FST School Write Up (Basic Parts)

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1. Control Apparatus Sections
    a. Control Panel
        i. Create a box to store all of the main electronic components
            1. Motherboard, LCD Display, Wiring Connections, etc.
        ii. The box must have openings for the following components:
            1. On/Off Rocker Switch
            2. LCD Display
            3. Status Catherite LED
            4. Side 3 Step Rocker Switch for switching between modes
            5. Wire Connections
        iii. The box must also have a section in the bottom for the battery
            1. Must have a lid that will open and close to promote accessibility
2. Starting Gate Apparatus Sections
    a. Laser Module Holding Piece
        i. Will be an L-shaped structure that houses the laser module on the start gate
        ii. The L will be rotated so that the long side is parallel to the horizontal axis, and so the the wing is pointing upward
        iii. The end that is farthest right will have a circle cut out to fit a rod of PVC that will connect this piece to the Receiving Laser Module Holding Piece
        iv. The structure will be hollow to provide space to feed wiring and modules
        v. The wing section of the structure that is pointing upward will have a circle cut out at the top
            1. Indie the cut out will be a cuff that is measured to hold the Laser Module to emit the laser, creating the start gate
    b. Receiving Laser Module Holding Piece
        i. Will be an L-shaped structure that houses the laser module on the start gate
        ii. The L will be rotated so that the long side is parallel to the horizontal axis, and so the the wing is pointing upward

iii. The end that is farthest right will have a circle cut out to fit a rod of PVC that will connect this piece to the Laser Module Holding Piece
iv. The structure will be hollow to provide space to feed wiring and modules
v. The wing section of the structure will have a circular cut out in the top section of the wing
    1. Inside of this cut out there will be a disk with a cut out at the bottom that will hold the Receiving Laser Module
    2. This disk will be perfectly aligned to the Laser Module in section 2.a, finishing the start gate

3. Ending Gate Apparatus sections
    a. Stud Cuff Holder
        i. A semi-circle, measured to fit inside of the pylons and to hold the stud running inside of the pylon in place
        ii. Will have a cut out in the center measured to the dimensions of the stud
        iii. Will have locations for screws to be put in place
            1. To secure the cuff to the stud
            2. To secure the cuff to the pylon
    b. Stud End Stop Cuff
        i. A full circle, measured out for inside of the pylon that will be the end cap for the stud running inside of the pylon
        ii. Will have a depression in the center of the circle measured to the dimensions of the stud, the depression will not run through the end of the cuff
        iii. Will have locations for screws to be put in place
            1. To secure the stud to the cap
            2. To secure the cap to the pylon
    c. Laser Module Holding Piece
        i. This structure will be a full circle, measured to the inside of the pylon with a rectangle cut out facing the inside of the end gate apparatus
        ii. There will be a cuff for the Laser Module, measured to its dimensions, with the following specifications:

1. The cuff will be at an acute angle to the opposite pylon
    a. This will cause the creation of a laser grid throughout the entirety of the End Gate Apparatus
2. The cuff will be aligned center to the other pylon

iii. The structure will be positioned on the top of the left pylon, still inside of the pylon structure

d. Receiving Laser Module Piece
    i. This structure will be a full circle, measured to the inside of the pylon
    ii. This structure will replace the pylon Stud End Stop Cuff on the right pylon, being positioned in the lower middle section
    iii. The structure will have a depression in the center that the stud will be secured into
        1. There will be locations to secure the structure to the stud with screws
        2. There will be locations to secure the structure to the pylon with screws
    iv. The structure will also have a tab that will rise to the lowest section of the stud
        1. This tab will have a disk at the end with a cut out at the bottom to store the Receiving Laser Module
        2. The tab will be aligned with the last reflection from left pylon, ending the laser grid on the Ending Gate Apparatus

4. Pylon Alignment Pieces
    a. These pieces will be cuffs that are measured to the outside of the pylon
    b. The top section of the cuff will be glued to the bottom of each pylon
    c. The bottom section of the cuff will be glued to the top part of the connector
    d. Each of the pieces of the cuff will have alternating teeth, ensuring that the pylons will always be perfectly aligned every assembly
5. Pylon Caps

a. These pylon caps will be measured to the inside of the pylon, and the top section of the cap will be measured to the outside radius of the pylon
b. These caps will give structural stability to the pylon with the Laser Module, and seal the top of the other pylon
    i. This will give the End Gate Apparatus uniformity

6. Testing Structures
    a. There will be two parts to the Testing Structure, the Laser Module Holder and the Receiving Laser Module Holder
    b. These parts will be connected to a bracket that will hold the testing structure together
        i. Laser Module Holder
            1. The Laser Module Holder will be attached to the bracket
            2. The Laser Module Holder will consist of a cuff measured to the width of the Laser Module, it will be slightly elevated
        ii. Receiving Laser Module Holder
            1. The Receiving Laser Module holder will be attached to the bracket
            2. The Receiving Laser Module holder will be a disk that has a cut out in the back to feed wiring into the disk
                a. The wiring will be the wires that are a part of the Receiving Laser Module
            3. The Receiving Laser Module will be slightly elevated, but it will be perfectly aligned to the Laser Module on the opposite side of the bracket