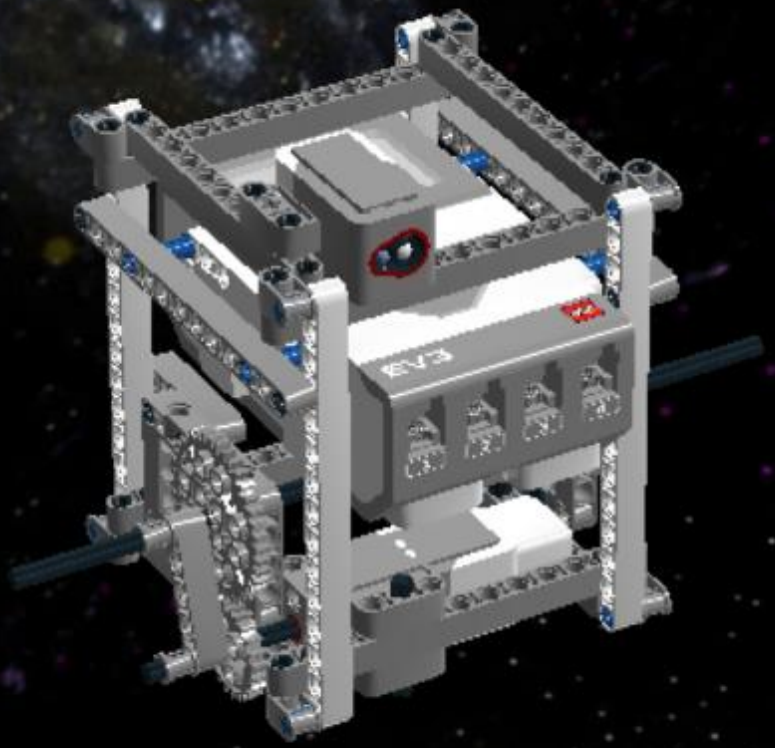
CubeSat Directions



STF-1
West Virginia's First Spacecraft

NASA Independent Verification and Validation Facility in Fairmont, West Virginia

www.STF1.com

Introduction

West Virginia's first spacecraft is set to take off in summer 2017. This spacecraft is called STF-1 (Simulation to Flight-1) and is part of a series of spacecrafts called CubeSats. STF-1 will take pictures of Earth, monitor atmospheric weather, test electronic shielding and demonstrate the capabilities of software-only simulation environments.

You are going to build a STF-1 mockup using LEGOs with a light sensor, rotational sensor and a motor to move to appropriate positions. STF-1 is a 3U CubeSat but you are going to build 1U for this demonstration. 1U is a CubeSat with one cube with standard dimensions of 10x10x11cm. STF-1 is composed of three of these stacked on top another. This allows for one launch technique for all CubeSats.

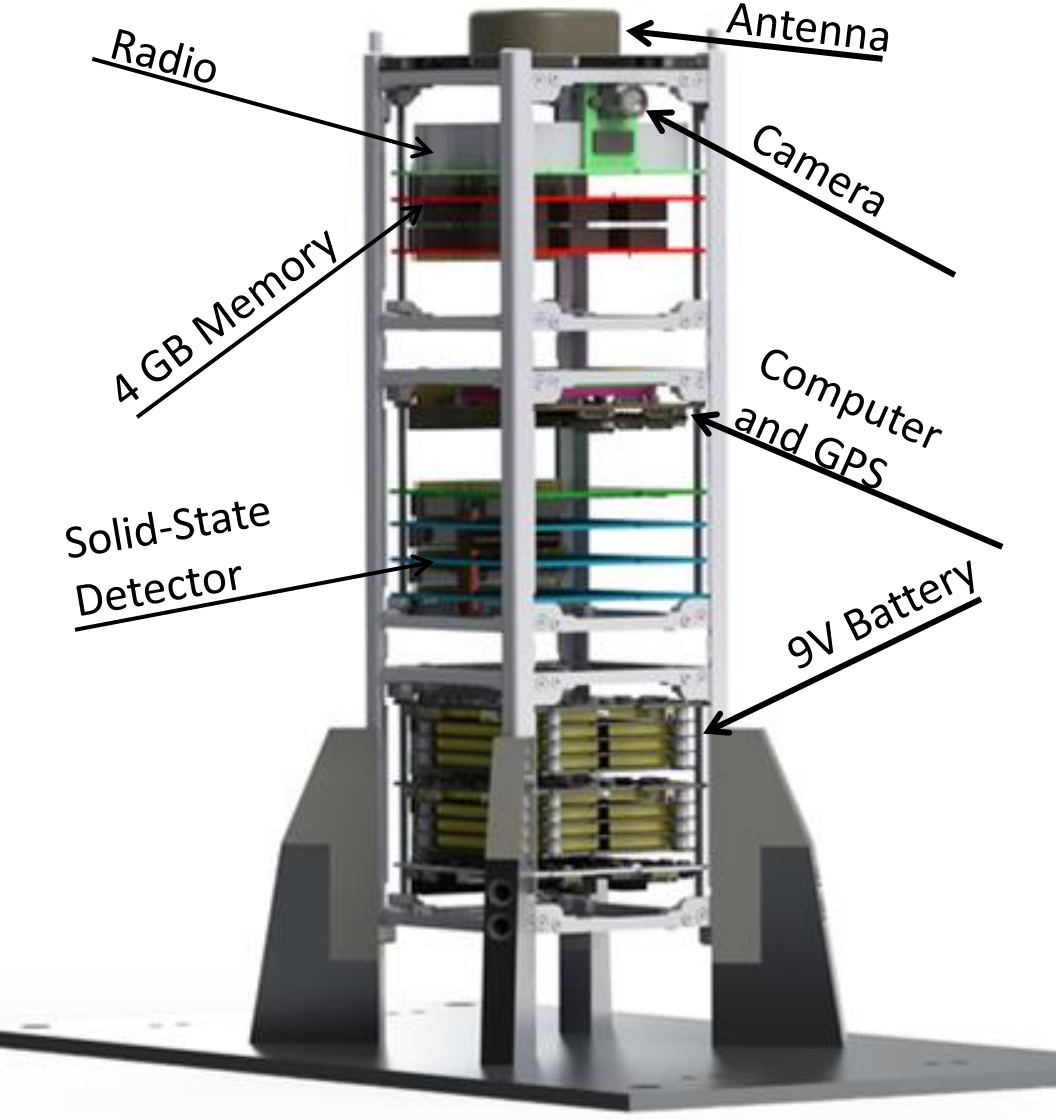
Did you know?

- STF-1 stands for Simulations to Flight-1
- STF-1 is West Virginia's First Spacecraft
- STF-1 is about the same size of a loaf of bread (10x10x34 centimeters to be exact) and weighs 9 pounds
- STF-1 will orbit earth every 93 minutes
- STF-1 will be in orbit for 6 months then burn up entering Earth's atmosphere

Directions

Follow the steps to build your CubeSat. At the end there will be various codes to modify and make it your own.

STF-1 Components



Simulation to Flight-1

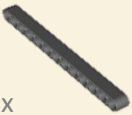
1

2 x

4 x

2

2 x



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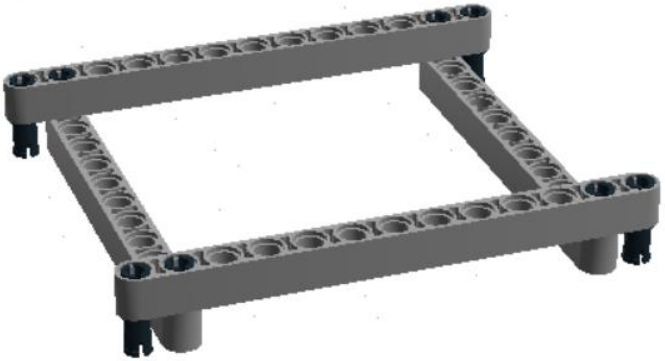

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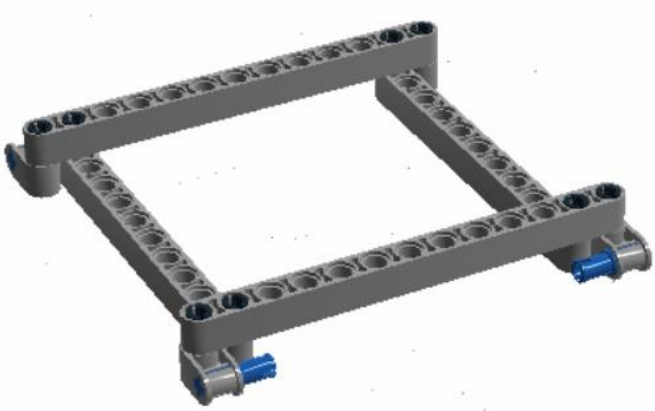
4 x



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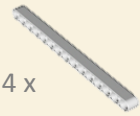

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4 x

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4 x

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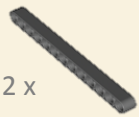

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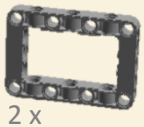
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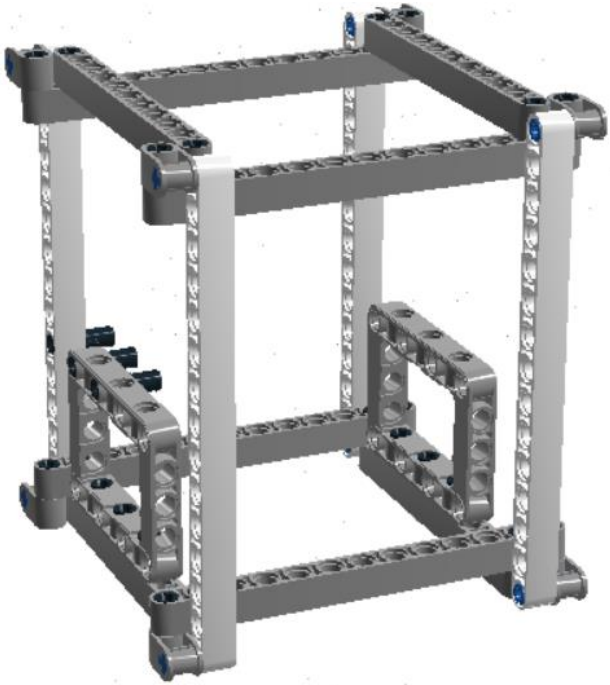
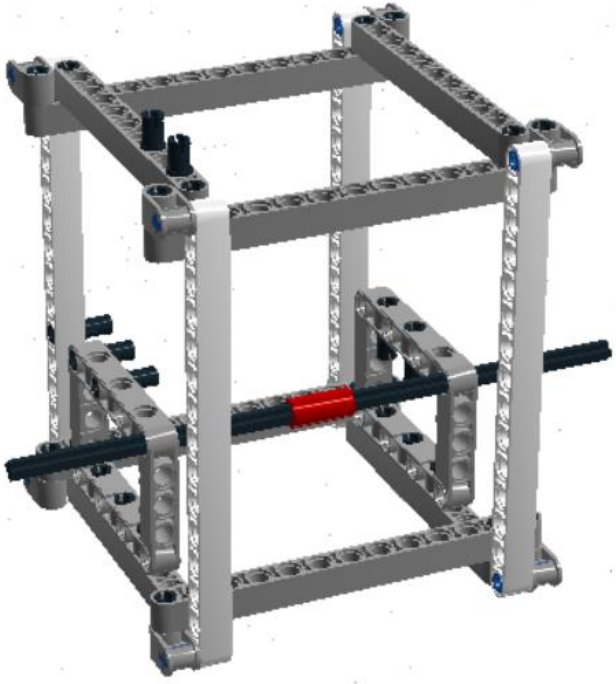


10


2 x


4 x


1 x



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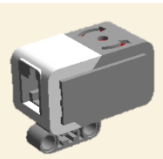

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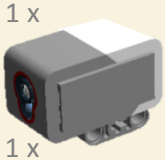

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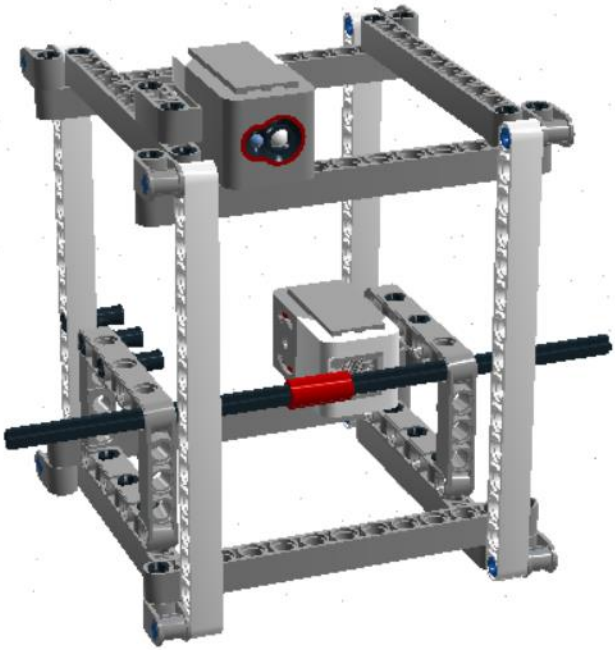

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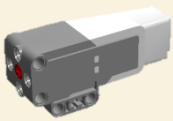

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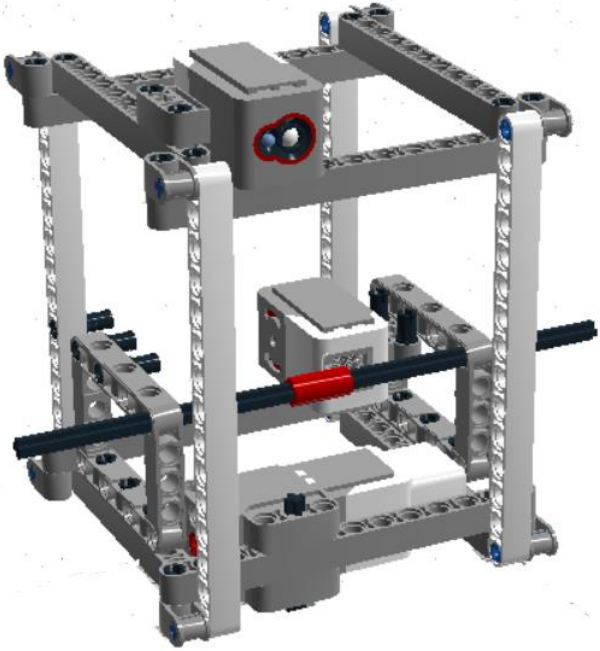

13


1 x


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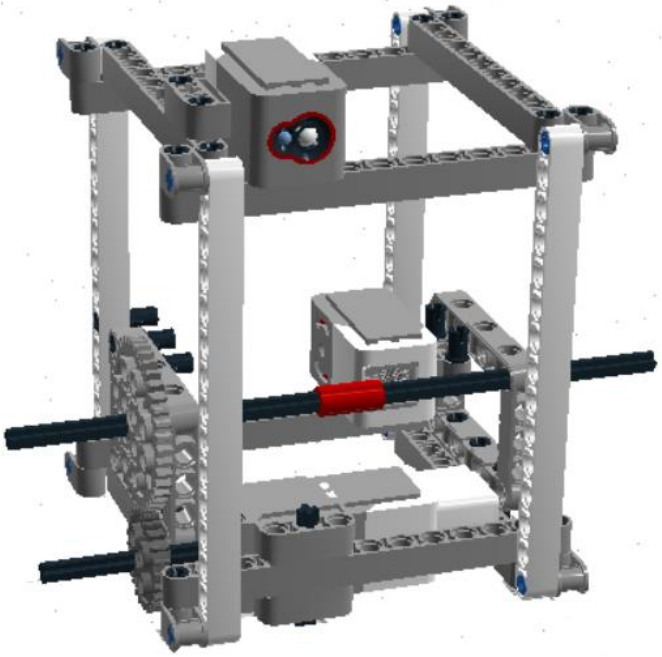

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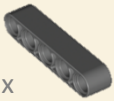
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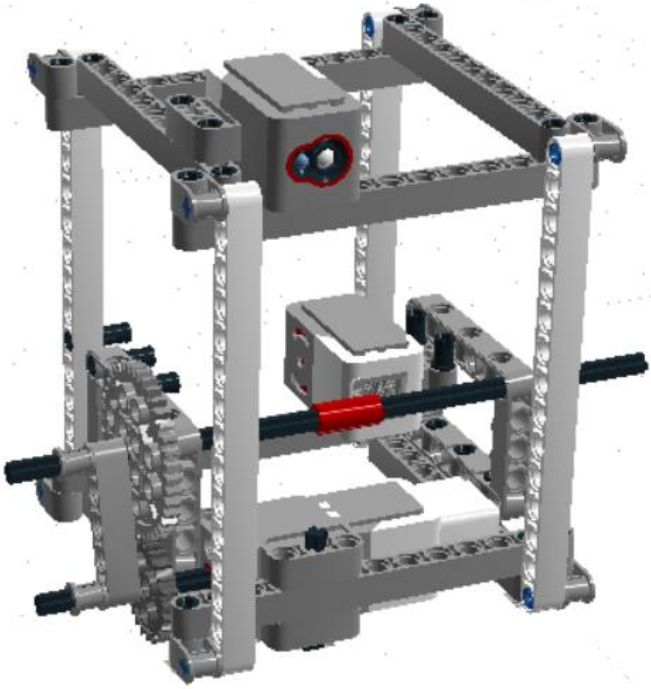
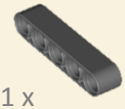
2 x



15


4 x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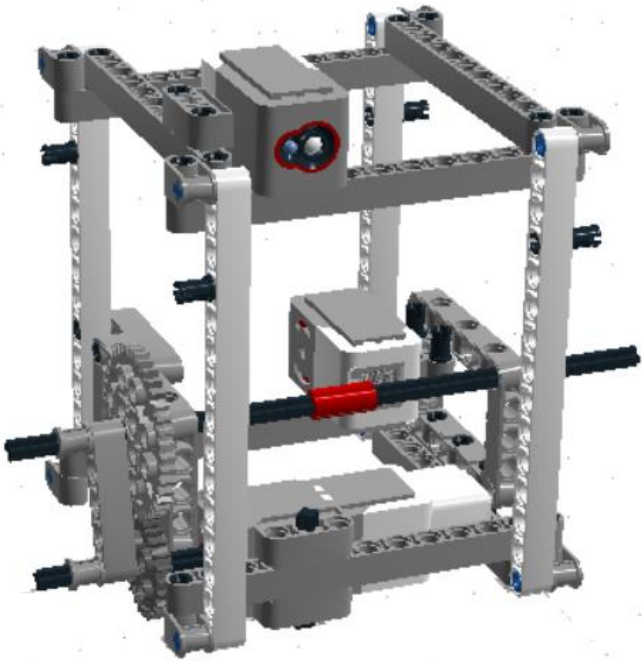
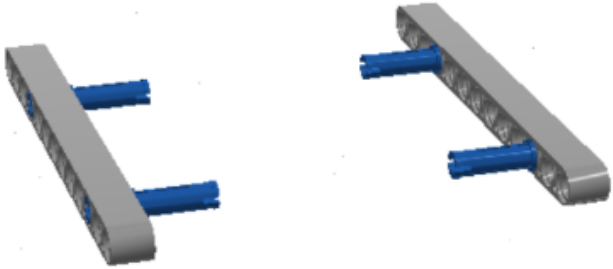


16

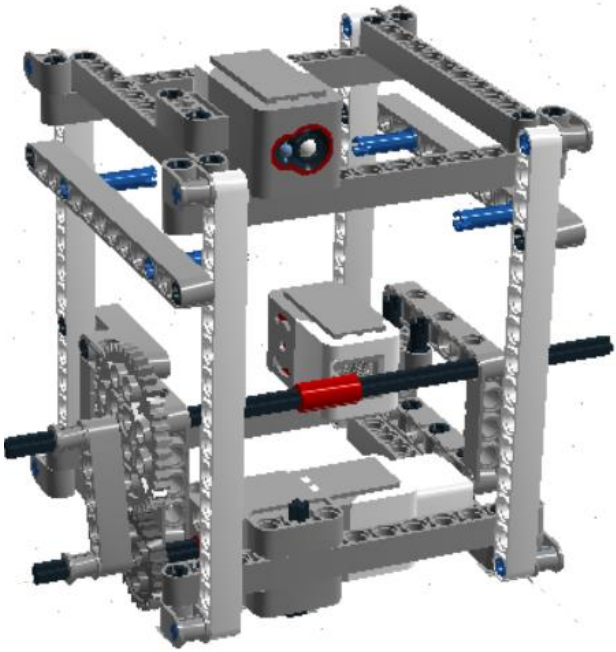

2 x


4 x



17

1 x



Continue to step 18 to place your EV3 brick in place.

18

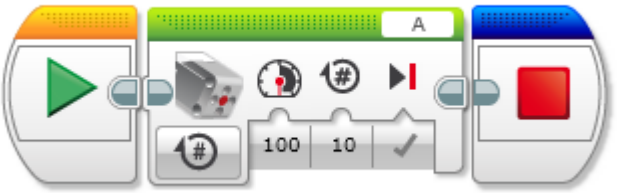
3 x

19

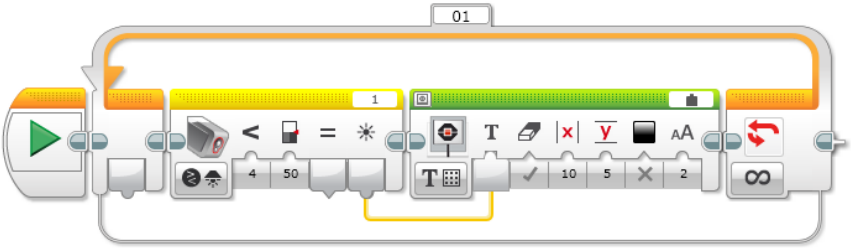
Connect your EV3 Brick to motor, light sensor and level using the shortest wires. Keep the wires inside the CubeSat.

Code Suggestions

Make your CubeSat spin



Find the ambient light number



Turn the CubeSat to a certain degree

About us

NASA IV&V (Independent Verification and Validation) is located in the heart of West Virginia's emerging technology sector, NASA's IV&V Program was established in 1993 as part of an Agency-wide strategy to provide the highest achievable levels of safety and cost-effectiveness for mission critical software. NASA's IV&V Program was founded under the NASA Office of Safety and Mission Assurance (OSMA) as a direct result of recommendations made by the National Research Council (NRC) and the Report of the Presidential Commission on the Space Shuttle Challenger Accident. West Virginia Space Grant Consortium is in collaboration with NASA IV&V whose primary focus is on research, collaborations with high-technology industries, student fellowships as well as K-12 and public outreach programs.

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