Introduction to ANGKASA

CEOS WGCV Plenary #40

Outline

- Brief History of ANGKASA
- Campuses
- Organisation Structure
- Malaysia Space Centre
  - Optical Calibration Laboratory
  - Mission Control Facility
  - Assembly, Integration & Test (AIT) Centre
- Past Cal/Val Activities

Brief History

- 1989 – Establishment of the Planetarium Division under the Prime Minister's Department.
- 1993 – SPACE SCIENCE STUDIES DIVISION (BAKSA) was established with extended sphere of responsibilities it was envisioned to undertake.
- 2002 – National Space Agency (ANGKASA) established with the mandate to formulate policy and regulations, coordinate, implement and monitor space activities
- 2004 -Amalgamation of BAKSA into ANGKASA in year 2004.

Campuses

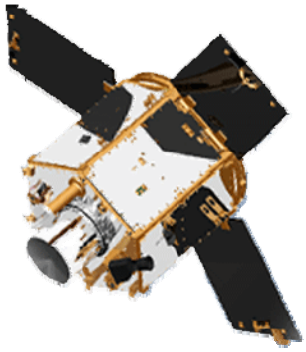

National Space Centre


National Planetarium


National Observatory

Organisation Structure

- Finance & administration
- Education & Space Science
- **Operation & Space System**
- Space Application & Technology Development
- Units
  - Legal & policy, international & strategic

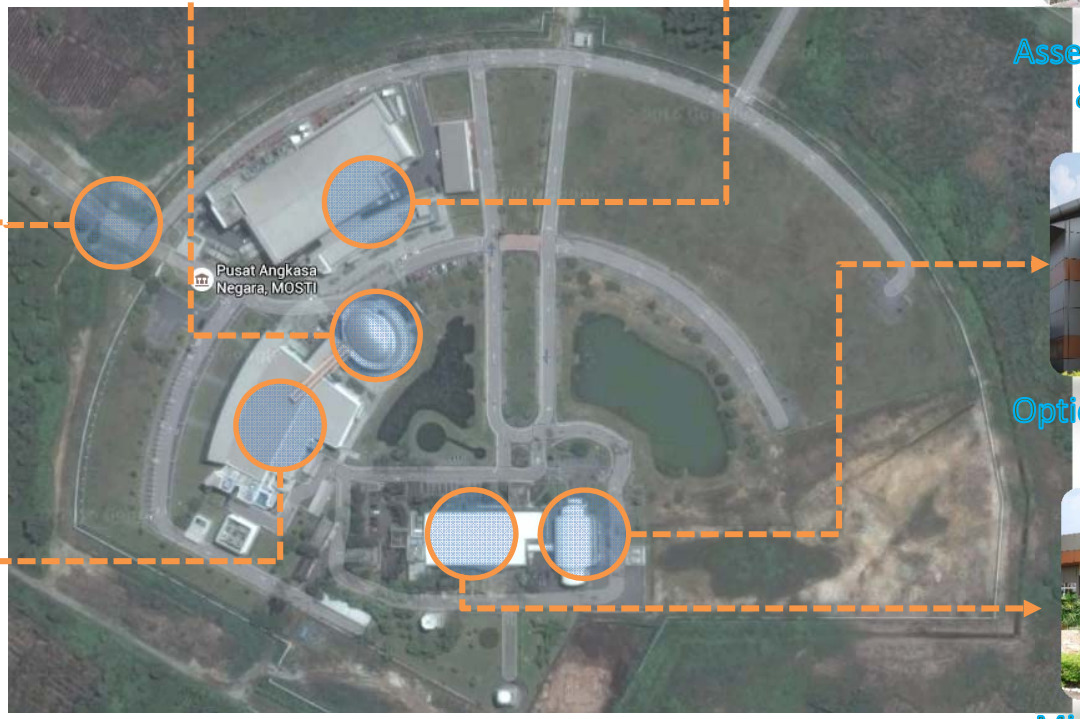


Malaysia Space Centre

Auditorium & Cafetaria

Main Entrance

Data & Archiving Centre



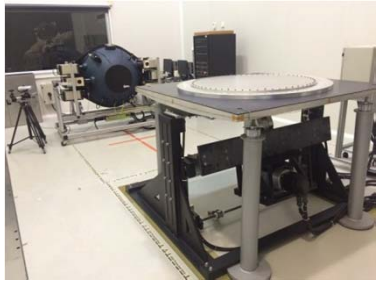
Assembly, Integration & Test Centre

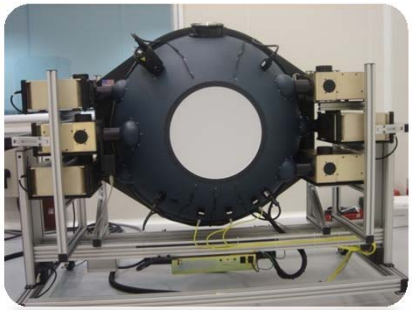
Optical Calibration Lab

Mission Control Facility

Optical Calibration Laboratory

- Cleanroom class 10,000 with temperature 18±2°C and relative humidity 50±5%
- SI traceable (via NIST) equipment/standard:
  - 40’ Integrating Sphere
  - 12’ White Reflectance Target
  - 1000 watt Quartz Tungsten Halogen Lamp
  - Handheld Spectroradiometer, 350 – 1000 nm
- Mechanical Ground Support Equipment
  - Optical table, turntable etc



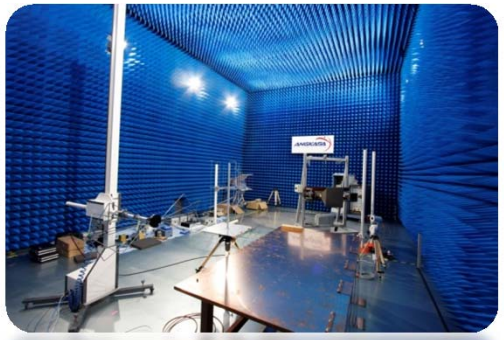


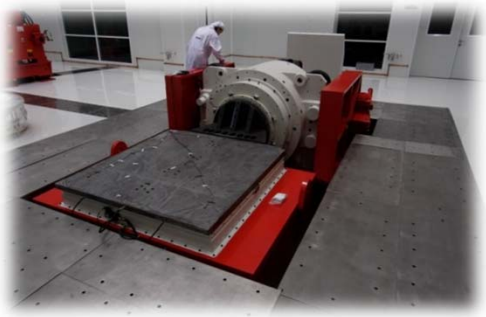
Mission Control Facility

- Tracking, Telemetry & Command (TT&C) of LEO & MEO satellites
- 2 antenna systems:
  - 5m diameter dish antenna enclosed in radome for TT&C in S-band
  - 7.3m diameter dish antenna for payload data reception in X-band

AIT Centre

- Cleanroom class 100,000 with temperature 22±2°C and humidity 55±10%
- Type of testing and measurement services:
  - Vibration
  - Reverberation acoustic
  - Thermal and vacuum test
  - Electromagnetic emission and susceptibility test
  - Mass properties
  - Alignment





Equipment	Key Specifications
Shaker	Max Sine Thrust 289 kN Max Random Thrust 267 kN 5 – 1700 Hz
Reverberation Chamber	Max 155 dB Sound Pressure Level 20 – 10,000 Hz
Thermal Vacuum Chamber	10^{-7} mbar -180°C – 150°C
Electromagnetic Compatibility Chamber	5m full anechoic compliance 20 Hz – 40 GHz
Mass Properties Measurement System	Max moment of inertia 1463 kgm^2 Spin speed 30 – 300 rpm
Alignment Measurement System	0.5 arcsecond Accuracy

Past Cal/Val Activities

- 2000 - 1st EO satellite, TiungSat-1 launched. No involvement
- 2007 – Preflight radiometric calibration of RazakSAT™
- 2009 – RazakSAT™ launched into Near Equatorial Orbit (NEqO).
  - Some preliminary inflight calibration activities conducted, but no actual measurement concurrence with satellite overpass is taken
  - Could be interesting results due to uniqueness of NEqO

Thank You