



PPD / EED / Infrastructure and Support Group

Technical Note: IG_20160003

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ANNIE VME64x Crate for SciBooNE Hall Installation Power Distribution

Overview:

The ANNIE experiment wants four 6U VME64x crates for installation in the SciBooNE experimental hall. These crates differ from the one described in document IG_20160001 “*ANNIE VME64x Crate Power Distribution*” which was assembled from assorted components for software and hardware development. For the final run of the D0 Detector, the Level 1 Calorimeter collaboration installed a number of integrated VME64x backplane, fan tray, power unit and from panel assemblies provided by Wiener. It was determined that these assemblies could be made compatible with ANNIE requirements by modifying the voltages for two of the outputs and making small changes to the wiring from the Wiener power unit back plane to the VME64x backplane. This document reviews the how the power connections for the crate are realized. A wiring diagram is included for completeness.

VME64x Crate:

The crate into which the VME64x backplane is secured is integrated into the chassis that holds the Wiener power unit. Wired connections are made between the power unit backplane and the VME64x backplane. The two higher current power connections were made via large tinned copper bus work connected to multiple power taps. The two low current power connection were made via direct connection to multiple power taps. The return current connections for all four are made common to a single wide tinned copper bus connected to many multiple backplane power taps.

Low-Voltage Power Supply:

The integrated VME64x crate contains a Wiener power unit backplane that provides four outputs. As recovered from their use for D0 L1 Cal, the four outputs were connected to the following labeled power connections on the VME64x backplane:

- U0 to the +5V power taps, with a nominal output voltage of +5V
- U1 to the +12V power taps, with a nominal output voltage of +5V

- U3 to the +3.3V power taps, with a nominal output voltage of +3.3V
- U5 to the -12V power taps, with a nominal output voltage of -5V

Connections to the bus work and individual backplane power tap were made via 10AWG wire.

The cards that ANNIE plans to insert into the VME64x crate require 4 power connections to operate; +5V, +3.3V and +/- 7.5V. These cards look for the first two voltages on the standard 5V and 3.3V pins. +/-7.5V are expected to be found on the +/-V1 pins so modification of the wiring between the power unit backplane and the VME64x backplane was necessary.

Sense lines connect the VME64x backplane to the Wiener power unit. The power unit will not operate if any of the sense lines are unconnected. As used for D0 L1 Calorimeter operation, the +/-5V low current outputs were wired to the +/-12V power taps on the VME64x backplane. The sense lead connections are integrated into the backplane and are not modifiable. Connections to the +/-12V power taps need to be maintained, even though ANNIE cards will not be make connections to these nets, to ensure proper operation of the Wiener power unit.

Examination of the wiring used by Wiener to connect the two backplanes caused us to make certain modifications. In all cases multiple conductors were used to make connections to and from the VME64x backplane. We elected to install series fuses into all of the individual non-ground current carrying conductors for safety. The rating of all fuse holders is 30A / 300V. Identifying information for the backplane power taps is not available. The current rating of these terminals is unknown.

AC Power:

AC power for the Wiener PL6000 power unit is provided via a standard 120V / 15A 5-15 plug / cord. It is expected that this power cord will be connected to a 120V / 15A 5-15 receptacle in the power distribution chassis that's protected with a 15A circuit breaker

+3.3Vdc:

The U3 output of the Wiener power unit is indicated to have a maximum current of 115A. After modification this output is connected to the VME64x backplane 3.3V and return busses with four gray and four black 10AWG wires. A 20A / 250V 3AG fuse is placed in series with each non-grounded conductor. The output voltage is adjusted to deliver 3.3V.

+7.5Vdc (+V1 and +12V):

The U1 output of the Wiener power unit is indicated to have a maximum current of 30A. This output is connected to +V1 power taps on the VME64x backplane with white and black 10AWG wire. A 30A / 32V 3AG fuse is placed in series with the non-grounded conductor. The output voltage is adjusted to deliver +7.5V.

This output is also connected to the +12V power taps on the VME64x backplane with orange (before the fuse), red (after the fuse) and black 10AWG wire. A 10A / 250V 3AG fuse is in series with the non-grounded conductor.

-7Vdc (-V1 and -12V):

The U5 output of the Wiener power unit is indicated to have a maximum current of 30A. This output is connected to -V1 power taps on the VME64x backplane with violet and black 10AWG wire. A 30A / 32V 3AG fuse is placed in series with the non-grounded conductor. The output voltage is adjusted to deliver -7.5V.

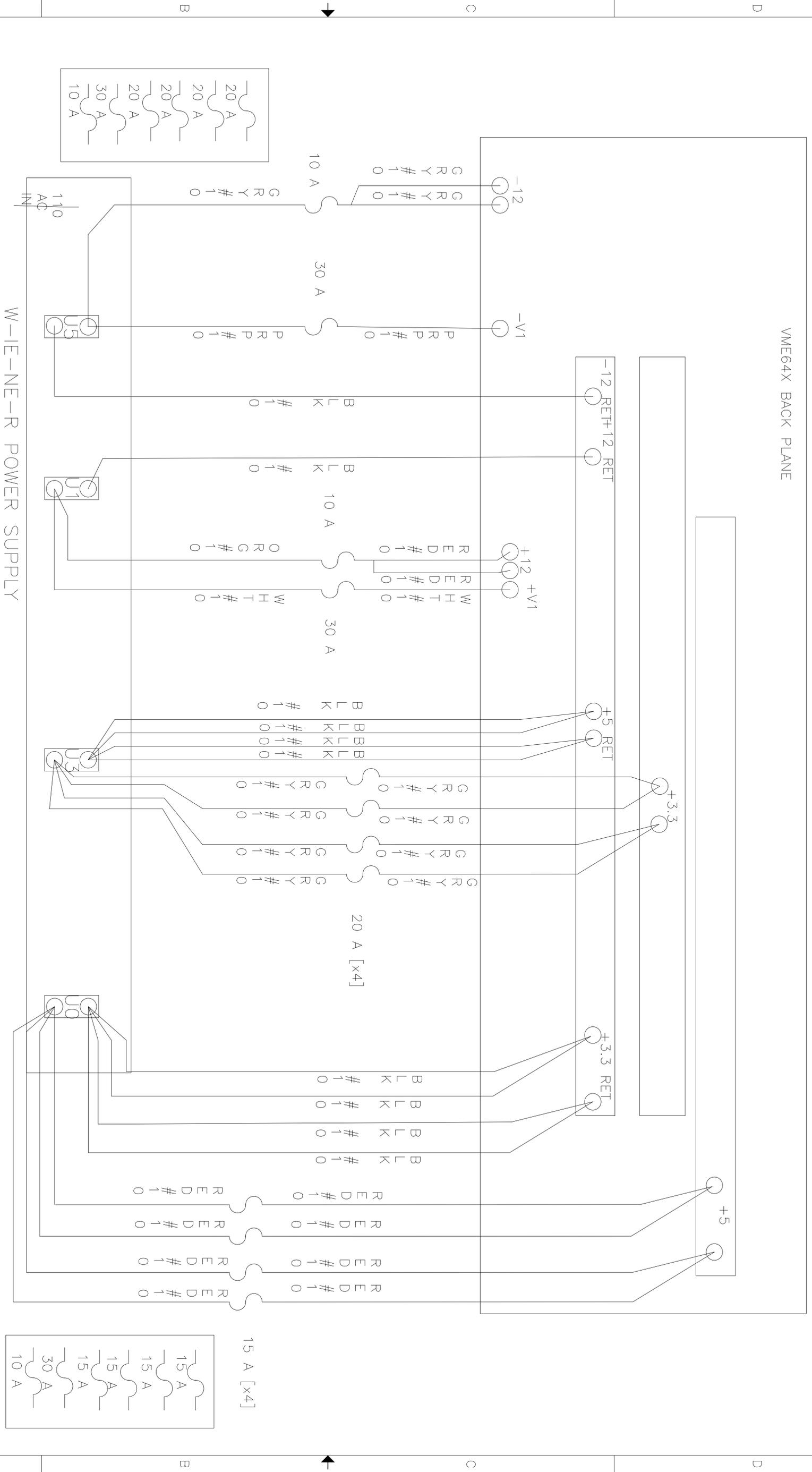
This output is also connected to the -12V power taps on the VME64x backplane with gray and black 10AWG wire. A 10A / 250V 3AG fuse is in series with the non-grounded conductor.

+5Vdc:

The U0 output of the Wiener power unit is indicated to have a maximum current of 115A. After modification this output is connected to the VME64x backplane +5V and return busses with four red and four black 10AWG wires. A 15A / 32V 3AG fuse is placed in series with each non-grounded conductor. The output voltage is adjusted to deliver 5V.

Wiring Diagram:

Please find “ANNIE SciBooNE Hall VME64x Crate Wiring Diagram”, drawing number 176948 attached.



ITEM	PART NUMBER	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPEC.	QUANTITY	7/7987/2018	
DESIGNED BY	W. M. MULLIK	6/7/79	
CHECKED BY	W. M. MULLIK	6/7/79	
APPROVED BY	W. M. MULLIK	6/7/79	
USED ON -	ANNNIE W-I-E-N-E-R VME64X		
APPROVAL			
FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY PRD / EED / INFRASTRUCTURE GROUP			
ANNNIE SCIBOONE HALL VME64X CRATE WIRING DIAGRAM			
SCALE	SIZE	ISSUE NO.	DRAWING NUMBER
		1	176948