OUFTI - 1
Status update
& Mission control software

Alain Collette
Amandine Denis – ON4EYA
Outline

Part I: Status update
   1. OUFTI-1 in a few words
   2. Subsystems status
   3. Schedule

Part II: Mission control software
1. OUFTI-1 in a few words

CubeSat standard

1 kg

Three payloads

litre

watt

Subsystems developed by students

2 universities + 3 engineering schools
2. Subsystems status - STRU
2. Subsystems status - ADCS
2. Subsystems status - EPS

3.3 V → 3.3 V
5 V → 5 V
7.2 V → 3.3 V
2. Subsystems status - THER
2. Subsystems status - OBC
2. Subsystems status - OBC

Modules:
- COM Rx
- COM Tx
- Sequencer
- Measurement
- Monitor
- Log
- Ground
2. Subsystems status - COM

Data processing + (de)modulation

RF → D-STAR → AX.25 → BEACON
BEACON → AX.25 → D-STAR → RF
2. Subsystems status - COM

RF

RX: 435 MHz

D-STAR

AX.25

ADF 7021
Demod D-STAR
Zone 1 et 2

MSP430
Codec
D-STAR

Data

ADF 7021
Modulation
AX.25 / D-STAR

MSP430 OBC
TC/TM
Processing

BEACON

TX: 145 MHz

RF
2. Subsystems status - COM

-99.1 dBm for AX.25
-105.5 dBm for D-STAR
2. Subsystems status - COM

Diagram:

- Modulateur ADF 7021 (D-STAR/AX.25)
- Adaptation impédance
- Combiner ADP-2-1W+
- Adaptation impédance
- PA RF5110G
- Adaptation impédance
- Combiner ADP-2-1W+
- Passe-bas + Adaptation impédance
- 145 MHz
2. Subsystems status - MECH
2. Subsystems status - Configuration
2. Subsystems status - GND

- **TCP/IP**
- **D-Star Repeater**
- **Satellite Extension**
- **User channel (D-STAR)**
- **Mission Control Center**
- **Ground Station**
- **Control Segment**
- **D-STAR Segment**

**TM / TC channel (AX.25)**
3. Schedule

May 2012-2013

- Finalization of design & tests of prototypes
- Fabrication of engineering-model boards
- Interconnections and tests of engineering-model boards
- Fabrication of flight model equipments
- Tests of flight model equipments and integration
- Tests of flight model
- Summer 2013
Outline

Part I: Status update

Part II: Mission control software
II. Mission Control Software

• Goal of the project:
  • Create an easy way to plan the mission
  • “User friendly” interface for commanding the satellite
II. Mission Control Software

• The software developed allow the user to:
  • Create a “script” to execute at the pass time (planning)
  • Manually command the satellite
  • Visualize the historic of the mission
  • Visualize the passes time
II. Mission Control Software

• Architecture:

- **Mission Data Server (MDS)**:
  - Main server
  - Linked with the ground station
  - Control the databases

- **Ground station software**:
  - Control the hardware
  - Check the reception of telecommands (TC)
  - Confirm the reception of telemetries (TM)
  - Developed by SwissCube

- **Graphical interface**:
  - Display of data
  - Command of the satellite manually or with the planning system

- **Scheduler**:
  - Synchronised with the satellite time
  - Responsible for the planning system
II. Mission Control Software

- Demonstration with a simulation of the satellite and a test planning:
Thank you for your attention!