Work Instruction : *Analyzer* ***G/L2xxx*****: Replacing G2000 Series Computer PCB**

Revision 01: May, 2013

REQUIRED TOOLS:

- ❑ 5/64 Ball Driver
- ❑ Phillips Screwdriver
- ❑ Small Flathead Screwdriver
- ❑ Forceps or Needle Nose Pliers

IMPORTANT SAFETY STEPS

- **The analyzer must be powered off**
- **Line power must be unplugged**
- **Static wrist-strap needs to be worn for grounding yourself to protect the instrument electronics**

4b. Put on the static/grounding bracelet

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FIGURE 1: Stabilize the Instrument

FIGURE 2: Rotate Analyzer 180 degrees

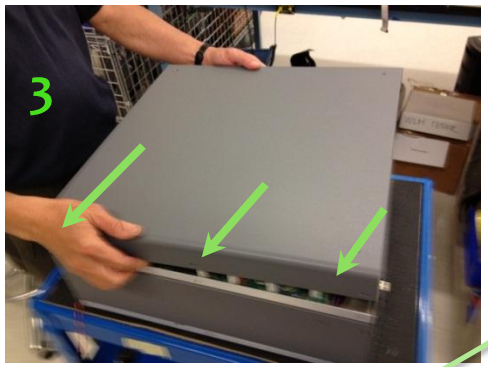

FIGURE 3: Remove 3 screws

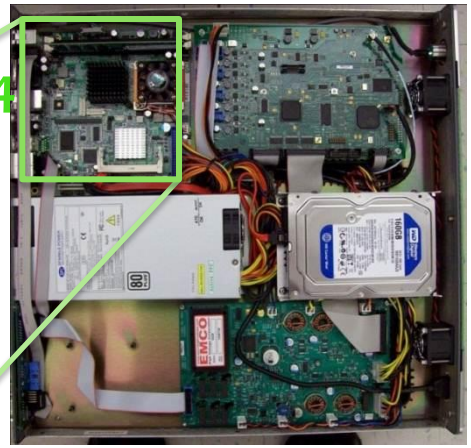

FIGURE 4: Locate Motherboard

FIGURE 5: Motherboard

INSTRUCTIONS

1. Find a stable horizontal surface on which to set the analyzer (Figure 1)
2. Pick up the analyzer and carefully turn it upside down, such that the bottom panel faces upward (Figures 2,3)
3. Remove the screws on either side of the bottom panel (3 on each side), then gently remove the bottom panel (Figure 3)
4. On the inside of the analyzer, locate the "motherboard" (Fig 4) and examine it's connections

4b. Put on the static/grounding bracelet

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Disconnecting the Power Supply Cable

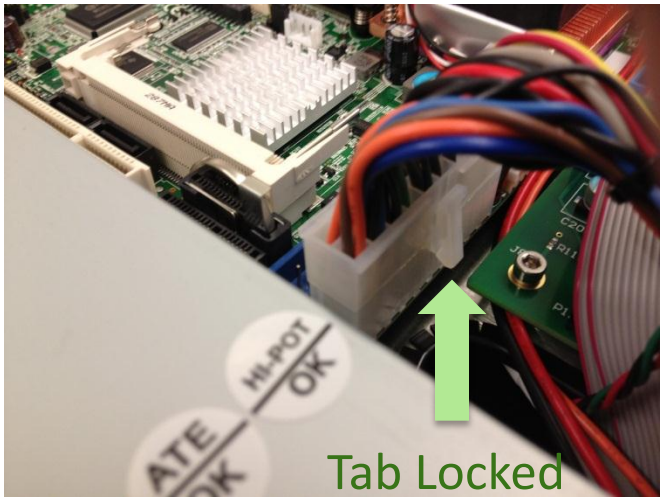

FIGURE 6: PS Cable Locked into PCB

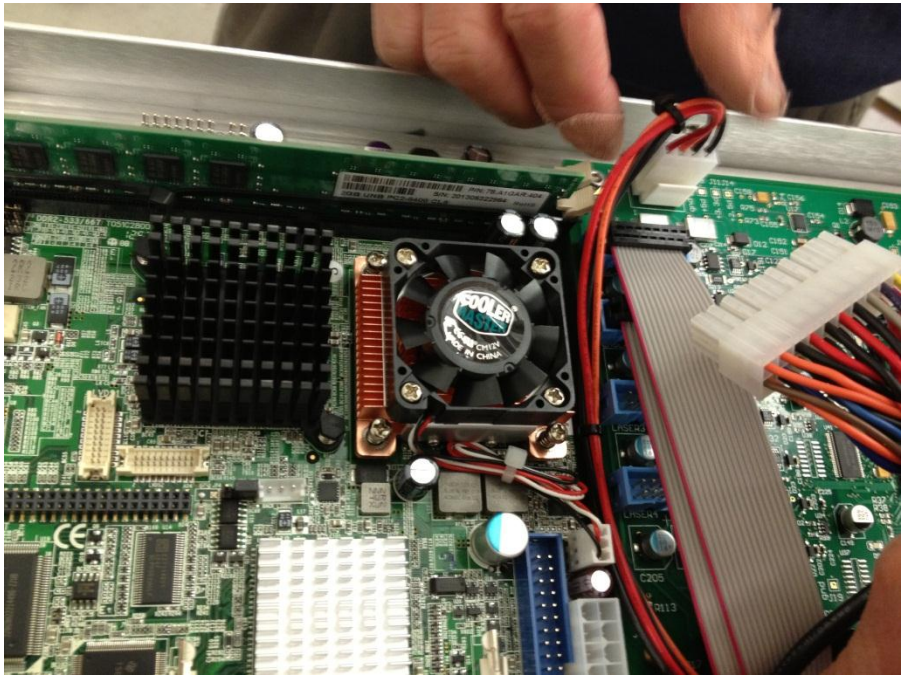

FIGURE 7: PS Cable Removed

INSTRUCTIONS (cont.)

5. Disconnect the Power Supply cable (Figure 6). This cable is locked into the board connection with a locking tab. To remove the cable, depress the tab with a small hand tool like a screwdriver or if possible with your fingers, then pull straight up on the cable to disconnect

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Disconnecting the USB Cable

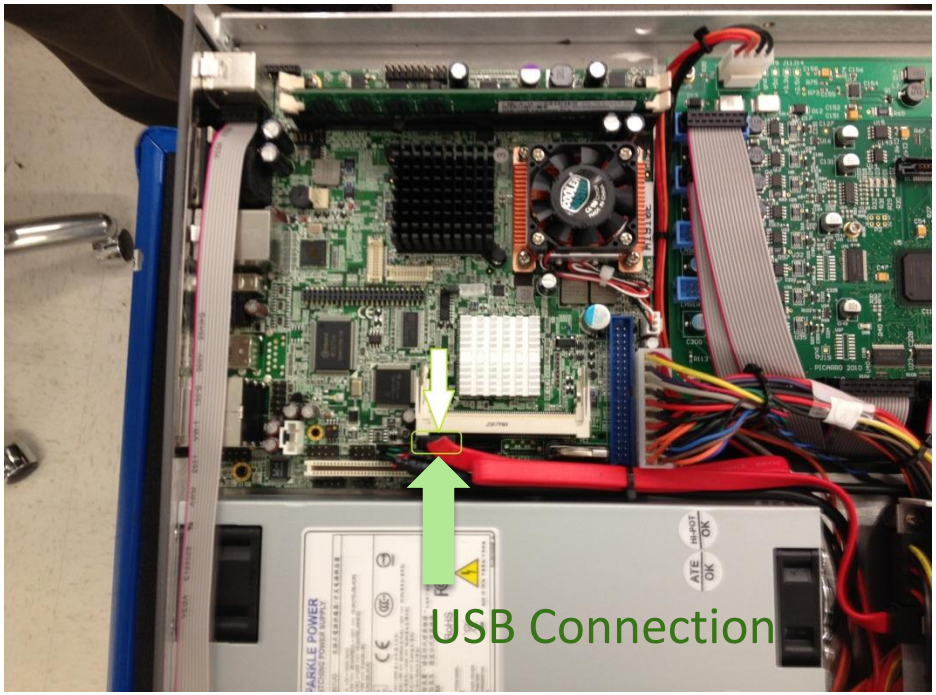

FIGURE 8: USB Cable Location

INSTRUCTIONS (cont.)

6. Disconnect the USB cable (Figure 8). This cable is also locked into the board connection with a locking tab. To remove the cable, depress the tab with a small hand tool like a screwdriver or if possible with your fingers (Figure 9), then pull straight up on the cable to disconnect

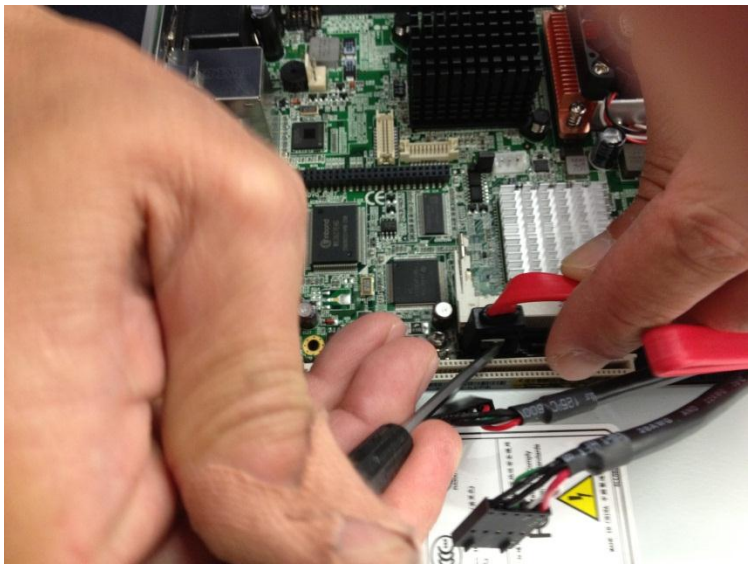

FIGURE 9: Removing USB Cable by unlocking tab

Disconnecting the 5-Pin DIN Cables

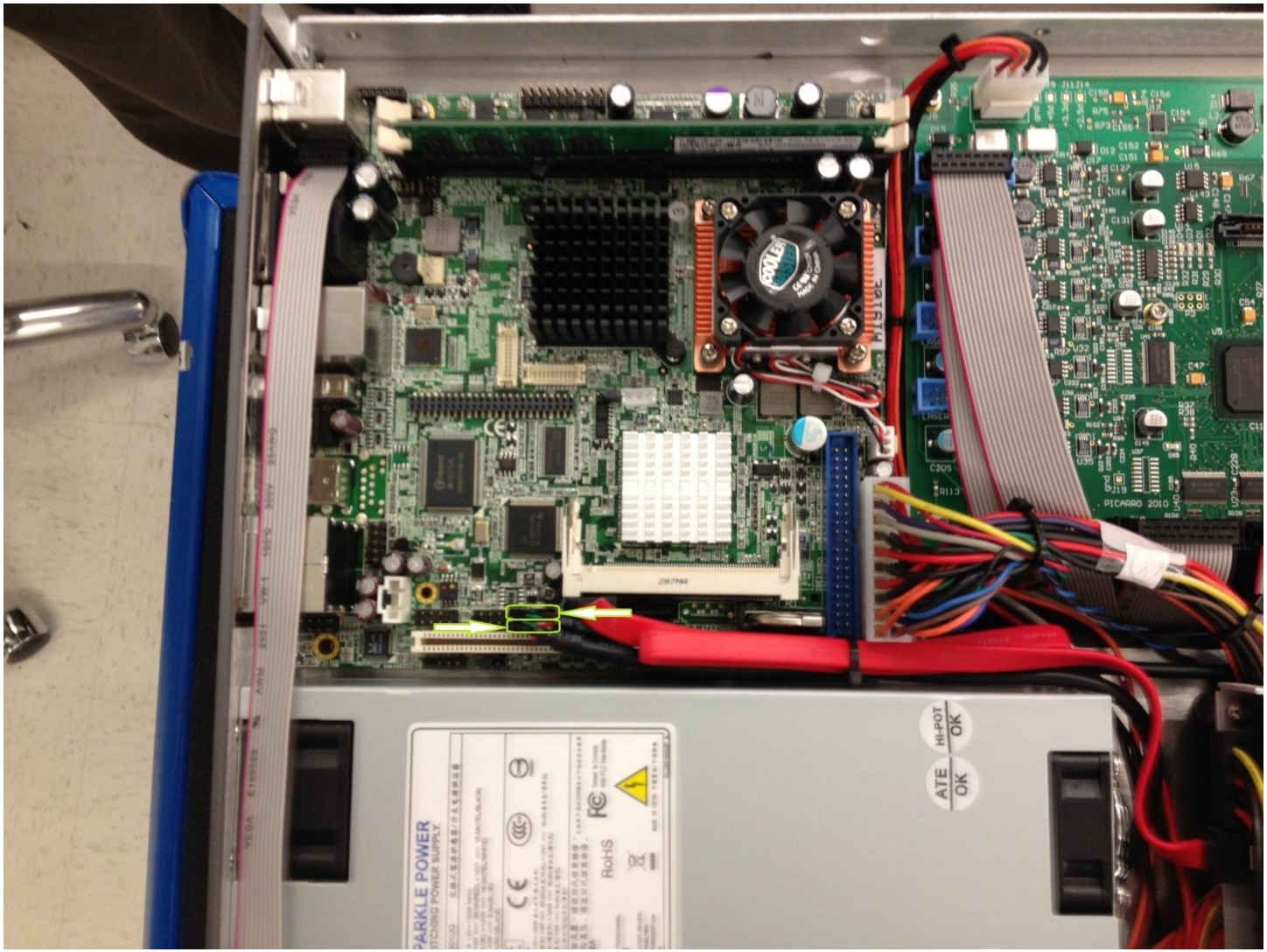

FIGURE 10: 5-pin DIN Cable Locations

INSTRUCTIONS (cont.)

6. Next to the USB connection on the PCB are 2 coupled 5 pin DIN connectors (female) which are connected to corresponding male pins from the PCB (Figure 10). Before removing these cables, make note of their orientation with respect to one another. They must reconnect to the new board in the same way, with identical orientation.

CSO note to self:
tape to back of the shed

Disconnecting the 5-Pin DIN Cables: Correct Orientation of Connectors

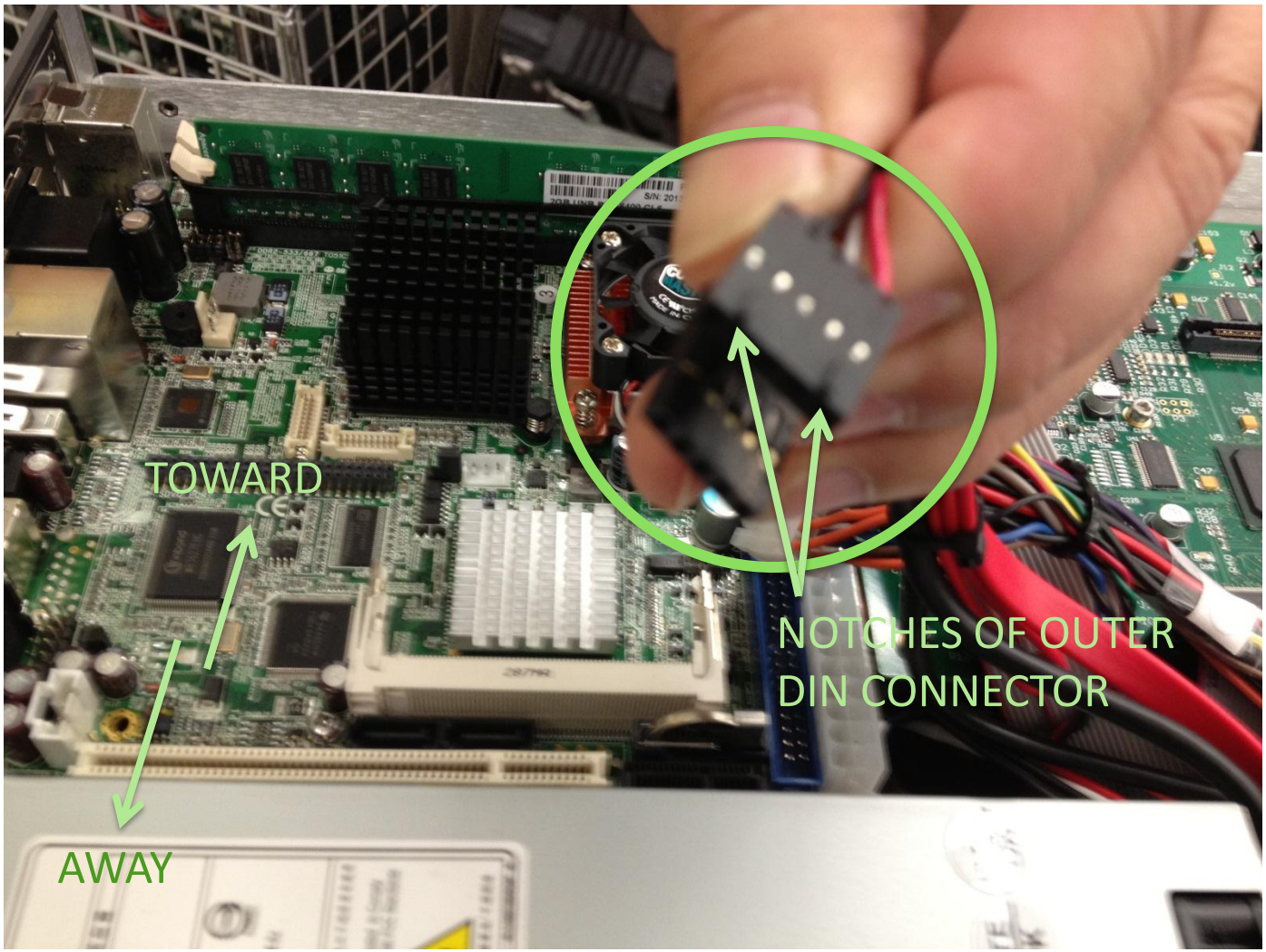

FIGURE 11: Correct Orientation of 5-pin DIN Cables

INSTRUCTIONS (cont.)

NOTE: The DIN cables are keyed with 2 notches raised on the connector housing. The notches should point toward the PCB for the inside connector, and away from the PCB for the outside connector, opposing one another, or 'flipped'.

In this illustration (Figure 12) the notches are lined up *CORRECTLY (notches of inner connector are not visible but are facing toward the PCB)*, with the notch of the outer connector facing *AWAY* from the PCB.

Disconnecting the 5-Pin DIN Cables: Incorrect Orientation of Connectors

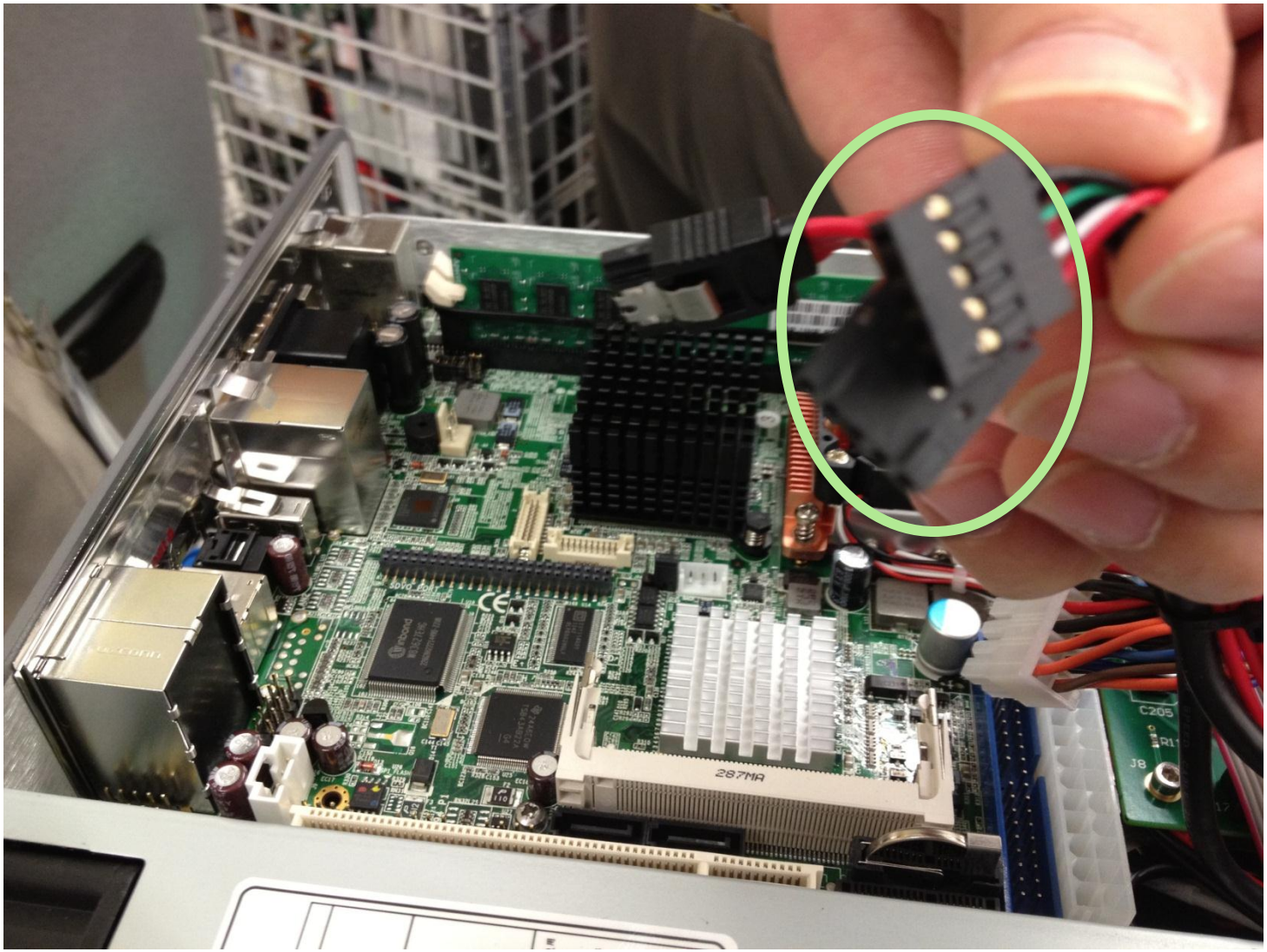

FIGURE 12: INCORRECT Orientation of 5-pin DIN Cables

INSTRUCTIONS (cont.)

NOTE: In this illustration (Figure 12) the notches are lined up incorrectly

Disconnecting the Ribbon Cable

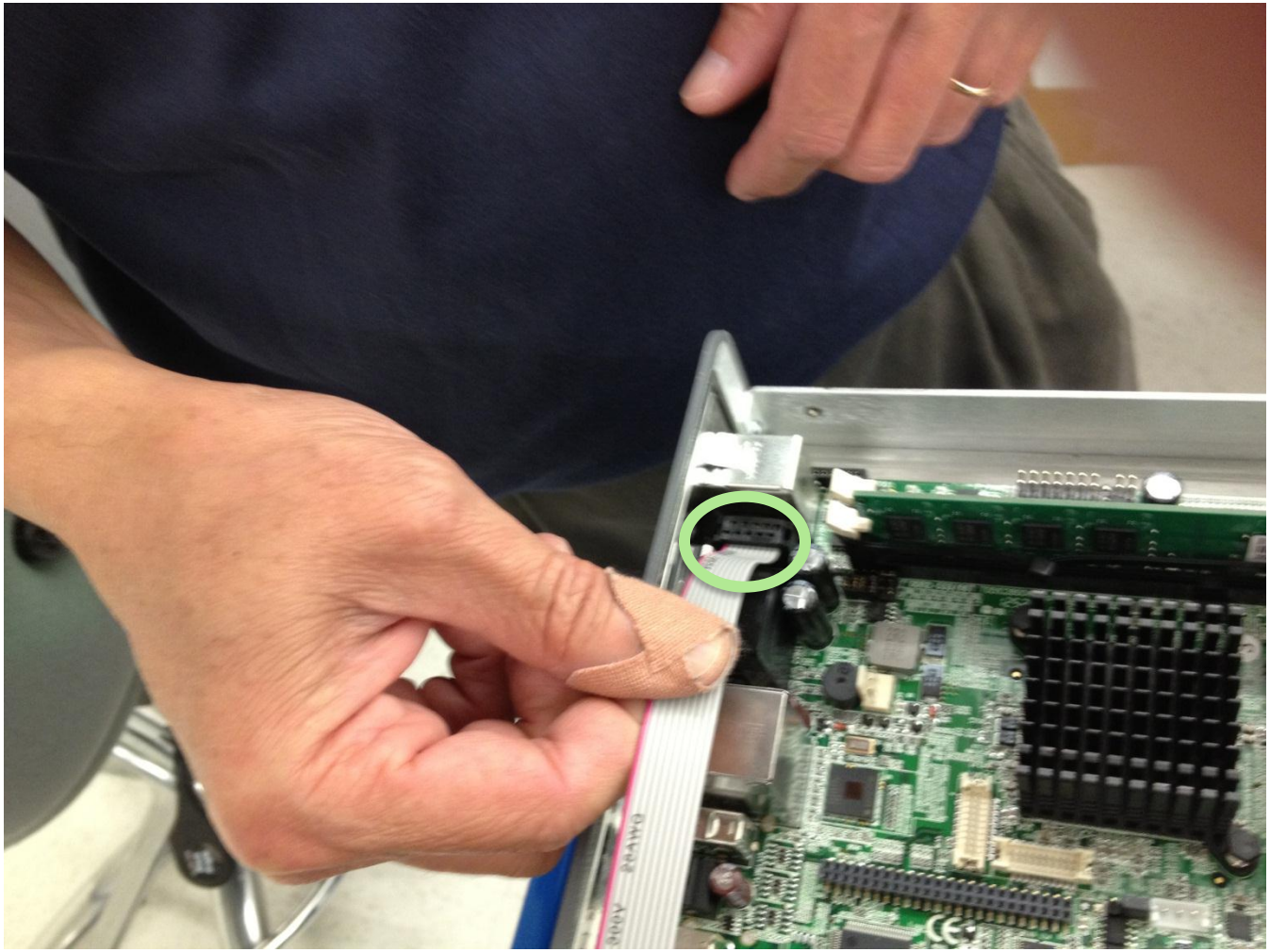

FIGURE 13: Removing Ribbon Cable

INSTRUCTIONS (cont.)

7. Disconnecting the ribbon cable is straightforward; simply pull up on the connector housing and disconnect from PCB.

7b. CSO NOTE, IMPORTANT: they were missing a step for something to remove. It's a rainbow cord that connect to the power button on the front of the machine (the wiring goes over to the far right of the Picarro as shown in the photos in this info packet). The side that plugs into the motherboard goes into a spot in the top middle of the PCB, right behind the RAM. That's the part where they mention on pg. 11 of this PDF that two of the metal pins have to be cut (should have arrived that way from Picarro).

The reason the two pins have to be cut is because it's the only way the thingy fits back in (the plastic edge of the thing goes into the "open" spot where the two pin blank spots are).

Removing PCB Attachment Screws

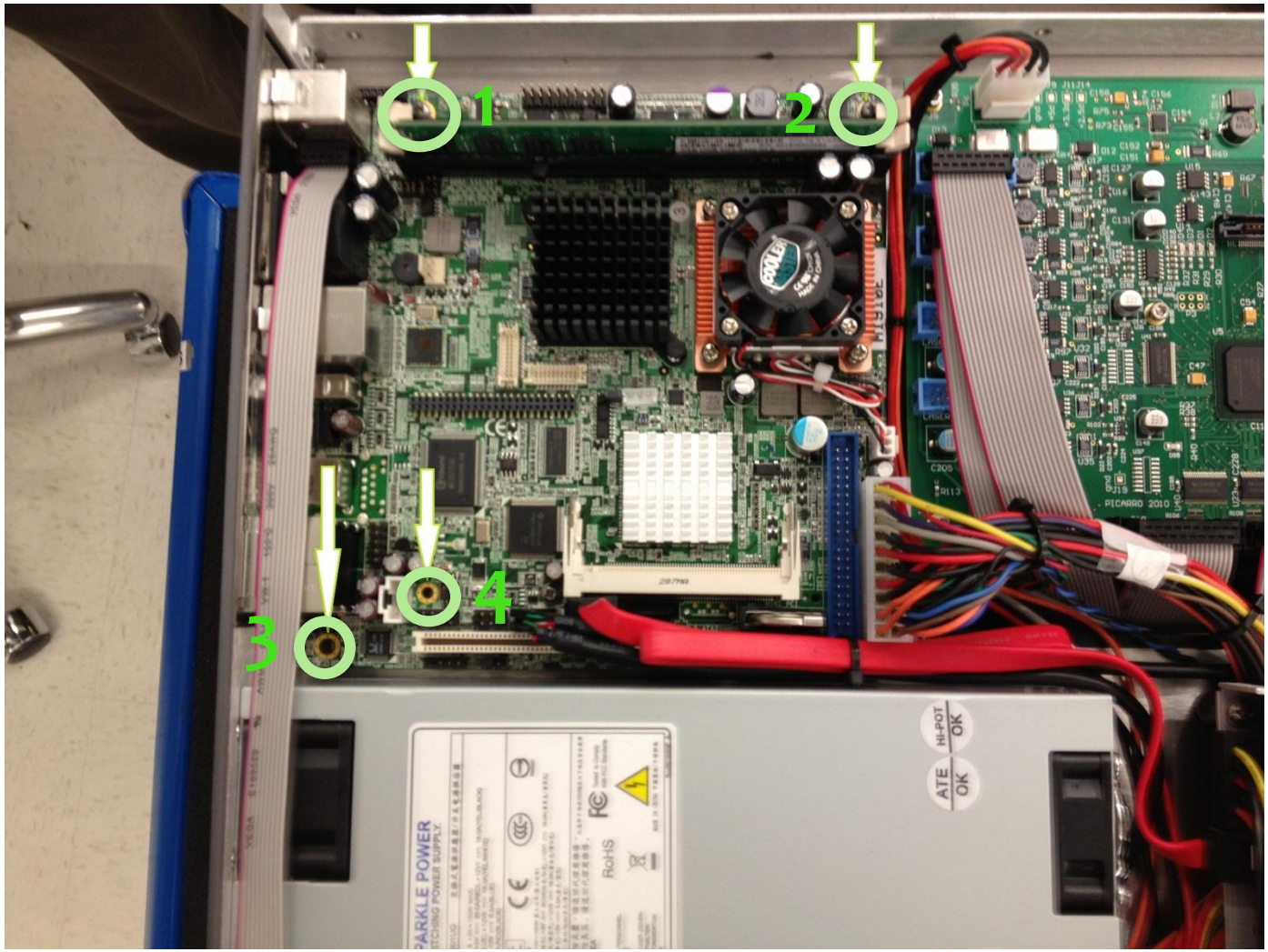

FIGURE 14: PCB Screw locations (x4)

INSTRUCTIONS (cont.)

8. Remove 4 screws (see Figure 14) that hold the PCB to the analyzer housing in the order shown in Figure 14. Initially loosen all 4 screws, then it's easier to remove the screws from the board level by retrieving them with forceps or needle nose pliers. Careful not to damage the board, and remember always to be grounded with a wrist strap.

CSO note - screw 3 and 4 aren't present. Instead there was a 3rd screw in the bottom right corner of the PCB.

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Removing PCB from the Analyzer

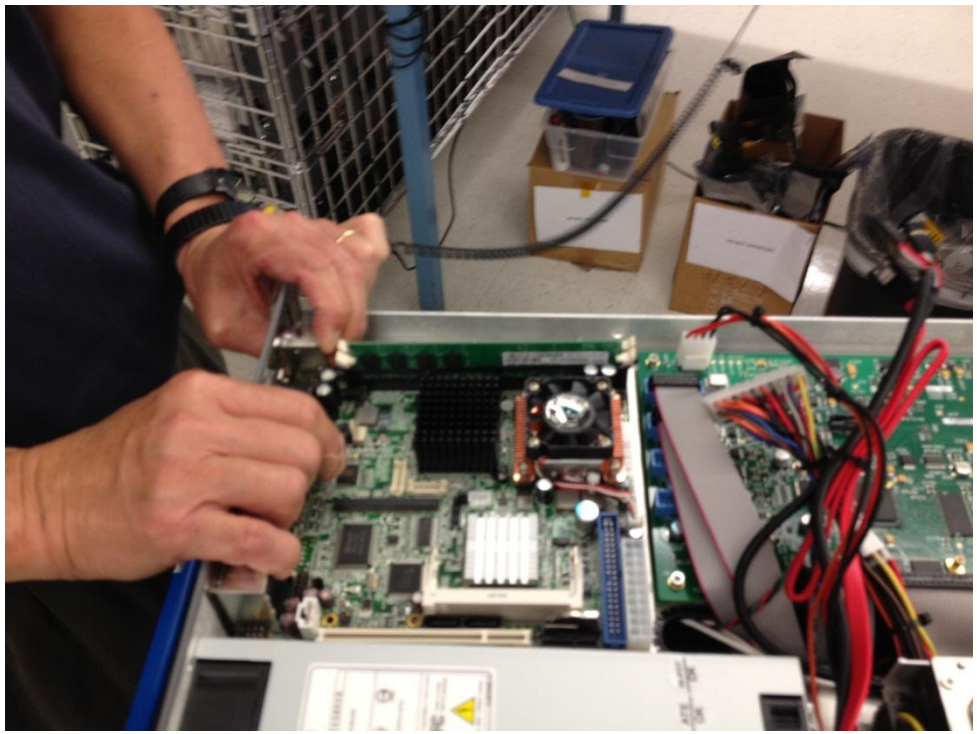


FIGURE 15: “Unsnapping” PCB from Analyzer Housing

INSTRUCTIONS (cont.)

9. Carefully remove the PCB from the analyzer. You might need to re-route the cable that goes in between the computer board and the adjacent board (just gently pull it up and out of the way). To remove the PCB, you have to unsnap it from the tabs on the analyzer housing that lock it into place.

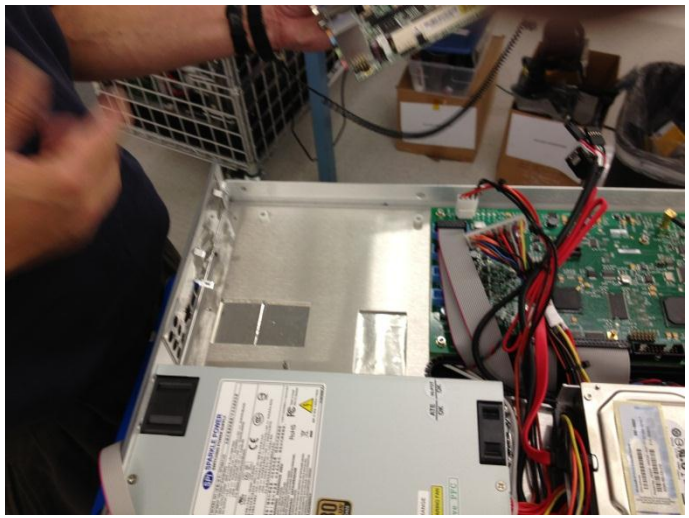


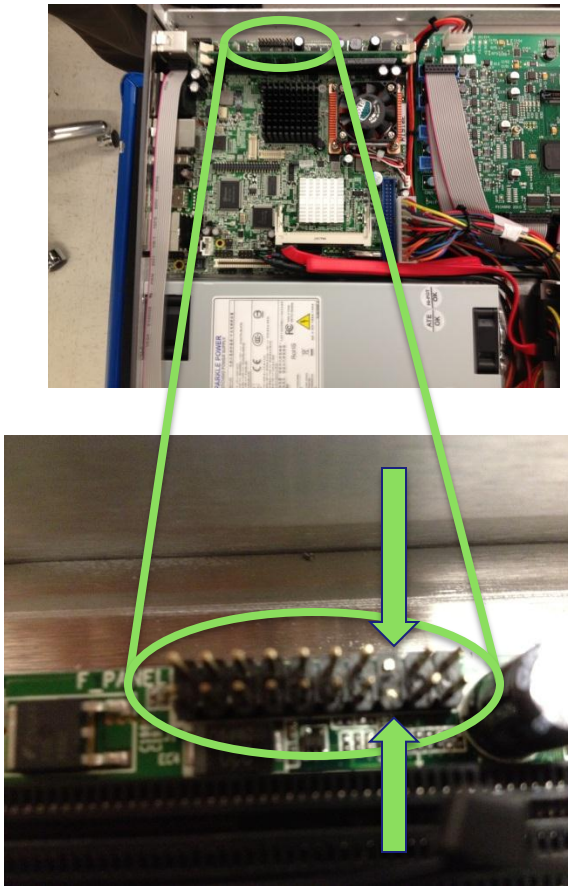
FIGURE 16: Removing the board

Installation: Inspecting the new PCB

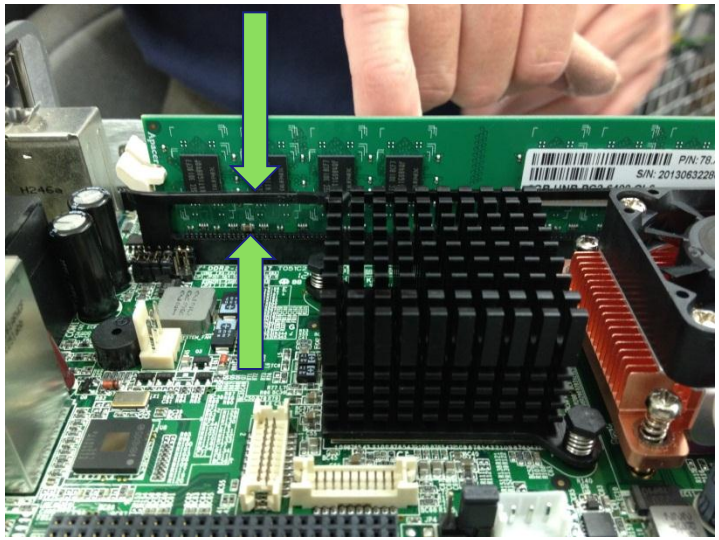
INSTRUCTIONS (cont.)

10. Before installing the new PCB back into the analyzer, check the overall board for any obvious damage (shipping) or other damage. Two additional things need to be qualified before installing the new board:

(a) On/Off connection leads AND (b) memory module security



Memory module must be seated properly *and* tie wrapped. If it's not, tie wrap it as shown in Figure 18 to the right.



Pins 5&6 must be cut in order for the power switch connector to fit

FIGURES 17-19: Inspection Points

Installing the new PCB

INSTRUCTIONS (cont.)

11. When inspection is complete, install the new PCB back into the analyzer. Installation is the reverse of removal:

    (a) Install the board, snapping the clip-connector side into the analyzer housing wall

    (b) attach the board with the 4 screws removed during removal of the old PCB

    (c) make all connections to the new board properly

12. When the new PCB has been installed and the cover replaced on the analyzer, and all external connections made properly, start up the analyzer by turning it on.

BIOS Setup

INSTRUCTIONS (cont.)

13. During the start-up POST process of the computer, enter the BIOS setup screen by pressing the <DEL> key
14. The BIOS setup screen should appear (please see Figure 20)
15. Select the "Standard CMOS Features" option, then hit <ENTER>
16. On the following screen (Figure 21), click to disable the floppy drive A ("None"):

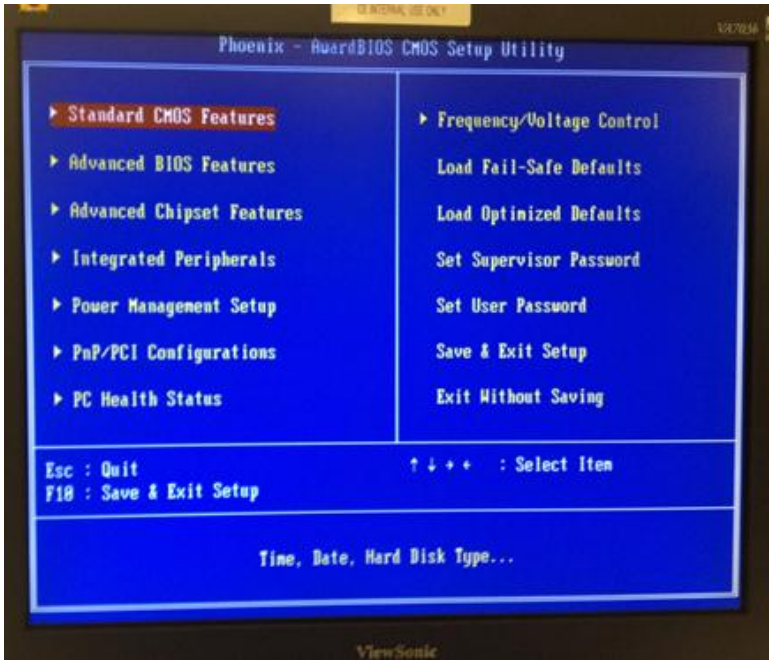


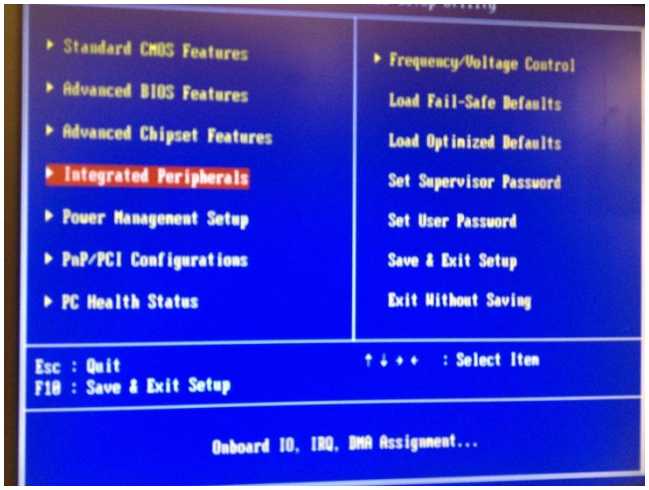
FIGURE 20: Initial BIOS Setup Screen

FIGURE 21: Selecting "None" for Drive A

BIOS Setup

INSTRUCTIONS (cont.)

17. When “None” is selected for Drive A, hit the <ESC> key to go back to the initial BIOS Setup screen
18. The BIOS setup screen should appear once again
19. Scroll down to select the “Integrated Peripherals” option, then hit <ENTER>
20. On the following screens (Figures 22 & 23), click the “SuperIO Device” option followed by the “PWRON After PWR-Fail” selection to “On (for auto restart after power failure).



FIGURES 22, 23, 24: Initial BIOS Setup Screen, Super IO Device, Power On after Fail enabled

INSTRUCTIONS (cont.)

21. Hit the <ESC> key twice to go back to the initial BIOS Setup screen
22. The BIOS setup screen should appear once again
23. Scroll over and down to select “Save and Exit”, select “Yes” at the Prompt, and wait as the computer reboots.

This ends the instruction on How to Replace the Computer Board on a G2000 Series Picarro Analyzer.

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