The Atsa 1 Camera: Current Status

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Abstract

A prototype of the Atsa 1 Camera has been built and fit-tested in the engineering testbed cockpit for XCOR Aerospace's Lynx spacecraft. A successful fit and function test was achieved, and many lessons were learned. After some re-design and further fit and g-load testing, the Atsa 1 Camera should be ready for flight this year.

The Atsa 1 Camera: description

The Atsa 1 Camera is an engineering testbed for the eventual Atsa Suborbital Observatory. The current system consists of an 800 mm catadioptric lens, connected to a five-position filter wheel and a Xybion ISS-750 visible-NIR camera. A Cartoni fluid-head mount is used for hand-steering. The Camera is mounted onto the Lynx's armrest with a team-designed bracket. There are no deployments in flight except for the unlocking and locking of the fluid head mount. A guide camera is mounted next to the primary fore-optic. Data acquisition is done with a Dell E6400XFR ruggedized laptop computer. Power is provided from a perfect sine wave converter which takes DC volts either from the spacecraft or a battery that we provide. The adapter, the battery, and the camera control box are all mounted in the XCOR Payload A box along with the computer. User controls for data acquisition and filter wheel control are in a team-designed control box attached to the mounting bracket.

Fit Test

The Camera was fit-tested in the engineering testbed cockpit of XCOR's Lynx suborbital

spacecraft in August. A successful fit was achieved (see figure), and the system was successfully operated from the cockpit. The team developed checklists for the installation and removal of the system, as well as for ingress and egress of the telescope operator. The system was also examined by an XCOR test pilot and by a safety officer.



Figure 1. The Atsa 1 Camera in the Lynx cockpit testbed

Future work

As a result of the fit-testing, we are re-configuring the camera to sit higher in the cockpit than in the figure, and building a smaller control box (which will also move from its current position). We are going to replace our fore-optic with a small research-grade telescope (though which one is to be determined); we will also include a truss in the next iteration of the Atsa 1 Camera to hold the optical elements in proper alignment through launch.