



METHOD STATEMENT

LOCATION:	UWA Makers Lab
TASK/ACTIVITY:	Tracking Telemetry System
PREPARED BY Name: Team 6	PERMISSION FOR TASK/ACTIVITY TO PROCEED Name: Michele Signature:
Date: 07/05/2024	Date:

This document is part of a Job Safety Analysis (JSA) and reflects the findings of an associated risk assessment which is attached.	TICK <input checked="" type="checkbox"/>
JSA Waiver - There are no identifiable hazards associated with this activity which warrant further risk assessment or description.	OR <input type="checkbox"/>

Purpose

The purpose of this document is to outline the steps to building a rocket telemetry system (comprising of a base station and payload module), where the payload module fits within the allocated dimensions of the CubeSat (80mm x 80mm x 20mm) and is under 100g. The document includes both the hardware and software aspects of the design.

Scope

The design process systematically develops both hardware and software components necessary for transmitting and collecting telemetry data from CubeSat sensors, GPS modules, and altimeters.

Inclusions

- Programming the microcontrollers on both modules
- Configuring the antenna and transceivers (transmitter and receiver) for communication
- Soldering of components on PCB board
- Battery mounting
- Coating the PCB board with conformal resin
- Attaching the antennas to the transceivers
- Securing PCB within CubeSat
- Creation of a container for a base station (for safety of the components)
- Building the loop antenna
- Iterative testing to validate design and make any necessary changes. This comprises of looking at the effectiveness of the hardware (set-up and configuration) and software (Arduino program)

Exclusions

- Etching and drilling of the PCB board (will be externally procured)
- Container for the rocket PCB
- Alterations to the CubeSat
- Waterproofing of the module

Related Information

First the PCB boards and components must be procured. The transceivers will be configured to be able to communicate with one another using a temporary breadboard to connect them to a Serial USB Adapter which is inserted into a PC. The microcontrollers will also be inserted into a PC to be programmed. The components will then be soldered in their allocated positions and the PCB will be coated in resin. The battery holder and antennas will then be attached and the fully charged battery shall be placed in the holder. Some functional testings can be conducted in the lab to ensure that the GPS and altitude data is being transmitted and received and that information is accurate. The rocket PCB will then be secured within the allocated CubeSat space and the cable for CubeSat sensor data will be inserted into the communication port. The loop antenna being used for triangulation is then be created using a RG8 Coaxial. The steps for creating the loop antenna are as follows: 1) Use a tool to remove the outer protective sheet, 2) Peel back the copper braid, 3) Remove the centre core insulation and soldering, 4) Connect the two ends of the coaxial cable to a PL 259 Plug then a T piece allowing for the antenna to be connected to one of the LORA transceivers in the base station via coaxial cable. Finally, a container for the base station PCB will be created using a 3D printer, keeping the port to the Webserver open and LORA transceivers open. Edges may need to be trimmed and tidied.

Method Statement Title	Published: Month 2011	Version 0.0
Authorised by:	Review: Month 2016	Page 1 of 1
UNCONTROLLED WHEN PRINTED		