Texas Instruments Electronics Online Challenge 2018

Datascope Passport 2 Patient Monitor

Team Number #6986C

Team Name: Team Lancers

School: Grace Brethren Junior High

Contributors:

Alex Likes, 7th Grade

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Manjot Lobana, 7th Grade

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Final Report:

Our team decided to do a deconstruct challenge. We looked for any electronic devices that we had available. Our options were a patient monitor, rack mounted computer, and a gas module. We decided to deconstruct a Datascope passport 2 patient monitor because we thought it would be interesting to see how the parts would work together to perform its given function.

First, we removed the power supply from the back of the monitor. Then, we disassembled the back panel from the main board along with battery pack cable. We then detached the screws holding the front housing assembly to the rear housing assembly. Then, we had access to the ground plate. Afterward, we unscrewed the eight screws holding the ground plate and main board from the rear housing assembly. Therefore, we had access to all the circuit boards in the rear housing assembly.

Inside the rear housing assembly, we discovered a recorder, a fan, and finally a battery holder assembly. We also found five PCB (printed circuit boards) which consist of a main board, a SpO2 board, a NIBP board, recorder board, and the patient connecter board. Then, we decided to inspect the main board. We found various parts on the main board. We found resistors, capacitors, chips, diodes, and connecters to other boards.

Our team learned a lot from this challenge. We learned how to identify capacitors, resistors, diodes, and chips, and we would have never know what a capacitor or a resistor was.

We chose the patient monitor because we have seen it show a heart rate and thought it was fascinating. Now, we have a broader knowledge of circuit boards and electronics.

Final Summary Word Count: 275 Words

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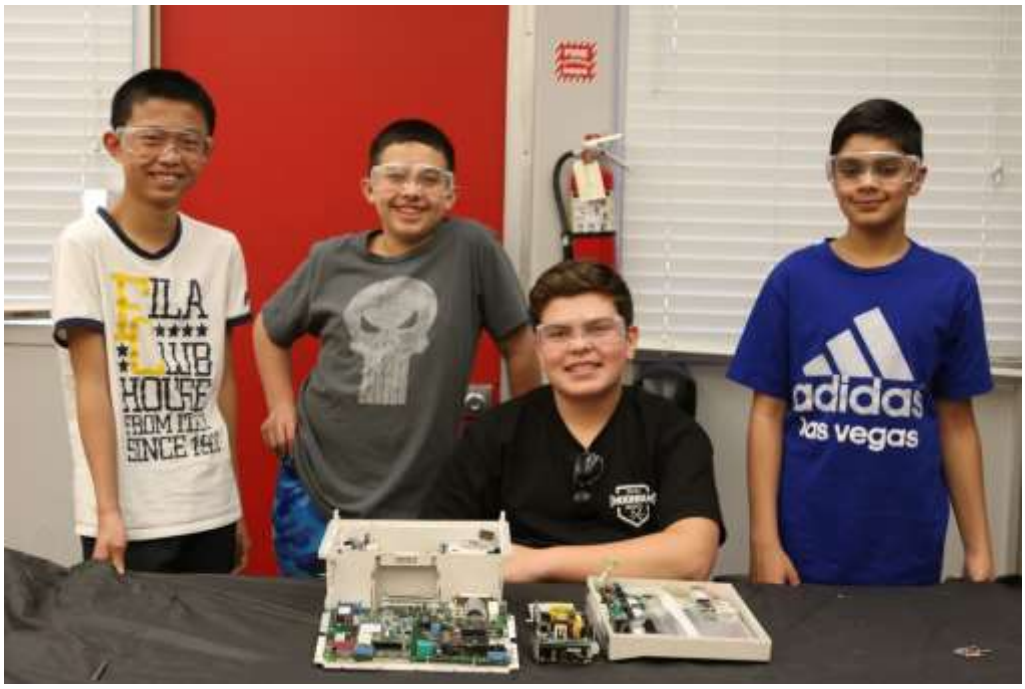

Patient Monitor

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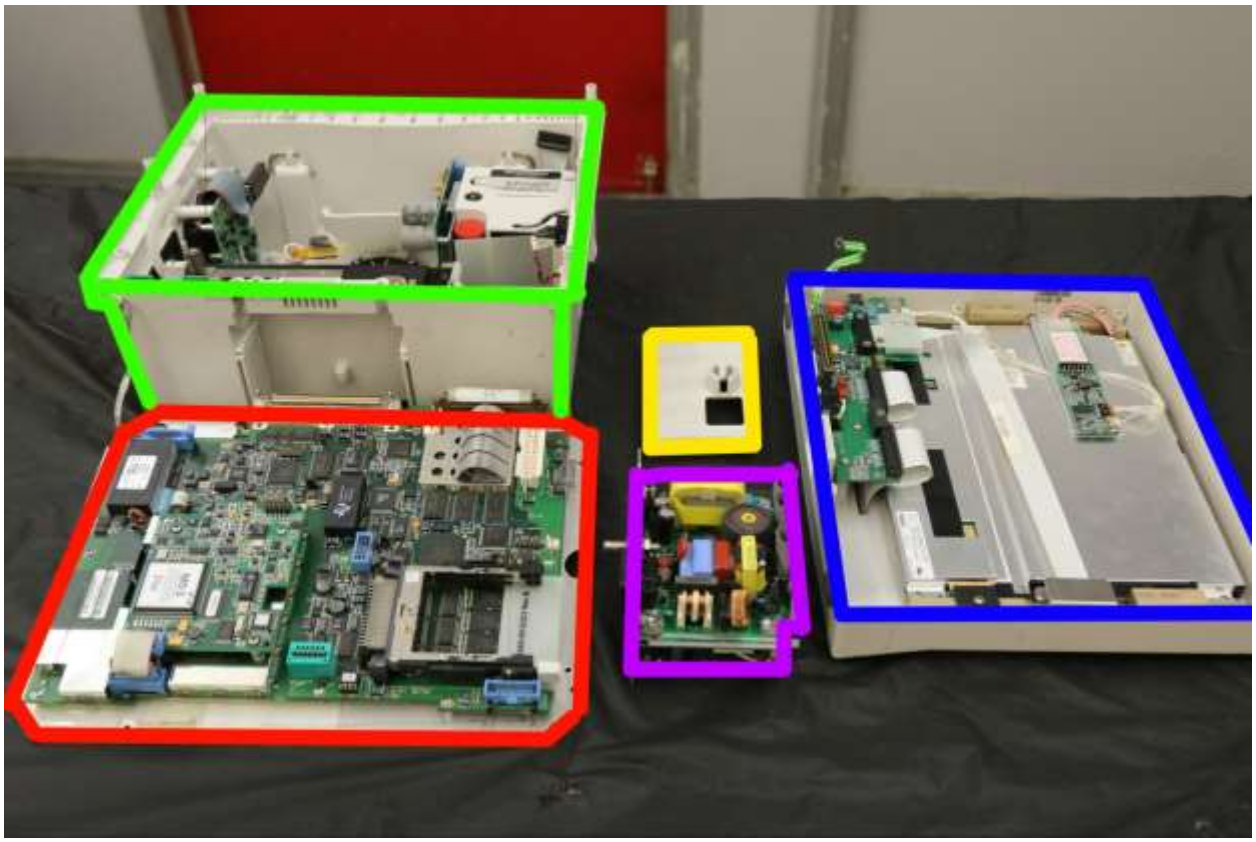
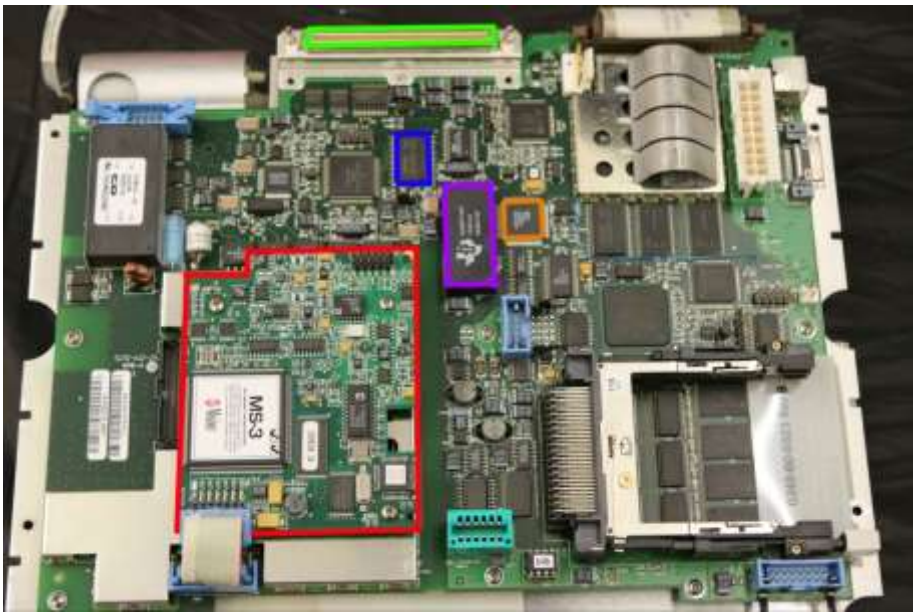
Figure 1: Overview



Main Board Power Supply Casing Rear Housing Assembly Front Housing Assembly

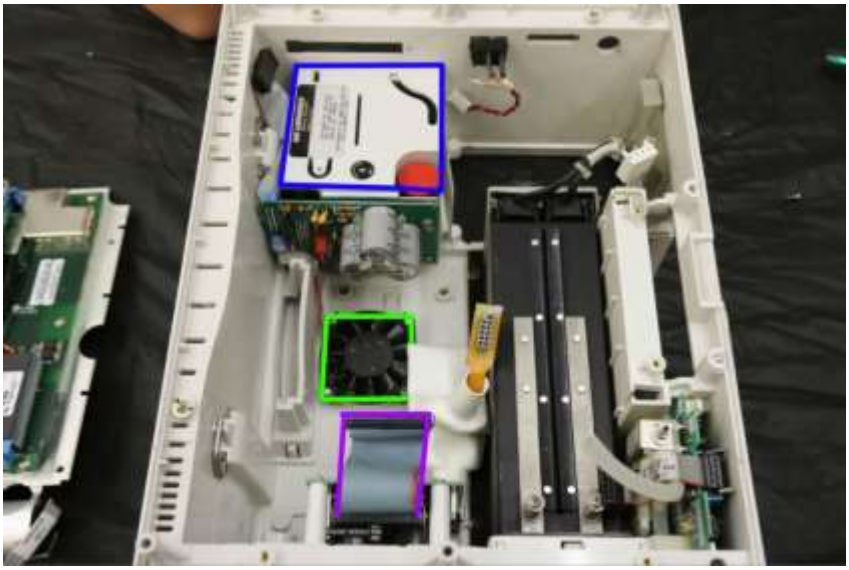
Power Supply

Figure 2: Main Board



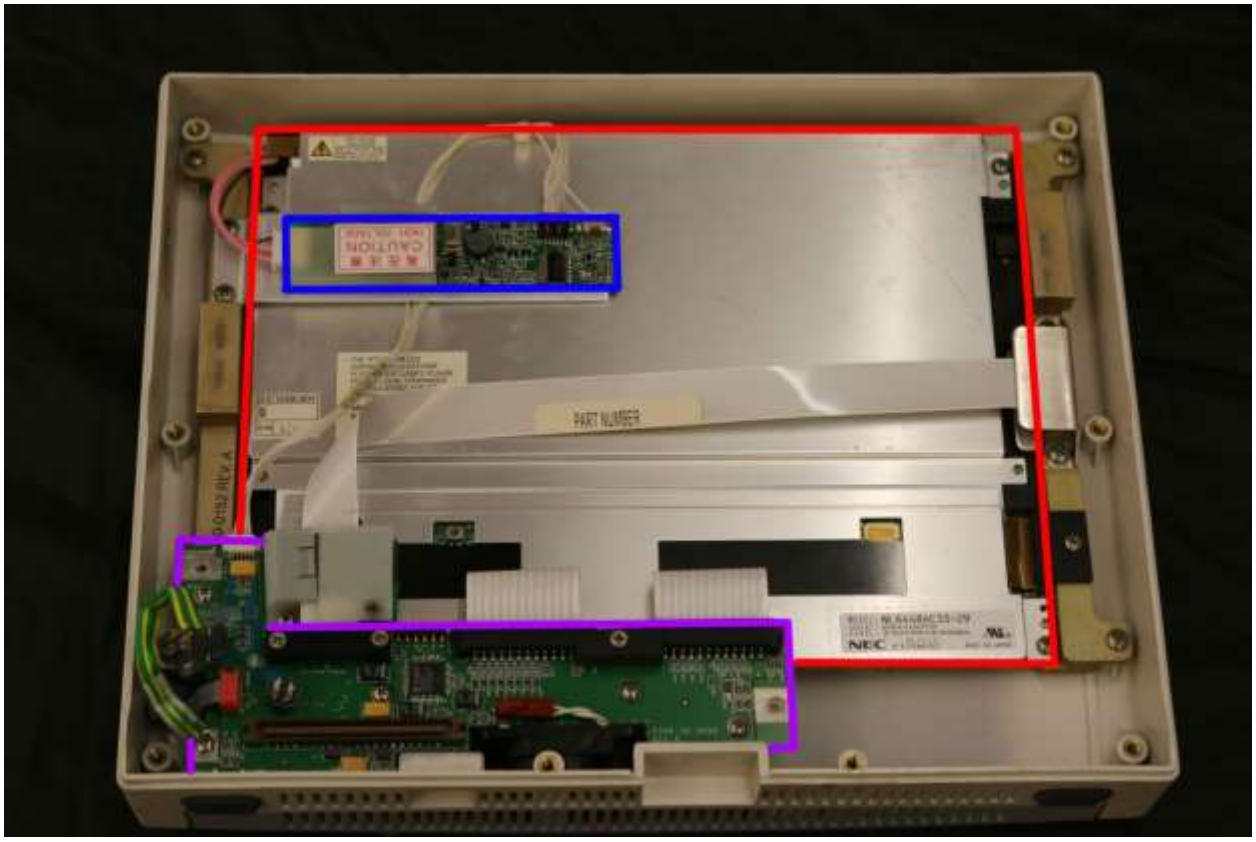
SpO2 Board IDT Chip Ribbon Cable Port Samsung Chip TI Internal Clock

Figure 3: Rear Housing Assembly



Data Recorder Fan Ribbon Cable

Figure 4: Front Housing Assembly



LCD Display Power Board Video Board

Figure 5: Power Supply

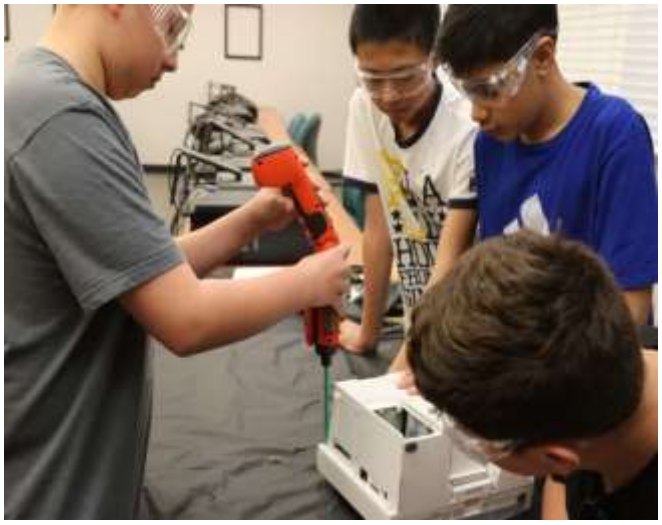


Figure 6: (At Left) Ethan unscrews the panel that holds together the rear housing assembly and the front housing assembly.

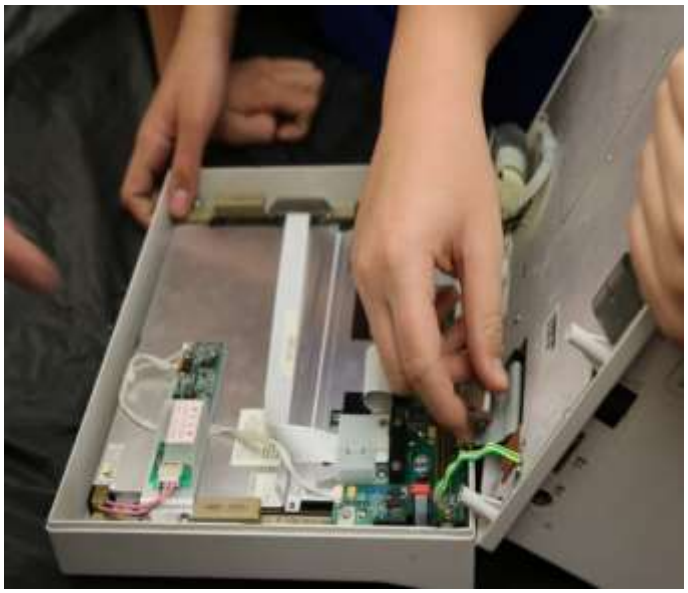


Figure 7: (At Left) Manjot is detaching a ribbon cable that held the front housing assembly to the rear housing assembly.

Figure 8: (At Left) Cooper is inspecting the power supply and identifying its parts.

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PCB Components

Resistors (R)	
Main Board	488
Function: Adds electrical resistance to the circuit to decrease the current.	

Capacitors (C)	
Main Board	495
Function: A passive component that can stock a small charge and discharge quickly. It can be used remove noise.	

Diodes (D)	
Main Board	9
Function: A passive two terminal component that only lets the current flow in one direction.	

Integrated Circuit Chips (U)	
Main Board	242
Function: Circuit boards shrunk into a small chip and can have various uses.	

Connectors (J)	
Main Board	25
Function: Connects points from board to board or component to component.	

Coils, Inductors, Ferrite Beads (L)	
Main Board	17
Function: Passive component used to oppose changes in the electrical current.	

Transistors (Q)	
Main Board	9
Function: A semiconductor used increase or switch electronic signals.	

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Chip Information

Manufacturer	Part Number	Purpose	Image
Texas Instruments	BQ4847NT	Real Time Clock	
IDT	71321	Dual Port RAM	
Samsung	K6TI008C2E-6B70	CMOS SRAM