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**PPD / EED / Infrastructure and Support Group**

Technical Note: IG\_ 20160001

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**ANNIE VME64x Crate**

**Power Distribution**

**Overview:**

The ANNIE experiment wants a VME64x crate to evaluate hardware and develop software. Geoff Savage, with help from Infrastructure and Support Group members, recovered sufficient equipment from the DZero Assembly Building to provide the crate as well as low voltage power for the crate to satisfy ANNIE requirements. This document reviews the how the power connections for the crate. A wiring diagram is included for completeness.

**VME64x Crate:**

Low-voltage power connected to the crate for it’s previous use was not compatible with the ANNIE requirements so the power supplies and wiring harness that were connected to the crate’s low-voltage power distribution network were removed. The low-voltage power distribution network consists of power terminals mounted in a G10 housing. The power terminals are connected to power terminals on the V64x backplanes via wires or plated copper bus work. The low-voltage power distribution network was left in place and re-used.

**Low-Voltage Power Supply:**

Previously used for the D0 Silicon Micro Tracker Detector system, an 8 output Wiener PL508 power supply and associated chassis were re-purposed to provide low-voltage power to the VME64x crate. To accommodate the ANNIE requirements, only 4 of the outputs are required. A new wiring harness and in-line fuses were designed to connect to the low-voltage power distribution network left connected to the crate.

Sense wire pairs are connected directly to each of the 8 outputs (local sensing). Voltage levels in the crate will be measures and output voltage levels of the Wiener supply will be adjusted as necessary.

This particular Wiener Power Supply / Chassis requires a +5Vdc level to be present on the front-panel 15-pin d-sub connector before output power can be generated. Currently this 5V level is provided by a re-purposed D0 Rack Monitor Interface. The D0 Rack Monitor Interface can monitor a number of rack environmental conditions, including smoke detection, and can drop the 5V level if rack conditions warrant. In this application rack environmental monitoring is not performed by the D0 Rack Monitor Interface.

**AC Power:**

AC power for the Wiener PL508 power supply is provided via a standard 120V / 15A 5-15 plug / cord. A 300V / 30A 3AG fuse holder installed in the Wiener chassis is in series with the non-grounded conductor in the cord. A 250V / 15A fuse is installed.

 **+3.3Vdc:**

The U0 output of the Wiener power supply is indicated to be in the range of 2 to 7V with a maximum current of 115A. This output is connected to high-current (large diameter fasteners) 3.3V terminals in the low-voltage power distribution network with red and black 4AWG wire. A 32V / 50A blade fuse is placed in series with the non-grounded conductor. The rating of the fuse holder is 32V / 250A.

The low-voltage power distribution network terminals are connected to the backplane power terminals with tinned copper bus work. The minimum cross-sectional area of the bus is 0.141 inch2.

Identifying information for the backplane power terminals is not available. The current rating of these terminals is unknown.

 **+7Vdc:**

The U1 output of the Wiener power supply is indicated to be in the range of 2 to 7V with a maximum current of 30A. This output is connected to low-current (small diameter fasteners) terminals in the low-voltage power distribution network with white and black 10AWG wire. A 32V / 30A 3AG fuse is placed in series with the non-grounded conductor. The rating of the fuse holder is 300V /30A. .

The low-voltage power distribution network terminals are connected to the backplane power terminals with 6AWG wires.

Identifying information for the backplane power terminals is not available. The current rating of these terminals is unknown.

**-7Vdc:**

The U5 output of the Wiener power supply is indicated to be in the range of 2 to 7V with a maximum current of 30A. This output is connected to low-current (small diameter fasteners) terminals in the low-voltage power distribution network with orange and black 10AWG wire. A 32V / 30A 3AG fuse is placed in series with the non-grounded conductor. The rating of the fuse holder is 300V / 30A.

The low-voltage power distribution network terminals are connected to the backplane power terminals with 6AWG wires.

Identifying information for the backplane power terminals is not available. The current rating of these terminals is unknown.

 **+5Vdc:**

The U7 output of the Wiener power supply is indicated to be in the range of 5 to 10V with a maximum current of 80A. This output is connected to high-current (large diameter fasteners) 5V terminals in the low-voltage power distribution network with yellow and black 4AWG wire. A 32V / 50A blade fuse is placed in series with the non-grounded conductor. The rating of the fuse holder is 32V / 250A.

The low-voltage power distribution network terminals are connected to the backplane power terminals with tinned copper bus work. The minimum cross-sectional area of the bus is 0.141 inch2.

Identifying information for the backplane power terminals is not available. The current rating of these terminals is unknown.

 **Wiring Diagram:**

Please find “Wiring Diagram for ANNIE VME64x Crate”, drawing number176947 attached.