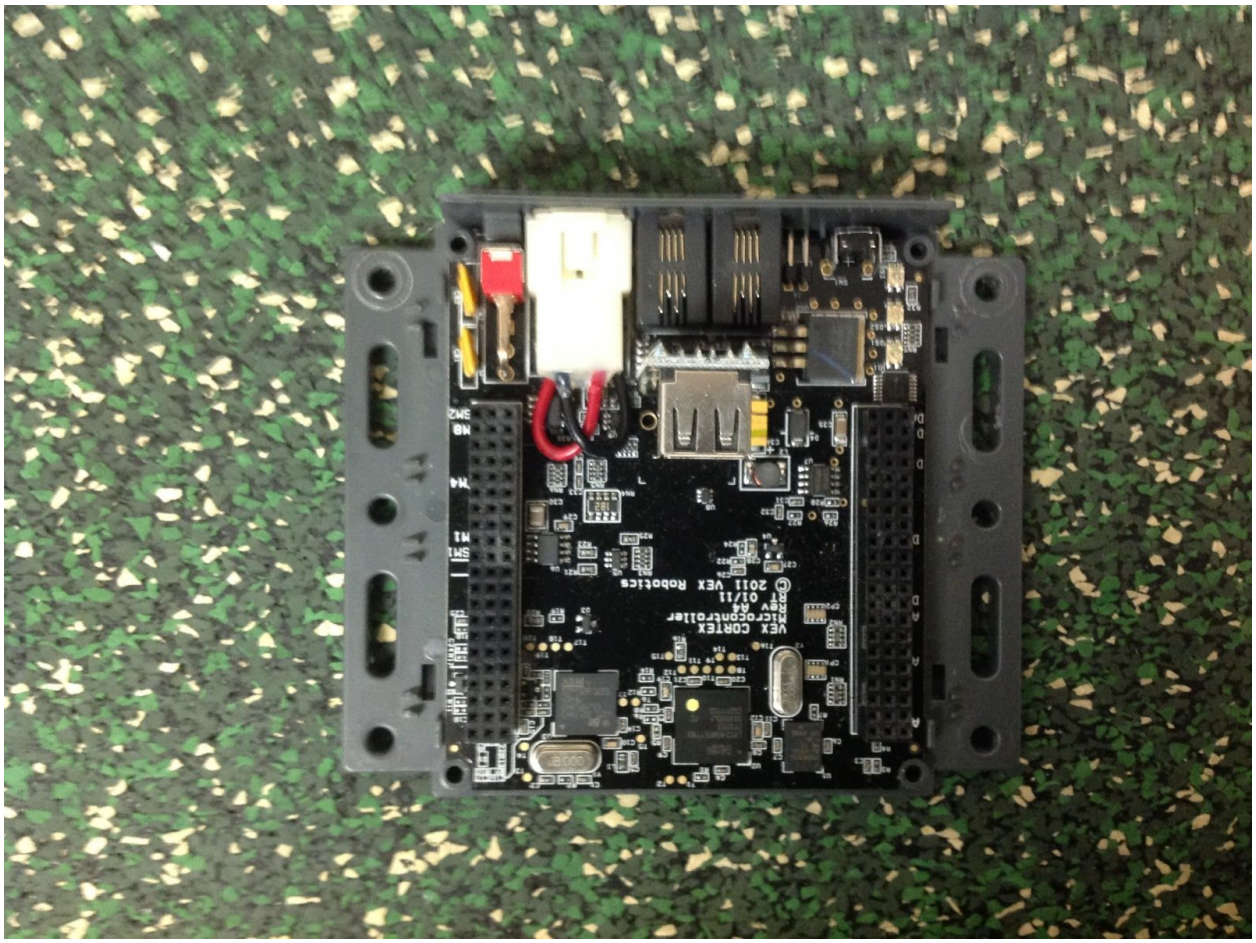
Texas Instruments Online Challenge 2018

By Team 8838E of the Robohawks

Below is the device our group dismantled: a regular VEX cortex. We chose to take apart this cortex because it was a readily available broken electronic as all of our team responsibly recycles our electronics in a electronic waste recycler. Also, we chose this electronic because we thought it would be cool to dismantle a computer and this is the closest thing we have.

A VEX cortex

Using plain old screwdrivers, we opened up the cortex and the inside looks like:



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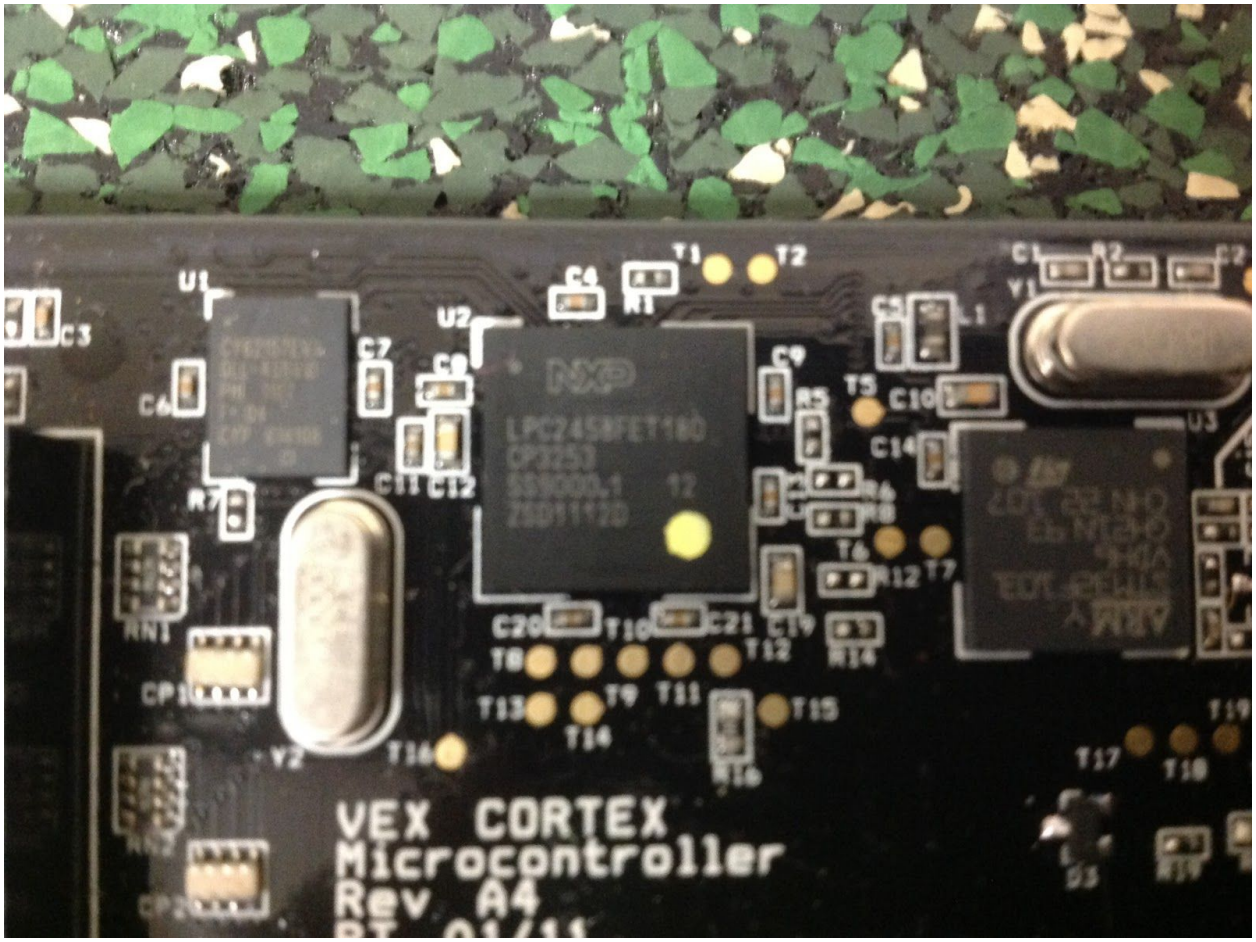
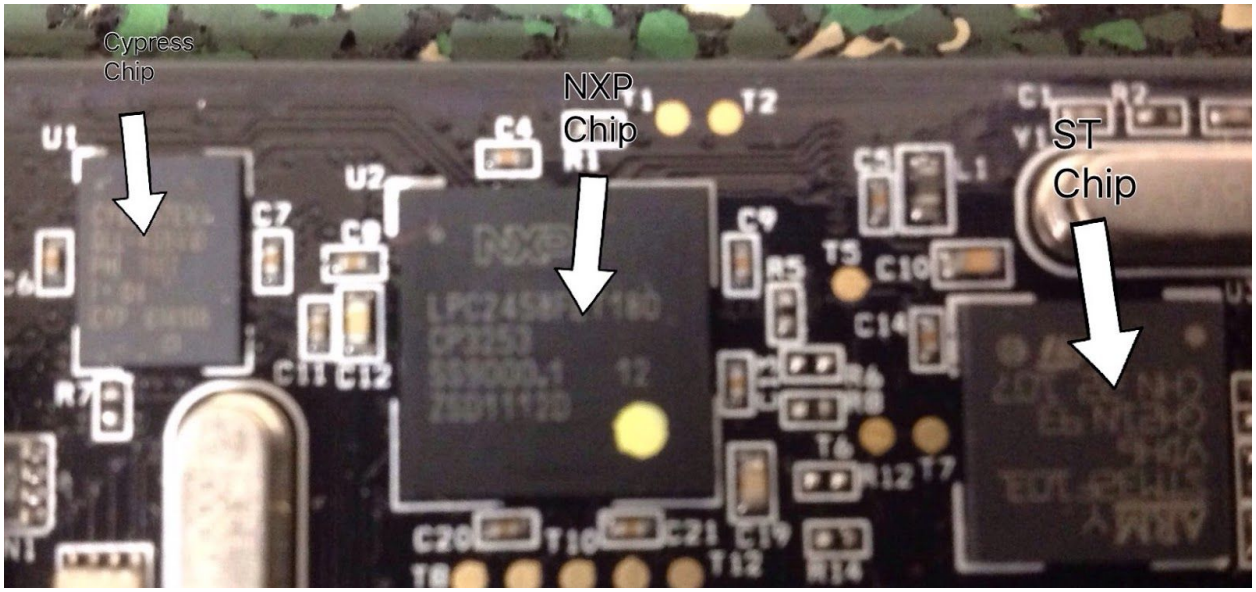
In the cortex, there is:

- a Microprocessor (NXP LPC2458FET180): This is a single chip 16 and 32 bit semiconductor with 512 KB of memory. It can reduce a code's file size by 30%. A microprocessor runs the code and tells the other parts of the computer circuit what to do.

- a Microcontroller (ST STM32F103): This microcontroller has 512 KB of memory, can use USB, and can control motors. Microcontrollers are specialized computers that have an input, and they consume less power.

- a Memory Chip (Cypress CY62157EV30LL-45BVXI): This memory chip adds more SRAM to the cortex. Memory chips help the microcontrollers and microprocessors process operations.

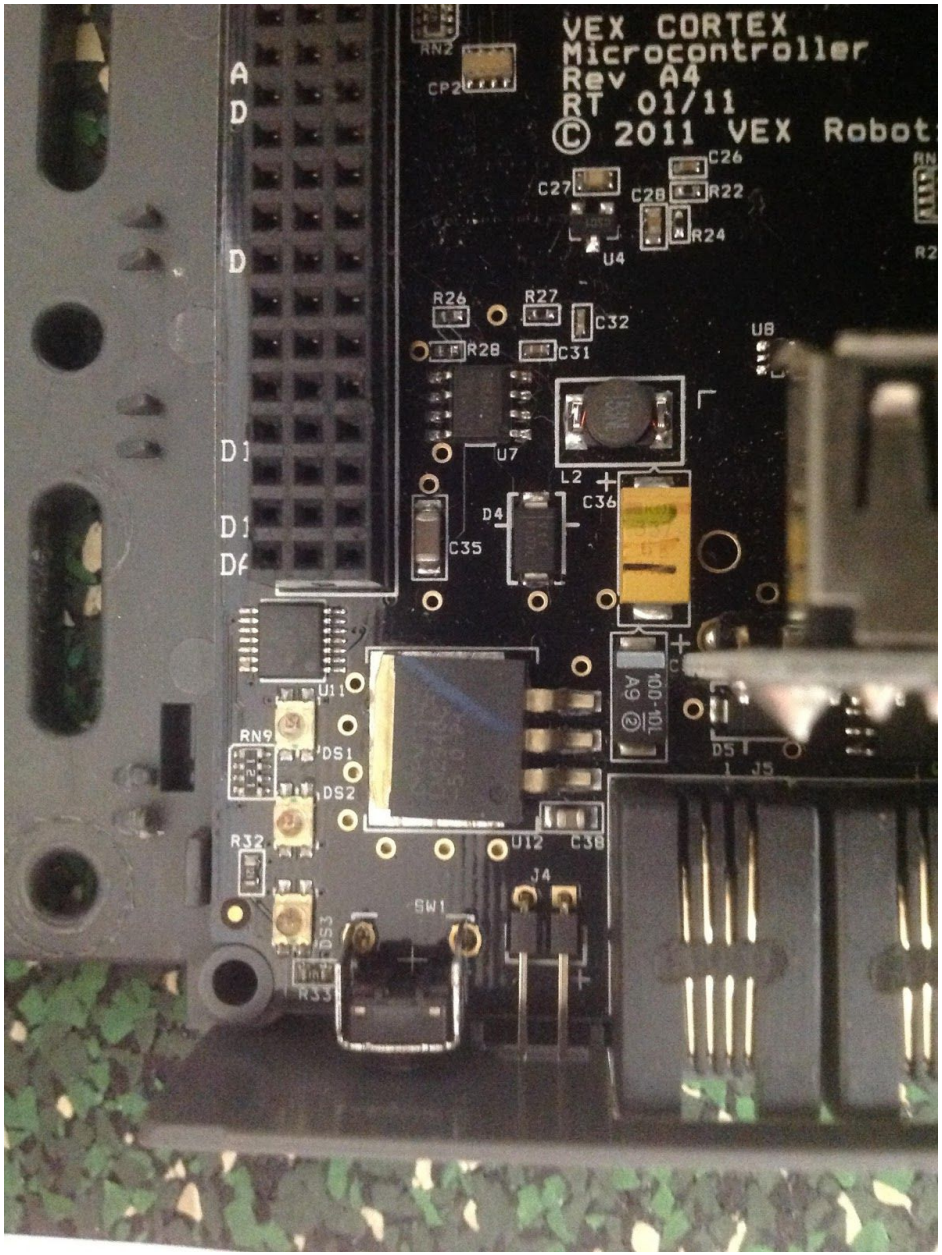




The NXP, Cypress, and ST chips

- an RF Transformer (Texas Instruments AD04): This RF transformer helps keep the power at a lower usage rate. This part is made by Texas Instruments.

- a Dropout Regulator (Texas Instruments LM2940CT): This dropout regulator, regulates the power to 1 amp. This helps by not frying the chips using electricity. This part is made by Texas Instruments.


VEX CORTEX
Microcontroller
Rev A4
RT 01/11
© 2011 VEX Robot
RN2
CP2
C27
C26
C28
R22
R24
U4
R26
R27
C32
R28
C31
U8
U7
L2
C36
D4
C35
U11
RN9
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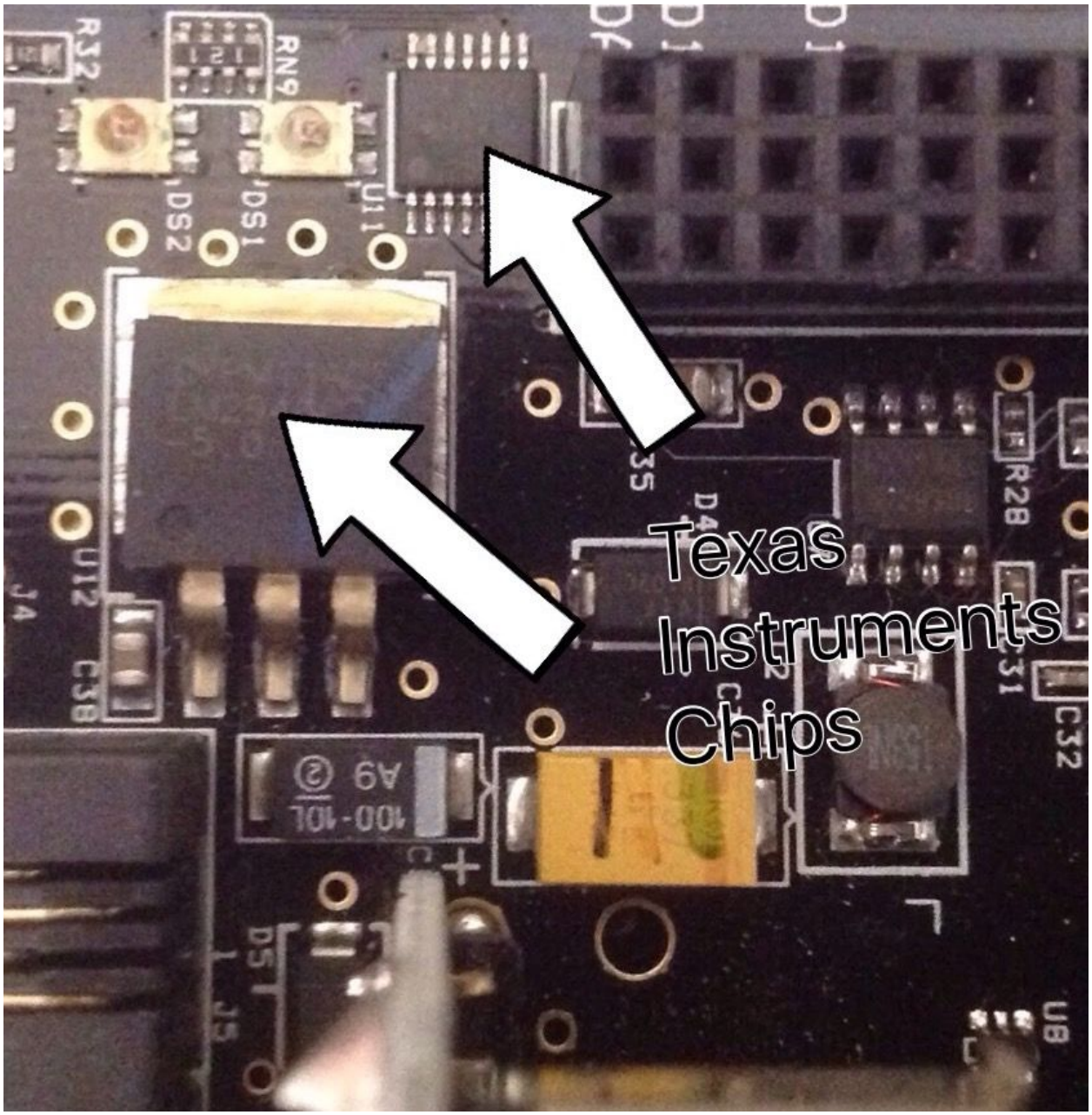
DS2
R32
U12
C38
J4
SW1
DS3
R33
J5
D5



The Texas Instruments chips

From this experience, I learned about what is in a VEX cortex, how the different components inside work together to make the device function correctly, and most importantly, how to use a VEX cortex to maximum efficiency. And of course, I learned how to safely take apart electronics.