



Dark Energy Survey
Detector Head Electronics Crate
Disassembly
&
Modular Replacement
Instructions
For Type 1 DAQ Crate

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Version 1.1



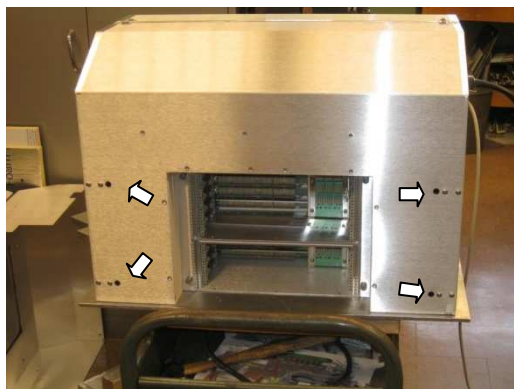
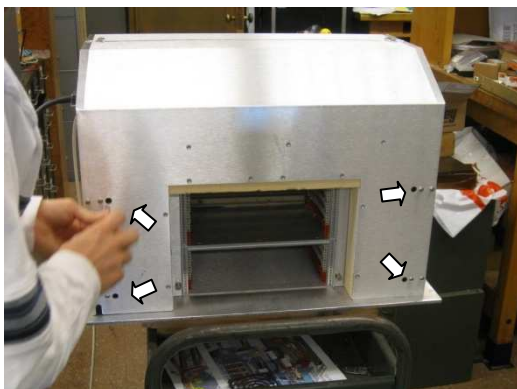
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This document shows how to disassemble and replace modules in the Dark Energy Survey Type 1 DHE DAQ Crate. Some mechanical knowledge & patience is needed to perform these steps. Be careful not to damage the dhe crate by stripping threads, breaking screws, or pinching wires.

I. Removing Insulating Top Cover:

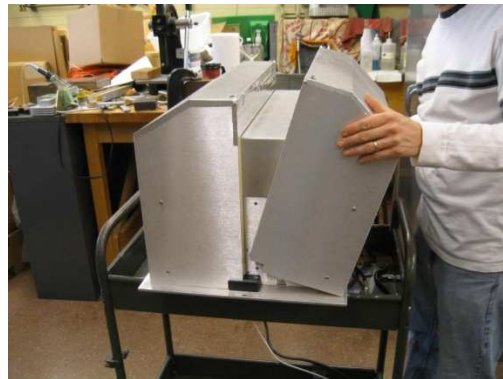
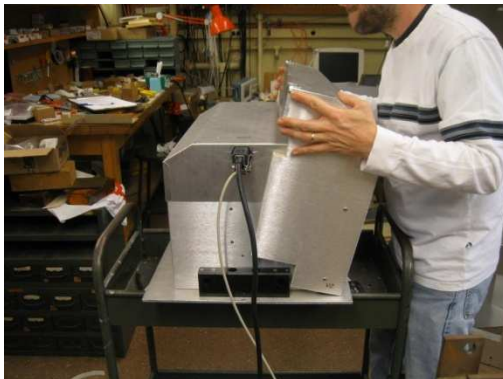
- a. Loosen the four captive screws on two sides of the Insulating Top Cover:
 - i. Use a Phillips-headed screwdriver to loosen the four captive screws on each side of the Insulating Top Cover.
 - ii. These screws are spring loaded. Do not completely remove the screws.



- b. Move hooks on top of Insulating Top Cover:
 - i. Use a Phillips headed screwdriver to loosen the two mounting hooks on the top of the Insulating Top Cover.
 - ii. Only loosen the screws until the hooks can be moved.



c. Remove Insulating Top Cover:



II. Installing Insulating Top Cover:

- a. Installation is done in reverse order as the removal process.
- b. Make sure the sides fit into the grooves in the blocks on each side. The grooves help keep the sides of the Insulating Top Cover up against the crate.

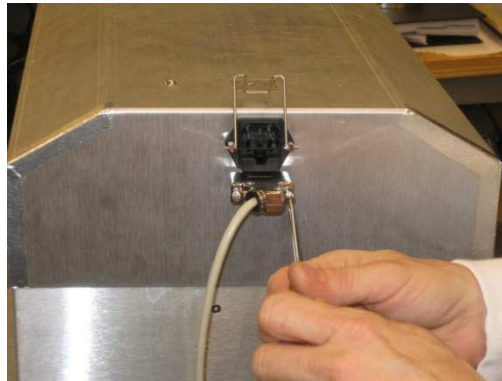
III. Removing Top Cover:

- a. Remove Insulating Top Cover.
- b. Unplug a/c cord.
 - i. Make sure a/c power is off to crate before removing plug.
 - ii. Flip cord retaining clip up to free the plug.
 - iii. Pull the plug out from the Top Cover.



DHE Disassembly Directions For Type 1 DAQ Crate

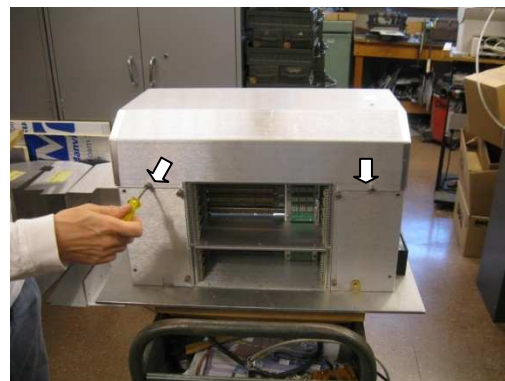
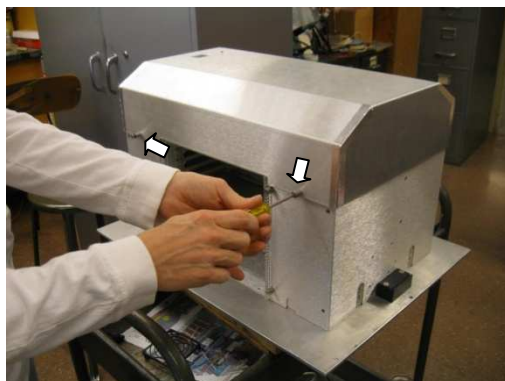
- c. Unplug ICS ICC Interface Cable:
 - i. Use a small flathead screwdriver to loosen two screws holding the db15 connector to the Top Cover.



- ii. Unplug the db15 connector from the Top Cover.



- d. Loosen two captive screws on each side of the Top Cover:
 - i. Use a Phillips-headed screwdriver to loosen the two captive screws on each side of the Top Cover.
 - ii. These screws are spring loaded. Do not completely remove the screws.

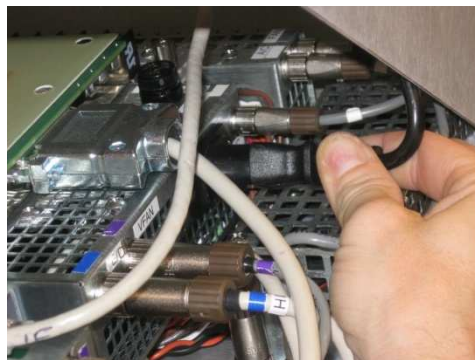


DHE Disassembly Directions For Type 1 DAQ Crate

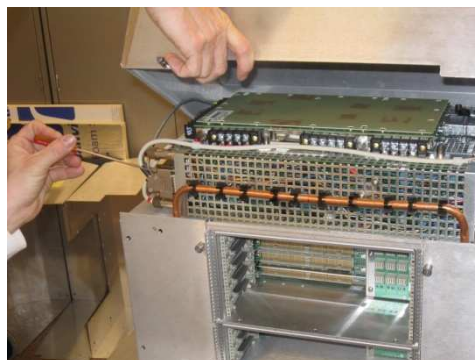
- e. Lift top cover from crate:
 - i. Carefully lift the top cover straight up about 6 inches.



- f. Unplug the a/c power cable from the Vicor Fan Shield Module
 - i. Unplug the black a/c power cable from the Vicor Fan Shield Module, which is located inside the Top Cover.



- g. Unplug ICS ICC Interface Cable:
 - i. Use a small flat-headed screwdriver to unscrew & Unplug the db15 connector from the ICC Board Module, which is also inside the Top Cover.



DHE Disassembly Directions For Type 1 DAQ Crate

- ii. Use a small flat-headed screwdriver to lift and remove the ICS ICC Interface cable from two cable clamps.



- h. Remove top cover:
 - i. The a/c power cord & ICS ICC Interface cable should have been unplugged from inside the Top Cover before removing the Top Cover.



IV. Installing Top Cover:

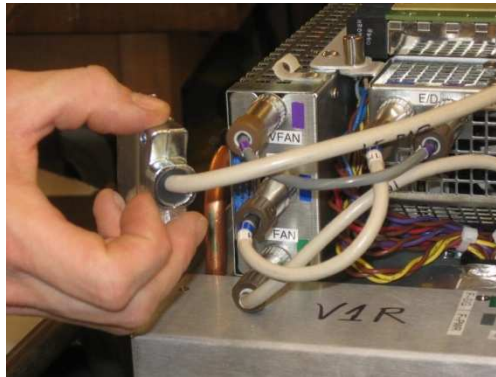
- a. Installation is done in reverse order as the removal process.
- b. Don't pinch any wires at either end when installing Top Cover.
- c. Install wire ties to bundle cables together at both ends.
- d. Center captive screw into hole before tightening.
- e. Top Cover may need pushed down from top to line up captive screws properly.

V. Removing ICC Board Module:

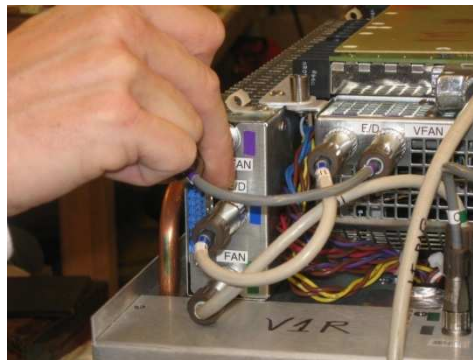
- a. Remove Insulating Top Cover.
- b. Remove Top Cover.

DHE Disassembly Directions For Type 1 DAQ Crate

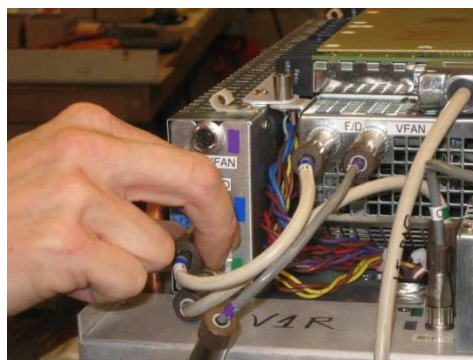
- c. Unplug cables from ICC Board Module.
 - i. Use a small flat-headed screwdriver to unscrew & Unplug the db25 VMonitor connector, (Cable I), from the ICC Board Module.



- i. Unplug violet Vicor Fan RPM cable, (Cable G).

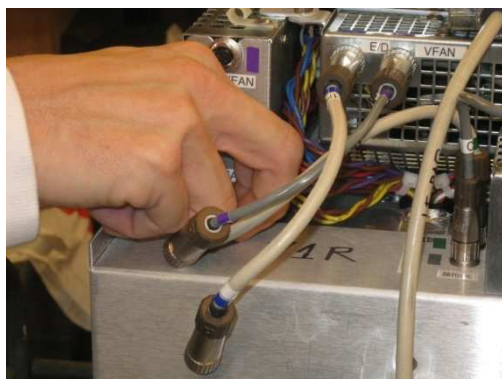


- ii. Unplug blue Enable/Disable cable, (Cable H)..



DHE Disassembly Directions For Type 1 DAQ Crate

iii. Unplug Green Fan RPM cable, (Cable E).

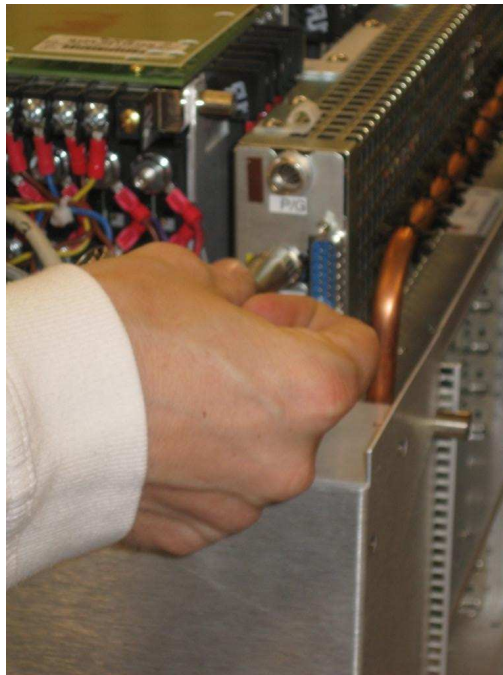


iv. Unplug Brown Power-Good cable, (Cable J)..

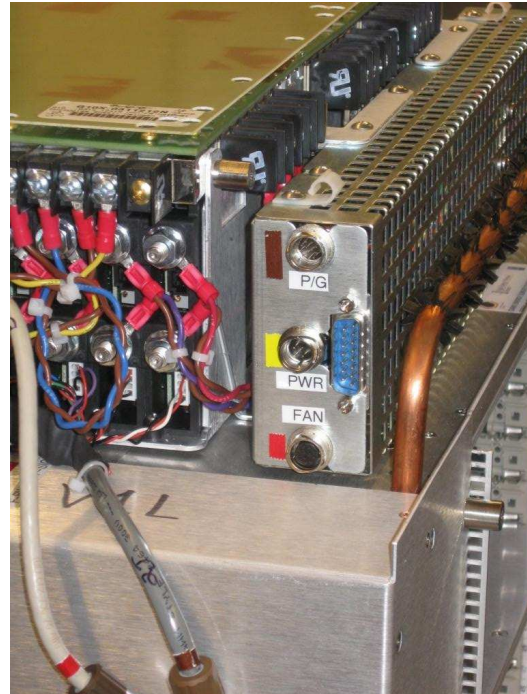
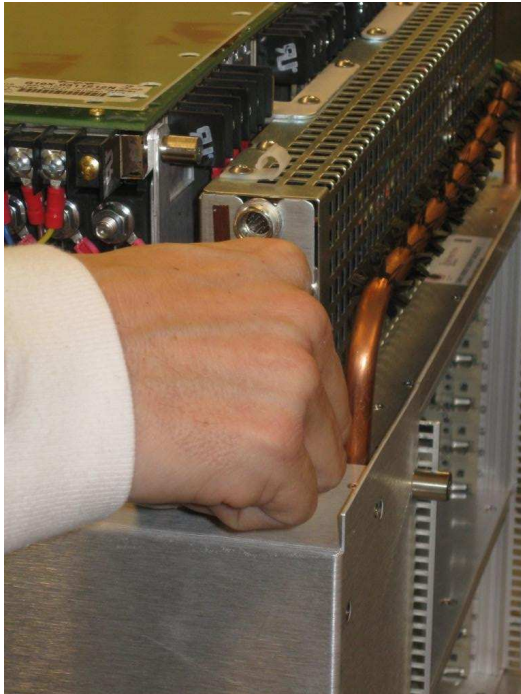


DHE Disassembly Directions For Type 1 DAQ Crate

- v. Unplug Yellow ICC Power cable, (Cable D).



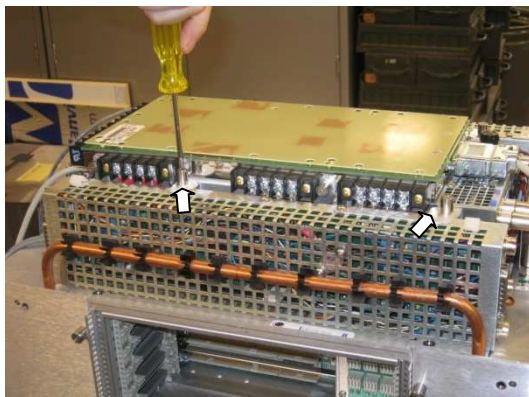
- vi. Unplug Red Fan RPM cable, (Cable E).



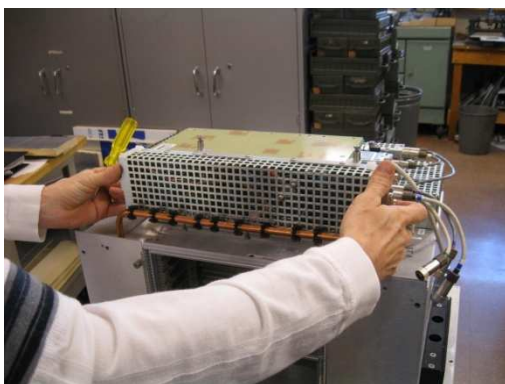
- vii. Cables with Hirose connectors are unplugged by turning the connector counter-clockwise and pulling carefully until connector is unplugged.
viii. Don't pull on the cable to unplug the connector.

DHE Disassembly Directions For Type 1 DAQ Crate

- d. Loosen two captive screws on top of ICC Board Module.
 - i. Use a Phillips-headed screwdriver to loosen the two captive screws on the top of the ICC Board Module.
 - ii. These screws are spring loaded. Do not completely remove the screws.



- iii. Lift ICC Board Module straight up and remove.

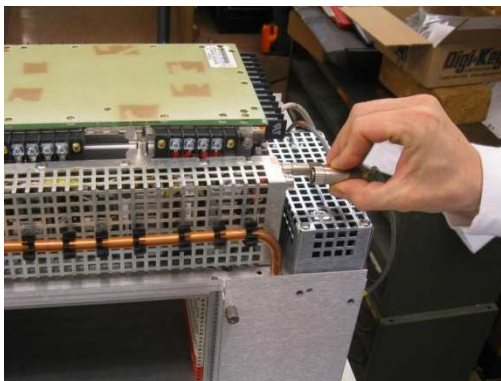


VI. Installing ICC Board Module:

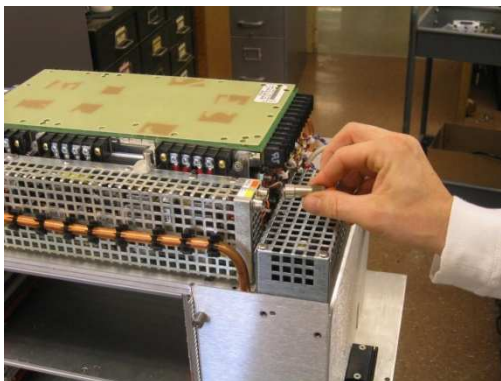
- a. Installation is done in reverse order as the removal process.
- b. Install ICC Board Module into top of crate.
- c. Tighten the two captive screws.
- d. Plug the cables in.
 - i. Cables with Hirose connectors are plugged in by turning the connector clockwise.
 - ii. Don't pull on the cable to unplug the connector.

VII. Removing Power Supply Module:

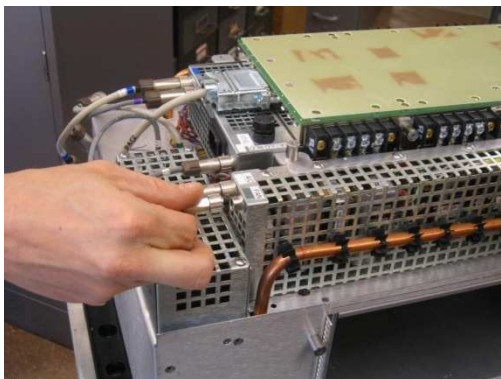
- a. Remove Insulating Top Cover.
- b. Remove Top Cover.
- c. Unplug cables from Power Supply Module.
 - i. Unplug yellow ICC Board Module power cable, (Cable D).



- ii. Unplug orange left fan plenum power cable, (Cable C).

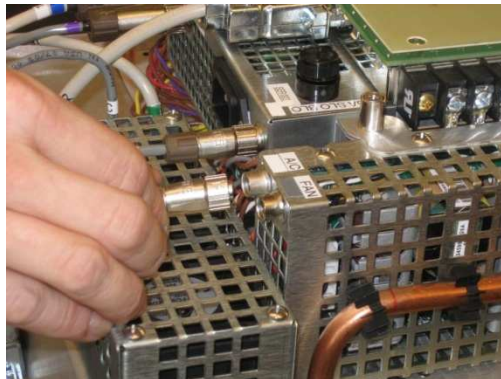


- iii. Unplug grey right fan plenum power cable, (Cable C).

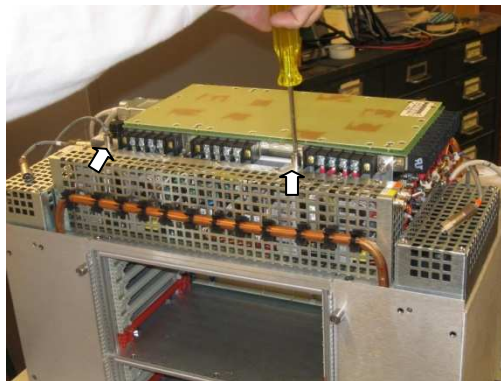


DHE Disassembly Directions For Type 1 DAQ Crate

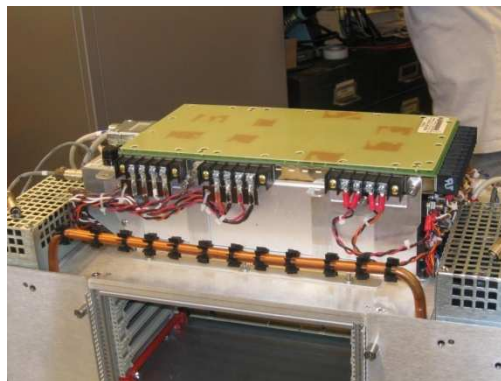
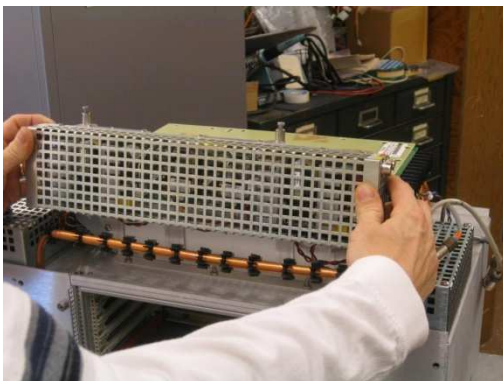
- iv. Unplug white a/c input power cable, (Cable B).



- v. Cables with Hirose connectors are unplugged by turning the connector counter-clockwise and pulling carefully until connector is unplugged.
 - vi. Don't pull on the cable to unplug the connector.
-
- d. Loosen two captive screws on top of Power Supply Module.
 - i. Use a Phillips-headed screwdriver to loosen the two captive screws on the top of Power Supply Module.
 - ii. These screws are spring loaded. Do not completely remove the screws.



- e. Remove Power Supply Module.

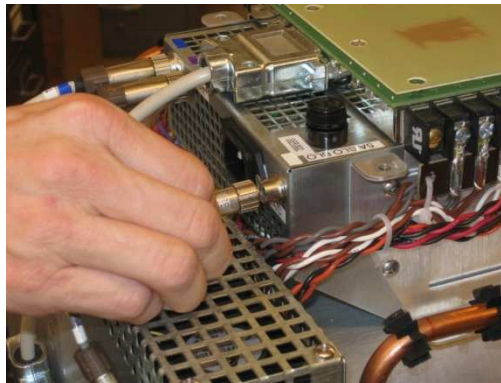


VIII. Installing Power Supply Module:

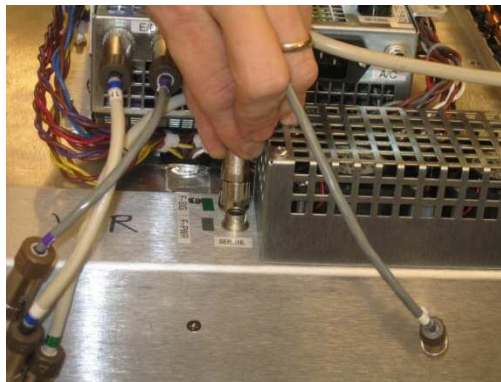
- a. Installation is done in reverse order as the removal process.
- b. Install Power Supply Module into top of crate.
- c. Tighten the two captive screws.
- d. Plug the cables in.
 - i. Cables with Hirose connectors are plugged in by turning the connector clockwise.
 - ii. Don't pull on the cable to unplug the connector.

IX. Removing Right Fan Plenum Module:

- a. Remove Insulating Top Cover.
- b. Remove Top Cover.
- c. Remove ICC Board Module.
- d. Remove Power Supply Module.
- e. Unplug cables from Right Fan Plenum Module.
 - i. Unplug white a/c cable from Vicor Fan Shield Module, (Cable B).

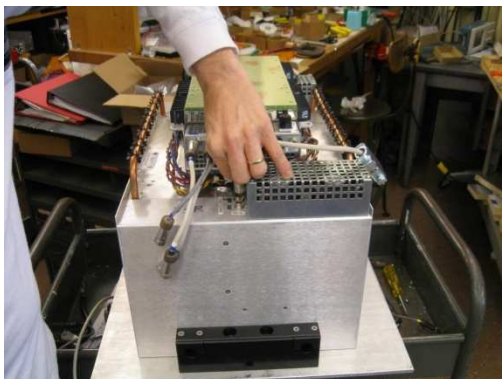


- ii. Unplug grey fan power cable, (Cable C).

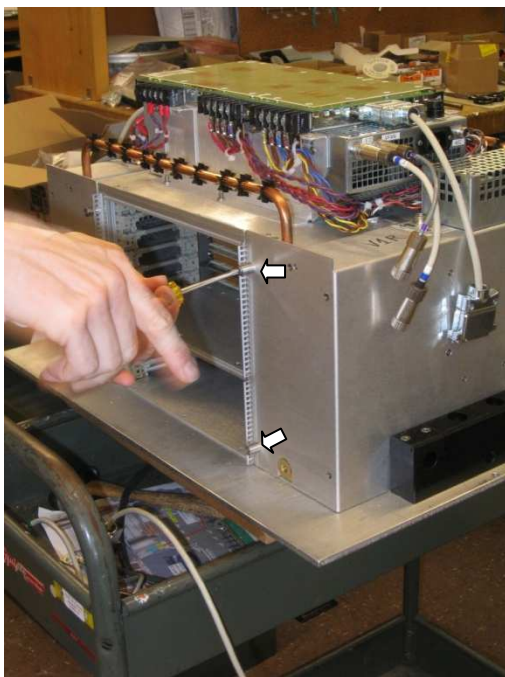


DHE Disassembly Directions For Type 1 DAQ Crate

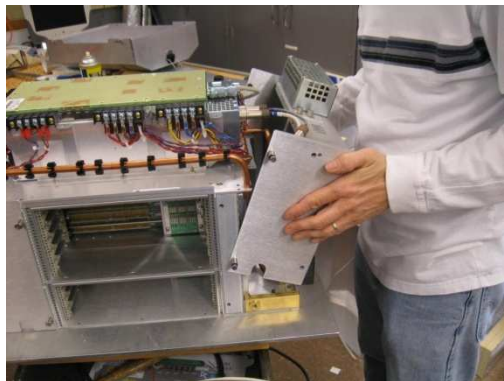
- iii. Unplug green fan signal cable, (Cable E).



- iv. Cables with Hirose connectors are unplugged by turning the connector counter-clockwise and pulling carefully until connector is unplugged.
- v. Don't pull on the cable to unplug the connector.
- f. Loosen two captive screws on each side of Right Fan Plenum Module.
 - i. Use a Phillips-headed screwdriver to loosen two captive screws on each side of the Right Fan Plenum Module.
 - ii. These screws are spring loaded. Do not completely remove the screws.

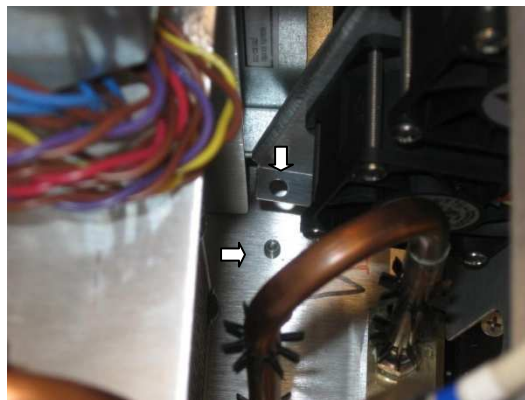


- g. Remove Right Fan Plenum Module.
 - i. Pull straight up to clear block, then pull out.



X. Installing Right Fan Plenum Module:

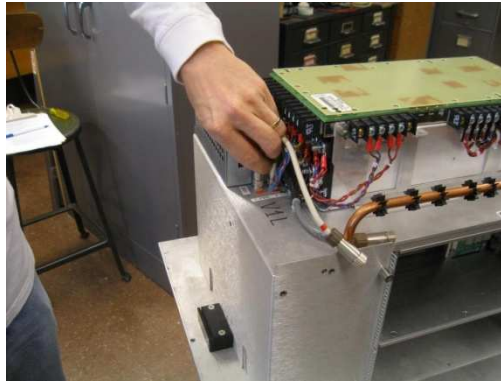
- a. Install Right Fan Plenum Module into right side of crate.
 - i. Align stud into hole when installing Right Fan Plenum Module.



- b. Tighten the four captive screws.
- c. Plug the cables in.
 - i. Cables with Hirose connectors are plugged in by turning the connector clockwise.
 - ii. Don't pull on the cable to unplug the connector.

XI. Removing Left Fan Plenum Module:

- a. Remove Insulating Top Cover.
- b. Remove Top Cover.
- c. Remove ICC Board Module.
- d. Remove Power Supply Module.
- e. Unplug cables from Left Fan Plenum Module.
 - i. Unplug orange fan power cable, (Cable C).

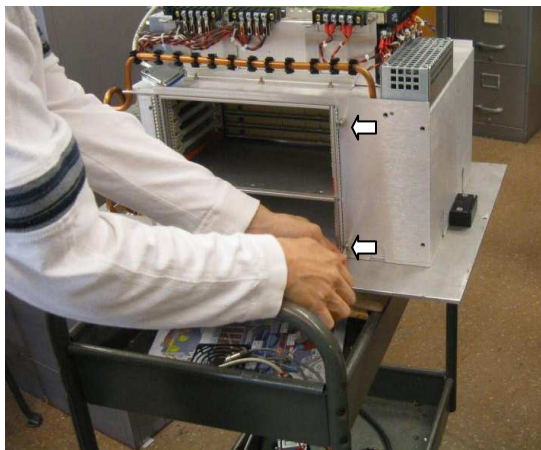
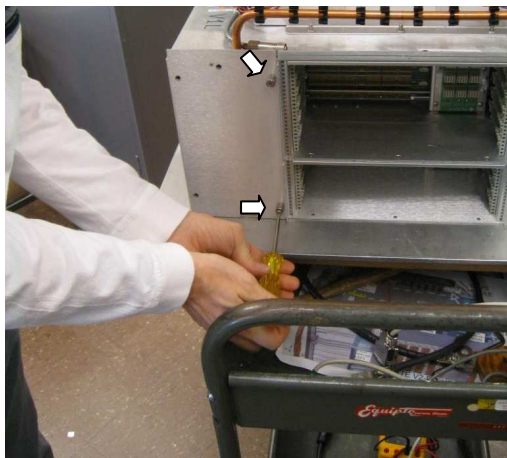


- ii. Unplug red fan signal cable, (Cable E).

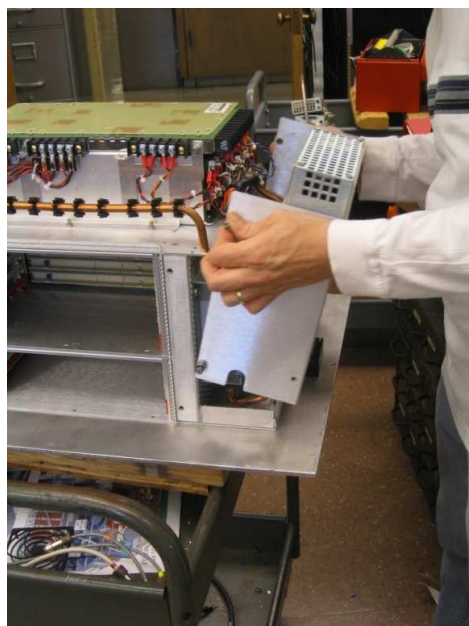


- iii. Cables with the Hirose connectors are unplugged by turning the connector counter-clockwise and pulling carefully until connector is unplugged.
- iv. Don't pull on the cable to unplug the connector.

- f. Loosen two captive screws on each side of Left Fan Plenum Module.
 - i. Use a Phillips-headed screwdriver to loosen two captive screws on each side of the Left Fan Plenum Module.
 - ii. These screws are spring loaded. Do not completely remove the screws.



- g. Remove Left Fan Plenum Module.
 - i. Pull straight up to clear block, then pull out.

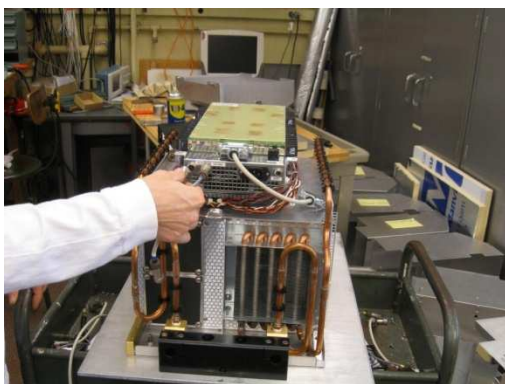


XII. Installing Left Fan Plenum Module:

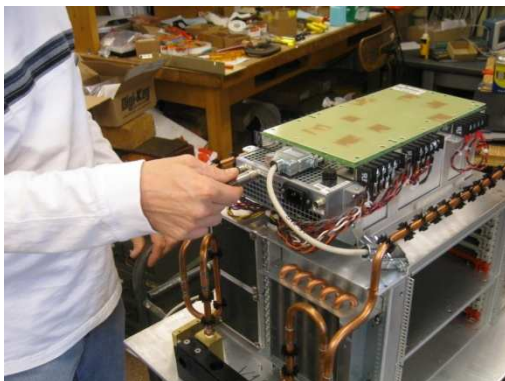
- a. Install Left Fan Plenum Module into left side of crate.
- b. Align stud into hole when installing Left Fan Plenum Module.
- c. Tighten the four captive screws.
- d. Plug the cables in.
 - i. Cables with Hirose connectors are plugged in by turning the connector clockwise.
 - ii. Don't pull on the cable to unplug the connector.

XIII. Removing Vicor Fan Shield Module:

- a. Remove Insulating Top Cover.
- b. Remove Top Cover.
- c. Remove ICC Board Module.
- d. Remove Power Supply Module.
- e. Remove Right Fan Plenum Module.
- f. Unplug cables from Vicor Fan Shield Module.
 - i. Unplug blue enable-disable cable, (Cable H).

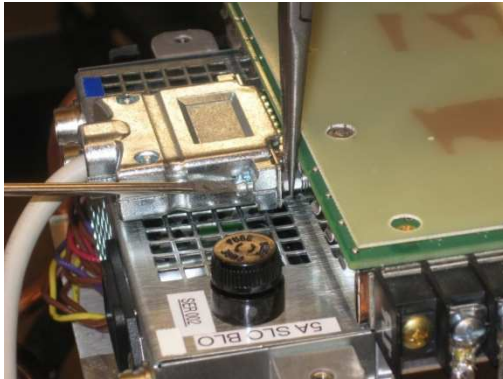


- ii. Unplug violet Vicor Fan RPM cable, (Cable G).



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- iii. Use a flat-headed screwdriver and a pair of needle-nose pliers to loosen the screws holding the db25 VMonitor cable.
 1. Failure to secure jackscrew with pliers may allow jackscrew nut inside filter box to come off.



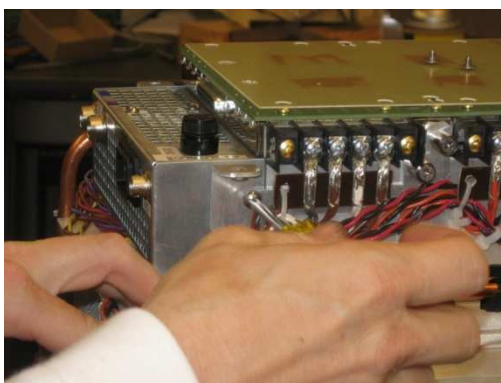
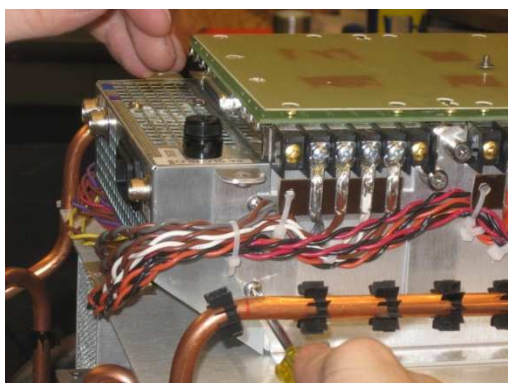
- iv. Unplug db25 VMonitor cable.



- v. Cables with Hirose connectors are unplugged by turning the connector counter-clockwise and pulling carefully until connector is unplugged.
- vi. Don't pull on the cable to unplug the connector.

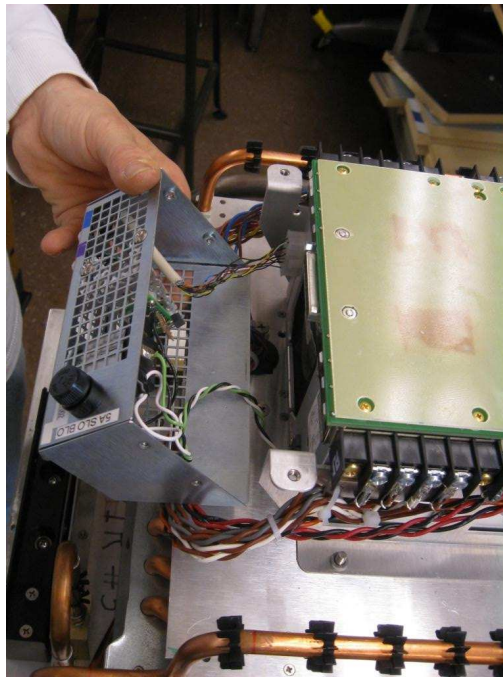
DHE Disassembly Directions For Type 1 DAQ Crate

- g. Remove two screws on each side of Vicor Fan Shield Module.
 - i. Use a Phillips-headed screwdriver to remove two screws on each side of the Vicor Fan Shield Module.
 - ii. Don't drop or loose screws.
 - iii. Push back wires with finger to access top screws.

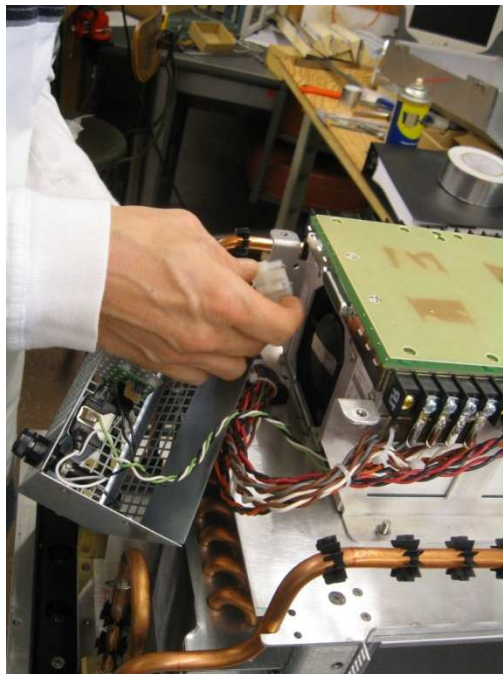


DHE Disassembly Directions For Type 1 DAQ Crate

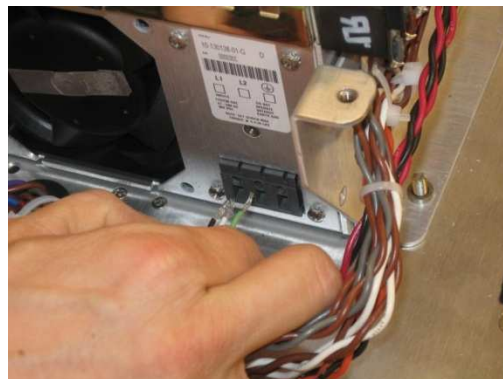
- h. Pull out Vicor Fan Shield Module to gain access to Vicor enable-disable & a/c input connectors.



- i. Unplug Vicor enable-disable connector.



- j. Loosen and remove a/c wires using a small flat-headed screwdriver.

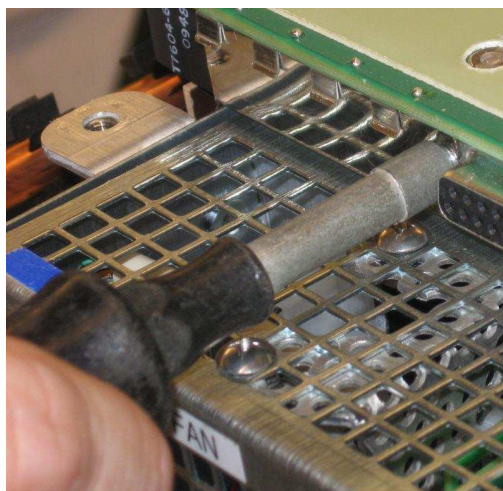


- k. Remove Vicor Fan Shield Module.



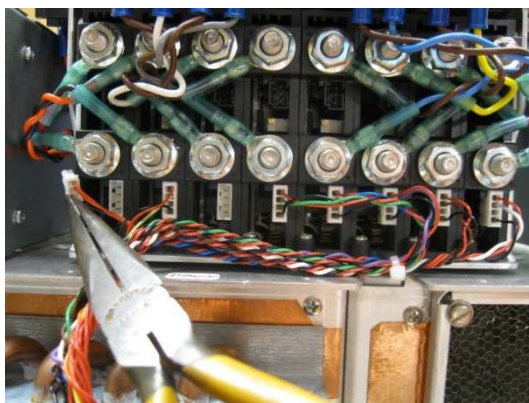
XIV. Installing Vicor Fan RPM Shield Module:

- a. Installation is done in reverse order as the removal process.
- b. Re-tighten jack screws on VMonitor connector mounted to filter box using a nutdriver.
 - i. Don't over-tighten or damage may occur.



XV. Removing Vicor Power Supply / Filter Box Module:

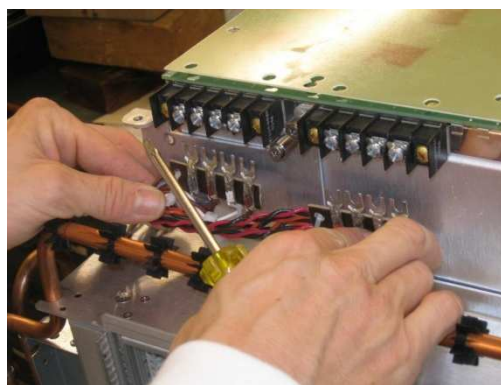
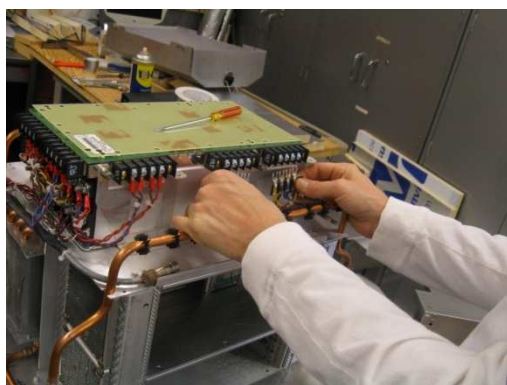
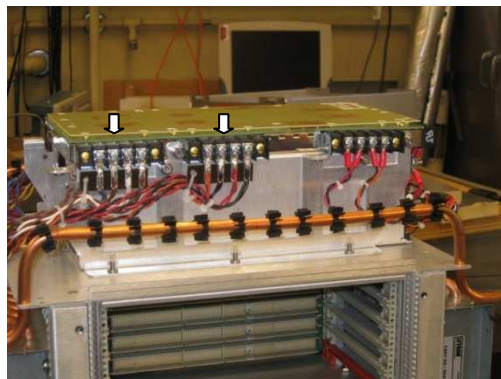
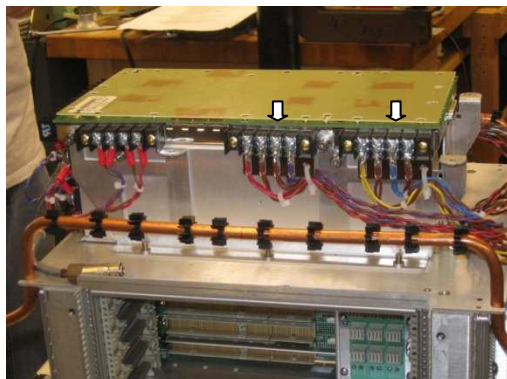
- a. Remove Insulating Top Cover.
- b. Remove Top Cover.
- c. Remove ICC Board Module.
- d. Remove Power Supply Module.
- e. Remove Vicor Fan Shield Module.
- f. Remove Left Fan Panel.
- g. Remove Power Good Cables.



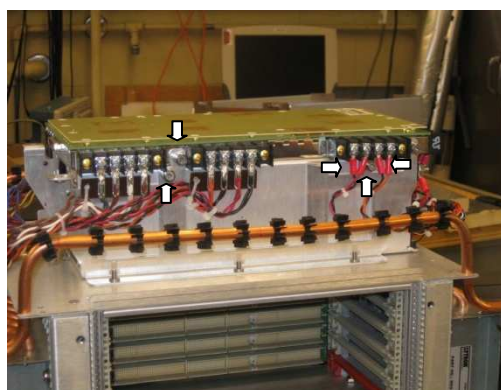
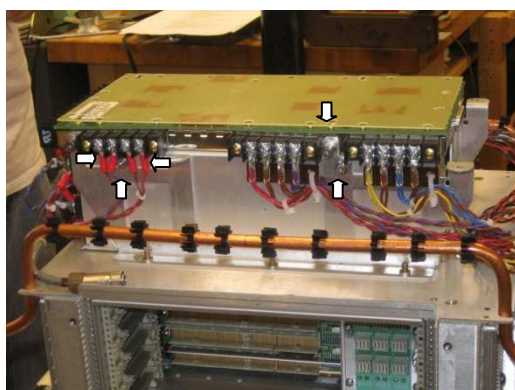
- h. Remove all filtered dc output power cables & loosen dc input cables from Filter Box Module.
 - i. Use a Phillips-headed screwdriver to remove filtered dc output cables by loosening the screws & removing the cable assemblies.
 - ii. Use a Phillips-headed screwdriver to loosen the dc input cables.
 - iii. Only loosen, don't remove any screws.

DHE Disassembly Directions For Type 1 DAQ Crate

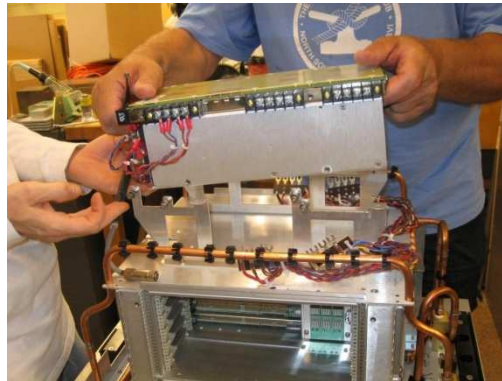
iv. Remember how the cables are to be re-installed.



- i. Loosen four screws on each side of Vicor Power Supply Module mount.
 - i. Use a Phillips-headed screwdriver to remove four screws on each side of the Vicor Power Supply mount.
 - ii. Move the dc input cables over to gain access to the screw.
 - iii. These screws are spring loaded. Do not completely remove the screws.



- j. Remove Vicor Power Supply/Filter Box Module.
 - i. Make sure none of the dc power cables that are attached to the Vicor Power Supply/Filter Box get hung up on the mounts when removing.

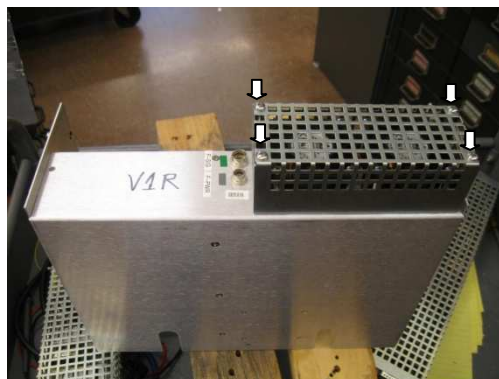


XVI. Installing Vicor Power Supply/Filter Box Module:

- a. Install Vicor Power Supply/Filter Box Module into top of crate.
- b. Tighten all 8 screws on both sides.
- c. The Vicor Power Supply/Filter Box may have to be raised to get the threads in the right place.
- d. Install filtered dc output cables.
- e. Move dc input cables back into original position & tighten screws.

XVII. Replacing Broken Cooling Fan in Fan Plenum Module:

- a. Replacing Fan #1, Fan #2, Fan #5, or Fan #6.
 - i. Remove Fan Plenum Module.
 - ii. Use a Phillips-headed screwdriver to remove four screws that mount the fan shield to the fan plenum.
 1. Don't drop or lose the screws.

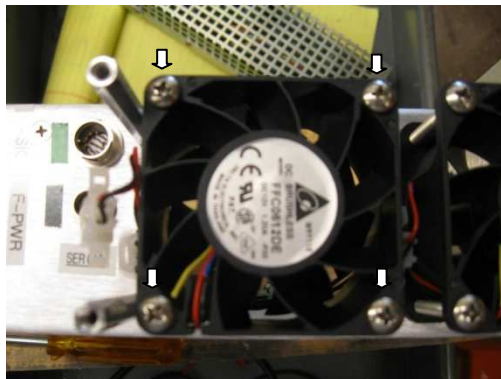


DHE Disassembly Directions For Type 1 DAQ Crate

iii. Remove the fan shield.



- iv. Use a Phillips-headed screwdriver to remove four screws that mount the fan to the fan plenum module.
 1. Don't drop or lose the screws.

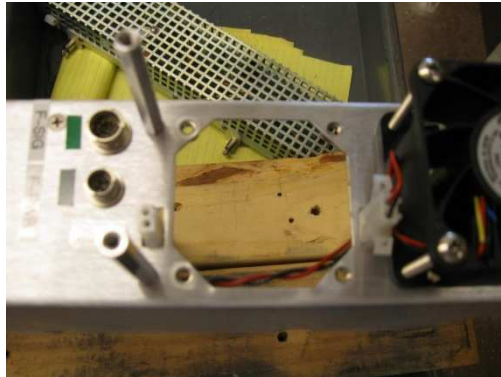


- v. Unplug the Molex power connector.



DHE Disassembly Directions For Type 1 DAQ Crate

- vi. Remove the fan.



- vii. Plug the new fan's Molex power connector into the connector in the fan plenum.
- viii. Mount the new fan with the four screws.
1. Make sure the fan is installed so the air flows in the right direction.



- ix. Mount the fan shield to the Fan Plenum Module.

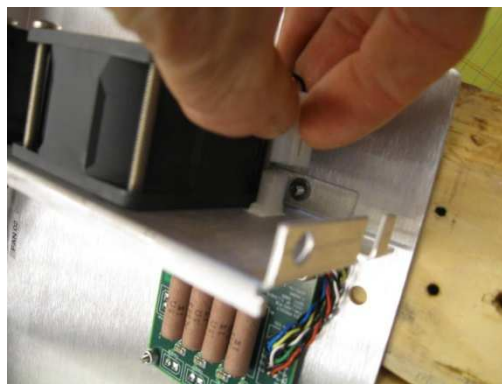


DHE Disassembly Directions For Type 1 DAQ Crate

- b. Replacing Fan #3, Fan #4, Fan #7, or Fan #8.
 - i. Remove Fan Plenum.
 - ii. Use a short or stubby Phillips-headed screwdriver to remove four screws that mount the fan to the fan plenum module.
 - 1. Don't drop or lose the screws.



- iii. Unplug the Molex power connector.

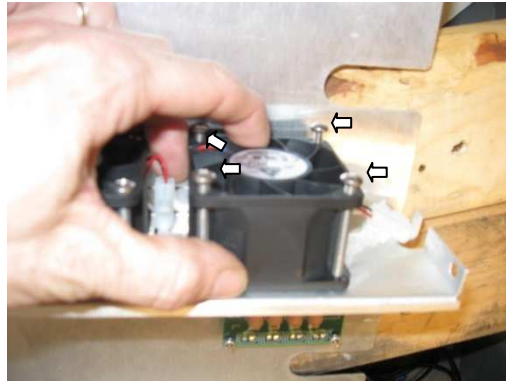


- iv. Remove the fan.



DHE Disassembly Directions For Type 1 DAQ Crate

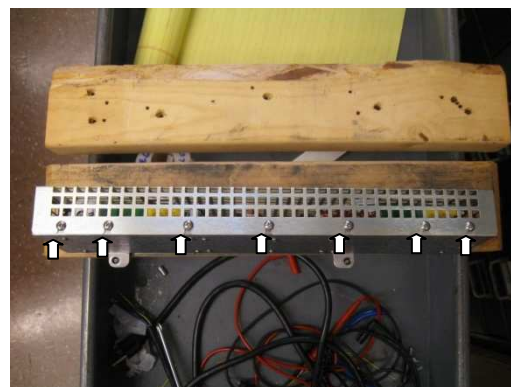
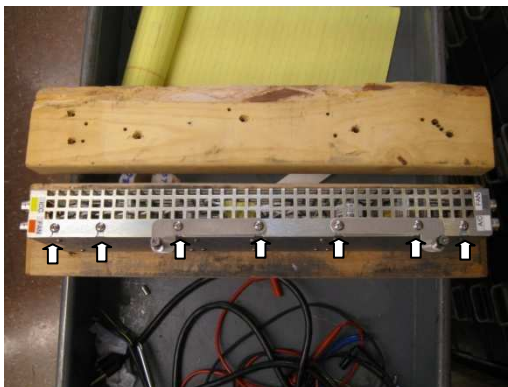
- v. Mount the new fan with the four screws inserted into fan.
 - 1. Don't crimp the fan power wires when installing the screws.
 - 2. Make sure the fan is installed so the air flows in the right direction.



- vi. Plug the new fan's Molex power connector into the connector in the fan plenum.
- vii. Install Fan Plenum

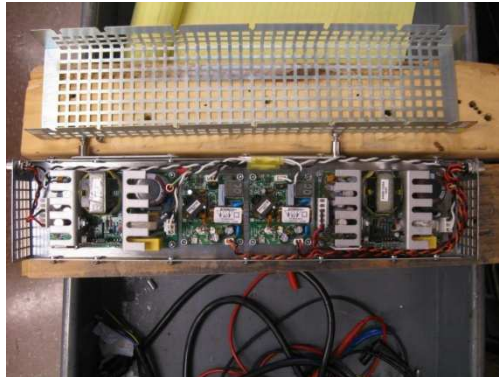
XVIII. Replacing Broken DC power supply in Power Supply Module:

- i. Remove Power Supply Module.
- ii. Use a Phillips-headed screwdriver to loosen seven screws on each side that mount the shield.

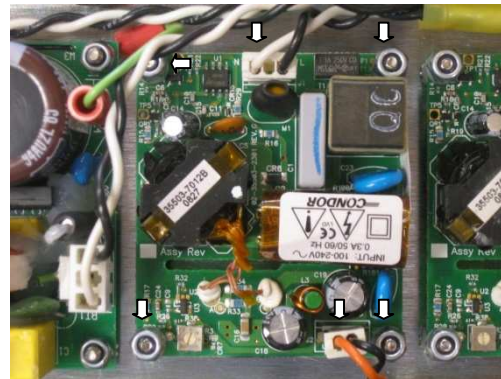
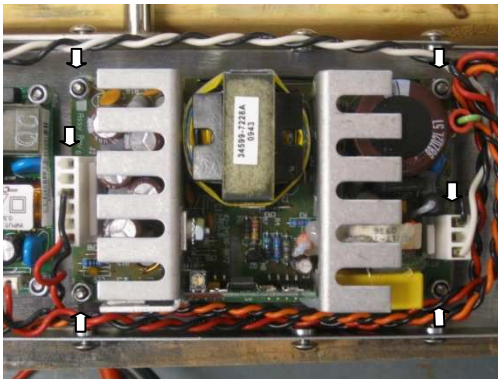


DHE Disassembly Directions For Type 1 DAQ Crate

iii. Remove the shield.



- iv. Remove the a/c connector to the broken power supply.
- v. Remove the dc connector to the broken power supply.
- vi. Use a 5/16" nutdriver to remove four machine nuts that mount the power supply to the power supply module.
 - 1. Don't drop or lose the plastic standoffs or nuts.



- vii. Remove the broken power supply.
- viii. Install the new power supply.
- ix. Install four nuts that mount the power supply to the power supply module.
- x. Install the a/c connector.
- xi. Install the dc connector.
- xii. Install the shield.
- xiii. Tighten five screws on each side of power supply module that hold the shield.
- xiv. Install the power supply module.



XIX. Video showing how to connect/disconnect Hirose connectors:

