

Bias Wire Harness Design and Construction

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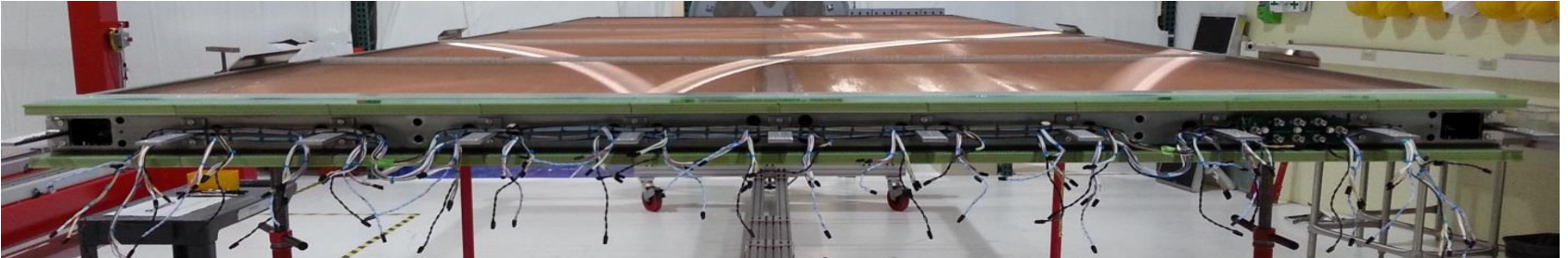
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Bias Wire Harness Features

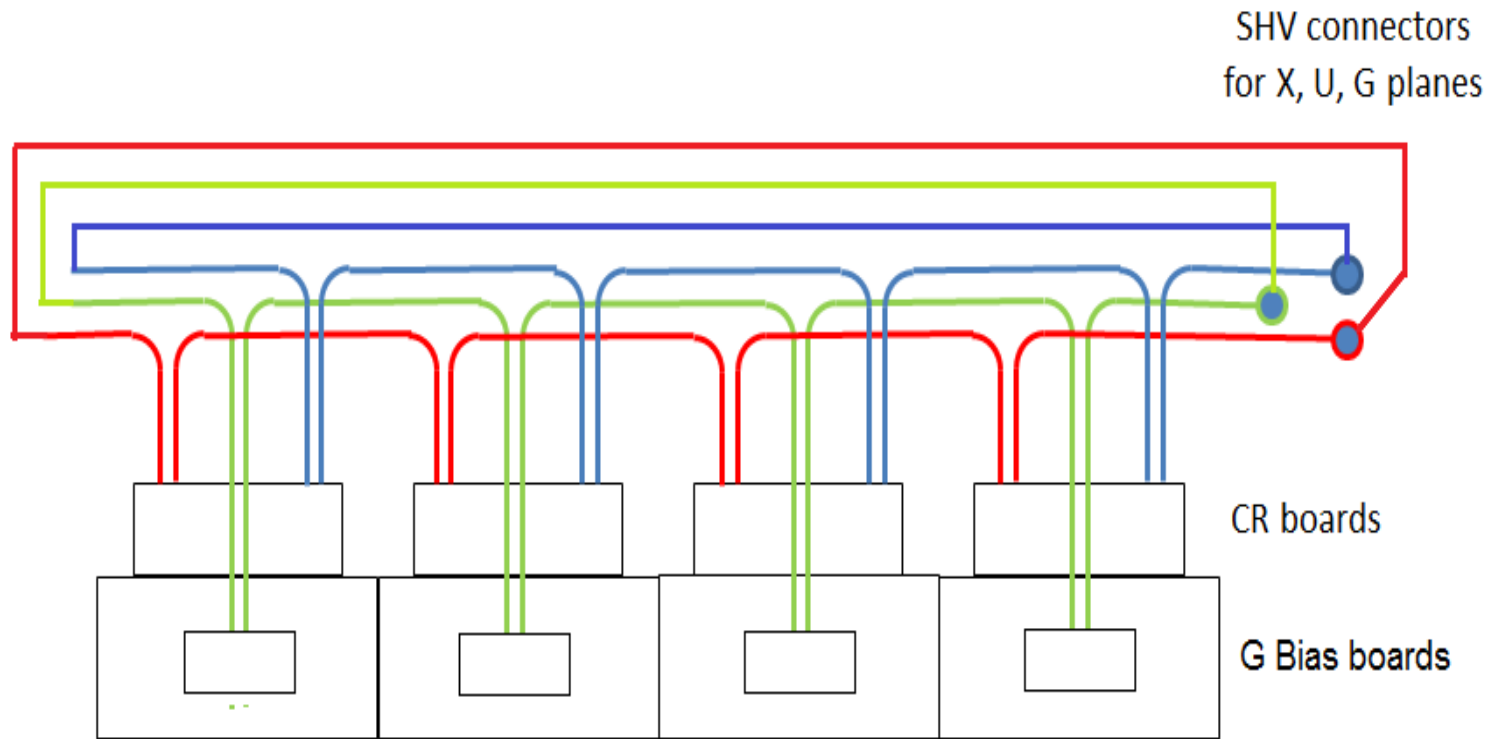
- Brings bias voltages to CR and G-bias boards
- Fed from the SHV receptacles in the SHV panel
- ProtoDUNE bias connectors probably should be upgraded to more secure locking method
- Better connectors could justify less redundant
- Pastel wire colors are difficult to differentiate
- Seeking ways to label bias connectors or wires

Bias Harness: A Mess of Wires

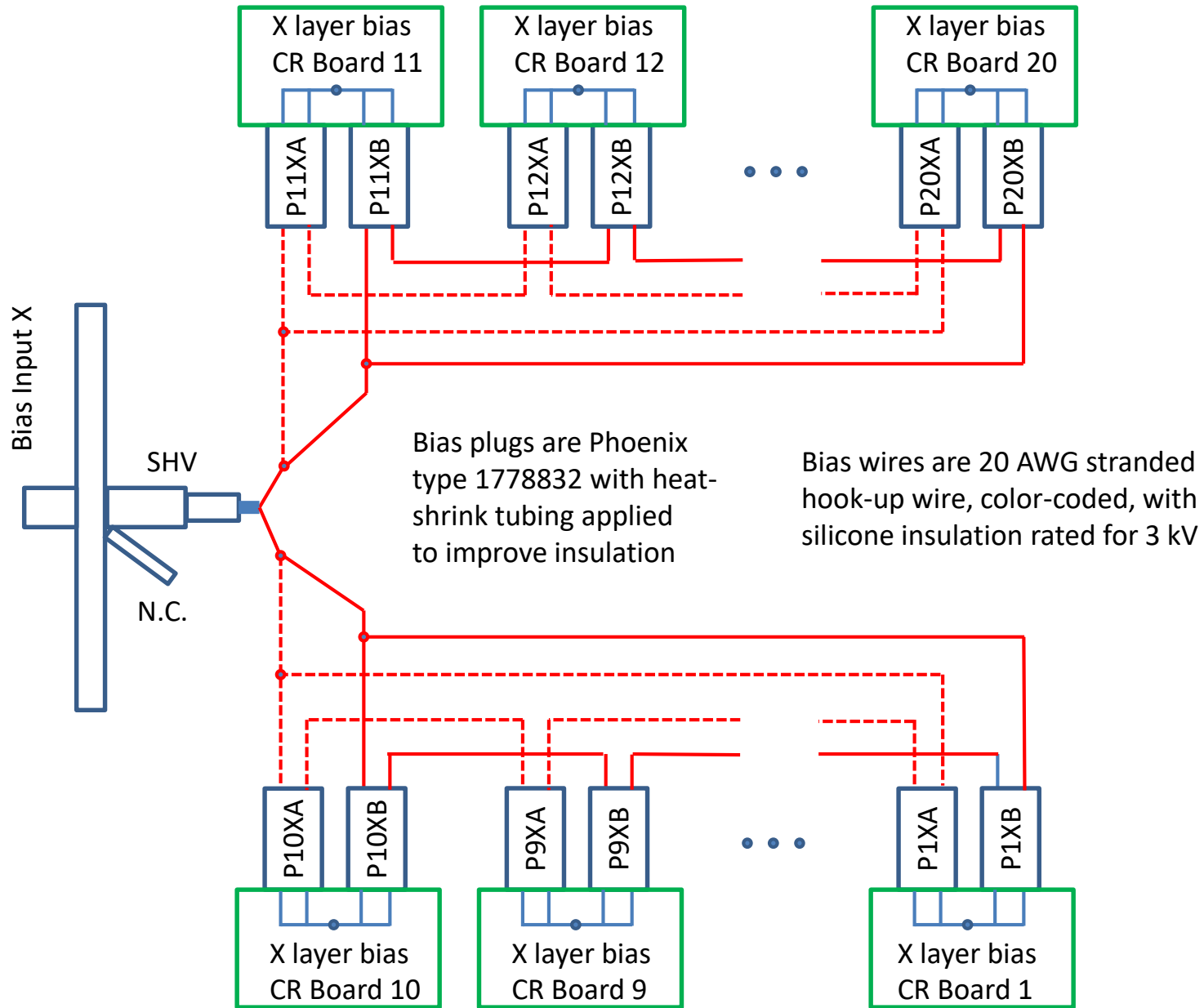


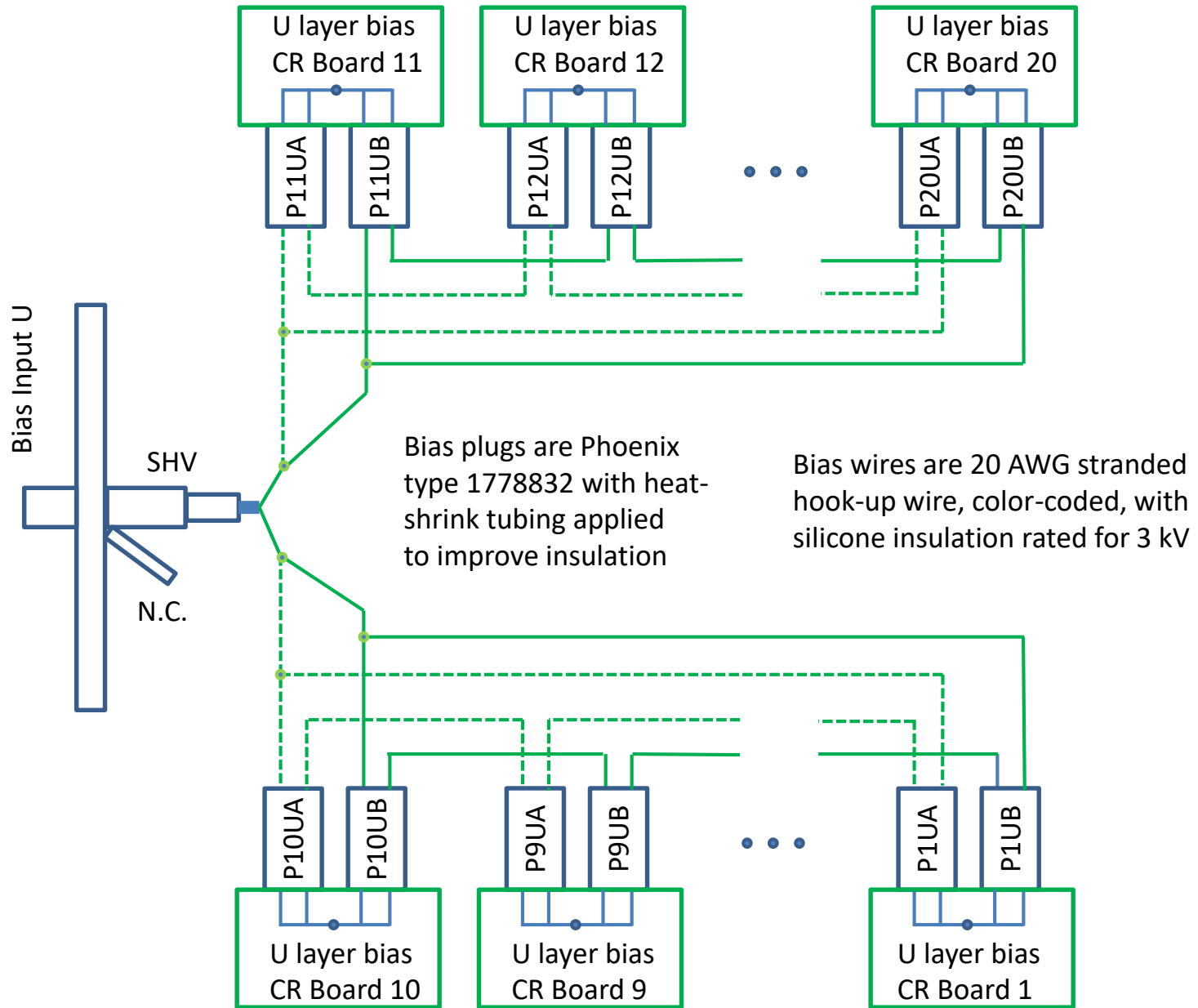
- Two bundles of 12 wires span the head tube
- Sixty bias pigtails have to be managed
- DUNE APAs ship without CR boards installed
- Harnesses could be installed on-site
- The wider DUNE head tube helps

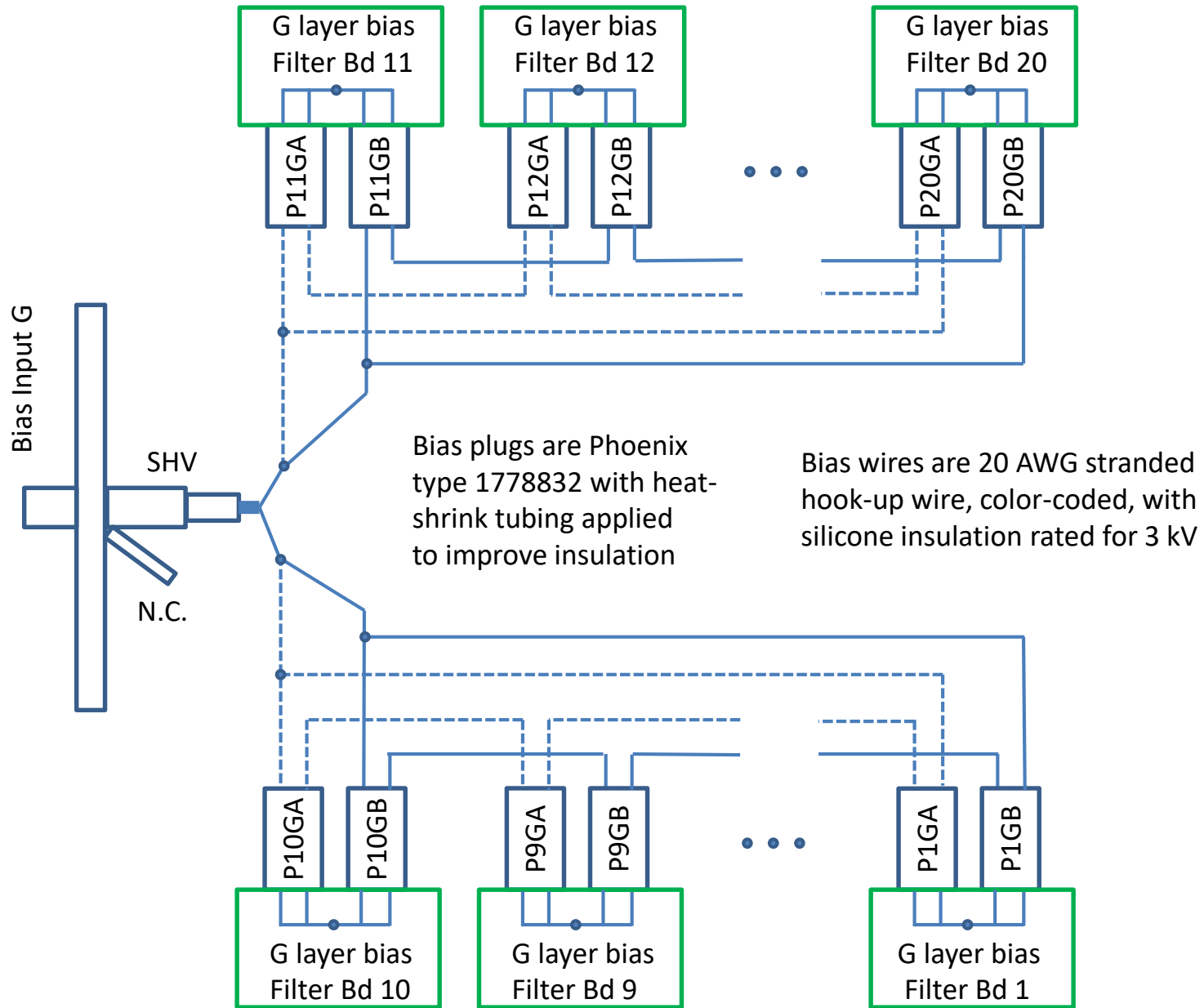
Looped Daisy-Chain (Ring) Architecture



- A single disconnected bias connector drops bias voltage to only one head board
- Redundant loops ensure that a single disconnected bias connector does not leave any X, U, or G wires unbiased







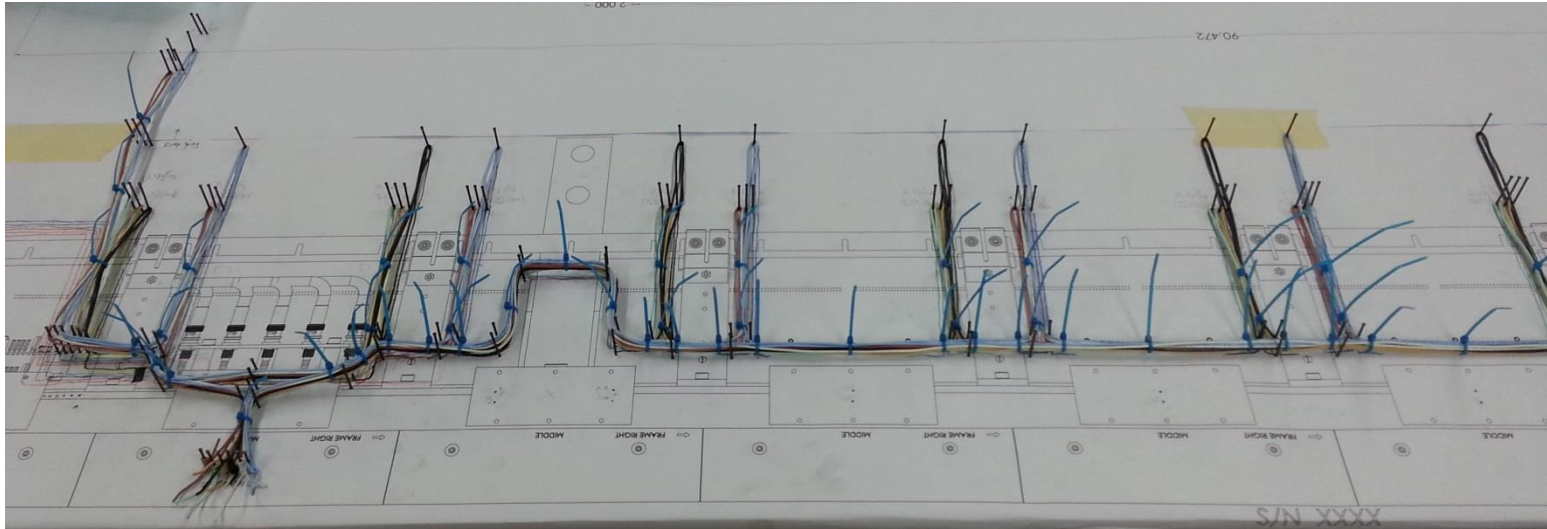
Bias Connectors

Surface-mount receptacles are compact and mount securely to circuit boards. The insulation material is a liquid-crystal polymer with high heat tolerance and good low-temperature performance.

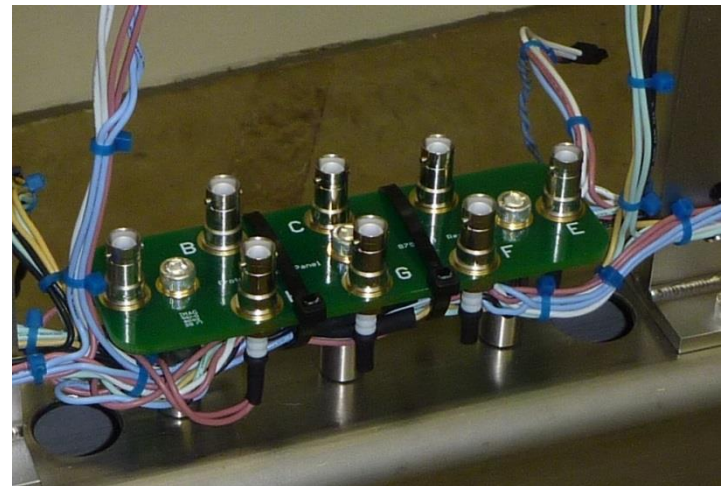


Plugs have small wedge-shaped protrusions that expand the receptacle body slightly when inserted. The protrusions lock into cut-outs in the receptacle body. Separation force is about 1 pound.

Wire harness construction



Field cage bias will bypass SHV panels in DUNE. The SHV panel will have fewer connectors and a smaller footprint.



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