CeD TALK

A Quick and Simple PC Board Keep Alive

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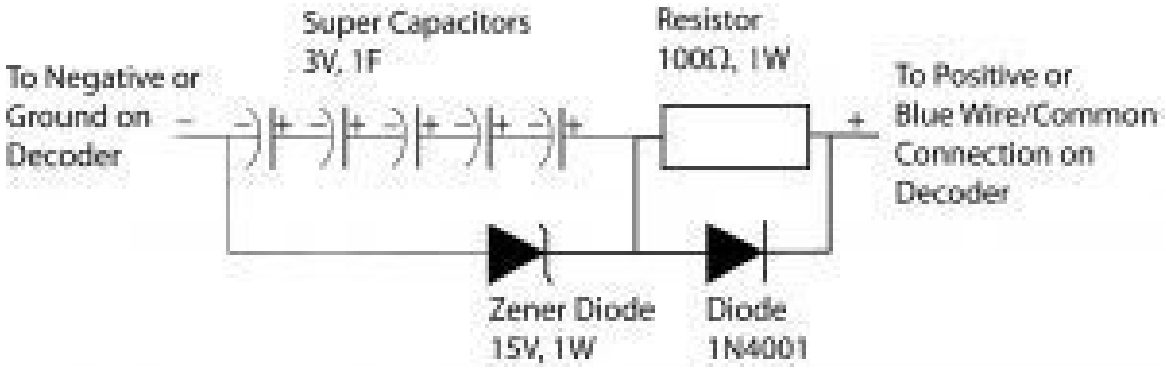
Why make a Keep-Alive board?

- 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!)



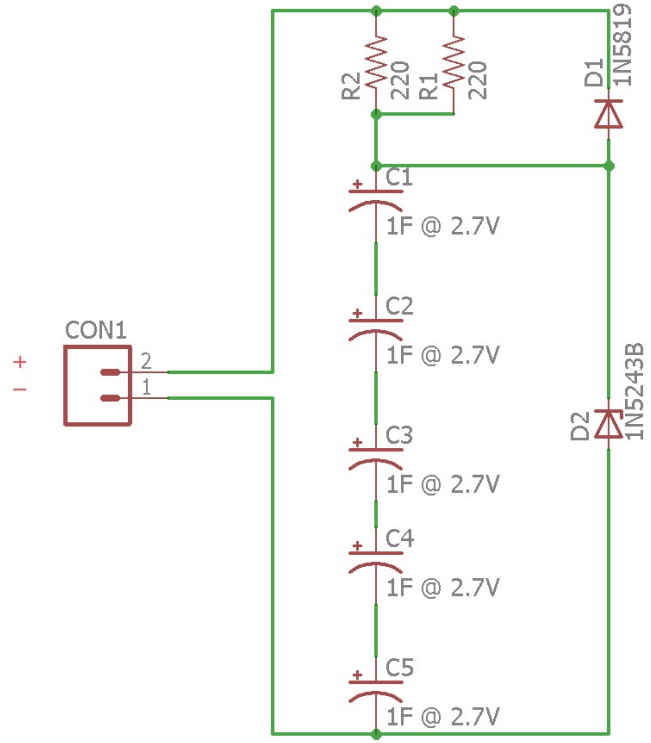
- Note using a KA, other than the decoder manufacturers', may void the decoder warranty

Pros and Cons of a KA like this

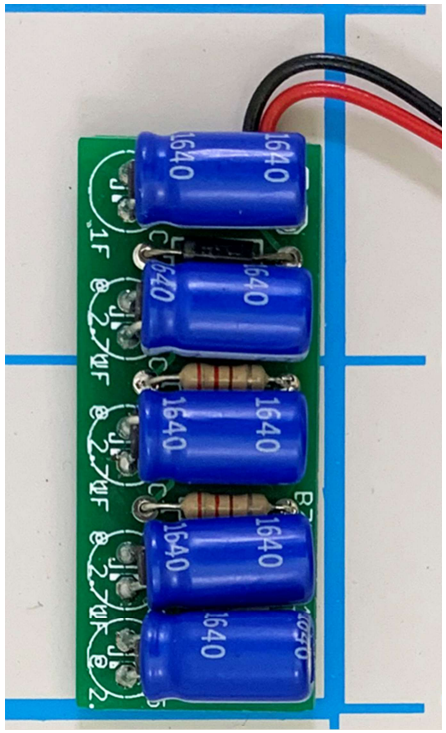
- Good:
  - Inexpensive – about $8.00 in parts
  - Easy to assemble in various physical configurations
- Not so Good:
  - Space wiring is hassle and is prone to coming apart at inopportune times (such as when the shell is tightened down)
- Solution:
  - Use low cost circuit board to hold everything together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

My implementation

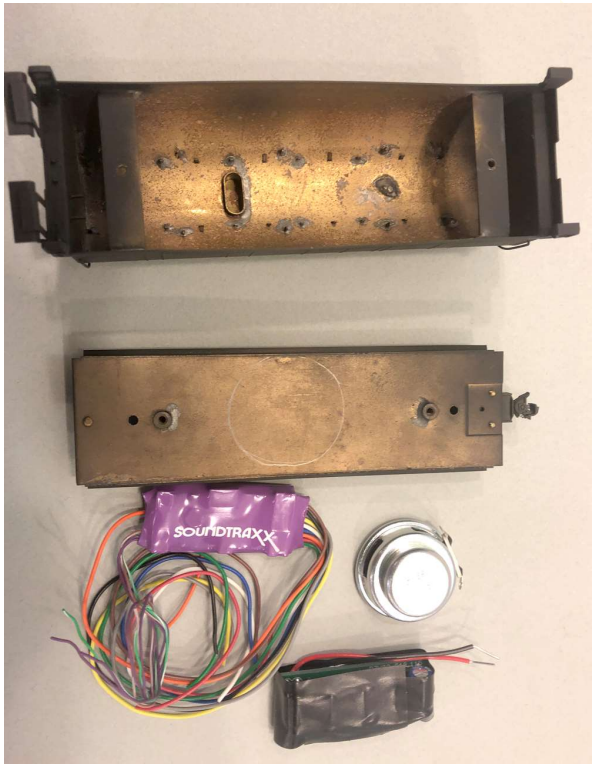
- Discussed the application with DCC gurus “the Marks Brothers”
- Made some component changes:
  - Discharge Bypass Diode to Schottky 1N5819 (lower forward drop, less power dissipated, so smaller)
  - Changed Zener diode to 13V 1W 1N5243B - smaller
  - I used 2x220 ohm at 1/4W instead of Instead of 1/2W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



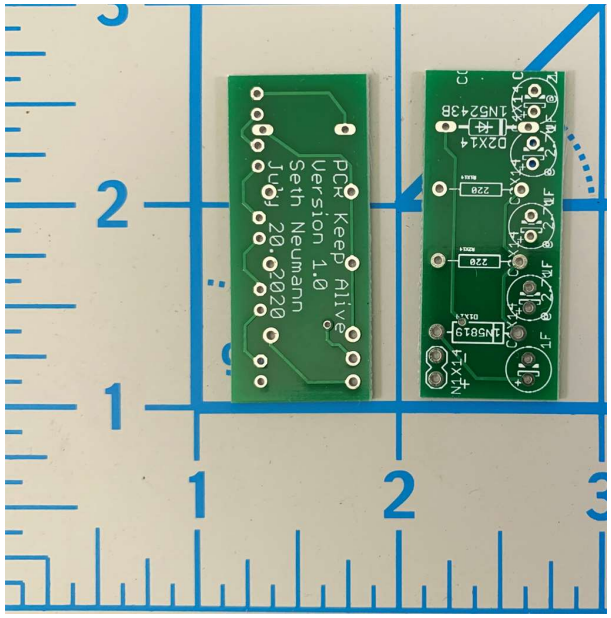
Prototype with Guy Cantwell



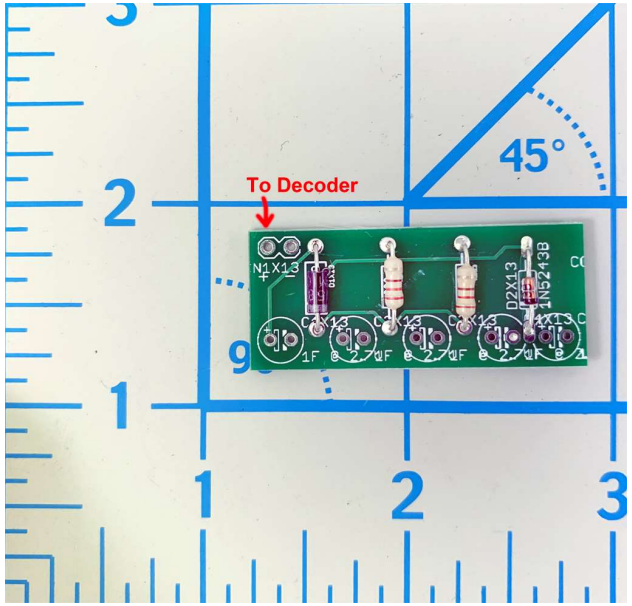
.710” wide (17.5 mm)
1.650” long (42mm)
.400” thick (10 mm) –



Bare Board

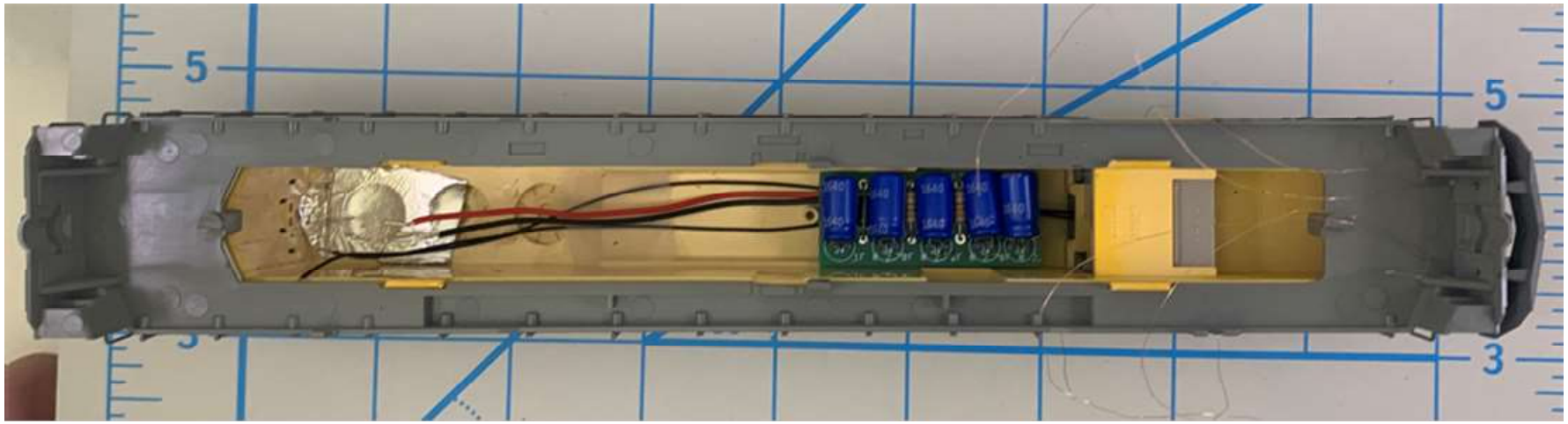


Top and Bottom



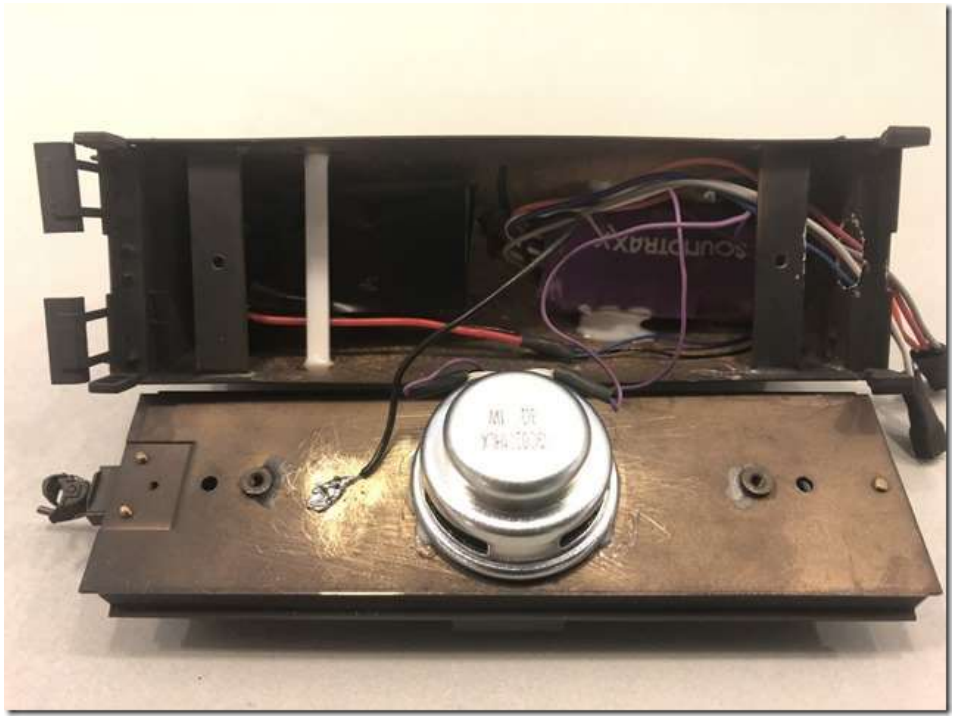
Diodes and Resistor stuffed

How does it fit?



PCR-Keep-Alive in Athearn SD40-2 shell

Guy Cantwell's Steam Installation



Tender, Tsunami, Speaker and Keep alive (wrapped in tape)

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, ~$20.00

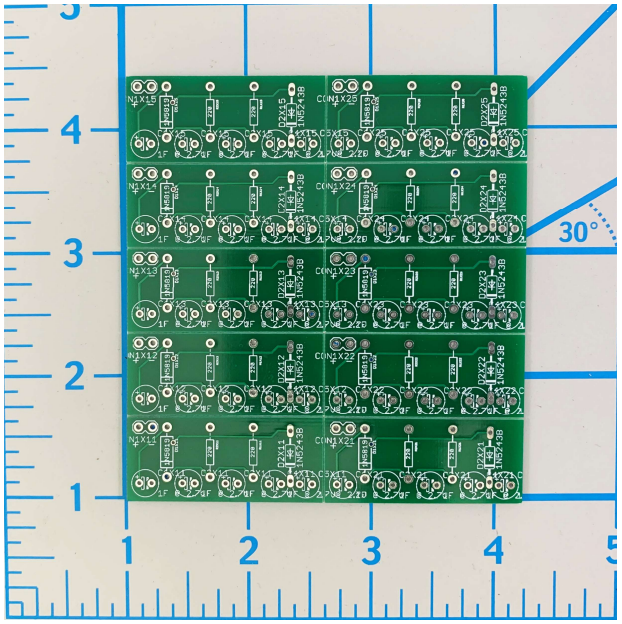
Bill of Materials – 10 Units

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

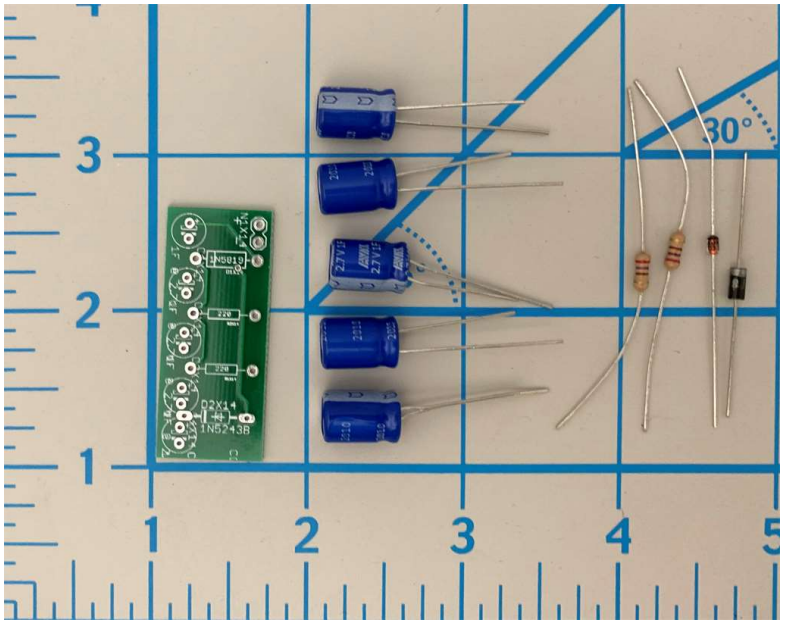
You can purchase this BOM from Digikey at https://www.digikey.com/short/z52wpf

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

Options to Purchase



Panel of 10 - $5.00



Kit for 1 - $9.95

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/
- Larry Puckett's Article like https://www.dccguy.com/?tag=keep-alive