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Logbook: Lava Tube Mapping

1st Day

We explored several lava tubes and identified one as suitable for the robot's deployment. Most of the equipment has been collected, with the exception of the generator, which will be retrieved tomorrow morning.

Tomorrow, we will begin the robot's mapping process. Before that, we need to manually clear a few small loose rocks to ensure the robot can navigate the area safely. As part of this preparation, we will document the original conditions, measure the rocks, and estimate their weight prior to moving them. After this we will place the lights into position and attempt to start the mapping process.

2nd Day

We have started the lava tube mapping activity after successfully retrieving and installing all equipment needed logistically (power, lights, etc). The tube surface has been manually recorded through video and photo taking as documentation of its original condition. Some major rocks measurements that needed to be removed to clear up the path for the robot have also been made.

For the robot, we have attempted today:

Manual walking with remote control (successful),

Manual walking while using slam mapping to create 2D navigation map of the tube (successful),

Manual walking and scanning positions with automated scanning (successful with collection of lidar and image data),

Manual walking of the entire feasible area of the tube while using slam mapping to create 2D navigation map (successful).

Note: the robot is not able to navigate through sloping terrain with autonomous navigation due to its conservative mechanism. It recognises terrain as obstacles.

Tomorrow we will walk the robot again through the entire feasible area of the tube while recording the lidar and video data of the robot continuously; some lights and walking path variations will be attempted, too. This should result in a complete lidar scan and video imagery of the lava tube which fulfills the minimal data retrieval of the mission. Afterwards, Alexander James will try to improve the autonomous navigation and run the scanning process again.

3rd Day

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4th Day

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