

VEX Game Clock by RoboticsAtRangitoto

Team 2901c

Why a VEX Game Clock?

During a VEX Competition the spectators often struggle to see how much time is left in the game. Our VEX Game Clock will stop them from ever wondering again! Measuring a whopping 2 meters long by 1 meter high it will be visible even from the other end of a football field.

What does it do?

The VEX Game Clock counts down in the same way as the clock on the Game screen but in a much cooler way. The noise when the time flicks over is like a whole lot of robots on a game field. The clock is started and stopped automatically by the field control stuff.

How does it work?

Well with VEXnet things are really easy. There is one main controller with VEXnet and three digit controllers. The digit controllers' digital inputs are plugged into the main controller's digital outputs.

Main Controller

The software in the main controller knows when autonomous starts and when driver control starts. When a period (autonomous/game) starts a count down counter is started (20secs/2mins) the time is output in BCD format on the main controller's Digital I/O pins.

Digit Controller

The three digit controllers are really stupid. All they do is convert the BCD number on their digital i/O pins to a 7-segment combination to show the BCD number.

Showing a number

Each number is made up, like a number on your calculator, of 7 segments.

Each of the 7 segments is an assembly with its own servo. To show a segment the 5x25 plate is turned by its servo so it is flat on to the spectators. To hide a segment the 5x25 plate is turned sideways to the spectators. It was hard to adjust the chain to get the plates to go flat or sideways so the actual position for each segment is set in software.

The design process...

The hardest part was thinking of something to design, the idea came to me at a scrimmage. Why not build a massive clock "that would be useful".

Discussions with our mentor helped me finding out about 7-segment displays, BCD and such stuff.

Once we started on the design we found that if we made each segment from scratch then we would never get the design done so we decided to create a segment as an assembly and drop them onto the clock board. Once we started we found other bits that should be done as assemblies.

Autodesk Features

We used Sketch, extrude, bend, sculpt, constrain and assemblies. The most helpful feature was constrain without it things would just fall apart. We wanted to draw in the chain but there seems no way to do it.

Useful?

Hell yeah!

Our house is like a VEX lab and a countdown clock makes things so much easier. I can even use it to time my eggs now.

Problem is I will have to ask my parents to get a bigger house.

