

Data Acquisition Memo #405

Remote Power Up feature for the Mark 5 Data Recording Units

by
Doug Gerrard

Background information

The Mark 5 is a computer. It has the unique purpose for storing lots and lots of data but it is just like a PC with a motherboard, hard drive, and the various computer interfaces. It is designed to run autonomously so the keyboard and monitor are optional for the user interface. Also, like many computers it has been known to “hang” or “lock-up” and not respond to any commands.

Once power is applied the Mark 5 is immediately in pass-through mode. As the name implies any data coming from the formatter can pass through the Mark 5 and be recorded on the tape recorders.

However, in order for the Mark 5 to be in pass through mode, it must be turned on. Like nearly all computers, if for any reason the computer loses power, *the computer will remain off even when power is restored*. Remember, the Mark 5 must be on to record *even if you are recording with the tape recorders*.

For these reasons, it is critical to (1) maintain the Mark 5 **on** at all times and (2) if power is secured or the Mark 5 stops responding, it can be reset as soon as possible. This is why the remotely turning on the Mark 5 is necessary. Hours of valuable data may be lost during the time it takes a site tech to be called out just to push the power button on the Mark 5 unit.

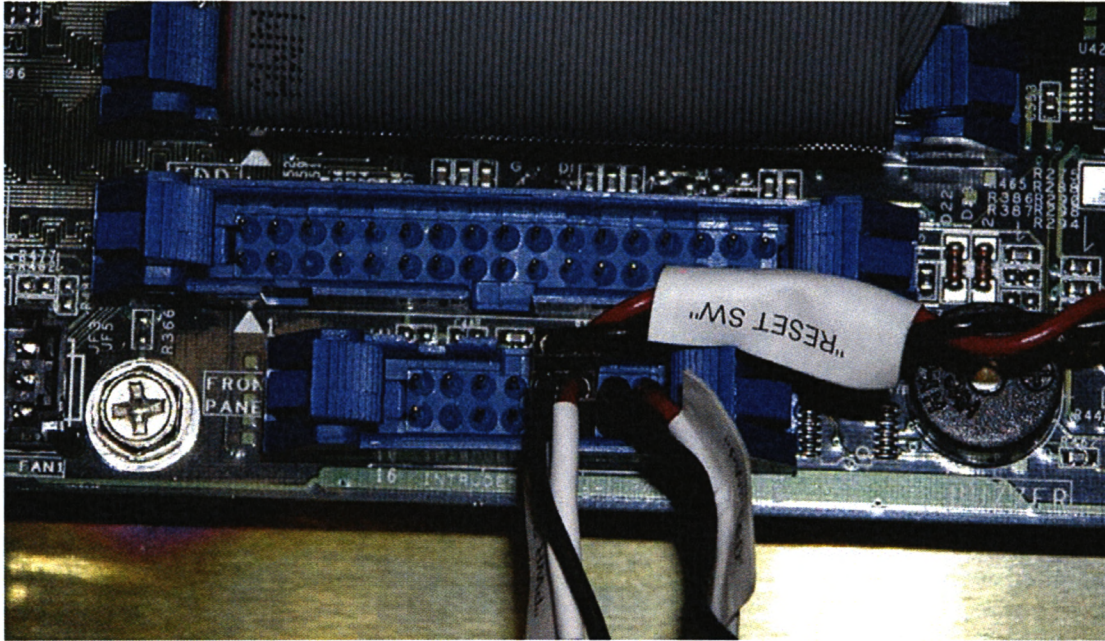
Remotely powering up the Mark 5

The Chatterbox at the VLBA sites have the Remote Supervisory Control Option feature for the VLBA operators to call and reset the VME computer using a touch-tone phone. This will be the same method used to reset the Mark 5 just using a different channel than the VME computer.

In order to utilize the Remote Supervisory Control Option feature of the Chatterbox, the Mark 5 has to have the power switch connected in parallel to the contacts of a relay controlled by the Chatterbox. This is accomplished in two parts.

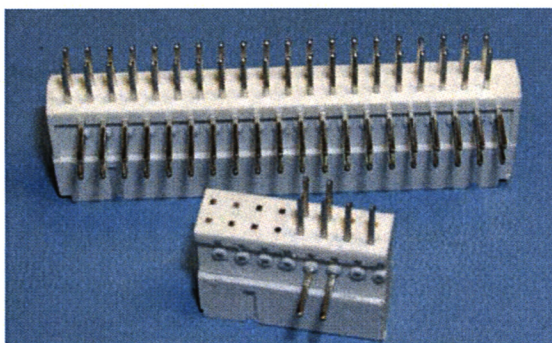
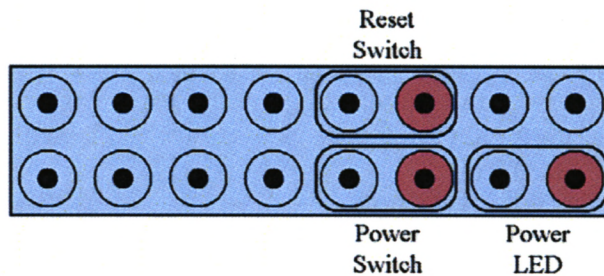
The first part is done at NRAO prior to shipping the Mark 5 unit to the VLBA site. The connections for the power switch are moved from the Motherboard to a standard computer bracket at the rear of the Mark 5 unit. The second part is done at the site. The connections for the power switch at the back of the unit are connected to the relay in the Remote Supervisory Control Box.

Part 1 – Completed at NRAO



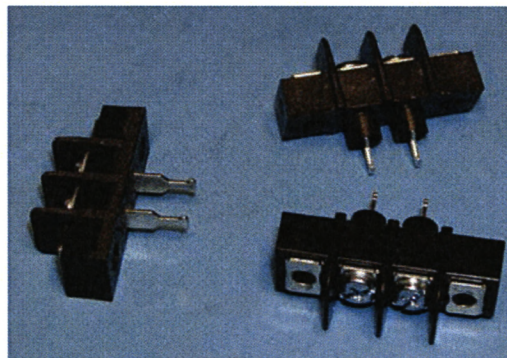
This photo and diagram show the original layout for the connections to the Motherboard. The polarity is shown in the diagram but only matters for the LED indicator.

In order to make a parallel connection with the power switch an intra-connector is used with two

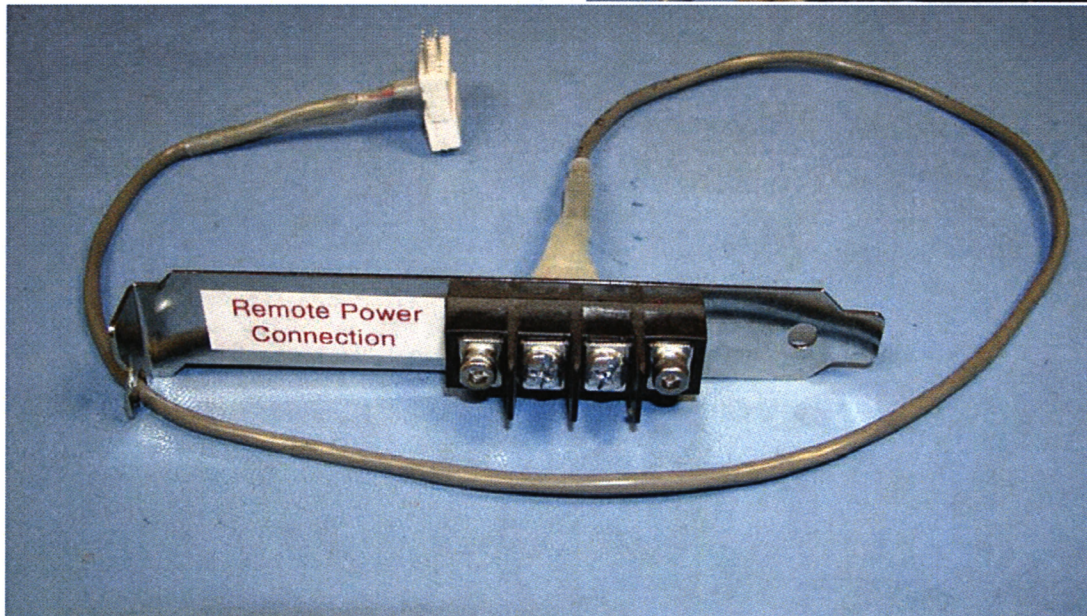
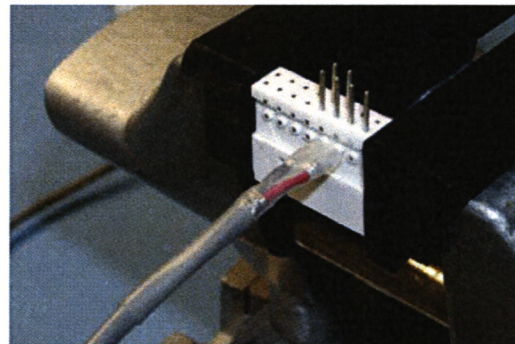
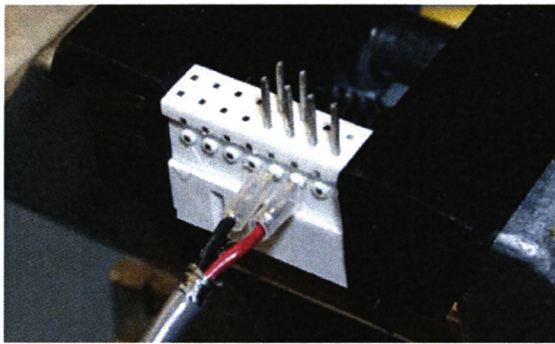
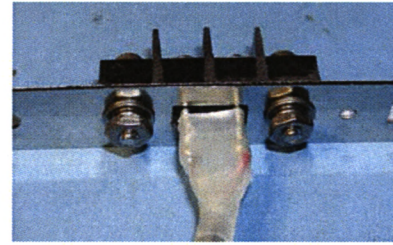
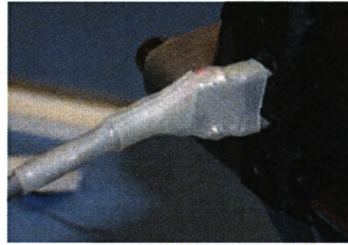
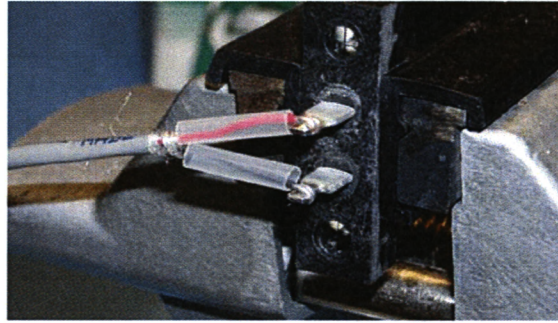


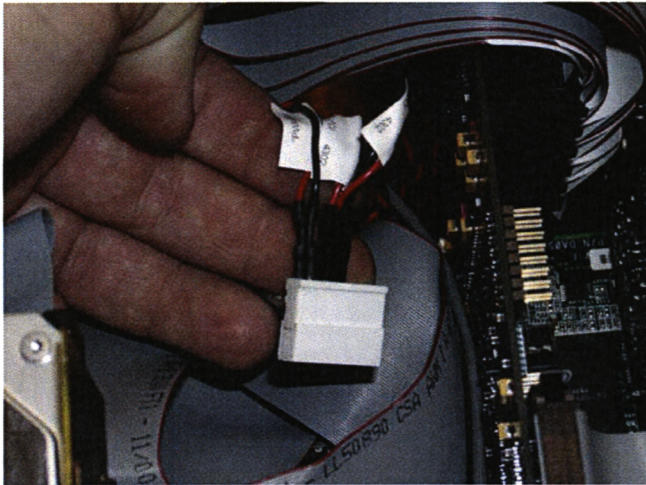
The power switch wires are connected to a standard computer bracket with a two-position bus terminal. The bus terminal had the plastic posts removed and the sides sanded to fit into the slot on the Mark 5.

wires connected to the power switch pins and inserted in between the Motherboard and the existing pairs of wires. The intra-connector is cut to 16 pins and the unnecessary pins are removed.

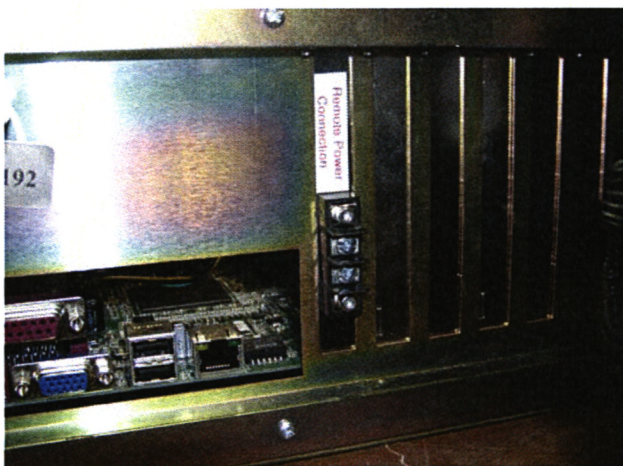
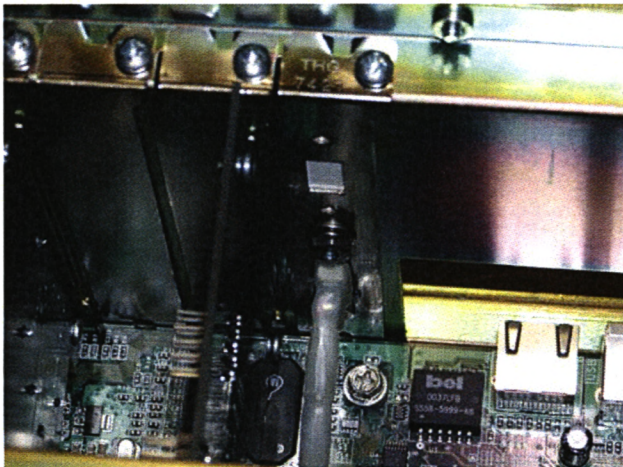


These pictures show the details of making the jumper from the intra-connector to the computer bracket with the bus terminal mounted. The unused pins are removed from the intra-connector and it is shortened to 16 pins. Two conductor stranded, shielded, 22 AWG wire about 18" long is used to go to the bus terminal. Once the jumper is installed the power switch can be accessed from the screw terminals in the back and the unit does not have to be opened by the site tech.

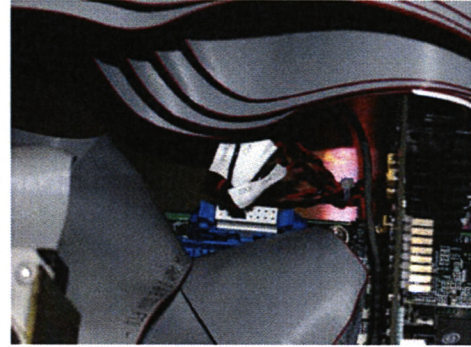




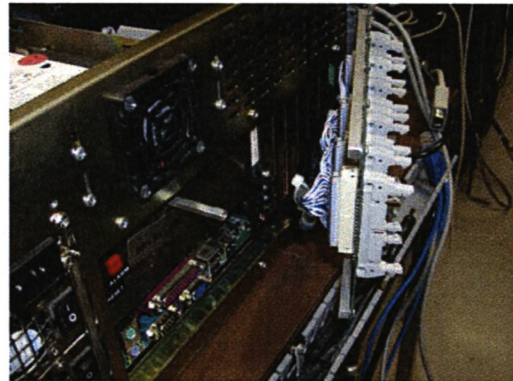
wires and place them on top of the intra-connector in the same location. The pairs of wires are labeled so use the diagram above if necessary. Insert the intra connector in the blue connector and lock the tabs on the side.



Installing the jumper is done before the Mark 5 unit goes to the site. With the power secured to the unit, remove the cover off the Mark 5 and swing back the I/O panel on the back. Find the blue 16-pin connector with three pairs of Red and Black wires going to only 6 pins. Remove each pair of

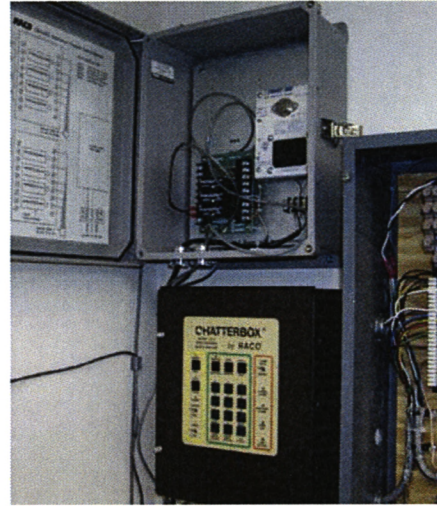
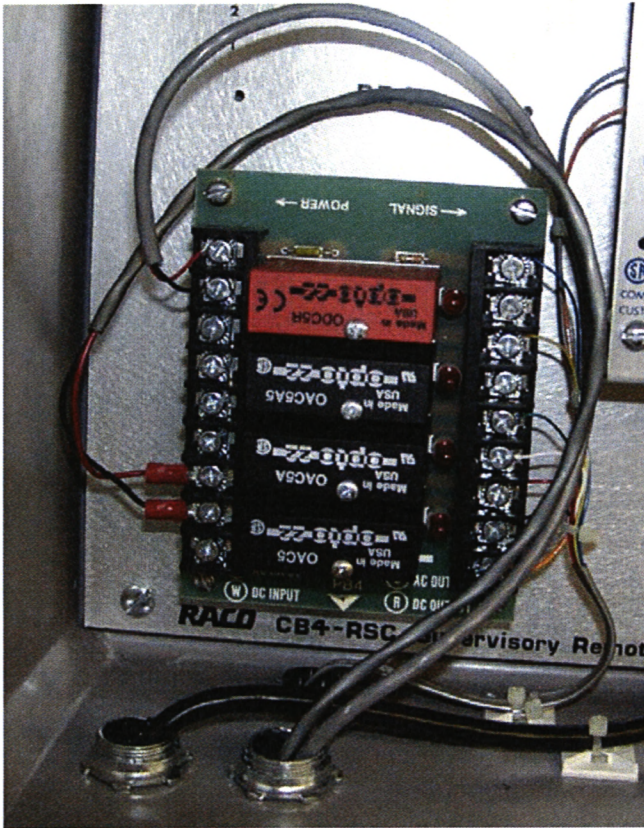


Remove the first blank panel on the rear of the Mark 5 unit by removing the top screw. Install the new panel making sure there is clearance for the I/O panel to close. The Mark 5 is now ready to be connected to the Remote Supervisory Control box connected to the Chatterbox.



Part 2 – Completed by the Site Techs

The connections at the VLBA site are easily accomplished by connecting one end of the 30' spool of wire to the terminals on the back of the Mark 5 unit and running the wire under the floor panels to the corner of room where the chatterbox is located.



Remove the existing relay in the number 4 spot (on top) and install the Opto 22 ODC5R reed relay. Bring the wire up to the relay box and connect the other end of the wire to terminals 8 and 9 on the output strip (Relay 4 output connections).

To test at the CB-4 panel, push the following buttons starting with the CB-4 unit in NORMAL and the Mark 5 unit OFF. This test should start the Mark 5 for it to begin the boot up procedure.

Press 1 then press PROGRAM

CB – 4 says “Enter Program Code”

Press . 4 2 then press ENTRY COMPLETE

CB – 4 says “Control Number 4 is ON for 1 second” and the Mark 5 starts booting.

Press NORMAL

CB – 4 says “Good bye” and goes back to NORMAL.

Finally, shut down to the Mark 5 (again) and contact the VLBA operator to perform a dial up test of the remote power up of the Mark 5 unit for your site.