

# Initial Studies

## Teleoperation of Aerospace Payload Systems Week 02



Tokyo Institute of Technology

# Outline

1. System Assignments
2. Photos
3. Project Logo
4. Contact Information List
5. Project Name
6. Project Website <http://www.mines.unr.edu/met-eng/Telescience/index.html>
7. Outreach Activities
8. CanSat Ideas
9. Discussions
10. Task Lists

## Objectives of Initial Studies

1. Estimate enough of the operating conditions to permit feasibility studies on various design approaches.
2. Identify technically feasible design solutions for each *key* system/subsystem.
3. Create an initial budget estimation for each system.
4. Assemble initial designs (in 1-week) and budgets
5. After that, system “Leads” will prepare brief reports (in 2 weeks) of the conclusions of the initial design study.
  - Design summary statement
  - Budget Projections
  - Schedule Projections

The following items need to be resolved ASAP because they play significant roles in the overall design approach.

- 1. Estimated Mission Duration**
- 2. Telepresence: ATV vs. Slow-scan TV vs. WebCam.**
- 3. Payload CanSat Location: GPS vs. RDF**
- 4. Telemetry: VHF serial data link vs. Wireless LAN vs. Embedded ATV**
- 5. RV Computer System: BASIC Stamp, Single Board Computer (SBC)**
- 6. Data Acquisition & Control: BASIC Stamp, Serial, SBC, USB DAC card.**

1. Obtain itemized quote from VersaLogic for what it would cost for the computer, including:
  - Operating System
  - Enough memory for OS and Visual BASIC (Disc On Chip ?)
  - Enough memory for OS and Run-Time program only
  - Power Supply, cables, etc.
2. Obtain itemized quote for complete Wireless LAN system (both ends). Assume we will have a laptop at the Control Station.

1. Find out what it would cost for us to get a new (2<sup>nd</sup>) copy of LabView to install on our Control Station PC.
2. Identify possible Auxiliary Functions for the CanSat. Please solicit input from others.
3. Develop ideas for the user-interface in the Control Station. Please solicit input from others.
4. Develop ideas for *backup* CanSat project(s). This can be a completely separate project (or projects) that have nothing to do with the RV (lets be creative). Please solicit input from others.
5. Take Technician license exam.
6. Develop Control Station Budget and Timeline.

1. Abort study of Balloon Track software. If we use this approach, *Microsoft MapPoint* will be the better solution (Balloon Track uses this itself). We may also be able to simply use a coordinate plot using LabView or Visual Basic.
2. Obtain the CanSat Specs from ARLISS. Also, be intimately familiar with every single link on that website. Including what other groups have done in the past.
3. Review the available documentation for CanSats on the ARLISS Website.
4. Assist Jill with Payload brainstorming
5. Develop ideas for Payload recovery system (in RV). Work with Guillermo on this.
6. Figure out how we can get the TH-D7A transceiver to fit in that can with all other necessary items (GPS, batteries, etc..
7. Develop Rocket Interface Budget & Timeline
8. Develop Payload Budget and Timeline

1. Characterize motor performance characteristics, especially current draw.
2. Develop plan for designing the RV chassis and drive train components.
3. Develop RV Budget and Timeline.
4. Develop Staging Area Budget and Timeline.

### Subsystems:

1. Drop Platform development and characterization.
2. Gyroscopic attitude control
3. Landing Balloon Deployment (a la Mars Sojourner)
4. Vibration environment characterization
5. Retrorocket firing

Tokyo Institute of Technology 2000, SSTV-Sat  
<http://horse.mes.titech.ac.jp/srtlssp/arliss/arliss2000/top.html>

**Overview:** Pointing a CCD Camera toward any direction and acquiring image by commands from ground.

**Objectives:**

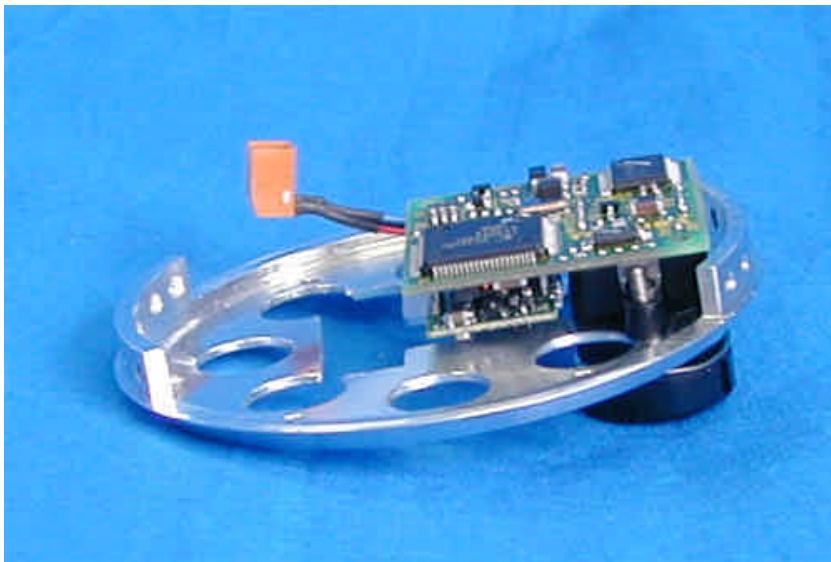
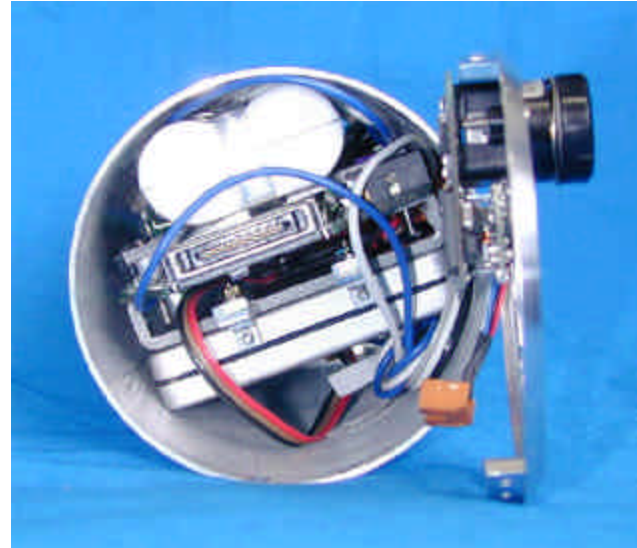
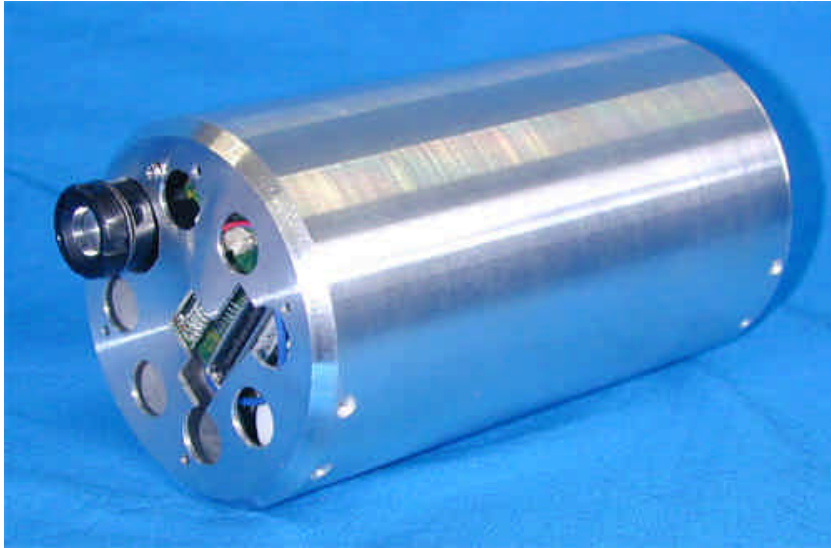
1. **Uplink Engineering Test:** CanSat receives commands transmitted from GS.
2. **Teleoperation Engineering Test:** CanSat takes a still picture at optional time by receiving a command from GS.
3. **SSTV Engineering Test:** Convert a still picture into SSTV fome and transmit it by the SSTV fome to the ground station.



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# CanSats

## Ideas from Other CanSats



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