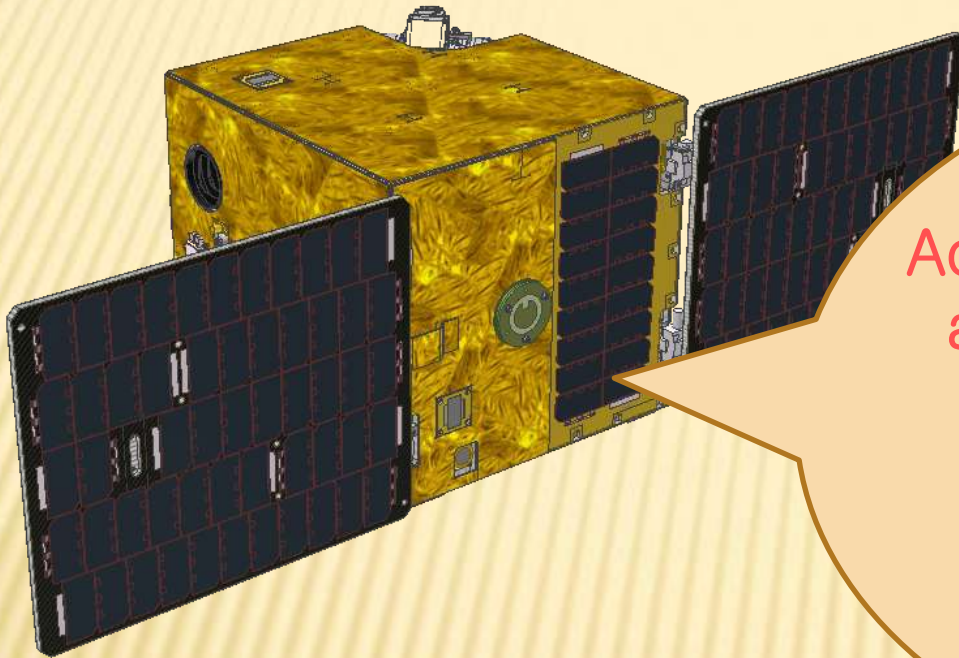


AES SATELLITE

- SOCRATES -



Adopted
as a piggyback satellite
of the ALOS-2 (JAXA) !!

Going to be launched
in 2013!!



Advanced Engineering Services Co.,Ltd.

MISSIONS OF SOCRATES

① Demonstration of the small satellite standard bus

Small satellite is composed of bus equipment which constitutes the basis of satellite and mission equipment for a special purpose.

Bus equipment was needed to design for each loaded mission equipment. Now we are developing a versatile standard bus. The developed standard bus enable to load various type of mission equipment.

Our purpose of this mission is to demonstrate the operation of the standard bus in orbit. As the first step, we'll confirm that it will operate in orbit through the use of this satellite, named "SOCRATES".

② Provision of environment to demonstrate advanced missions and element technologies in orbit

By demonstrating small satellite standard bus, we provide opportunity to load and launch various mission equipments for institutes and companies.

On this satellite, we are planning to load mission equipment developed by NICT(National Institute of Information and Communications Technology).

SUCCESS CRITERIA

In this satellite mission, we set the following three success criteria and we'll demonstrate these in orbit.

Minimum success	<ul style="list-style-type: none">· Confirmation of the most basic components operation capabilities consisting of satellite bus in orbit.· Deployment of two solar array panels and telemetry communication between space and ground .
Full success	<ul style="list-style-type: none">· Confirmation of all components of the bus will operate properly in orbit.· To generate enough electrical power and supply for the satellite to survive.· Implementation of direction change to the Sun by three axis stabilized attitude control.
Extra success	<ul style="list-style-type: none">· In addition to normal operations of mission equipment, contribution for experiment through stable attitude control and power based on the needs of users.· Establishment of automatic operation system (It means that we can operate it full automatic without manual control) .

BUS

1. Structure subsystem (STR)
2. Electrical power system(EPS).....power control unit(PCU)、 solar array panel(SAP)、 battery(BAT)
3. Data handling system(DHS)...onboard computer(OBC)

4. Communication system(COM)

- ...S band antenna(SANT)
- S band coupler(SCPL)
- S band diplexer(SDIP)
- S band transponder(STRX)

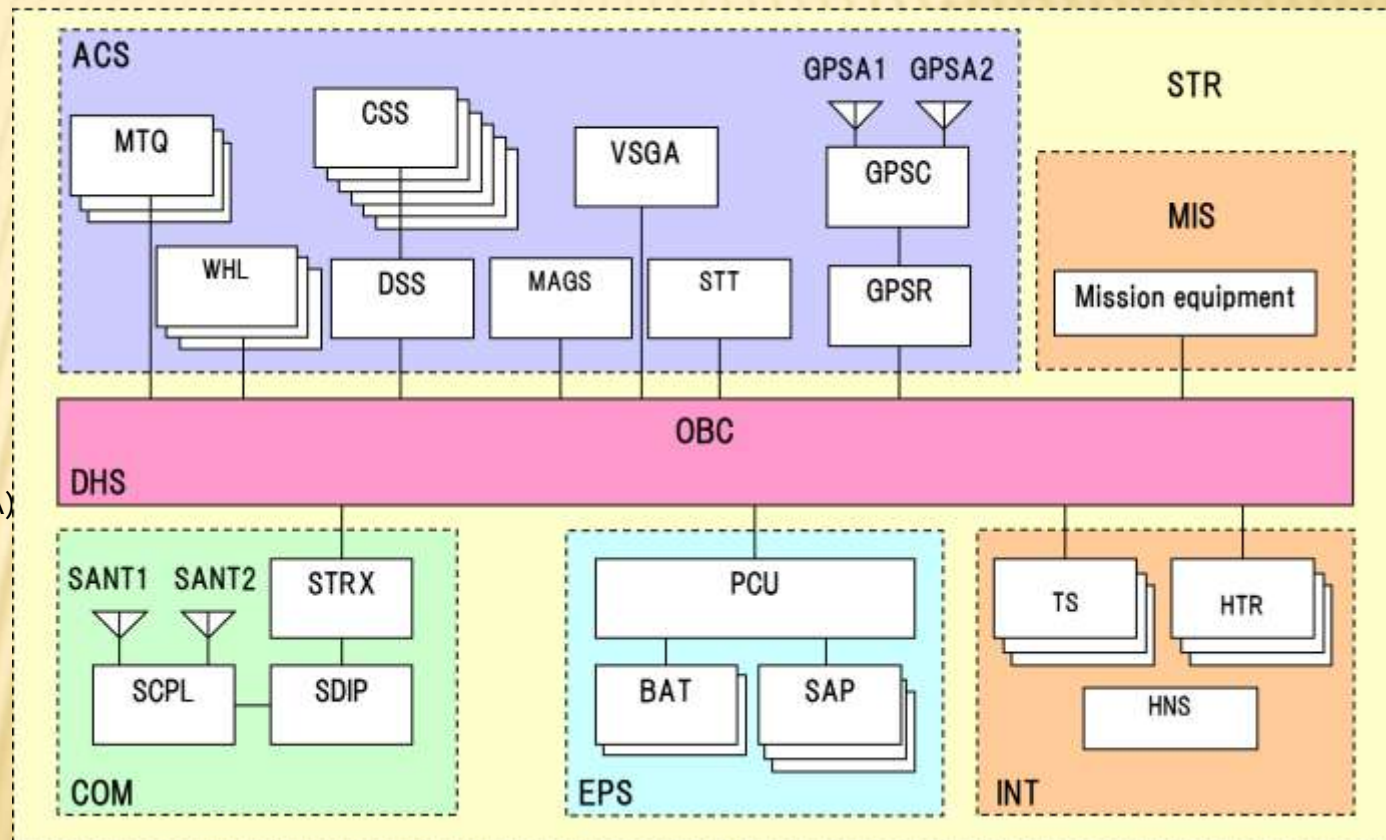
5. Attitude control system (ACS)

- ...magnetic torquer(MTQ)
- wheel(WHL)
- digital sun sensor(DSS)
- coarse sun sensor(CSS)
- magnetic sensor(MAGS)
- vibrating structure gyroscope assembly(VSGA)
- star tracker(STT)
- GPS antenna(GPSA)
- GPS coupler(GPSC)
- GPS receiver(GPSR)

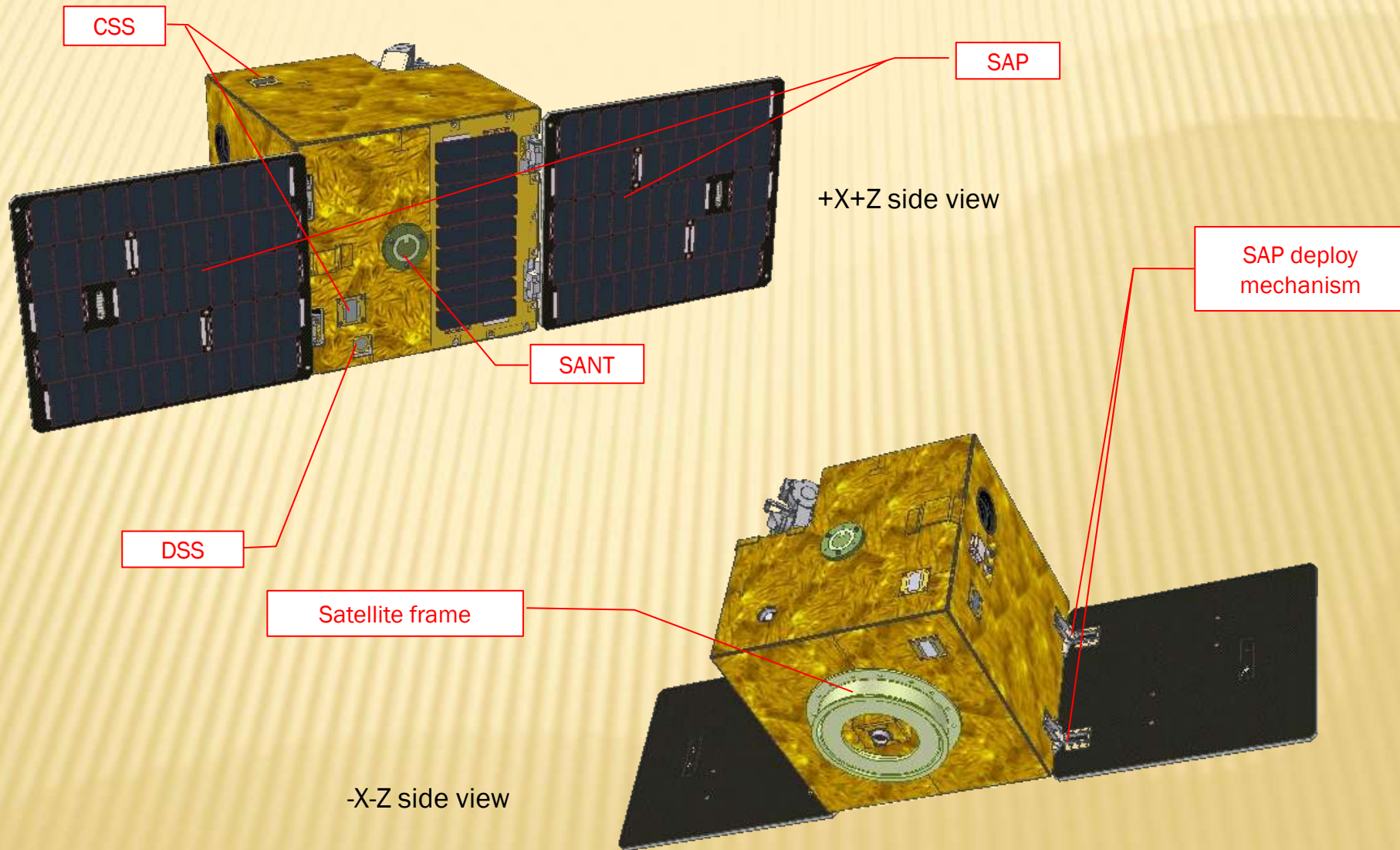
6. Integration hardware(INT)

- ...temperature sensor(TS)
- heater(HTR)
- harness(HNS)

System block diagram



VISUAL APPEARANCE OF SOCRATES



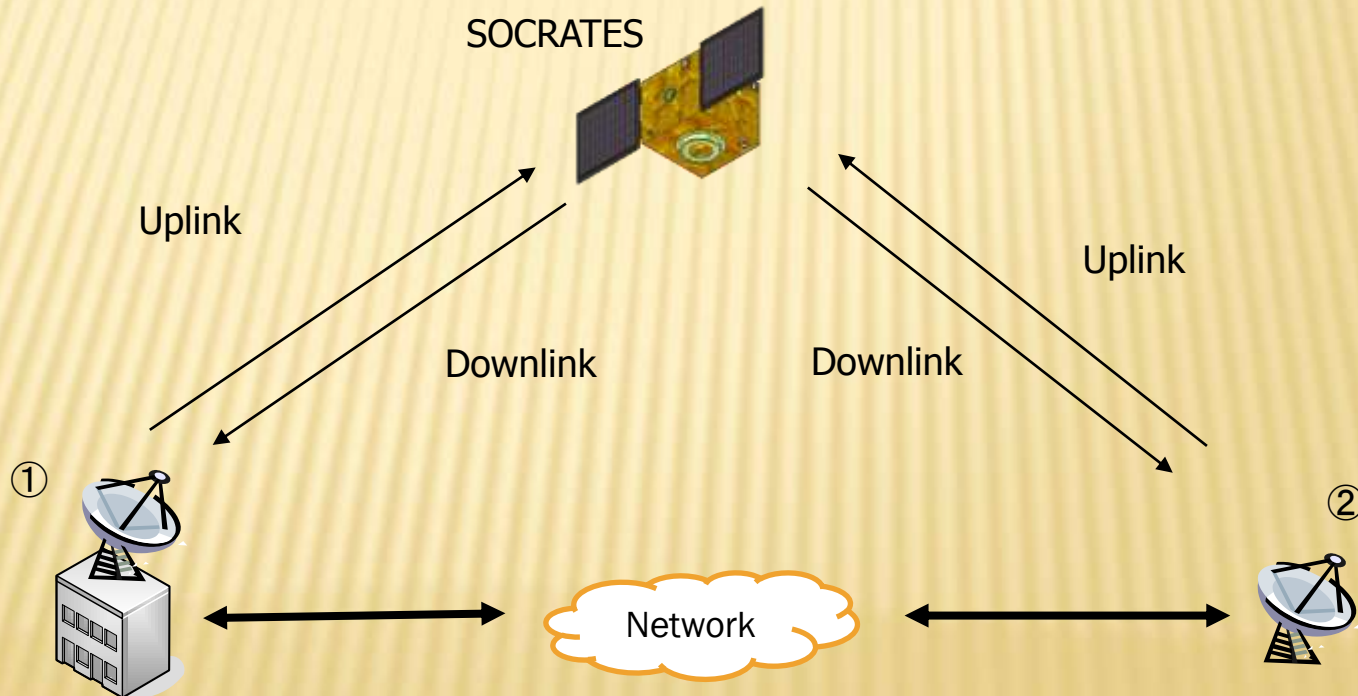
SPECIFICATION OF SOCRATES

Items	Specifications
External dimensions	During the launch (SAP folded) ; W496×D495×H485mm
	In orbit (SAP deployed) ; W507×D1394×H485mm
Mass	approx. 48kg (in orbit)
Orbit	Altitude ; approx. 628km Sunsynchronous subreccurent orbit
Launch year	H-2A rocket FY2013 share-ride small sub satellite
Power generation	It has SAP deploy mechanisms. approx. 100W (nominal) / approx. 120W (MAX)
Attitude control system	Three axis stabilized attitude control (solar pointing control, earth pointing control)
Communication band	S band

OPERATION PLAN

Operating station

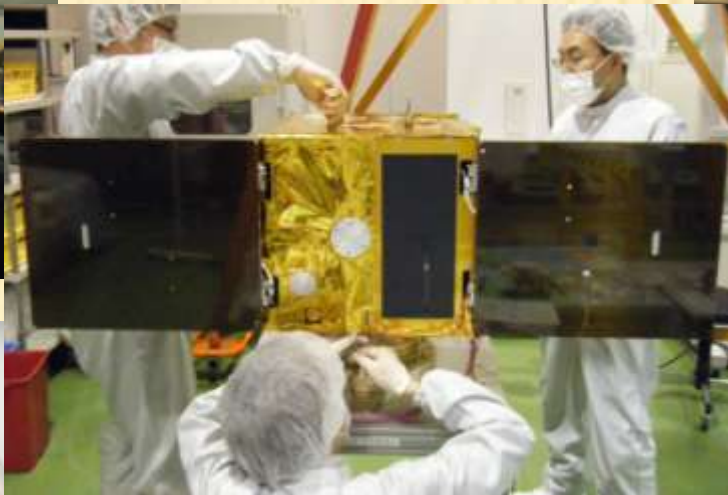
- ① AES ground station and small satellite operations control system @ Tsukuba, Japan
(It will dedicate in 2013)
- ② Svalbard ground station (KSAT) @ Norway



PICTURES①

~ASSEMBLY OF STRUCTURE THERMAL MODEL(STM)~

Now we're developing SOCRATES !!



PICTURE②

~TESTING OF STRUCTURE THERMAL MODEL (STM)~

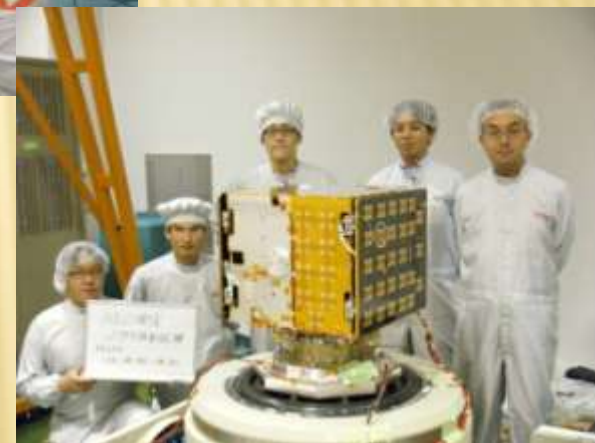


←Vibration test



↑ Thermal vacuum test
(Simulation of space environment)

←Deployment test of SAP



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