WATERLOO ROCKETRY

Deployable Payload Separation Test 1

March 17, 2018

Compiled on 2018-03-13

Separation Test Procedures

Contents

This document contains the following:

- The procedure for testing the separation mechanism of the deployable payload

Personnel Required

The procedure has no set roles, and as such all members participating in the test will be referred to as **OPERATOR**

Prior to Start

1   ☐ Items to be completed before beginning procedure

2   ☐ Connect up the cubesat rigging

3   ☐ Make sure you have a clear table and workspace with no nearby people

4   ☐ Make sure all participants in the test are wearing safety glasses for the duration of the test

5   ☐ Make sure the test is conducted outside

6   ☐ Make sure you have a deployment charge prepared according to the corresponding SOP

7   ☐ Make sure the batteries are disconnected from the stratologger and arduino, and no wires are connected to the MAIN or DROGUE terminals of the stratologger

Test Procedure

1. ☐ **OPERATOR** Lay the nose cone on the table with the tip pointed away from any personnel. Ensure that during the entire procedure the area in front and behind the nose cone always remains clear. Treat the system as armed for the entire procedure

2. ☐ **OPERATOR** Lay the cubesat on its side on the table behind the nose cone

3. ☐ **OPERATOR** Remove the 8 screws holding the cubesat side plate in place and set aside

4. ☐ **OPERATOR** Ensure that the batteries are disconnected from the stratologger and arduino

5. ☐ **OPERATOR** Grab one of the pre-assembled CO2 charges and zip-tie it to the Nylon tape, roughly 1 foot above the eyebolt of the cubesat

6. ☐ **OPERATOR** Wrap a fireproof cloth around the mount to protect the rigging from gunpowder

7. ☐ **OPERATOR** Run the charge wire through the hole on the top of the cubesat and connect to the stratologger screw terminal marked DROGUE

8. ☐ **OPERATOR** Connect the arduino and stratologger battery. At this point you have 15 minutes until the stratologger is armed

9. ☐ **OPERATOR** If the stratologger begins the arming procedure (Buzzer goes off) there are about 20 seconds before the stratologger is armed

10. ☐ Immedietly stop all work and step away from the table

11. ☐ Make sure the area in front and behind the nose cone assembly are clear

12. ☐ Wait 10 minutes for the arduino to automatically disarm the stratologger

13. ☐ Once the buzzer stops disconnect the battery from the stratologger and arduino

14. ☐ Restart the procedure

15. ☐ **OPERATOR** Replace the removed panel from the cubesat and fasten the 8 screws

16. ☐ **OPERATOR** Place the parachute in the nose cone

17. ☐ **OPERATOR** Place the rigging in the nose cone

18. ☐ **OPERATOR** Slide the cubesat into the nose cone, ensuring that the rigging is not interfering with the cubesat

19. ☐ **OPERATOR** Place the recovery top coupler over the bottom of the nose cone assembly

20. ☐ **OPERATOR** Attach the 3 shear pins that connect the recovery coupler to the nose cone assembly

21. ☐ **OPERATOR** Take the combustion chamber thrust mount and lay it horizontal

22. ☐ **OPERATOR** Place the nose cone in the thrust mount, ensure that the recovery top coupler is in the mount clamp

23. ☐ **OPERATOR** Tighten the mount clamp such that it only grips the recovery top coupler

24. ☐ **OPERATOR** Connect the vacuum pump hose to the hole in the base of the recovery top coupler

25. ☐ **OPERATOR** Stand back, ensuring that the area in front and behind the assembly is clear

26. ☐ **OPERATOR** Turn on the cameras filming the test

27. ☐ **OPERATOR** Wait for the arming procedure to begin and complete, when ready you should hear a beep once per second indicating good drogue continuity

28 ☐ **OPERATOR** Turn the vacuum pump on for 5 seconds

29 ☐ **OPERATOR** Shut off and wait for deployment event

30 ☐ **OPERATOR** Wait for the buzzer to stop, indicating that the system is no longer armed

31 ☐ **OPERATOR** Separate the cubesat from the nose cone

32 ☐ **OPERATOR** Remove the cubesat side panel

33 ☐ **OPERATOR** Disconnect the stratologger and arduino batteries

34 ☐ **OPERATOR** Proceed with disassembly