) can use a thermistor to measure the cell temperature and scale back charging as necessary.

3. Board/LED enclosure: One of the advantages of owning a 3D printer is that you can make your own custom parts such as a custom enclosure. The holder for the battery and the solar switch must be water resistant.

### **Next step:**

Now that the problems have been carefully identified, designing and building the charger and LED can start. Most of the buildings on Rallec Railroad will need the same TLC as this one. Next newsletter will cover the design aspects.

### **Just my opinion:**

My Grandfather introduced me to model railroading and I am glad he did. It is such an enjoyable and relaxing (sometimes) hobby that it is a wonder why more people do not take it up. There is so much that the hobby has to offer. You can show off your artistic skills, you can show off your building skills and then there is the part that drew me to the hobby with my Grandfather's help, operations. If our hobby is to continue and perhaps even grow, we need more Grandfathers to show the benefits of the hobby. For me it was the problem solving, for others it might be something else. Either way, the hobby has lots to offer and it is up to us to show it's offerings. STEAM is the latest acronym to be thrown around schools (Science Technology Engineering Art Math) and our hobby includes each and every one of those. A locomotive can use robotic technology to get around. Art is everywhere. I just finished doing some Trig to figure out the correct roof angle for some solar cells and relationships to the house I am Building. (You will see this in future issues.)

Stay safe:  
steve



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**Mission Statement:**

We are about education, instruction, products and having fun with G Scale model railroading. We cover such things as photography, video, metal working, 3D printing, electronics and much, much more. At heart everyone here is a maker. That means we enjoy the journey as much as the finished product.

To unsubscribe from this newsletter please send an email to: [support@rallecrailroad.com](mailto:support@rallecrailroad.com) and just include the word "stop".

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