

Levente Dudás
COM & GND

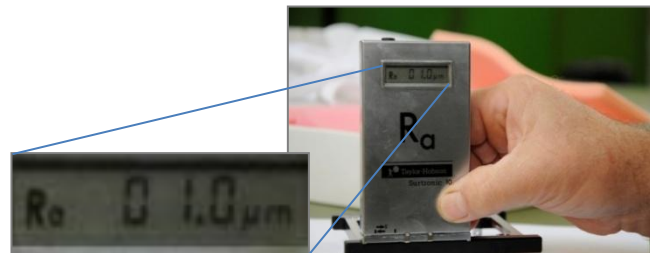
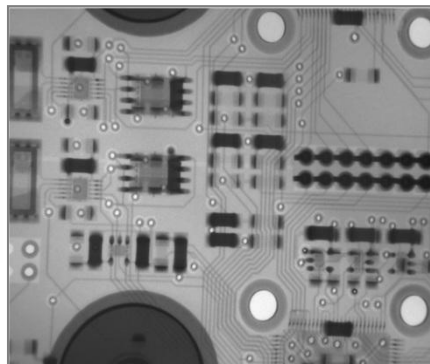
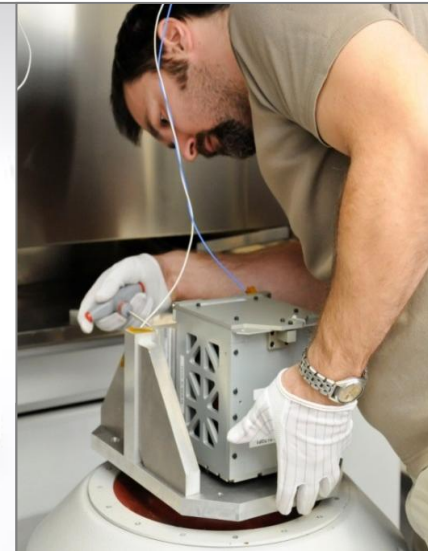
dudas@mht.bme.hu

ha7wen@ha7wen.hu

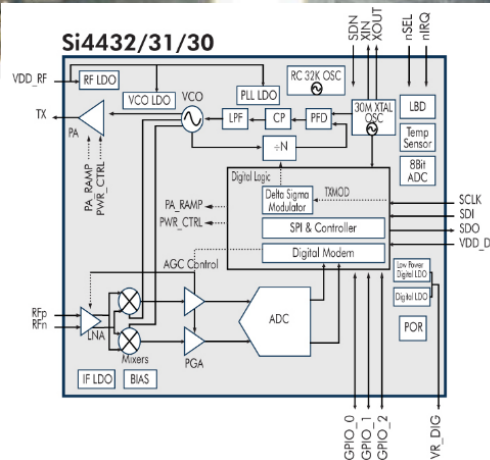
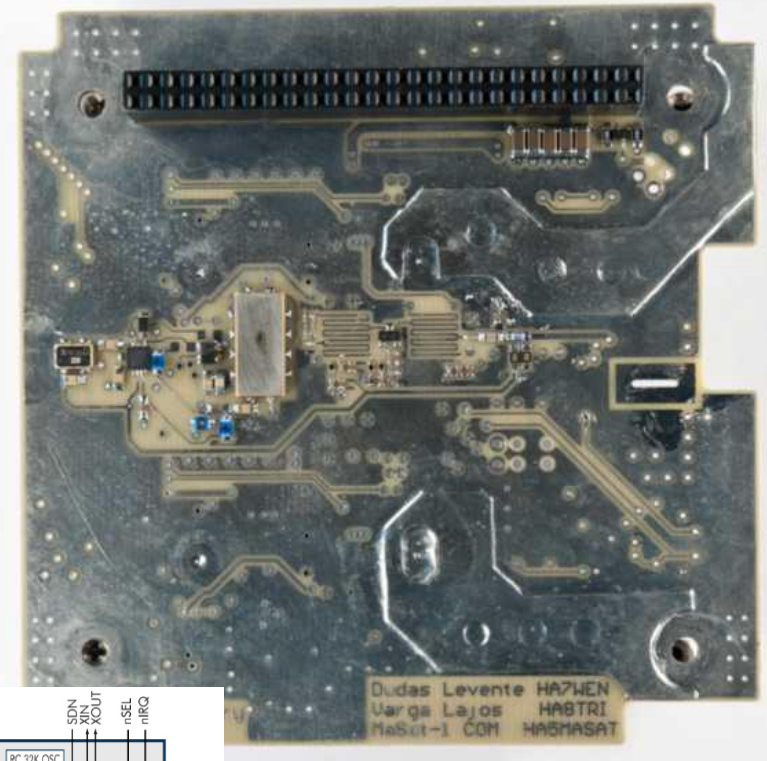
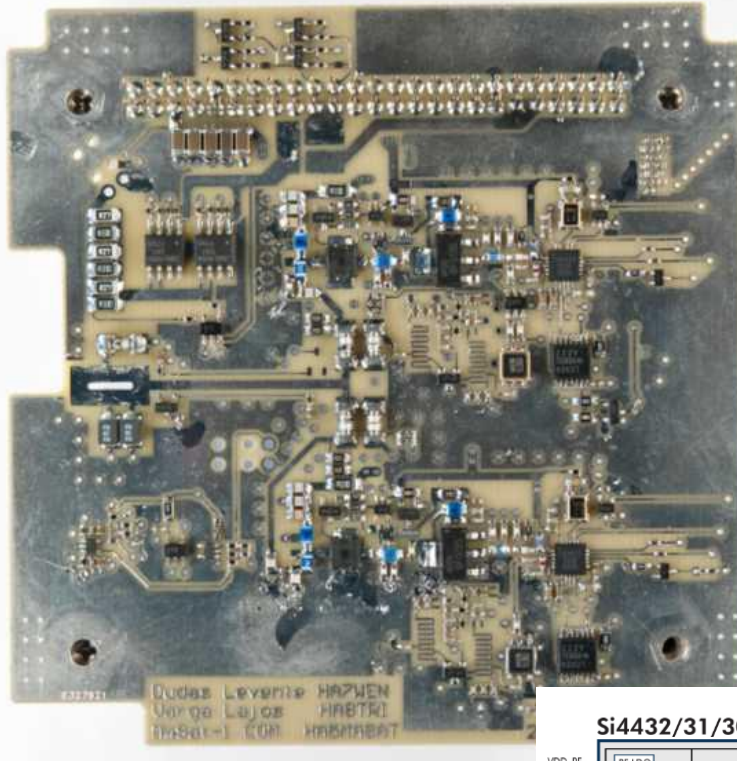
MAsat -1

<http://cubesat.bme.hu>

Masat-1 MO-72



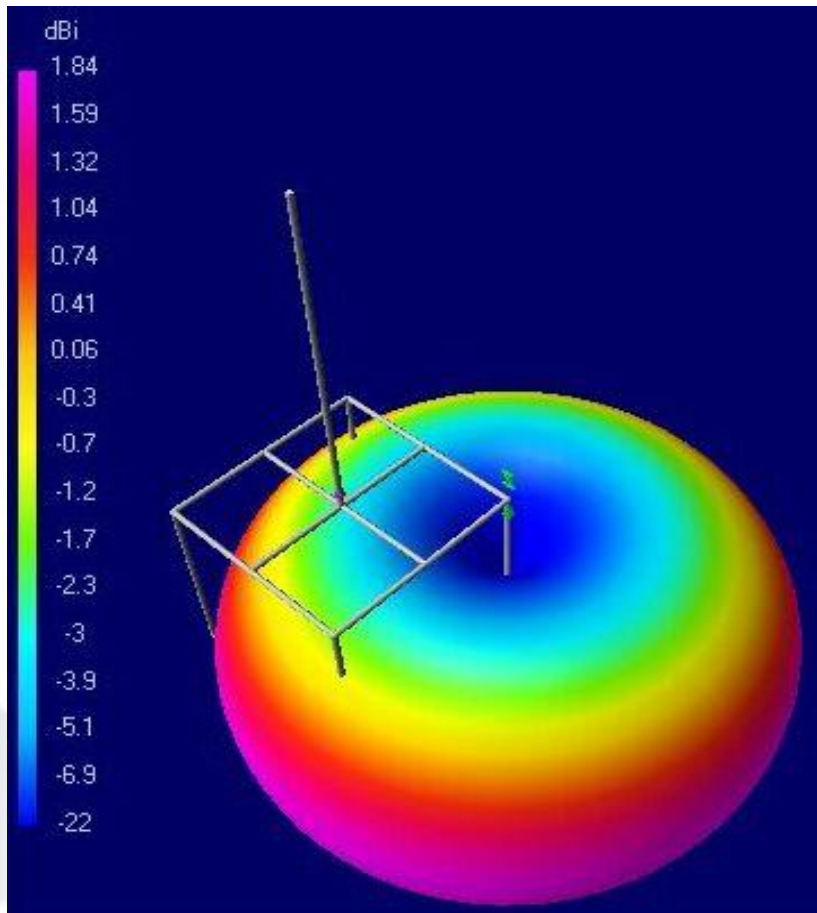
Masat-1 COM



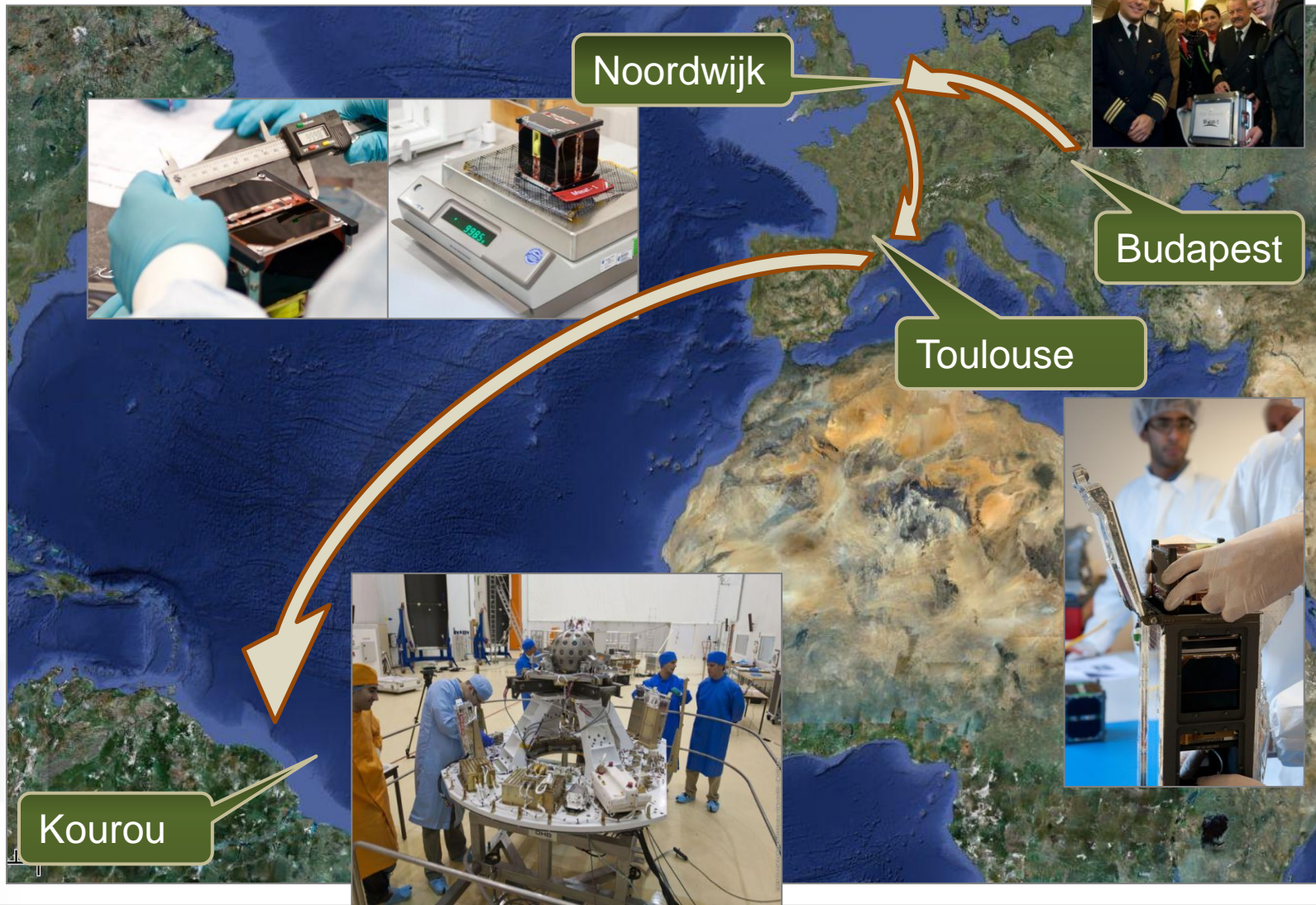
- ITU, UN
- IARU
- NMHH

- HA5MASAT
- HA5MRC
- HA7WEN

On-board Antenna



Acceptance Tests and Integration



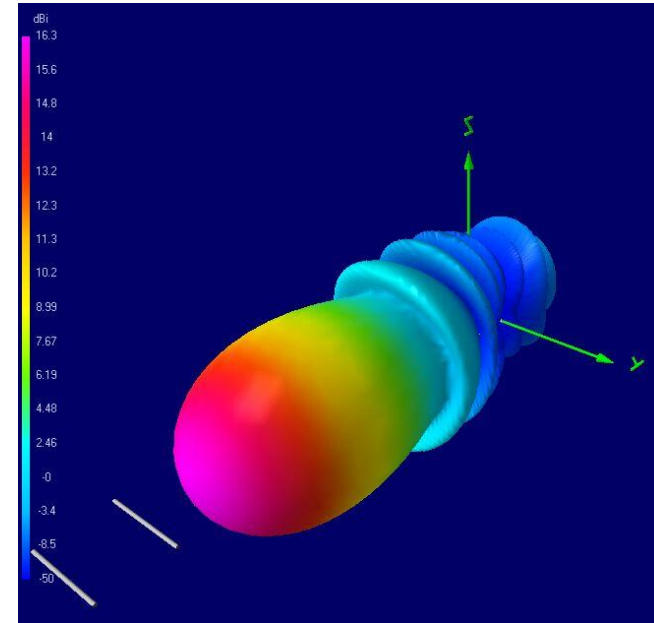
Vega Maiden Flight: 13.02.2012



The Big Jump...



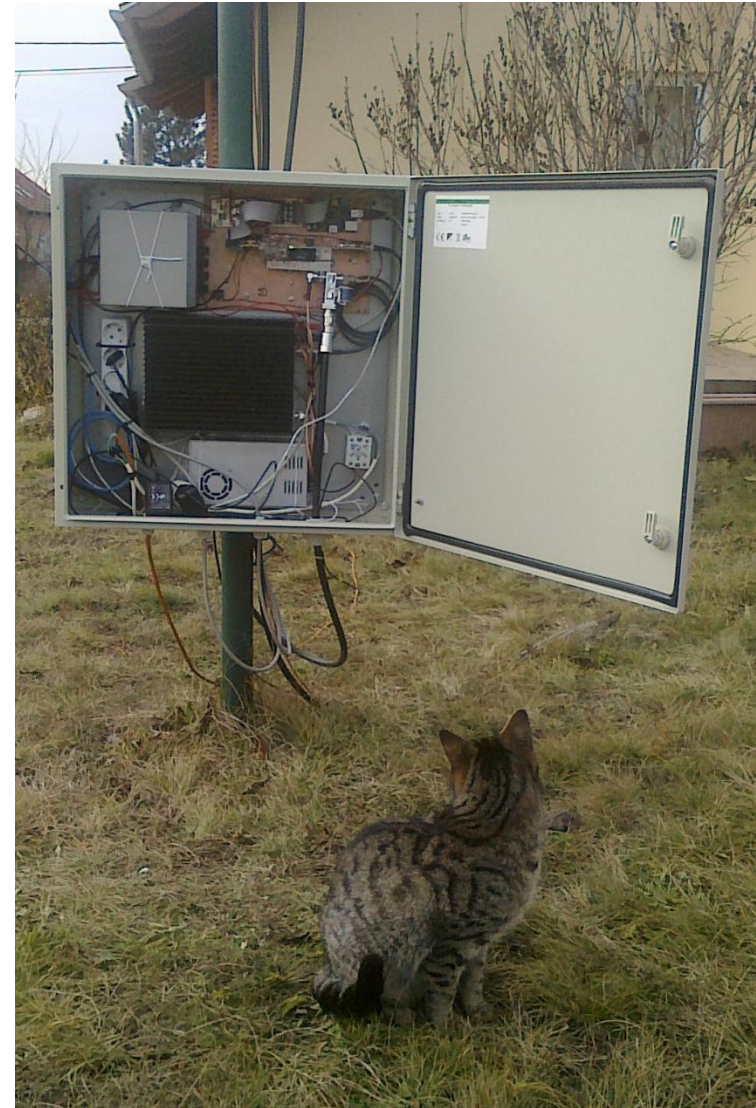
Primary Ground Station - BUTE



Aperture Antenna on 70 cm, 23 cm, 12 cm



Secondary Ground Station - Érd



Worldwide coverage?



- **1061** days in operation!
- >200 radioamateurs
- >600 MB downloaded data
- Automated and remote controlled ground stations!

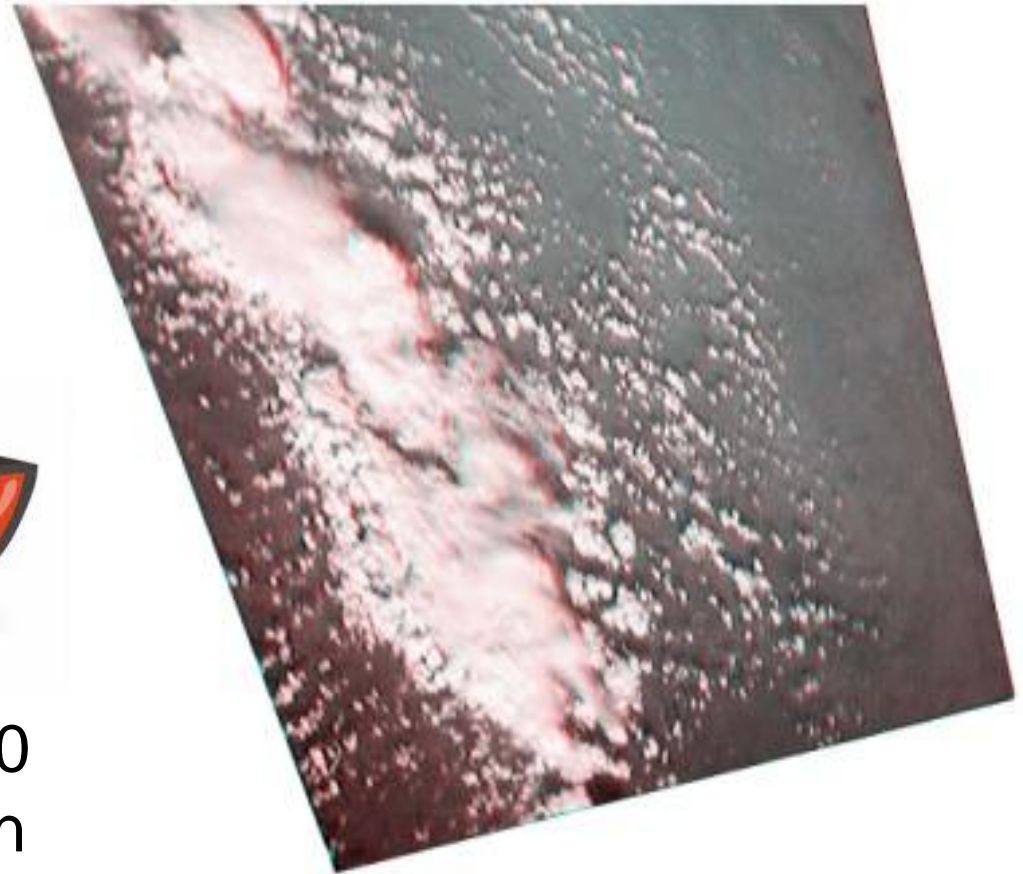
3D Image from 300 km

Data rates:

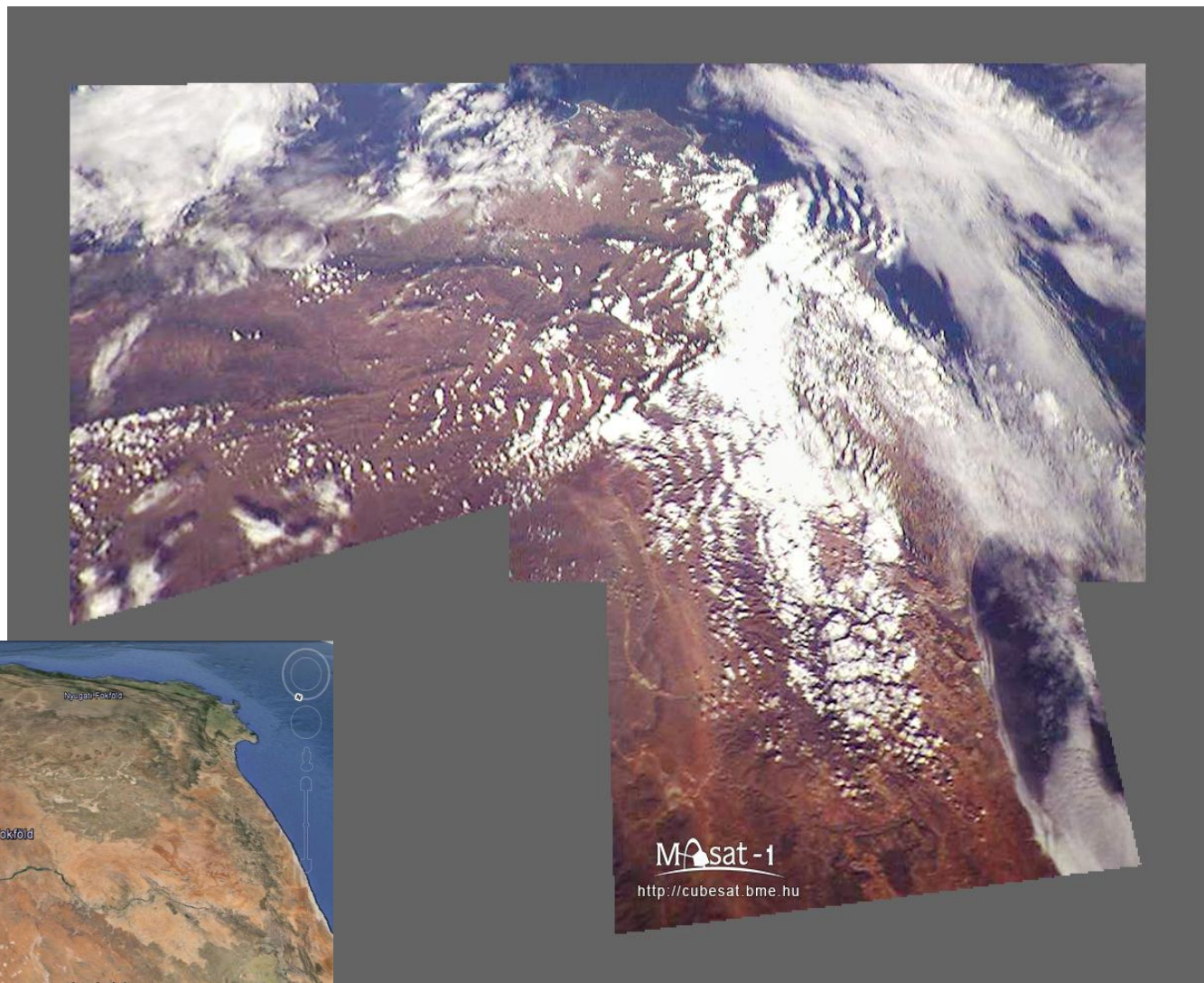
- 625 bit/s
- 1250 bit/s
- 5000 bit/s



640 x 480
resolution



Mosaic – South Africa



Mosaic-1
<http://cubesat.bme.hu>

Mosaic – South Australia



Mosaic – Western Australia



The Last Messages from Masat-1

- 437.345 MHz
- 145.980 MHz

Received packets

APID	Type	SubType	Received on
On-Board Time	Time management service	Time Report	2014-11-14 08:16:39 CET
On-Board Time	Time management service	Time Report	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Housekeeping and diagnostic data reporting service	Housekeeping Parameter #1 Report	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Housekeeping and diagnostic data reporting service	Housekeeping Parameter #1 Report	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Execution Completed Report - S...	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Execution Completed Report - S...	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Acceptance Report - Success	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Acceptance Report - Success	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Execution Completed Report - S...	2014-11-14 08:16:39 CET
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Beacon Message Publishing System	Telecommand verification service	Telecommand Execution Completed Report - S...	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Execution Completed Report - S...	2014-11-14 08:16:39 CET
Beacon Message Publishing System	Telecommand verification service	Telecommand Acceptance Report - Success	2014-11-14 08:16:39 CET

BEACON - Message

Beacon: Goodbye World!

Value

Masat-1 Greets Philae!

ITU
IARU, NMHH

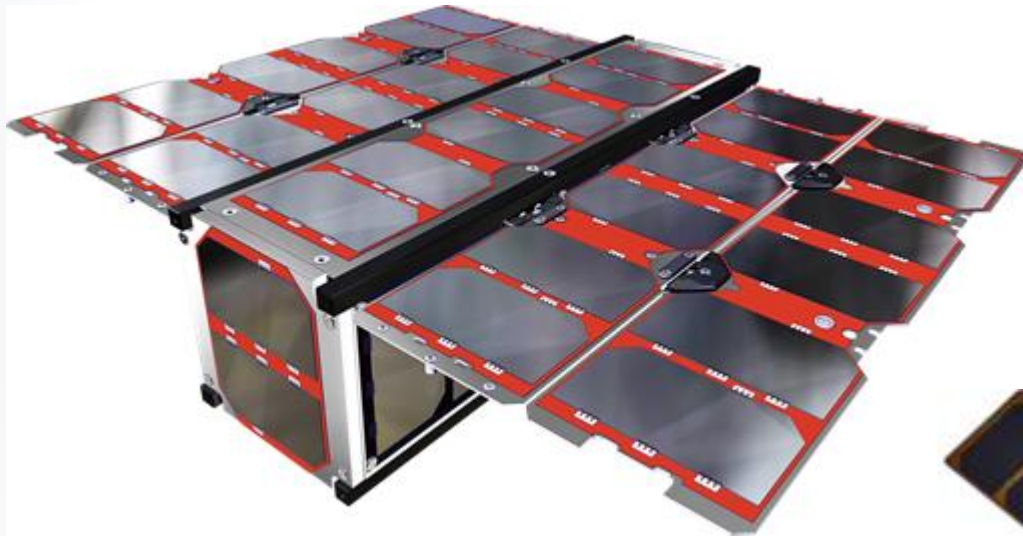
Ground Station Client - 2014. 01. 21.

Masat-1 Control Window

On-Board Time Time Code: Calendar Segmented On-board time: 2015-01-03 05:15:10 CET Timer Cntr.: 26495502 Osc. Status: Running Reporting: Reporting on.	OBC - Data Acquisition Acquiring Data: No OBC - Battery Status Battery Status (OBC): OK Battery Voltage (OBC): 4.00 [V] Vbus Unreg. (OBC): 3.98 [V] Battery Temp. (OBC): +17 [°C] Heater PWM: 0 [%] Heater Enabled: Disabled	OBC - Error Counters TC Integrity Error Cntr.: 14179 TIME Get/Set Error Cntr.: 10 SPI FLASH/RTC Error Cntr.: 5624 SPI COM Error Cntr.: 7 I2C1 Error Cntr.: 0 I2C2 Error Cntr.: 565 UART AP Error Cntr.: 0 UART CAM Error Cntr.: 9 FILE SFDR Error Cntr.: 5621 ADCS Connection Lost: No ADCS Connection Lost: 0 [sec.] HK1 Connection Lost: No HK1 Connection Lost: 0 [sec.] HK2 Connection Lost: No HK2 Connection Lost: 0 [sec.] HK3 Connection Lost: No HK3 Connection Lost: 0 [sec.]	OBC - Reset Flags Power On Reset: Brown Out Reset: Watchdog Timeout Reset: Software Reset: External Reset: Illegal Opcode Reset: Trap Conflict Reset:
OBC - General Information OBC Timer Cntr.: 26495444 Boot Attempts Cntr.: 7 Current Op. Mode: LP Normal Next Op. Mode: HP Normal Op. Mode Locked: Open Program Memory Chk.: 0x0D7E Debug Mode: Normal	OBC - Overcurrent Status ADCS Overcurrent State: OK ADCS Overcurrent Cntr.: 0 COM Overcurrent State: OK COM Overcurrent Cntr.: 0 COM1 Overcurrent Cntr.: 0 COM2 Overcurrent Cntr.: 0 HK Overcurrent State: OK HK Overcurrent Cntr.: 0	OBC - Power States Active OBC: OBC-2 Active COM: COM-1 ADCS Power State: On COM Power State: On HK Power State: On CAM Power State: Off	OBC - Temperatures OBC uC Temp.: +11 [°C] OBC Board Temp.: +8 [°C] Battery Temp. (OBC): +17 [°C] OBC - A/D Converter OBC Vref / 2: 1.25 [V]

Masat-2 – Commercial Way

www.c3s.hu

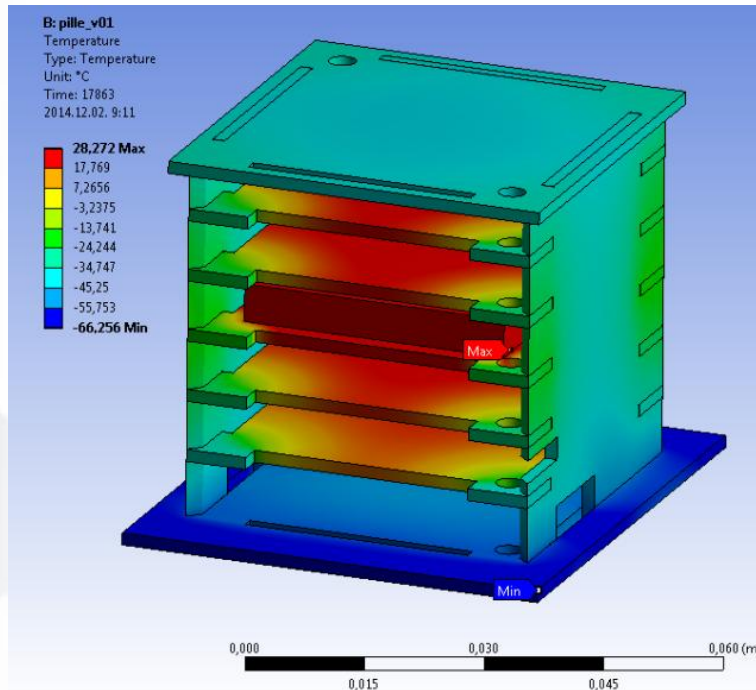
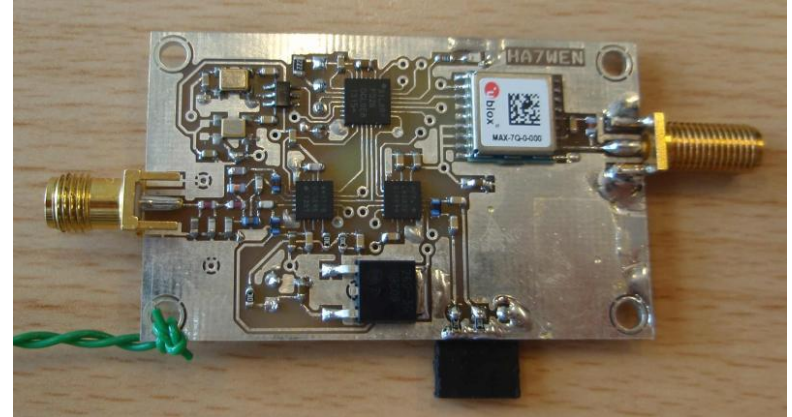


- 3U or 6U Structure
- Solar panels (body mounted and/or deployable)
- OBC (with mass memory)
- EPS (including battery pack)
- COM (UHF transceiver)
- COM (S-Band transmitter)
- Antennas (for UHF and S-band)

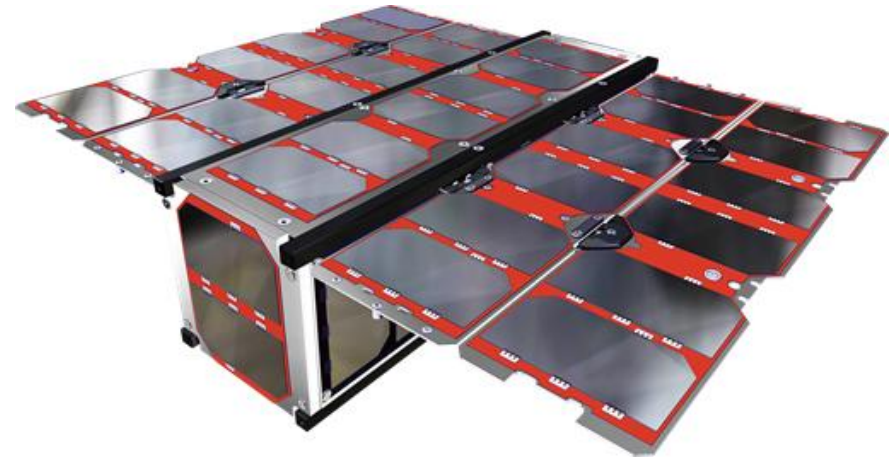
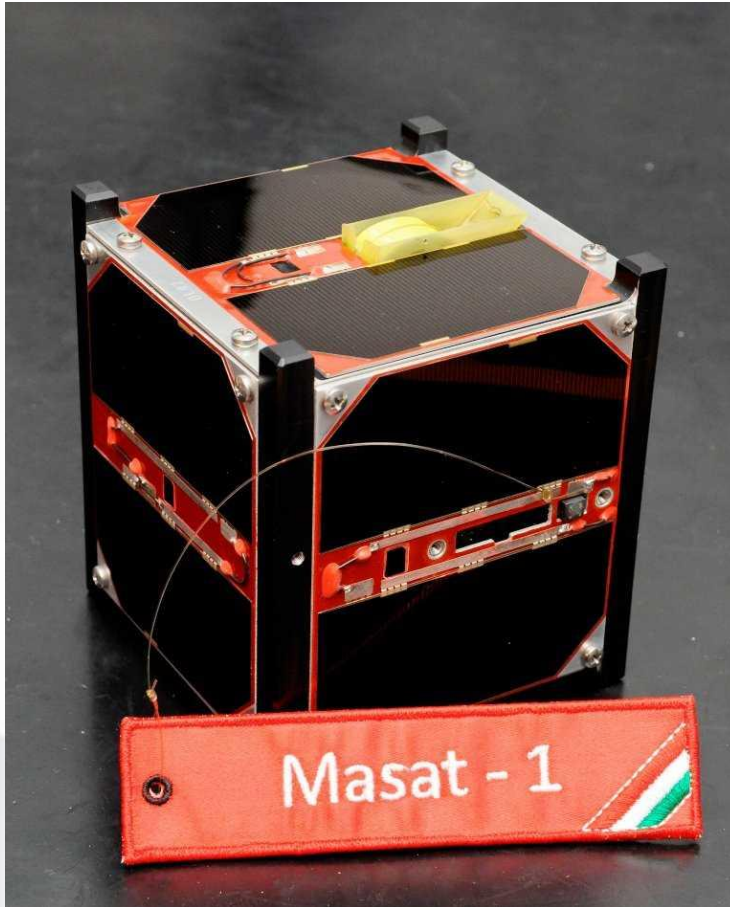


Smog-1 – Educational Way

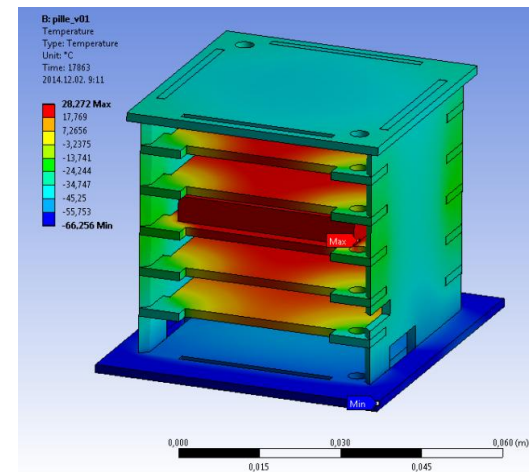
- 5 x 5 x 5 cm PocketQube
- Max. 175 g mass
- 300 mW average incoming DC power



- EPS
- OBC
- COM – UHF
(radioamateur band)
- Spectrum analyzer:
 - 430-860 MHz
DVB-T band
- www.gnd.bme.hu



Masat-2



Smog-1