

CeD TALK

A Quick and Simple PC
Board Keep Alive

Seth Neumann

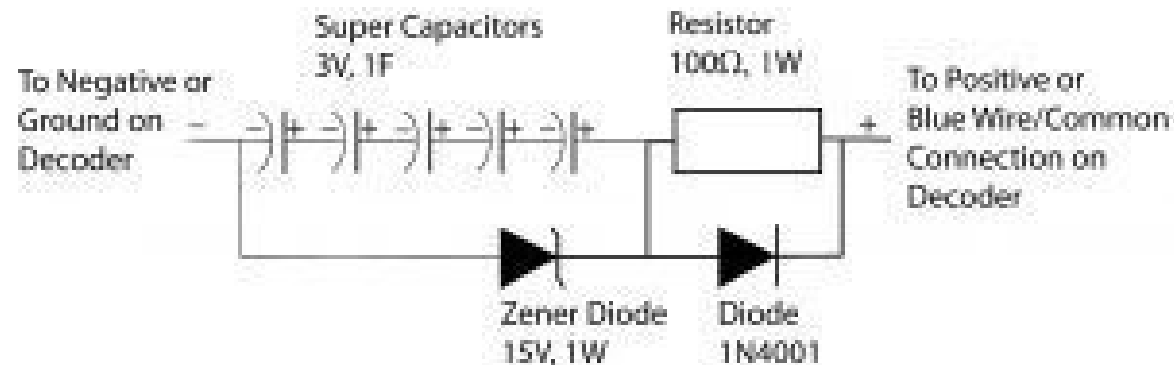
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Why make a Keep-Alive board?

- A Keep-Alive is a large capacitor that will keep a DCC-equipped locomotive running for a few seconds in the absence of power to get over dirty track or a dead frog. They can be used with most decoders.
- Phil mentioned using a circuit found on the web instead of expensive offerings from decoder manufacturers
- He started with something like <https://www.dccguy.com/?tag=keep-alive> by Dr. Larry Puckett (thanks Larry!)



- Note using a KA, other than the decoder manufacturers', may void the decoder warranty



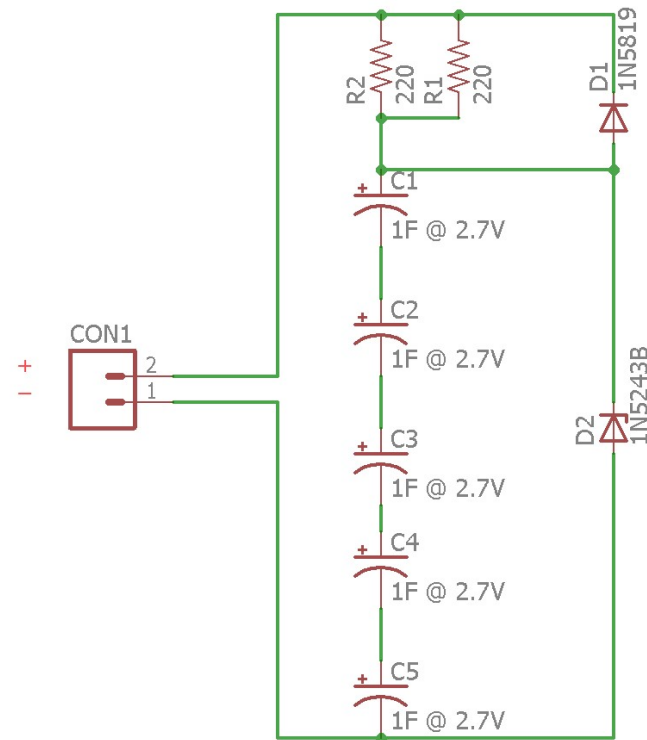
Pros and Cons of a KA like this

- Good:
 - Inexpensive – about \$8.00 in parts
 - Easy to assemble in various physical configurations
- Not so Good:
 - Space wiring is hassle and is prone to coming apart at inopportune times (such as when the shell is tightened down)
- Solution:
 - Use low cost circuit board to hold everything together
 - Less flexibility in size but it can fit within an HO EMD shell.

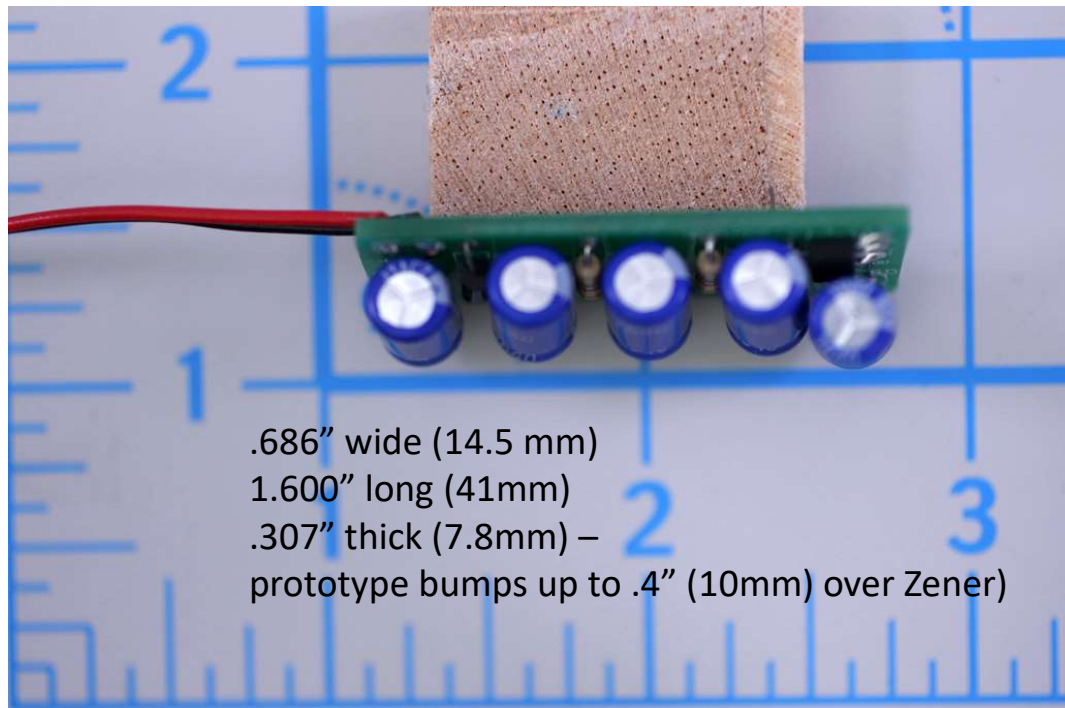
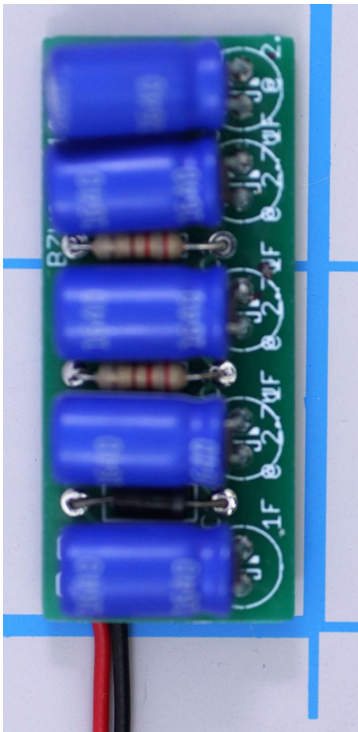


My implementation

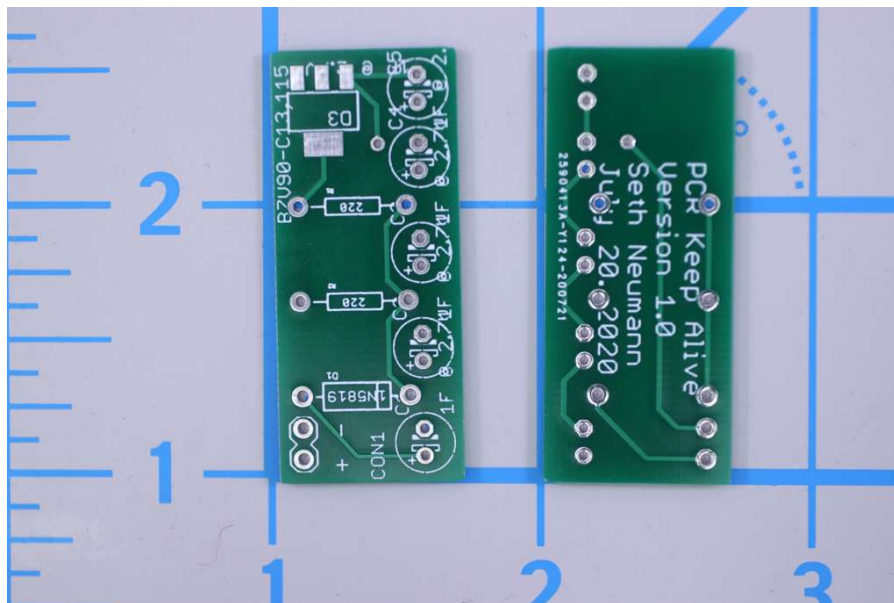
- Discussed the application with DCC gurus “the Marks Brothers”
- Made some component changes:
 - Discharge Bypass Diode to Schottky 1N5819 (lower forward drop, less power)
 - Zener diode to 13V 1W 1N5243B
 - Instead of 1/2W 100 ohm, used 2x220 ohm at 1/4W to save height and use a more available component



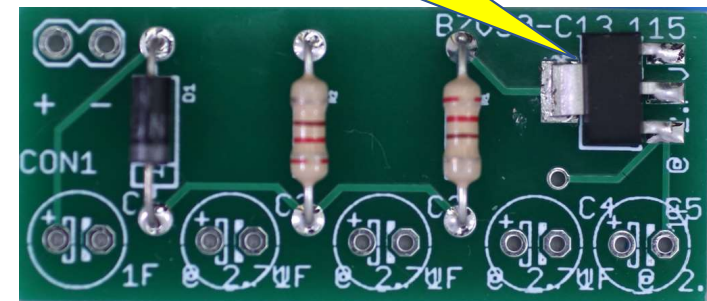
Prototype out with Beta User



Bare Board

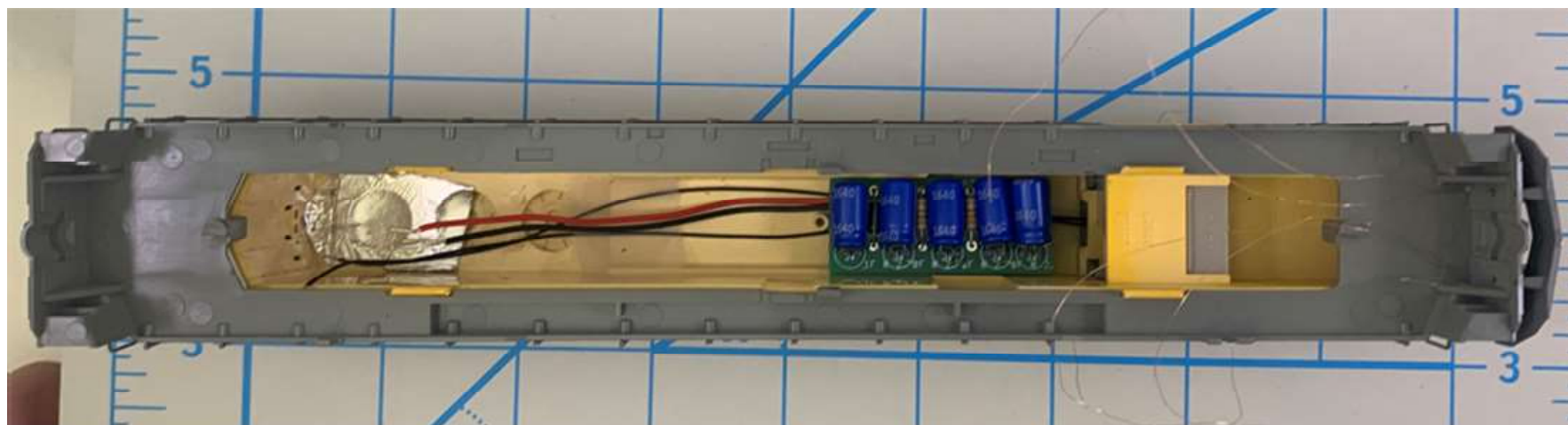


This Zener becomes axial through hole device



Diodes and Resistor stuffed

How does it fit?



PCR-Keep-Alive in Athearn SD40-2 shell



Bill of Materials – 1 Unit

Quantity	Description	Digikey P/N	Unit	Ext'd
1	Printed Circuit Board (panel of 10)	MRCS	\$5.00	\$0.50
5	AVX 1F 2.7V Super Capacitor	478-10010-ND	\$1.26	\$6.30
1	1N5819 1W Schottky Diode	497-6610-1-ND	\$0.30	\$0.30
1	1N5243B 13V 1W Zener	1N5243BTRFSCT-ND	\$0.14	\$0.14
2	220 ohm @ ¼ W resistor	CF14JT220RCT-ND	\$0.10	\$0.20
	Total for 1 unit			\$7.44

You can purchase this BOM from Digikey at <https://www.digikey.com/short/z5229d>

Plus sales tax, shipping, tariff surcharges etc, ~\$10.00



Bill of Materials – 10 Units

Quantity	Description	Digikey P/N	Unit	Ext'd
10	Printed Circuit Board (panel of 10)	MRCS	\$5.00	\$5.00
50	AVX 1F 2.7V Super Capacitor	478-10010-ND	\$1.09	54.60
10	1N5819 1W Schottky Diode	497-6610-1-ND	\$0.12	\$1.23
10	1N5243B 13V 1W Zener	1N5243BTRFSCT-ND	\$0.25	\$2.47
25	220 ohm @ ¼ W resistor	CF14JT220RCT-ND	\$0.03	\$0.70
	Total for 10 units			\$64.00

You can purchase this BOM from Digikey at <https://www.digikey.com/short/z52wpf>

Plus sales tax, shipping, tariff surcharges etc. ~ \$13.00



References and links

- EAGLE CAD Files on my GitHub
<https://github.com/SethNeumann/PCR-Keep-Alive>
- MRCS Product Page for board
<https://www.modelrailroadcontrolsystems.com/pcr-keep-alive-panel-of-10/>