



## *MiniSShot*

### Launch Director Duties

Rev. 2010/09/13

## Introduction

This document outlines the duties of Launch Director. The Launch Director (LD) is a person tasked with leading ground operations in such a manner as to follow Launch Rules and to maximize the likelihood of achieving mission success. Ground operations include vehicle assembly, launch preparations and countdown, and tracking & recovery operations.

- D-1 The Launch Director is responsible for ensuring Launch Rules are followed during pre-launch preparations, launch countdown, flight and recovery operations.
- D-2 The Launch Director shall endeavor to see that safe procedures are followed throughout the during pre-launch preparations, launch countdown, flight and recovery operations.
- D-3 Any deviation from established procedures which may affect safety or accomplishment of Mission Objectives will require Launch Director approval.
- D-4 Approval of deviations to Checklist procedures is up to the discretion of the Launch Director. Minor deviations such as the order in which Checklist procedures are performed may be approved on-the-spot and need not be recorded. Significant changes to procedures, or skipping checklist steps, are major deviations and approval may be made by the Launch Director. The Launch Director may consult with the Project Manager.
- D-5 The Launch Director is responsible for having all significant checklist deviations or other procedural deviations recorded.
- D-6 Prior to launch, the Launch Director will confirm that all Checklists have been reviewed to confirm all steps checked off. For any approved unchecked steps, the deviation must be recorded.
- D-7 The Launch Director should endeavor, as much as practical, to keep the Project Manager informed of problems and proposed solutions during all phases of the Launch preparations.
- D-8 The Launch Director will give the go-ahead for countdown procedure to commence. The countdown procedure will be called aloud from 10 to 0 in one second increments by the responsible Launch Crew member.

## **Mission Objectives**

- MO-1 To safely launch and recover the rocket components intact.
- MO-2 To achieve a minimum apogee of 40, 000 feet (12.1 km).
- MO-3 To record essential on-board flight data that will describe in detail the ballistic performance of the rocket vehicle including basic data on the performance of the rocket propulsion system.

## **Launch Rules**

- R-1 The launch will be scrubbed in case of loss of a Mandatory Item. The Mandatory Items are listed in Appendix B
- R-2 Weather/visibility conditions must be acceptable for countdown to commence (see Appendix A)
- R-3 Procedural or Assembly checklists must be used, whenever such checklists exist.
- R-4 Clearance for launch must be obtained by Team Meteorologist.
- R-5 Valid FAA (or equivalent) flight waiver is required.
- R-6 Personnel safety takes precedent over all other aspects of Ground Operations.

## Appendix A

A **Mandatory Item** is a vehicle element that is essential for accomplishment of the Mission Objectives which includes pre-launch, ground support, flight and safe recovery operations.

### Mandatory items:

- MI-1 All recovery system components including both chute controllers, pyro devices, Drogue and Main parachutes and tether system
- MI-2 Main flight Computer
- MI-3 Airframe (all essential components must be structurally sound)
- MI-4 Payload Capsule recovery beacon
- MI-5 Booster recovery beacon
- MI-6 Ignition Safety Shunt
- MI-7 All rocket motor components as listed in the Rocket Motor Assembly Manual (exclusion - see MI-8)
- MI-8 Fasteners for securing structural members such as motor components and airframe joints. For any single joint, with less than six fasteners, none are allowed to be missing. Joints with six or more fasteners, one may be missing. Joints with 20 or more fasteners, two may be allowed to be missing.
- MI-9 Nosecone o-ring

Any item not included in this list but in the opinion of LD is potentially critical for achieving Mission Goals – consult with Program Director.

The following items are *not* Mandatory Items

- telemetry system components including patch antenna
- camcorder and related components
- GPS system components
- thermal board, sensors or related components
- DTMF system components
- vibration sensor components
- motor pressure transducer

## Appendix B

Acceptable weather/visibility conditions for launch:

- W-1 Launch will only take place between sunrise and sunset.
- W-2 Visibility - Sky must not be overcast such that rocket's trajectory will carry it through any cloud cover
- W-3 Visibility – Fog or haze must not be present to the extent that it is not possible to ensure that the sky overhead is clear of air traffic.
- W-4 Ground level winds - Winds at ground level must not be greater than 20 mph
- W-5 Upper level winds - Clearance for launch to be received from Team Meteorologist who will analyze upper level winds to determine if safe for launch and recovery. Such clearance should be obtained within 24 hours of launch
- W-6 Ambient temperature - Acceptable launch site ambient temperature range at ground level to be between 35°F and 110°F
- W-7 Precipitation – launch shall not take place if rain has begun to fall or if rain is imminent

Unless all above conditions are conformed to, launch will be scrubbed or delayed until such time as all criteria are met. Clearance for non-conformance launch may be approved only by Project Director.