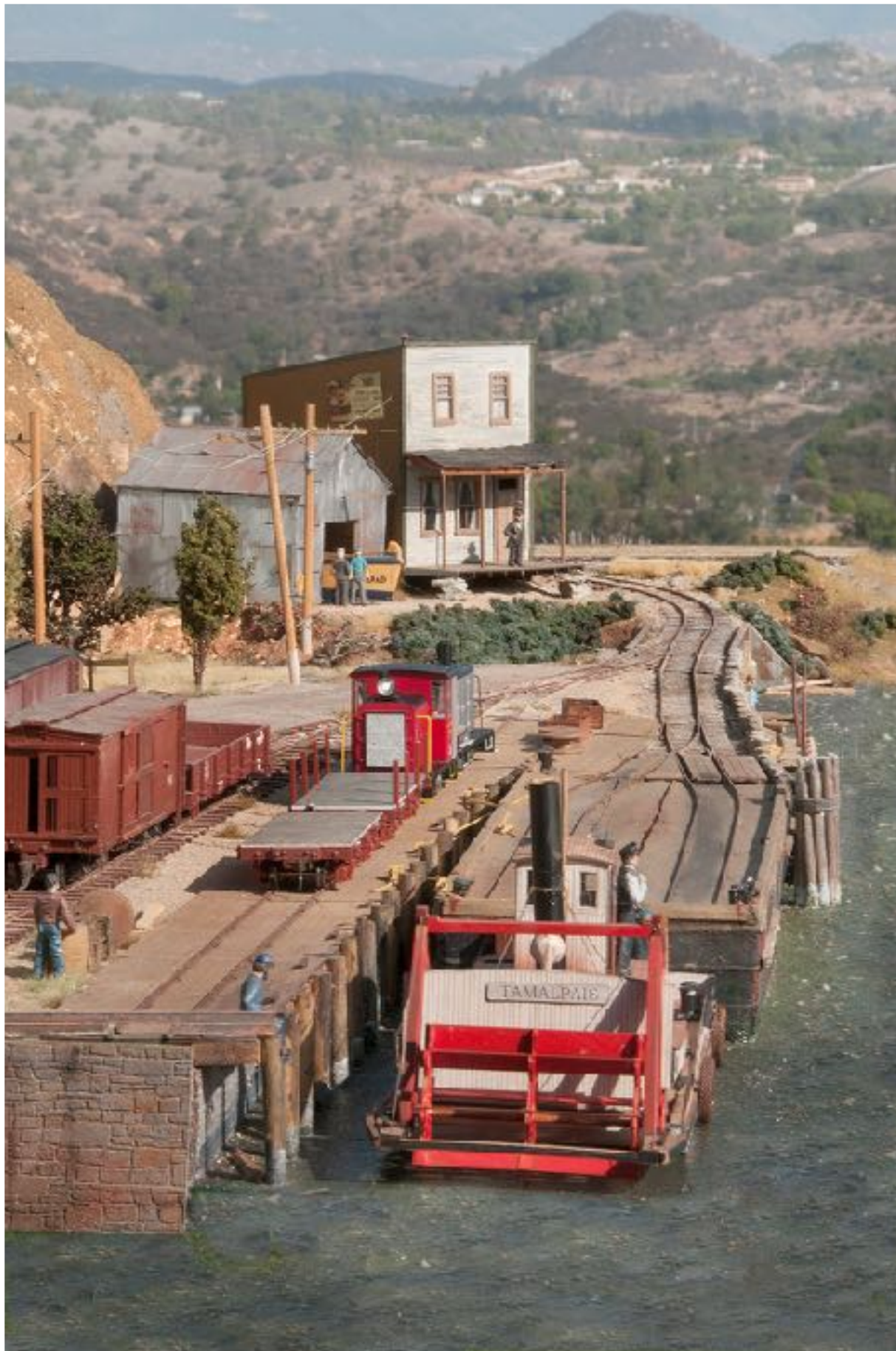




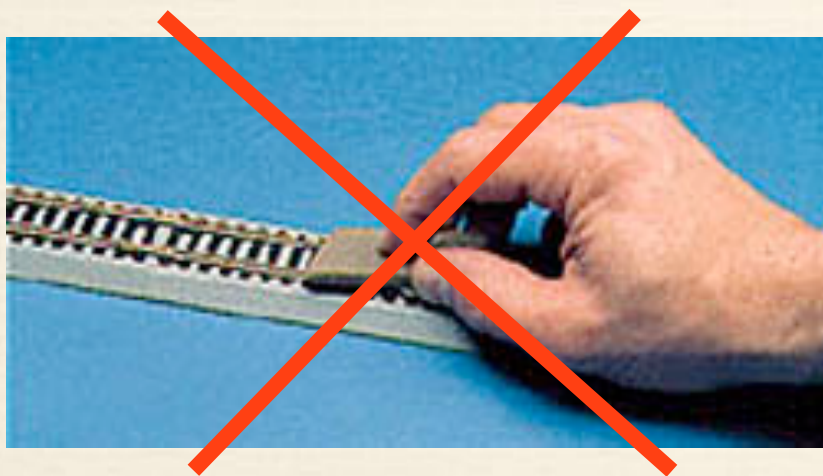
Dead Railing or Never Clean Track Again



Duncan McRee
Tam Valley Depot

Why Go To Dead-Rail?

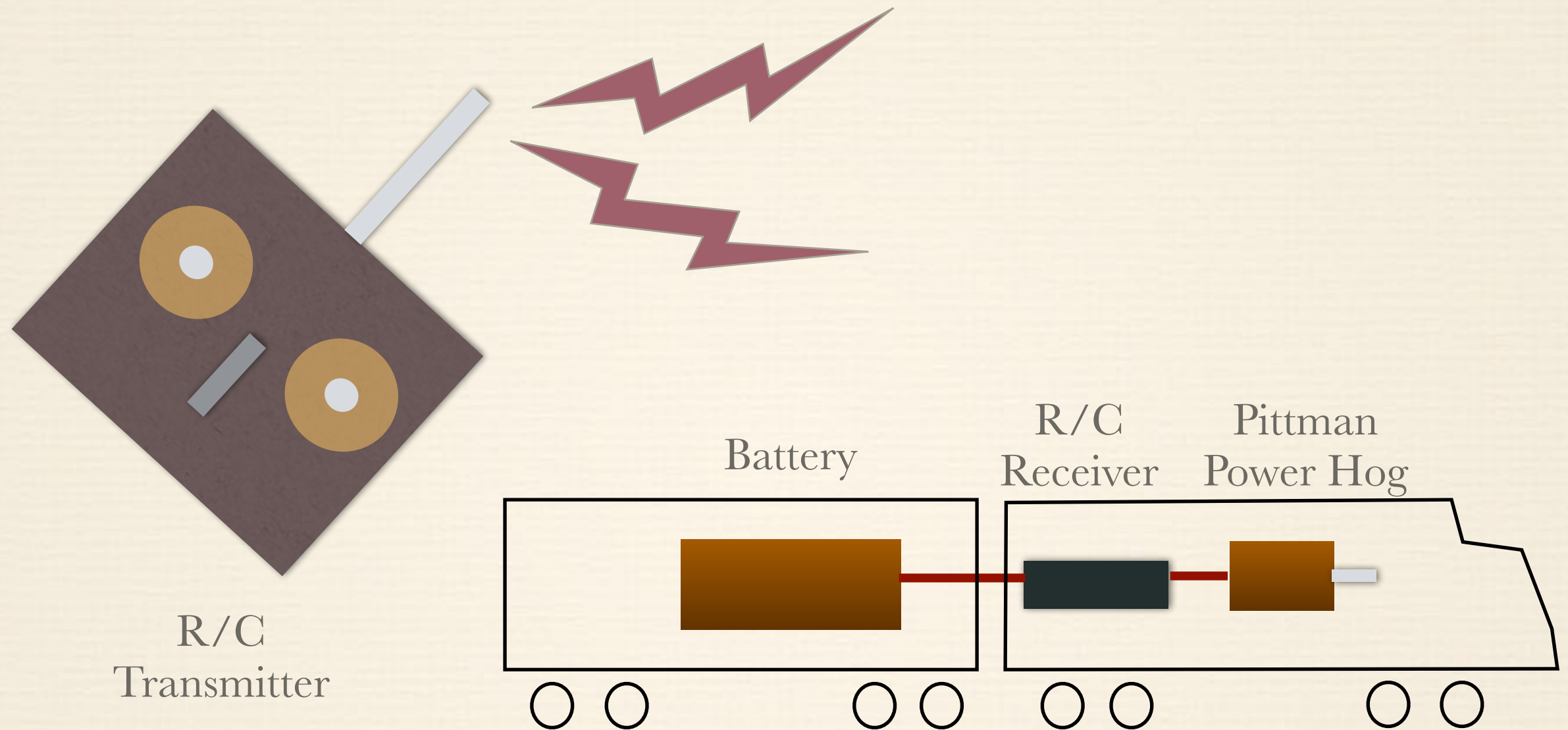
**Seems like I spent more time
cleaning track than running
trains.**



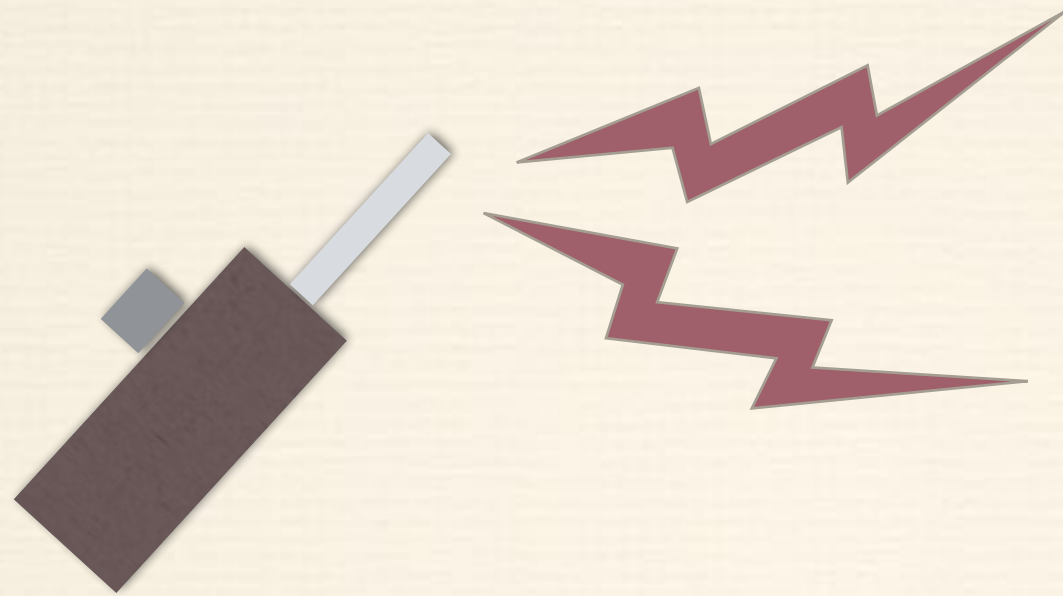
Dead Rail Society



Evolution of Radio Control



Evolution of Radio Control

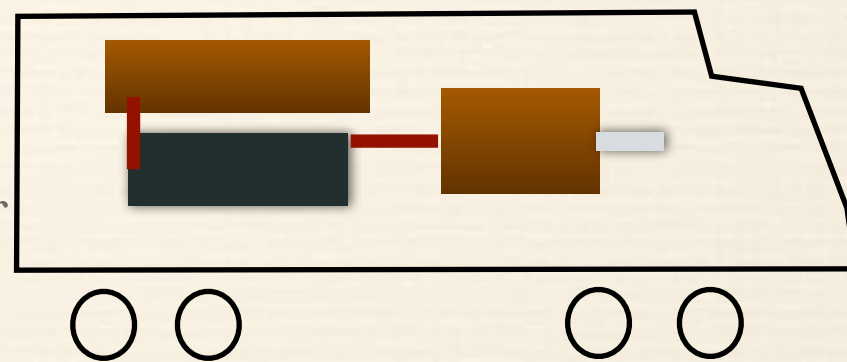


Special
Transmitter

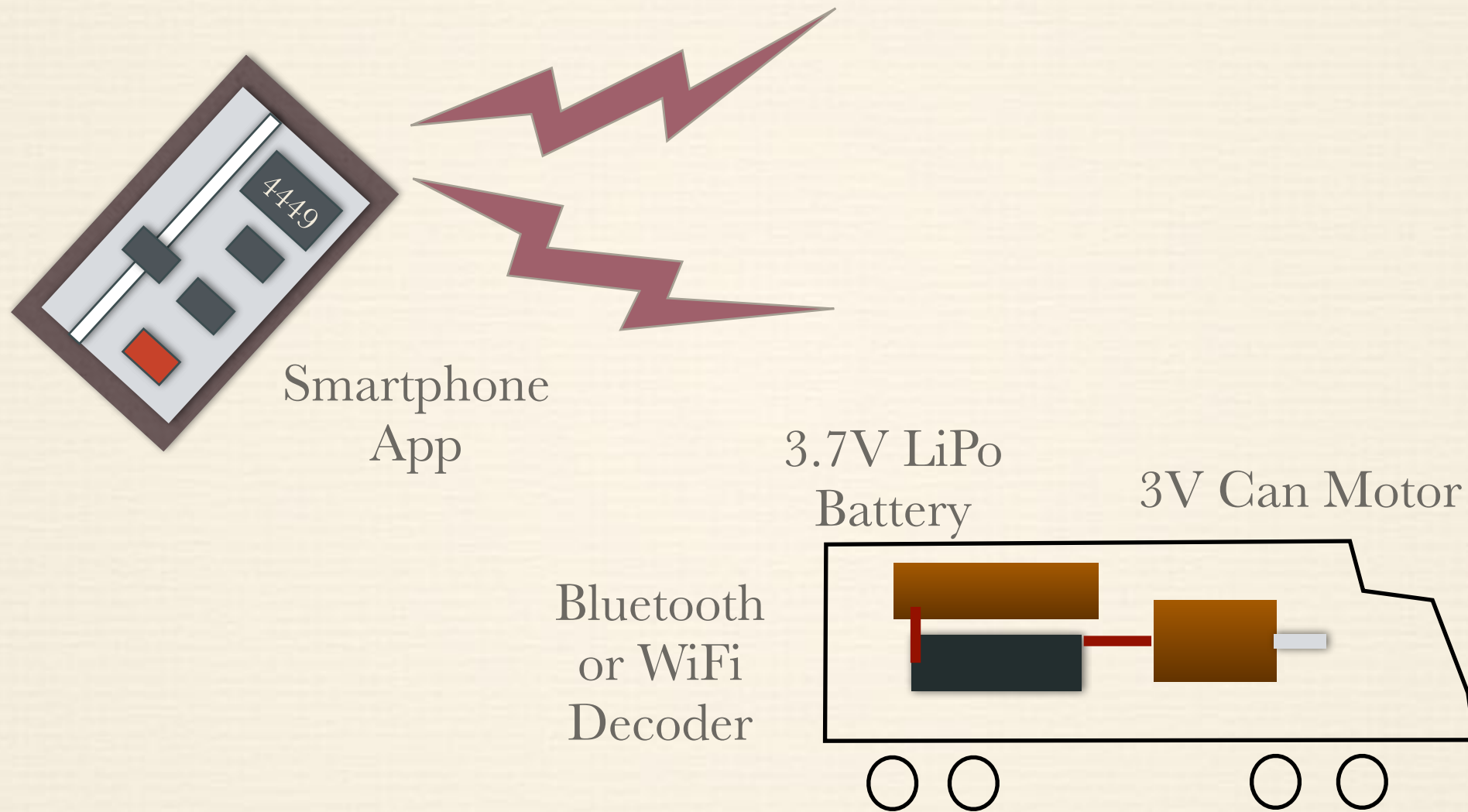
LiPo Battery

Can Motor

Receiver+
DCC Decoder



Future of Radio Control?



General Radio Info

Operate on the ISM Bands (instrument-science-medical)

900 Mhz (USA)

800 MHz (Euro)

2.4 MHz (Everywhere)

The lower the frequency the better the penetration

The higher the frequency the faster the data rate

Due to security concerns the future will be packet radios with encryption requiring pairing - most of today's systems pair automatically upon power up and have no security features
(good side effect - lots of interoperability)

Wireless DCC

Uses existing DCC system

Replaces Track power with an on-board battery

Replaces Track DCC signal with a radio

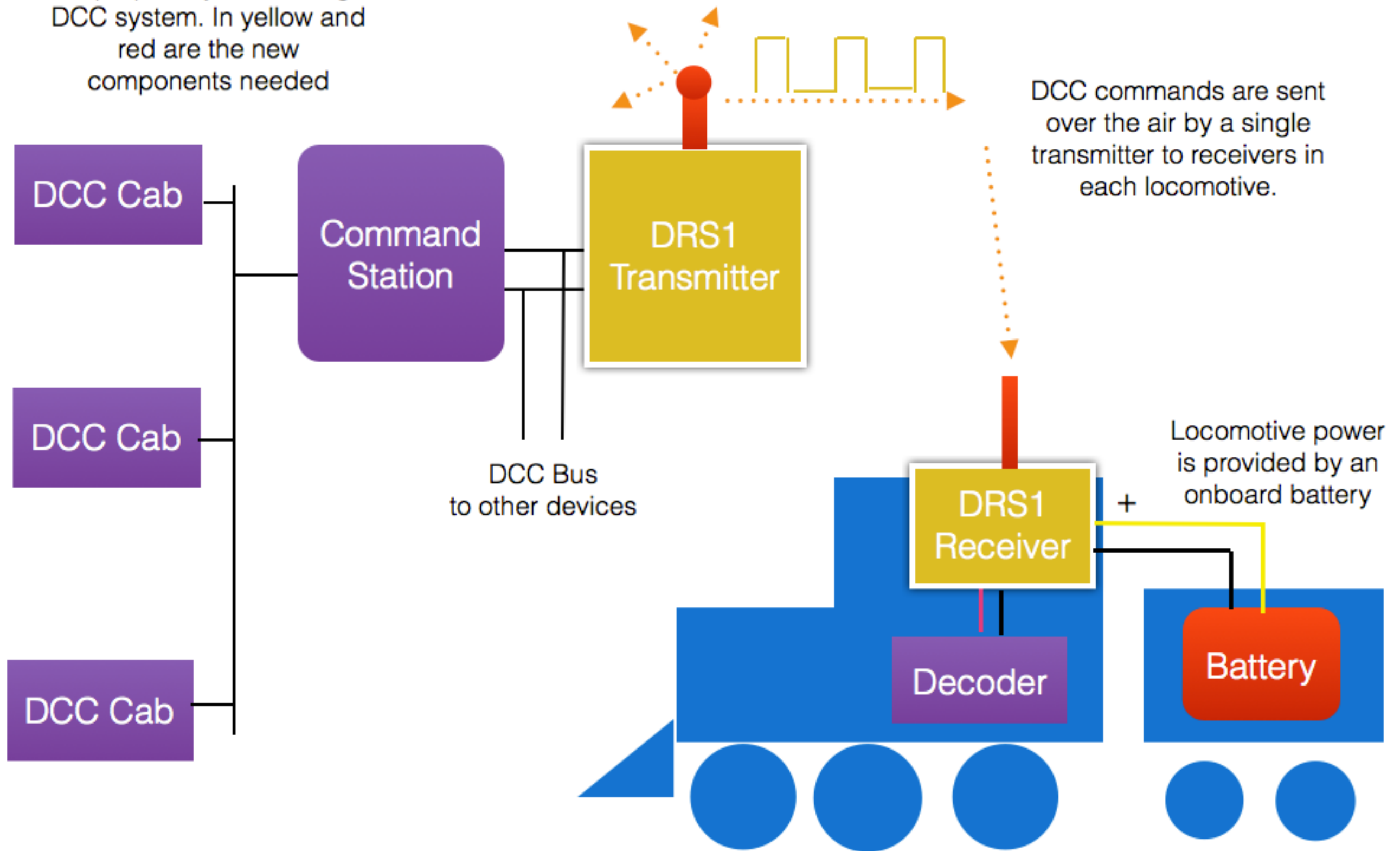
Sends DCC over the air

No cleaning track

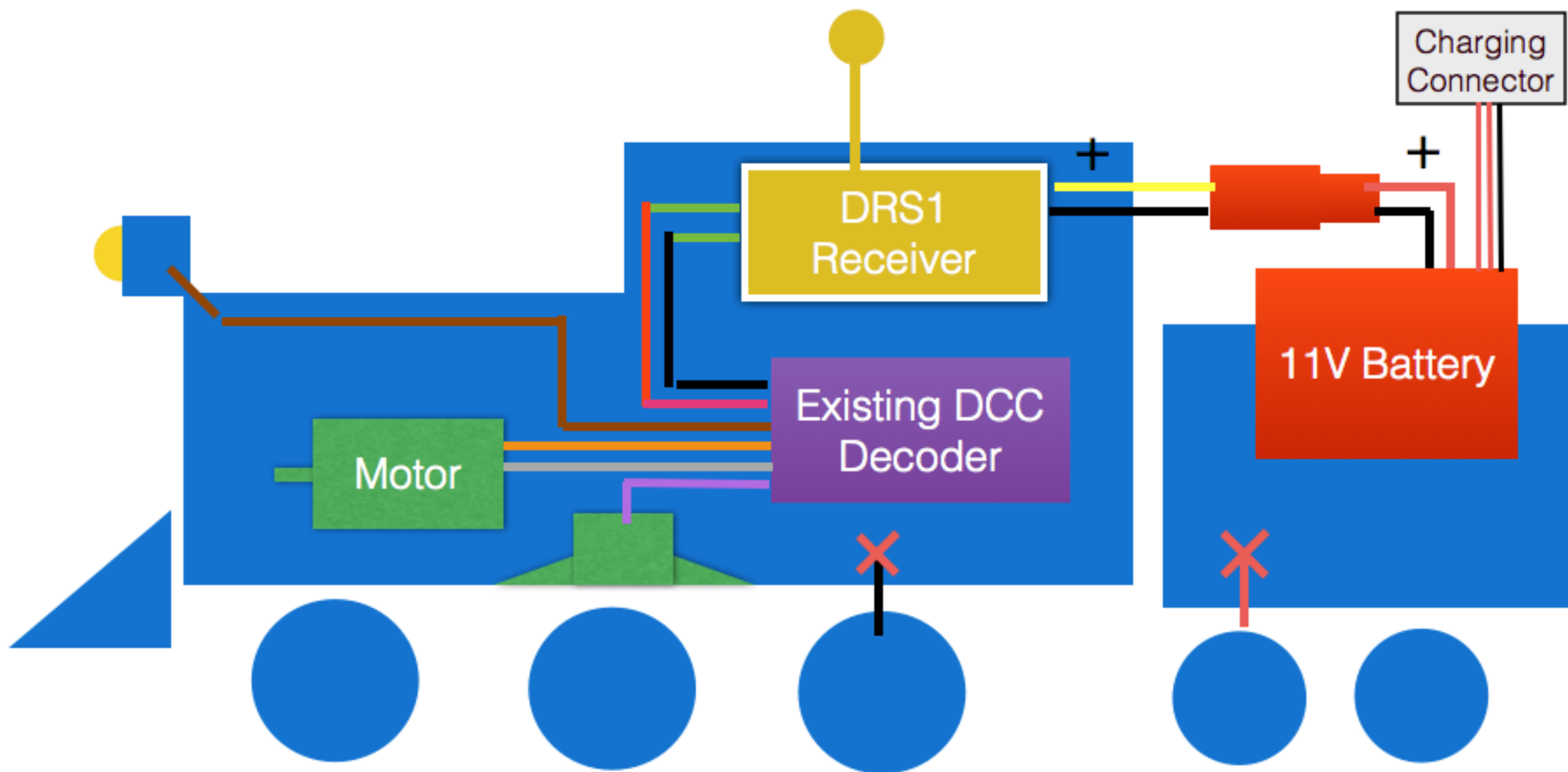
Use existing DCC throttles and locomotives

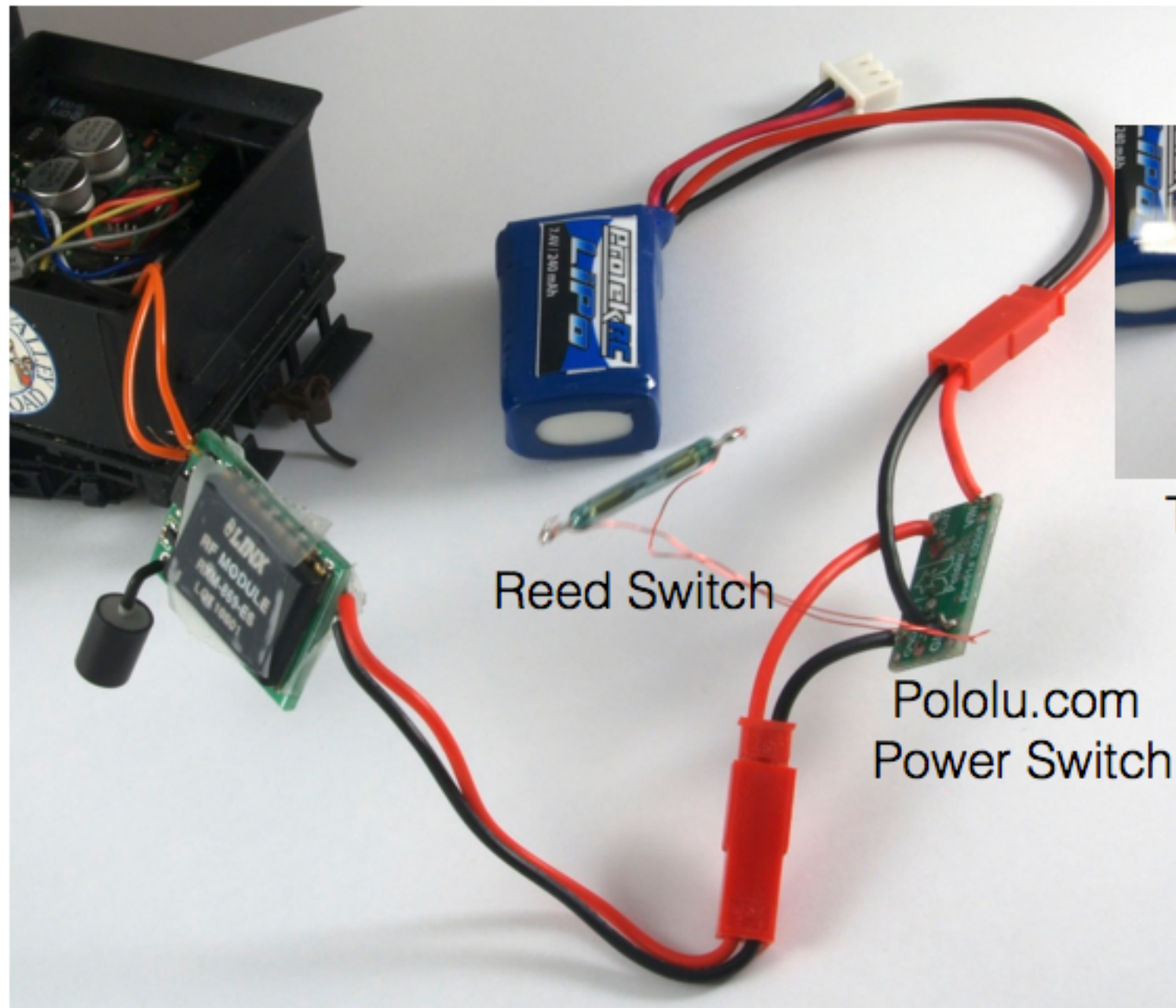
Overview of Wireless DCC

In purple is your existing DCC system. In yellow and red are the new components needed



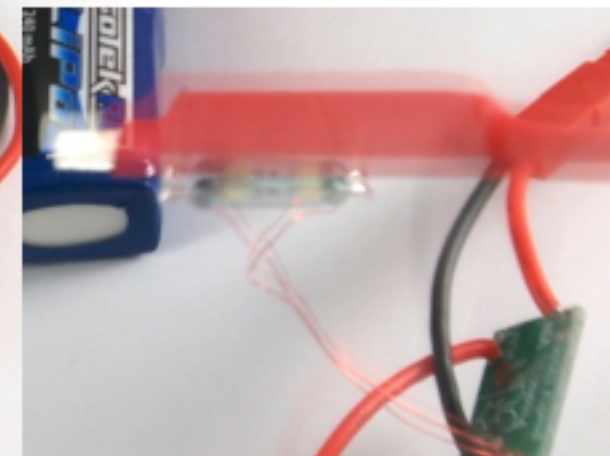
What is in the Locomotive?



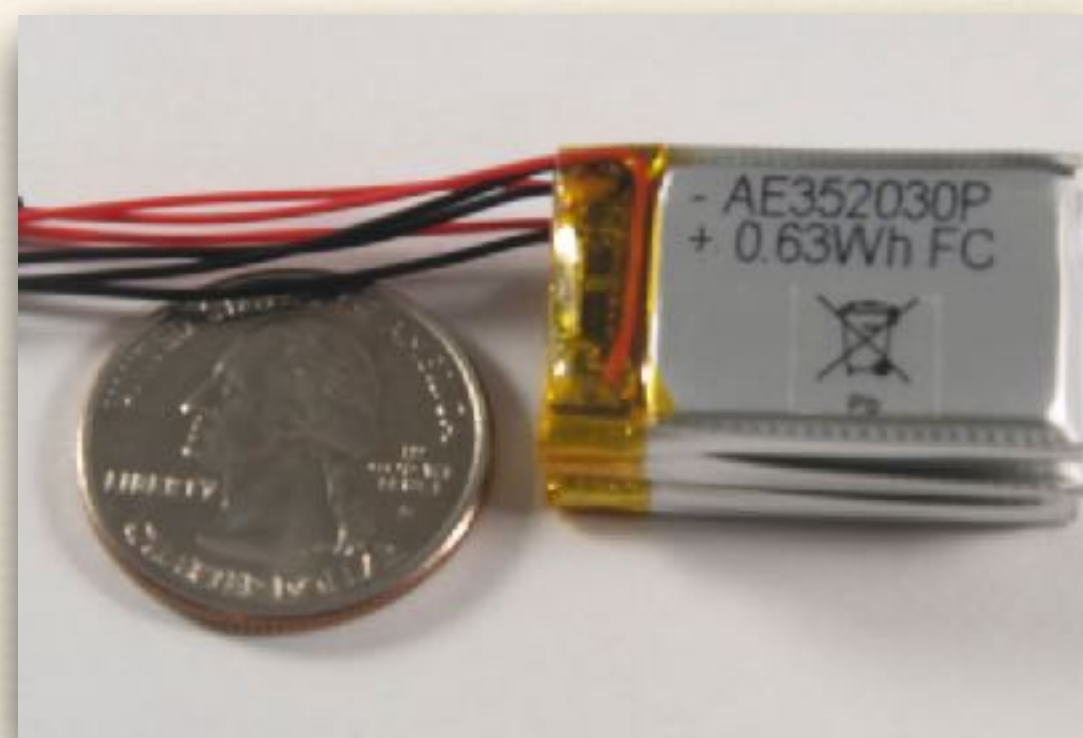
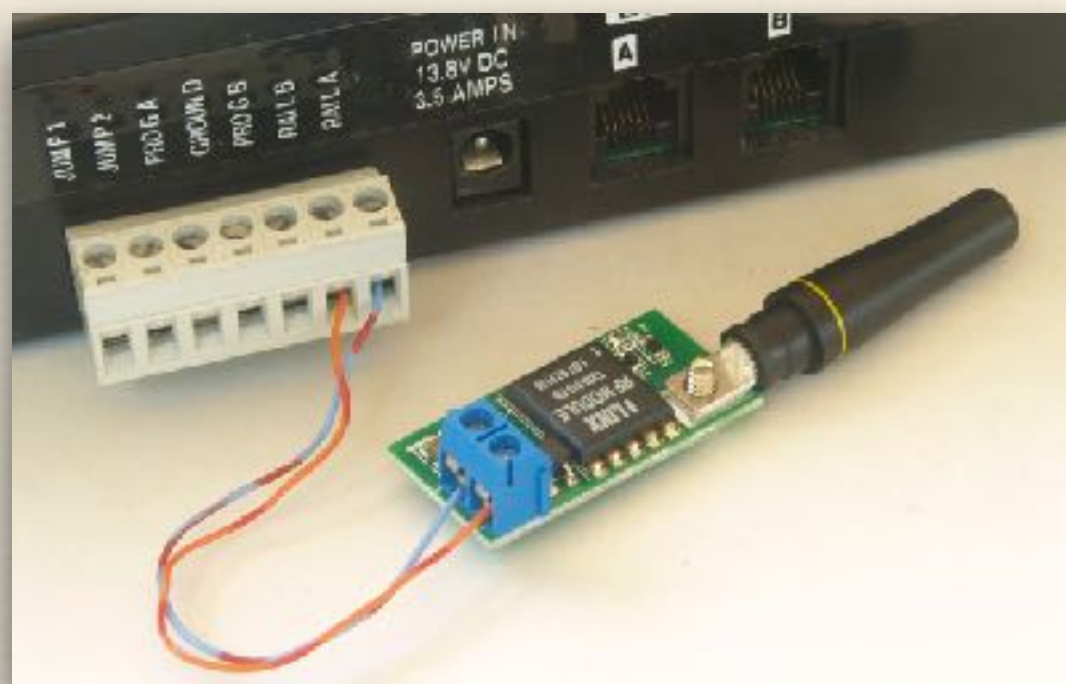


Reed Switch

Pololu.com
Power Switch



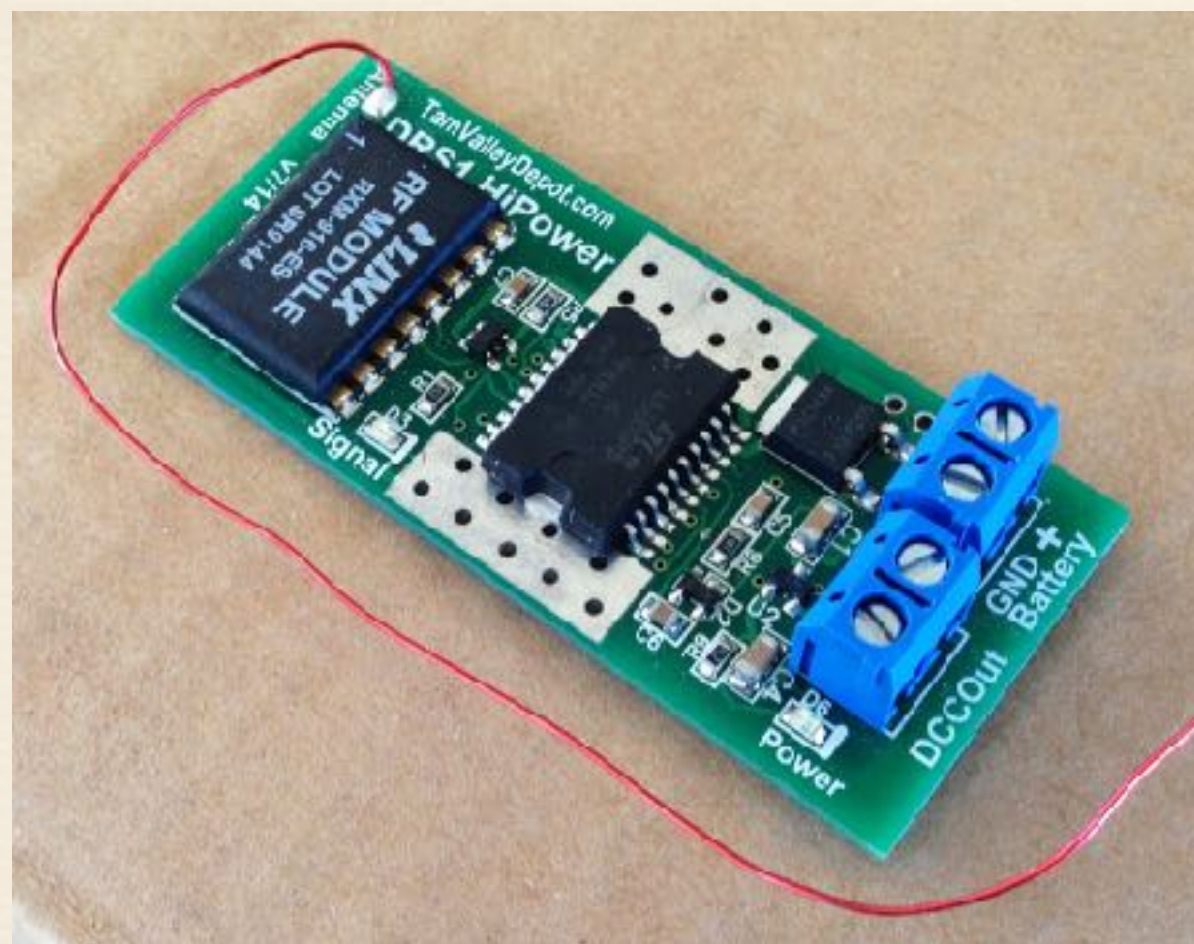
Tap with magnet
to turn on/off





CVP T5000 Handheld
Wireless DCC throttle
16 channels 900 MHz

Interoperates with
Tam Valley and
Stanton on Channel 16

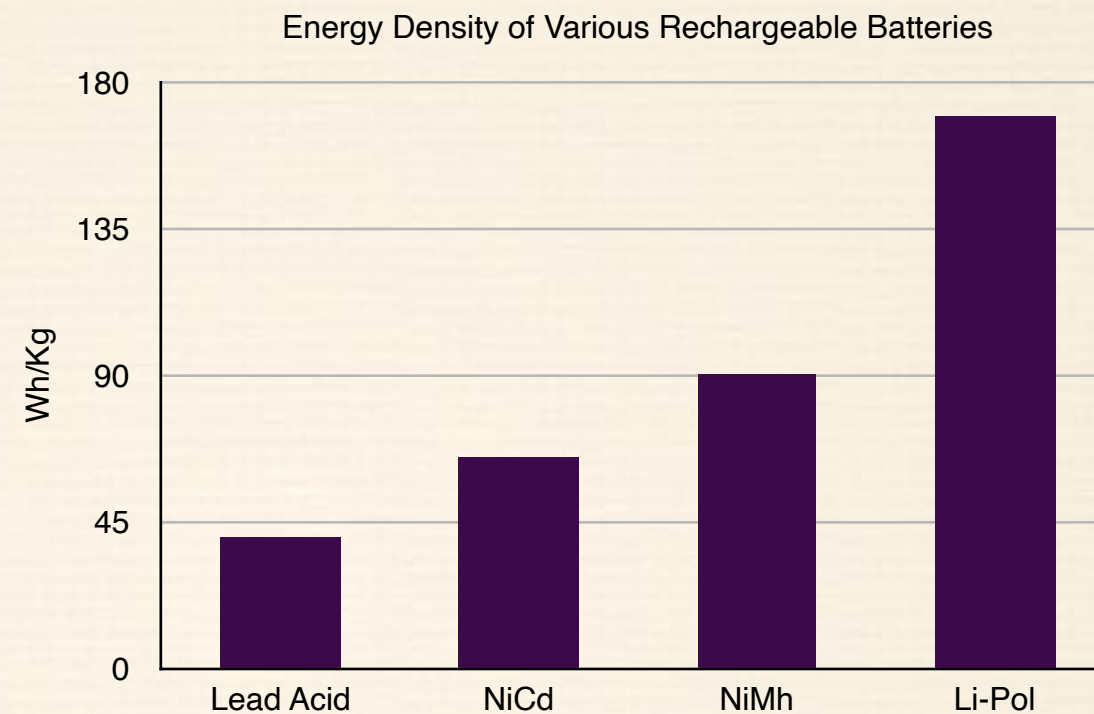


Tam Valley Hi-Power
Receiver
5 Amps of DCC output
Short protected
(CVP makes a similar
unit)

Interoperates with T5000
on channel 16

Battery Info

Nica & NiMh	
# cells	Nominal Voltage
1	1.2
2	2.4
3	3.6
4	4.8
5	6
6	7.2
7	8.4
8	9.6
9	10.8
10	12



Lithium Polymer		
# cells	Nominal Voltage	
1	3.7	
2	7.4	
3	11.1	Smaller Scales
4	14.8	Garden Scale

Battery Safety

- ❖ Several planes have been brought down by Li-Ion battery shipments! Houses have been burned down by careless users!
- ❖ DO NOT overcharge a Li-Ion battery - they may catch fire or explode - with high energy density comes a high discharge. Charge only with a Li-Ion charger. DO NOT trickle charge.
- ❖ Never damage a Li-Ion battery - throw away if punctured, bent or swollen.
- ❖ Do not drain a Li-Ion battery to zero - it may not be recoverable
- ❖ DO use a Li-Ion battery with a Protection PCB built-in - this will prevent over-charging, too-high discharge rate and over-discharging.
- ❖ Note - Flight batteries do not have the protection PC due to need for massive discharge rates (20-30 Amps) needed to lift off a model plane



Protection PCB





94055

CAPY 70000
★ LD LMT 70000
LT WT 55700 TUC 9-52

RECORD 2-22
REC 8-22

R-30-9

12 33-2
1W 8-2
1H 2-2
EXP JOURNALS





LiPo CHARGE
1.0A 14.8V(45)

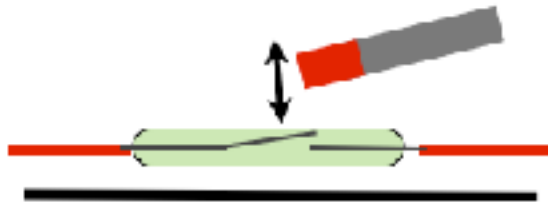
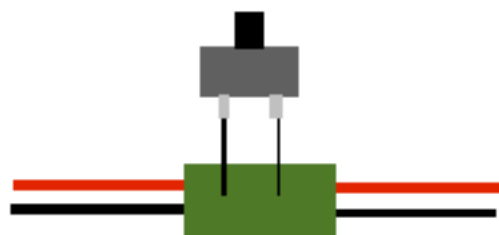
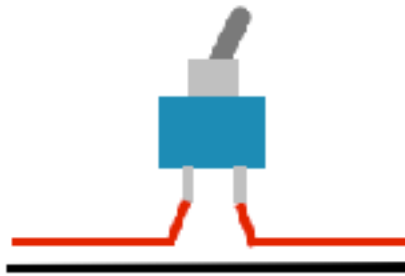
Multi charger **X1 AC PLUS**

STATUS + START ENTER

TRIPLE J DEPOT

PACIFIC

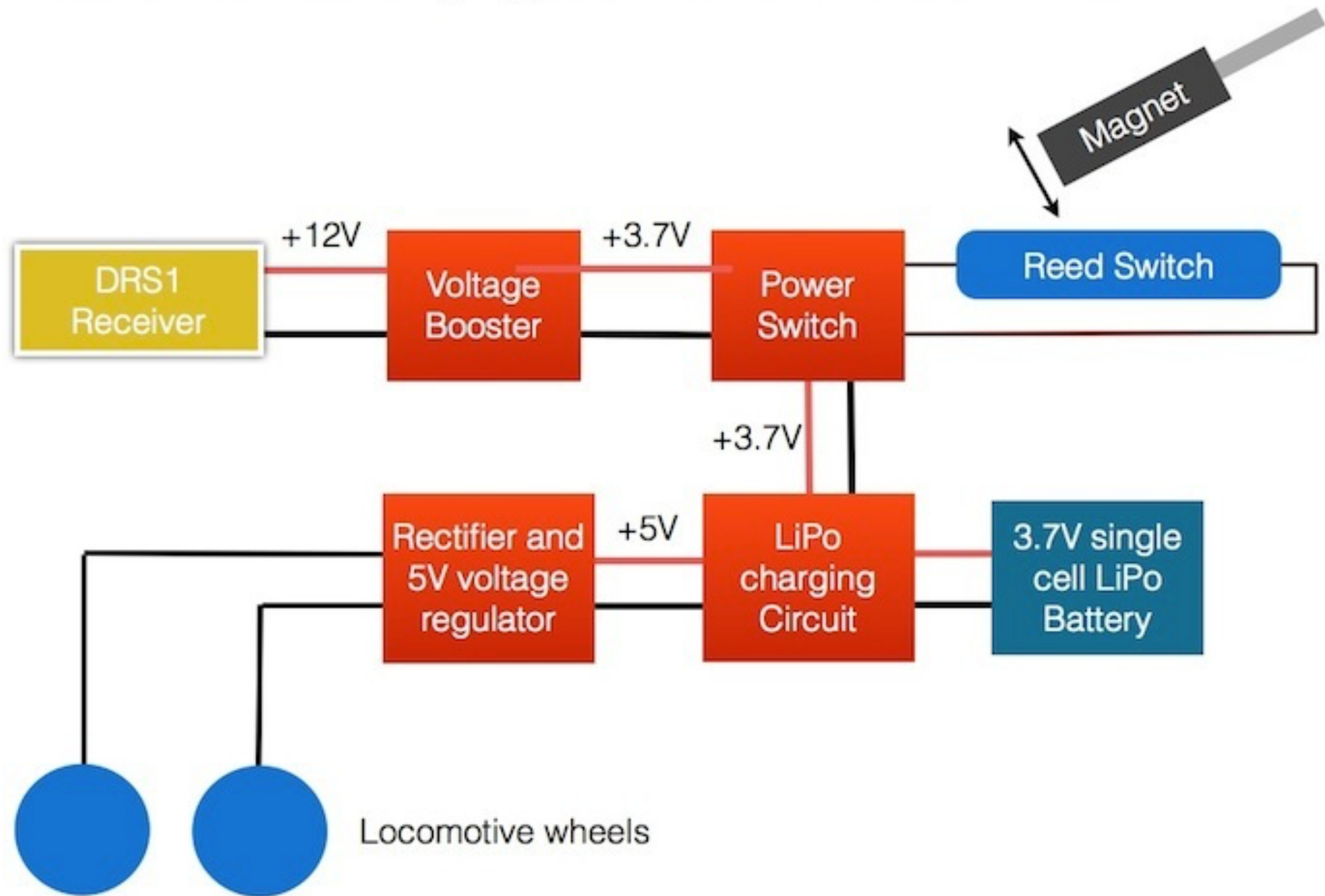
SF-D



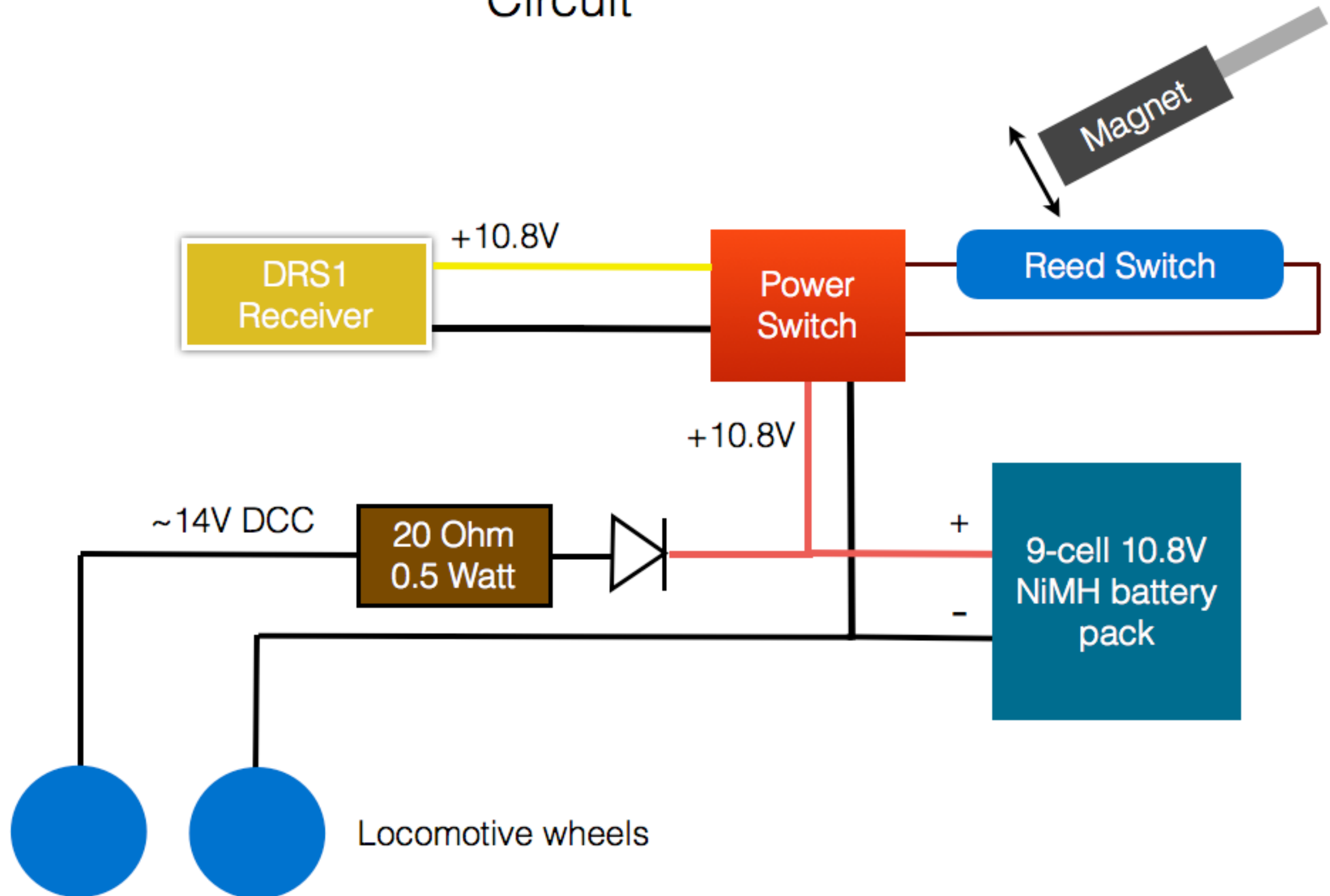
Turning off the battery
power

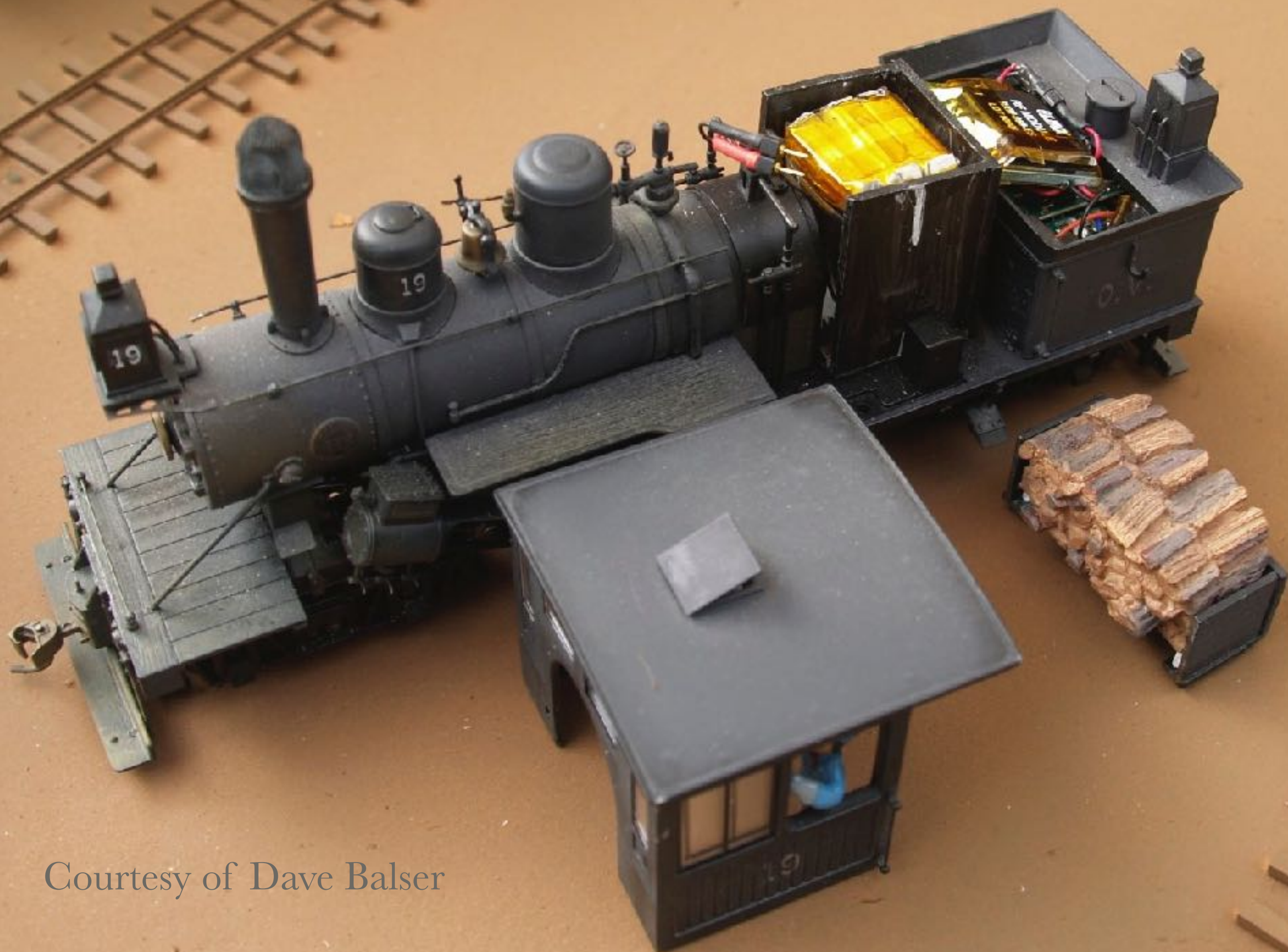
Some means of turning
MUST be installed as
otherwise battery will drain
between sessions

Wheels Based Charging and Power Control Circuit



NiMH Wheels-Based-Charging and Power Control Circuit



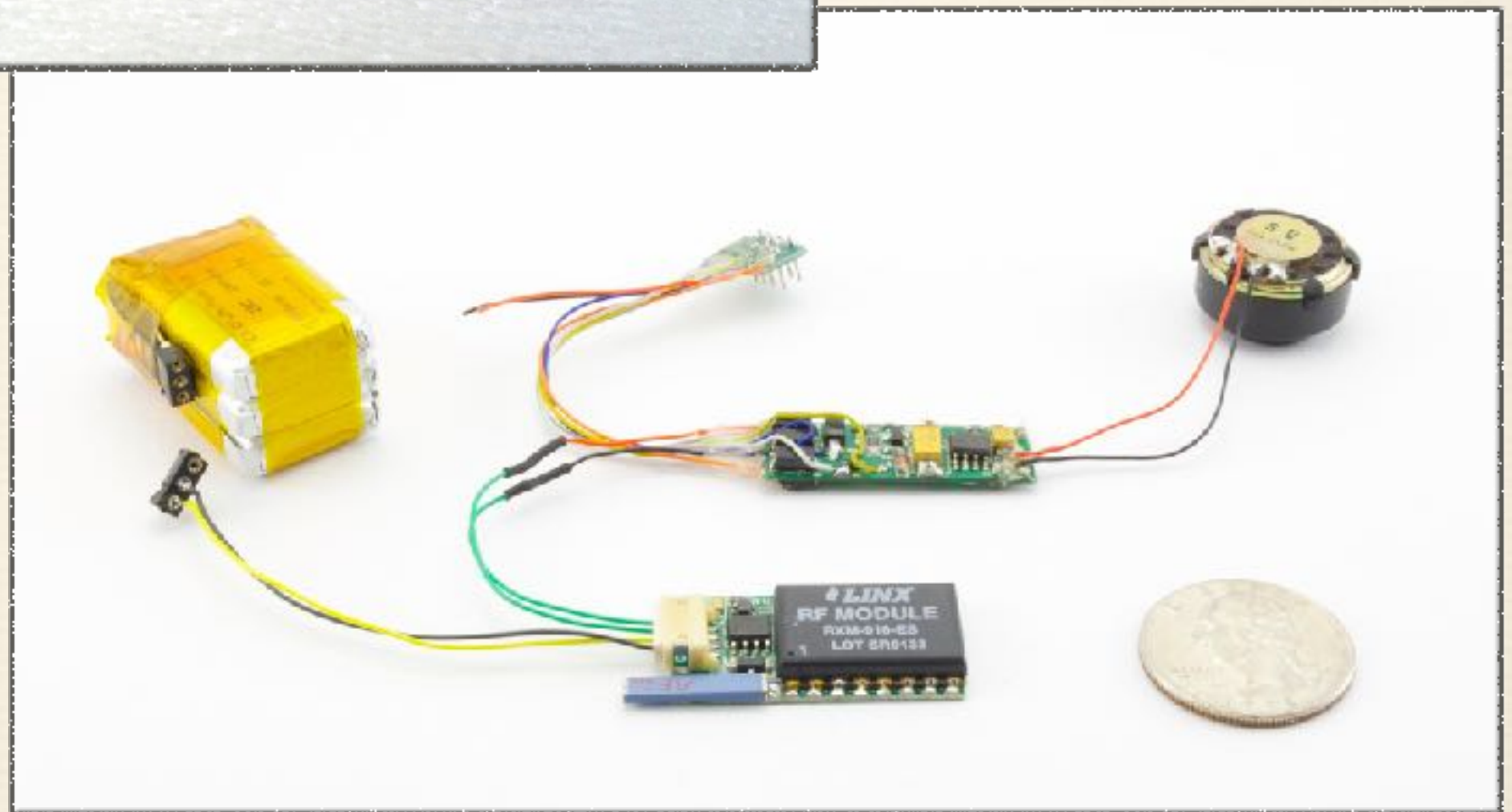


Courtesy of Dave Balser



*Justin's HOn3
3-truck Shay*

*Components
Used*



Trailing Battery Car





Another Solution: Put the Battery in a Dummy





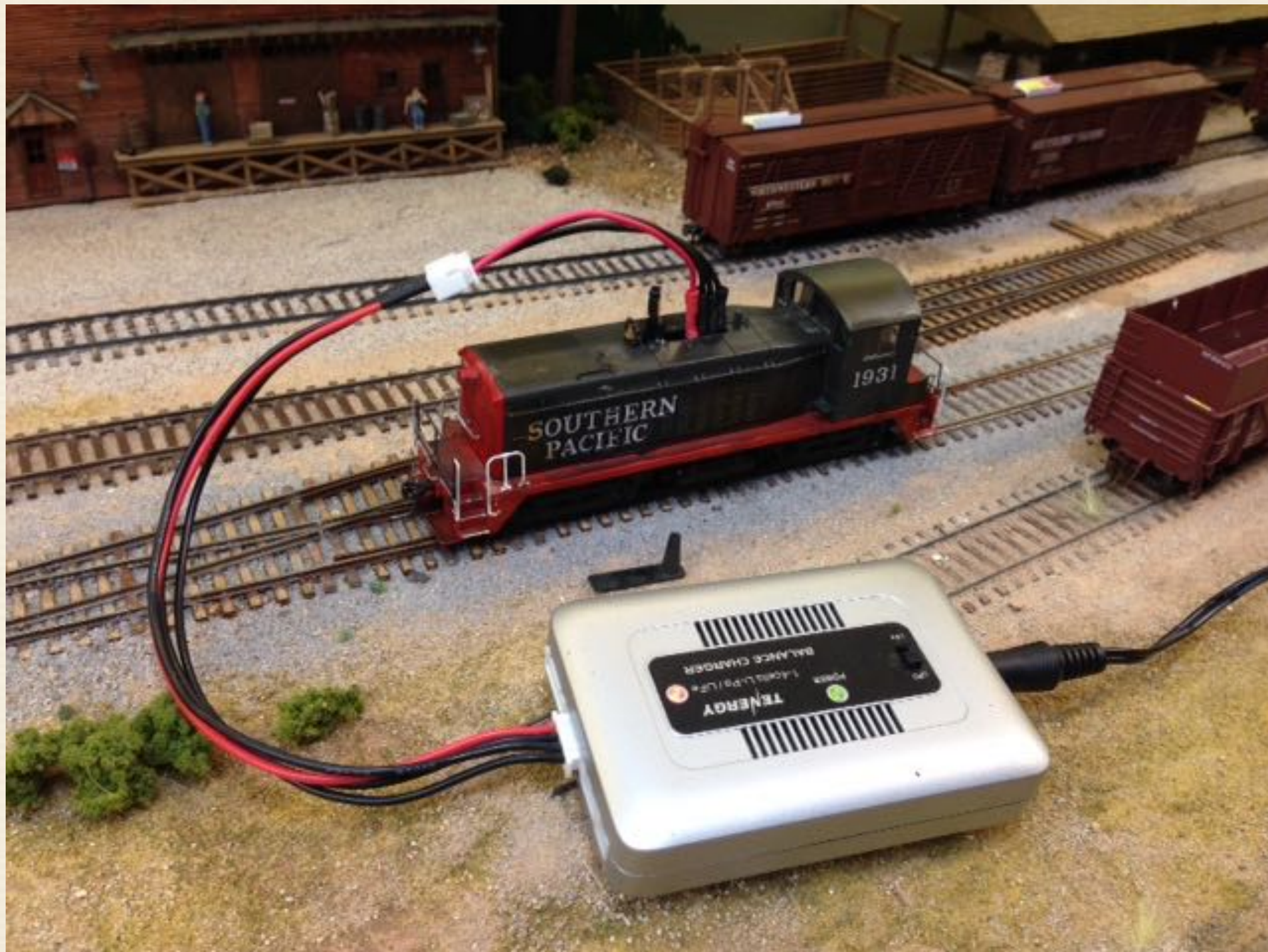
Steam Engines with a Tender





SOUTHERN PACIFIC

Battery Powered Switcher (No Sound)



The Fleet of Modified Engines



Pros and Cons



- ❖ Engines run much smoother
- ❖ No Track Cleaning
- ❖ No Wheel Cleaning
- ❖ No Short Circuits
- ❖ Major Geek Cred
- ❖ No Flickering Lights



- ❖ Batteries Need Charging
- ❖ Radio Signal Range
- ❖ Higher Cost Per Engine
- ❖ Installation needed
- ❖ No Flickering Lights

More Info

- ❖ Get the Book - Free download at [http://www.tamvalleyrr.com/images/DRS Book version Oct 2013.pdf](http://www.tamvalleyrr.com/images/DRS_Book_version_Oct_2013.pdf)
- ❖ Dead Rail Installs - complete sales including batteries, radios and installations - <http://www.deadrailinstalls.com> exclusive source of Tam Valley DRS.
- ❖ CVP USA - <http://www.cvpusa.com/> - boards for large to small scales.
- ❖ Stanton Radio Cab - <http://www.s-cab.com/>
- ❖ Bluetooth App and decoder - <http://bluerailtrains.com/> - new smaller board coming soon.
- ❖ Deltang for Trains - <http://www.deltang.co.uk/trains.htm>
- ❖ Batteries - adafruit.com, sparkfun.com, amazon.com, Dead Rail Installs; Chargers - Tenenergy, RC Hobby Shops, amazon.com