

Status of GEO-KOMPSAT-2B

7 October 2015

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- **GEO-KOMPSAT-2 [GK2] Program Overview**
- **GK2 Payload Characteristics**
- **GK2 System Architecture**
- **GK2 Satellite Configuration**
- **GK2 Equipment Layout & Size**
- **GK2 Program Status**

➤ Development Outline

- Period : 2011 ~ 2019
- Launch
 - : [May](#) 2018 (Meteorological Satellite) for GK2A
 - : [March 2019](#) (Ocean/Environment Monitoring Satellite) for GK2B

➤ Missions

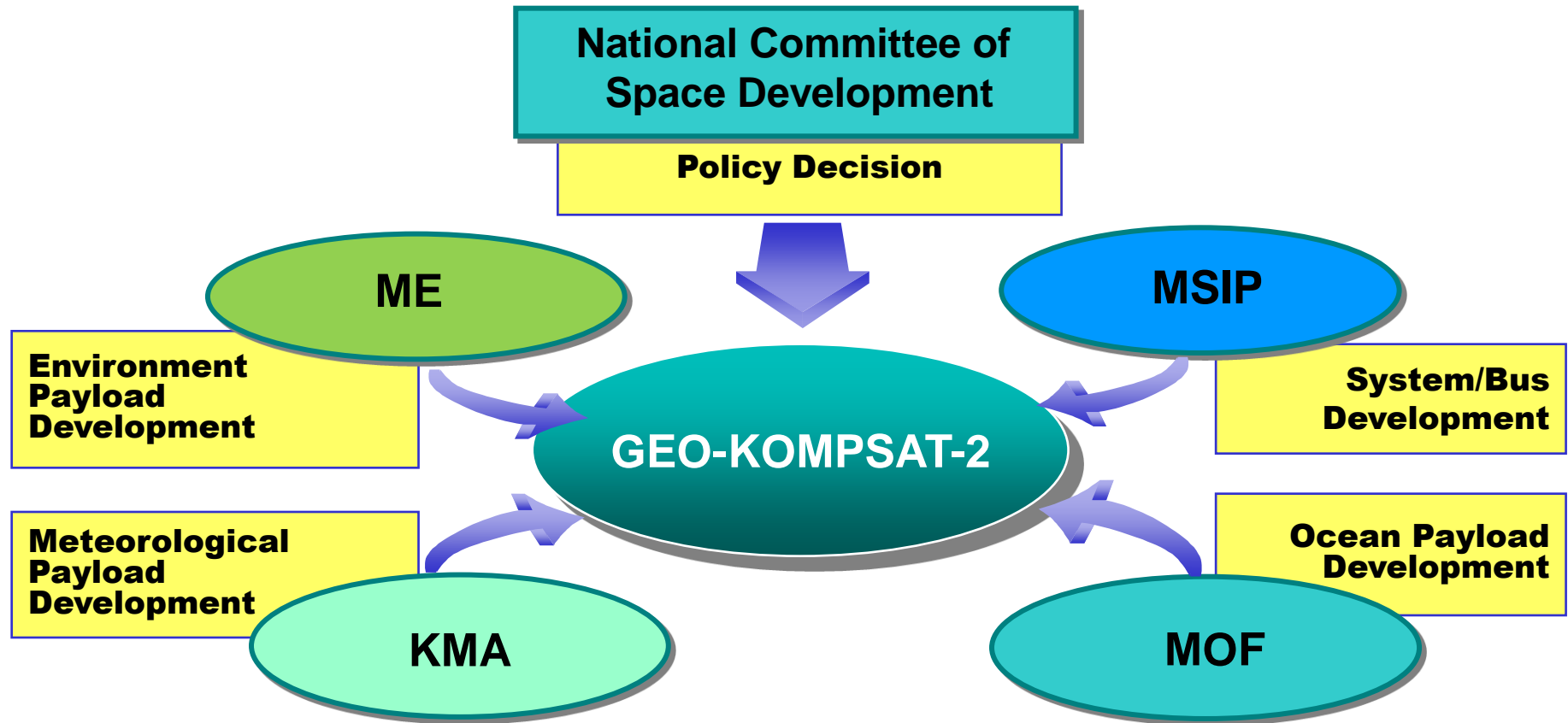
- Weather Monitoring including Space Environment Monitoring
- Ocean Monitoring
- Environment Monitoring

➤ Payload

- Meteorological Payload ([GK2A](#))
- Space Environment Monitoring Payload (KSEM) ([GK2A](#))
- Ocean Monitoring Payload ([GK2B](#))
- Environment Monitoring Payload ([GK2B](#))

➤ Lifetime : 10 years

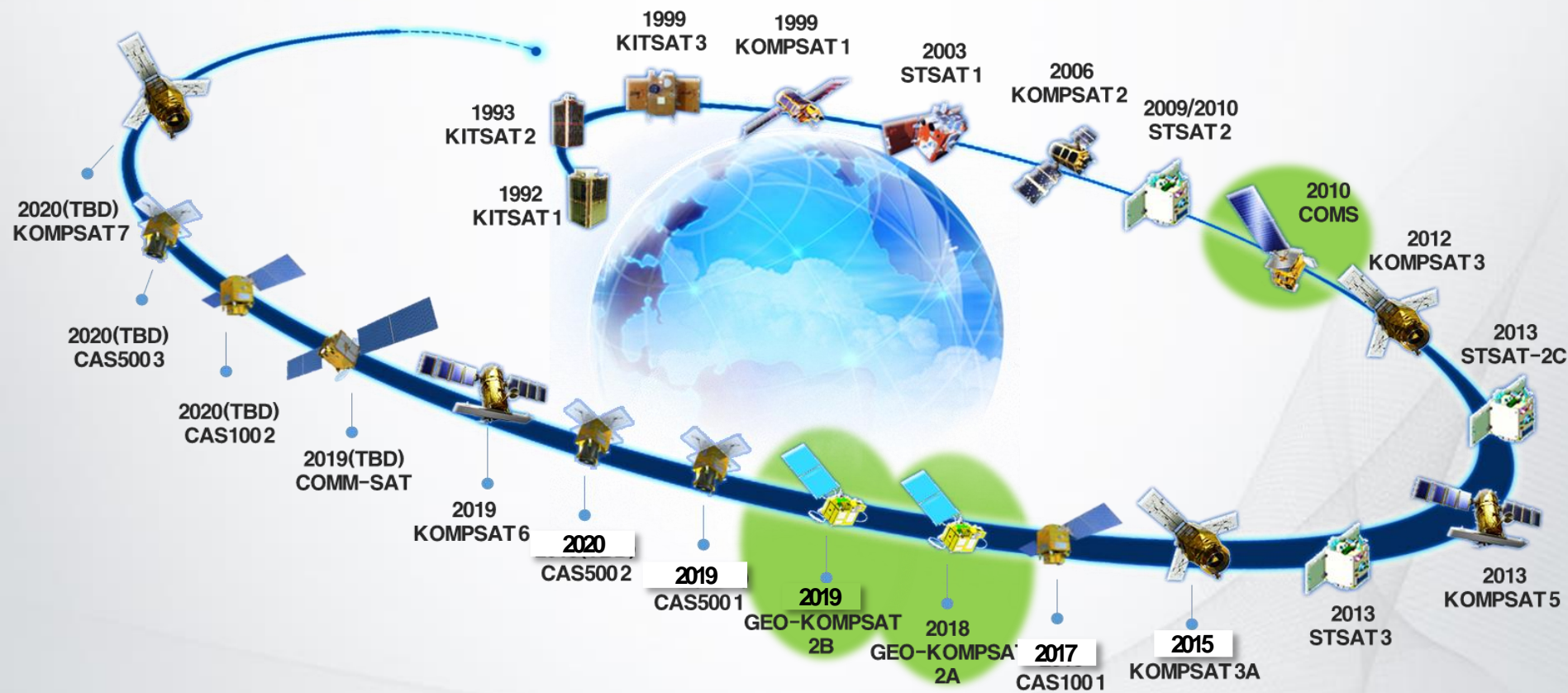
➤ Orbit : 36,000Km (GEO), 128.2+/-0.1deg. E



MSIP : Ministry of Science, ICT and Future Planning
MOF : Ministry of Ocean and Fisheries

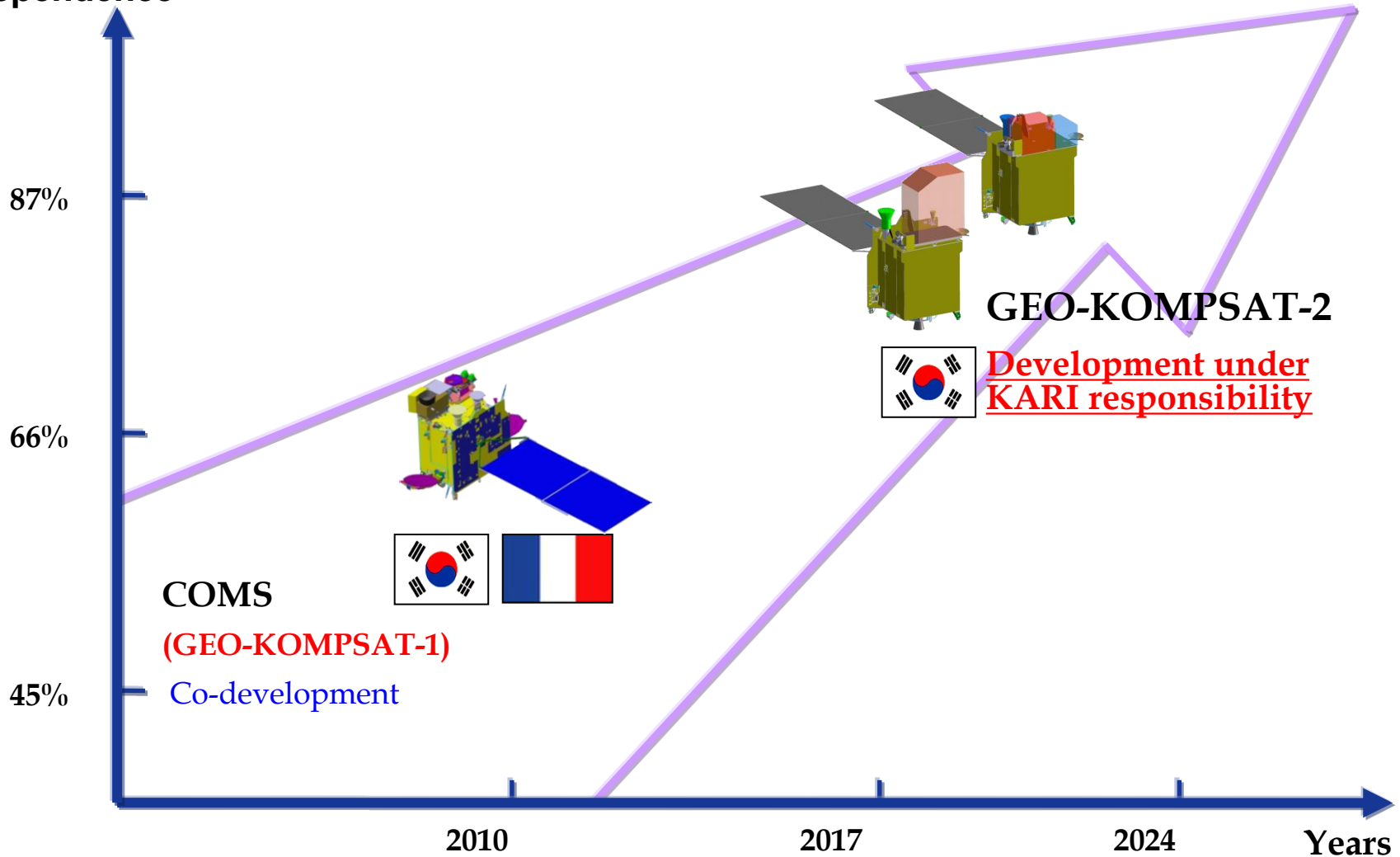
ME : Ministry of Environment
KMA : Korea Meteorological Administration

Satellite Development Plan until 2020



Goal of GEO Satellite Development

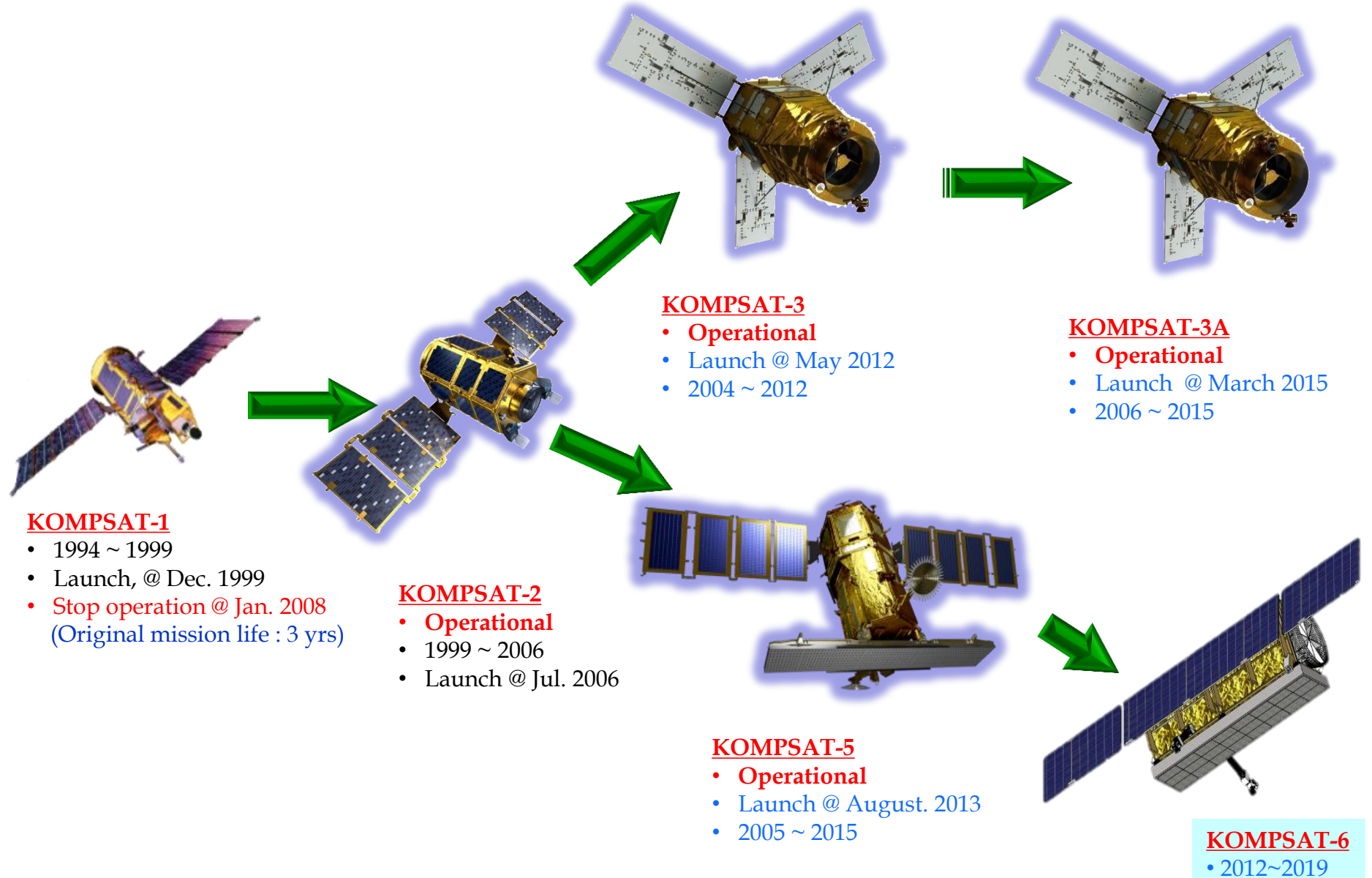
Degree of
Technical
Independence



Why GEO-KOMPSAT-2?

- **COMS** (*Cheollian in Korean*) stands for Communication, Ocean, and Meteorological Satellite
- There is no Communication Payload anymore in COMS Follow-on mission. COMS-2 cannot be a proper name for follow-on satellite.
- The translation of COMS Follow-on project in Korean would be “Geostationary Earth Orbit Multi-Purpose Satellite”.
- By the way, we made outstanding achievement through **(Low Earth Orbit) Korea Multi-Purpose Satellite[KOMPSAT]** (*Arirang in Korean*), development since 1994.
- Therefore, it is decided that COMS Follow-on satellite will be named as “Geostationary Earth Orbit **Korea** Multi-Purpose Satellite **[GEO-KOMPSAT]**”
- In GEO-KOMPSAT-2 (*Cheollian-2 in Korean may also be used*), the number 2 is used to emphasize the **continuation and heritage** from COMS, which is **virtually GEO-KOMPSAT-1**.
- **GEO-KOMPSAT-2** will be called simply GK2. Two of each satellite will be called as **GK2A & GK2B**
- By doing this we have the KOMPSAT platform fleet which covers LEO missions as well as GEO missions

Reference: LEO KOMPSAT



• Meteorological Mission

- * Continuous monitoring of imagery and extracting of meteorological products with high-resolution and multi-spectral imager
- * Early detection of special weather such as storm, flood, yellow sand, etc.
- * Extraction of data on long-term change of sea surface temperature and clouds

• Space Weather Mission

- * Monitoring the energetic particle flux and the magnetic field in the GK2A orbit
- * Monitoring the spacecraft charging due to the space weather phenomena

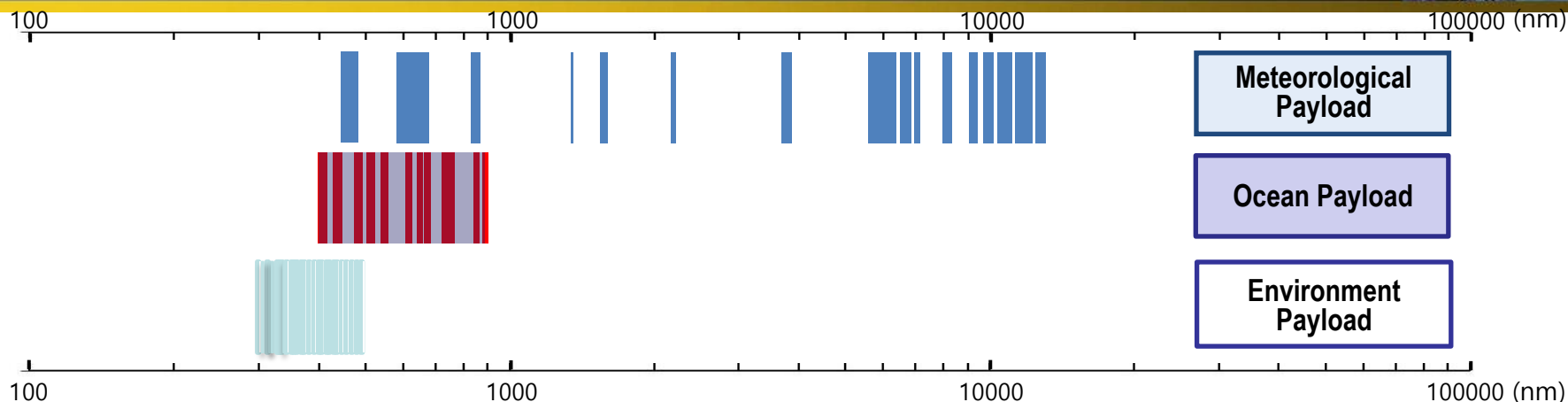
• Ocean Monitoring Mission

- * Monitoring of marine environments around Korean peninsular
- * Production of fishery information (Chlorophyll, etc)
- * Monitoring of long-term/short-term change of marine ecosystem

• Environmental Monitoring Mission

- * Monitoring of Atmosphere, Land and Ocean environments around Korean peninsular
- * Monitoring of long-term/short-term environmental impacts driven by climate change
- * Tracking of transport of aerosol and gases into, across, and out of Korean peninsula
- * Observing regional air quality for atmospheric chemistry/transport model evaluation

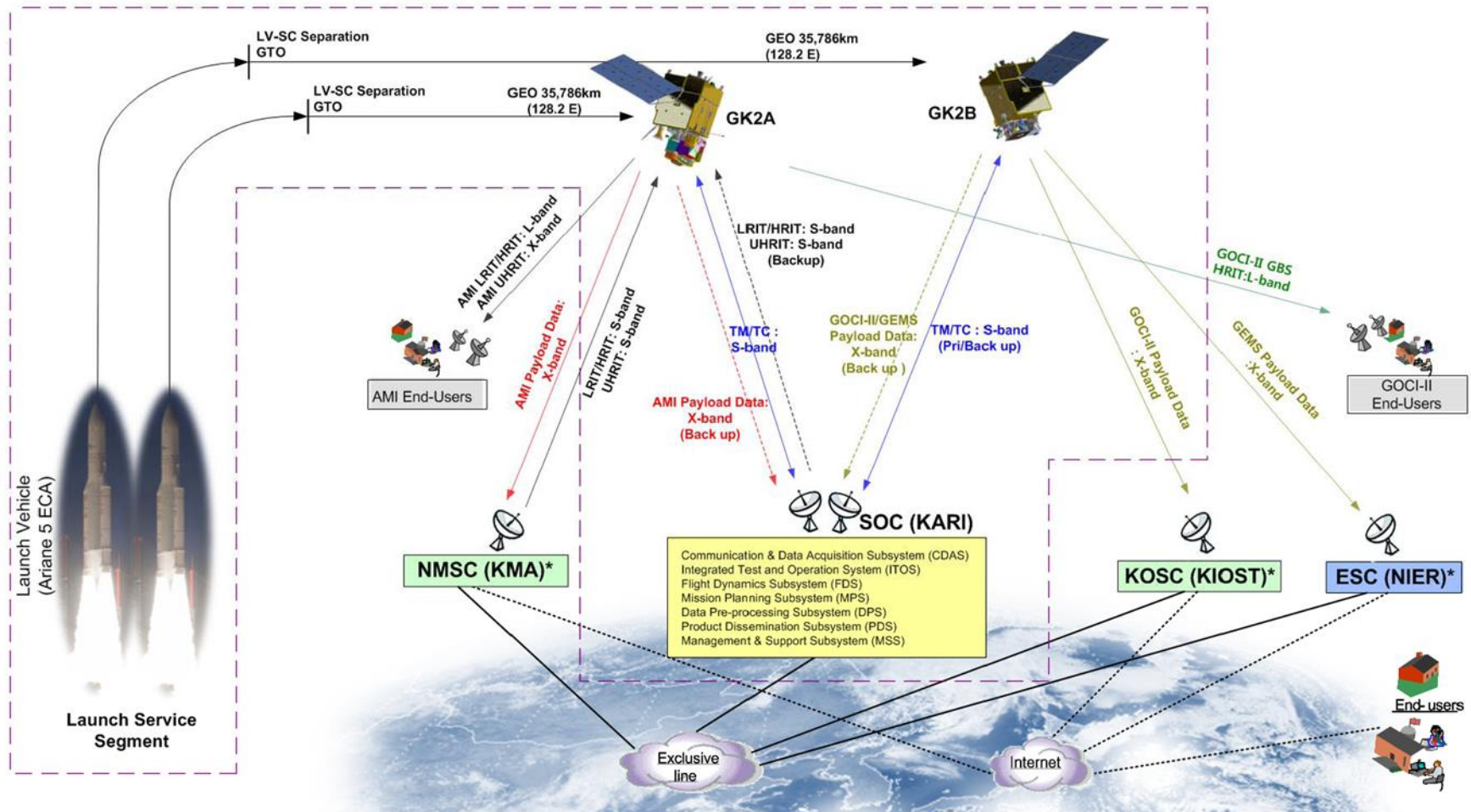
GK2 Payload Characteristics



Payload	GK2A		GK2B	
	AMI	KSEM	GOCI-II	GEMS
Spectral Range	0.45~13.6μm	-	370~885nm	300~500nm
Spatial Resolution	0.5~1km (VIS) 1~2km (IR)	-	< 250m (LA) < 1,000m (FD) at 130°E, 0°N	< 56Km ² (area) < 7km (NS) at Seoul
Spectral Resolution	30~1,250nm	-	10~40nm, wideband	0.6nm (sampling: 0.2nm)
No. of Channels	16	-	13	1000
Observation Area	FD, NH, ENH, LA	-	2,500km×2,500km (LA) ≥+/-60deg (FD)	5,000km×5,000km (45°N~5°S, 75°E~145°E)
Observation Period	FD: 6 times/hr NH: 12 times/hr ENH: 12 times/hr	EPD: ≤0.33sec MG: ≤0.1sec CM: ≤1sec	LA: 1 time/hr, 10 times/daytime FD: 1 time/day	1 time/hr, > 8 times/daytime
Imaging Time	FD: 10 min, NH, ENH: 5 min, LA: 2 min	-	LA: 30 min, FD: 240min	30 min

GK2 System Architecture

GK2 System Architecture



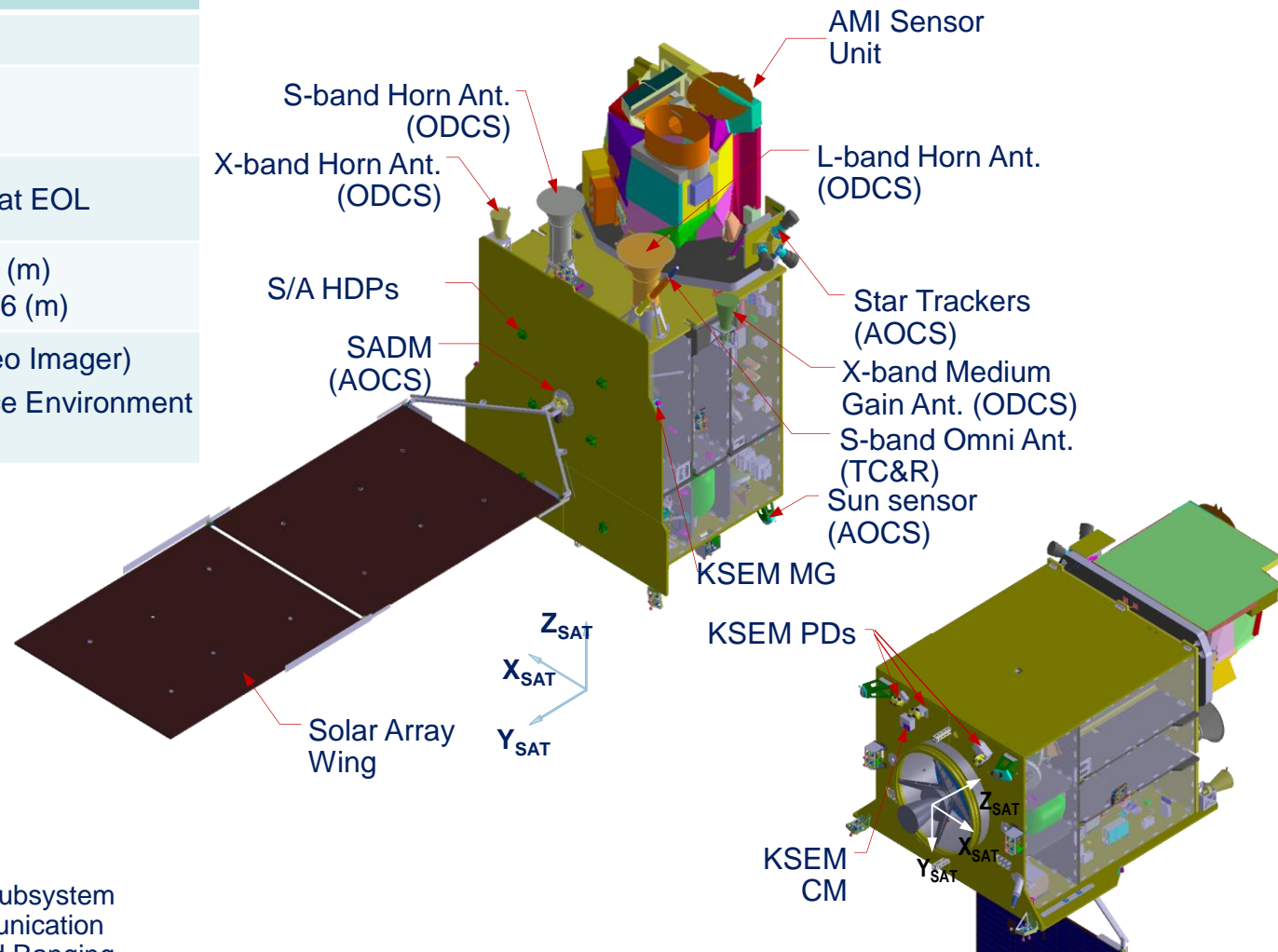
* Users' Ground Station and relevant interfaces under users' responsibility

Approval: Director, GEO-KOMPSAT-2 Program

2015.03.19 Rev.04

GK2A Satellite Configuration

Items	GK2A
Mission Life	10 years
Mass @CDR	3.44 ton @ Mission 3.5 ton @ Launch
Power @CDR	2.63 kW @ 52V, AEX at EOL
Size	<ul style="list-style-type: none"> Launch : 2.9×2.4×4.6 (m) On-orbit : 3.8×8.9×4.6 (m)
Payloads	<ul style="list-style-type: none"> AMI (Advanced Meteo Imager) KSEM (Korean Space Environment Monitor)



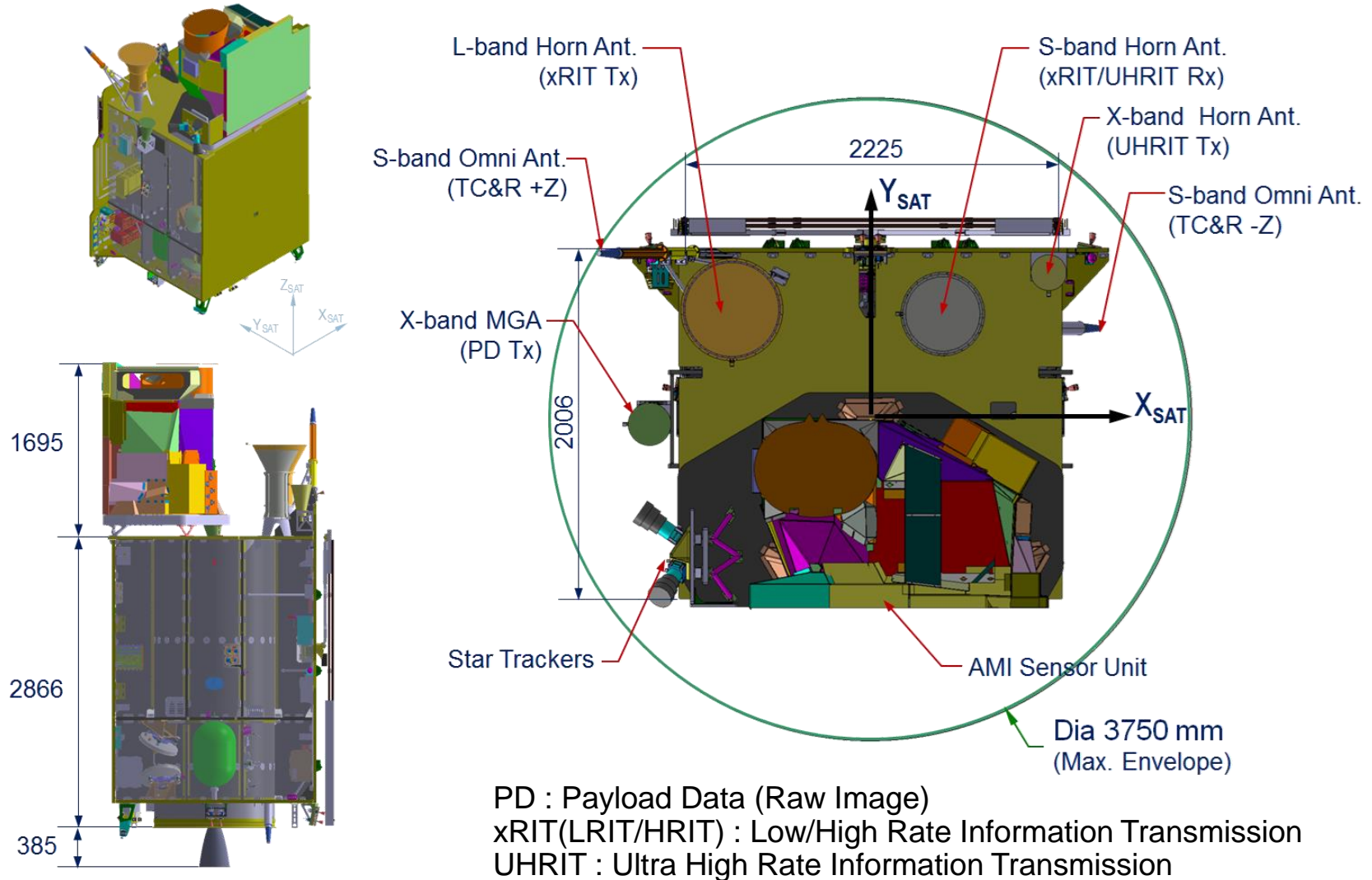
AOCS : Attitude & Orbit Control Subsystem

ODCS : Observation Data Communication

TC&R : Telemetry, Command and Ranging

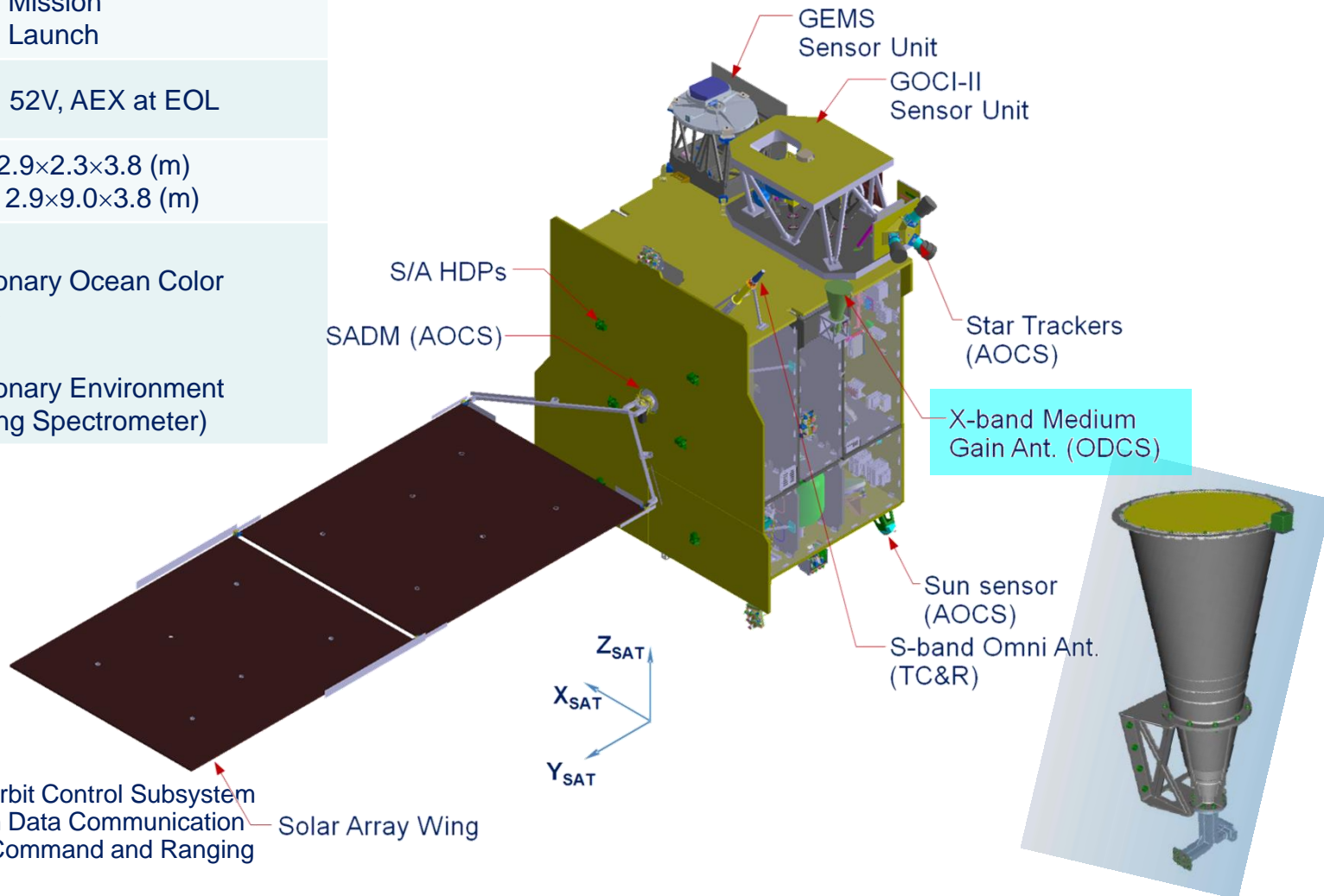
MG : Magnetometer / PD : Particle Detector / CM : Charge Monitor

GK2A Equipment Layout & Size

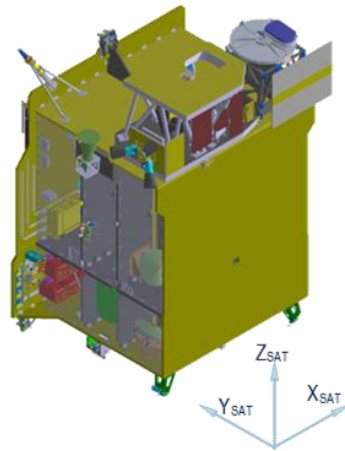


GK2B Satellite Configuration

Items	GK2B
Mission Life	10 years
Mass @PDR	3.20 ton @ Mission 3.50 ton @ Launch
Power @PDR	2.62 kW @ 52V, AEX at EOL
Size	<ul style="list-style-type: none"> Launch : 2.9×2.3×3.8 (m) On-orbit : 2.9×9.0×3.8 (m)
Payloads	<ul style="list-style-type: none"> GOCI-II (Geostationary Ocean Color Imager-II) GEMS (Geostationary Environment Monitoring Spectrometer)



GK2B Equipment Layout & Size



S-band Omni Ant.
(TC&R +Z)

X-band MGA
(PD Tx)

2006

Star Trackers

GOCI-II
Sensor Unit

2225

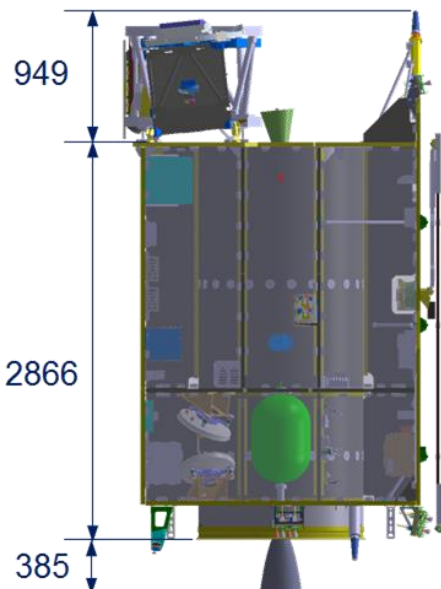
Y_{SAT}

S-band Omni Ant.
(TC&R -Z)

X_{SAT}

GEMS
Sensor Unit

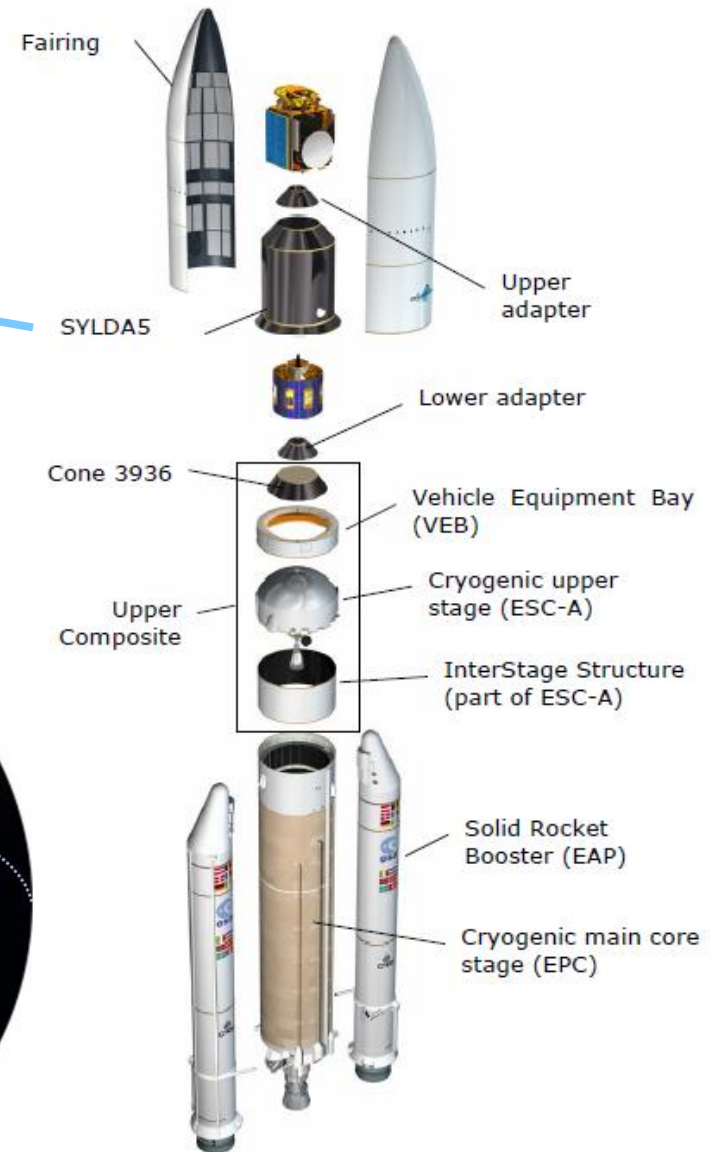
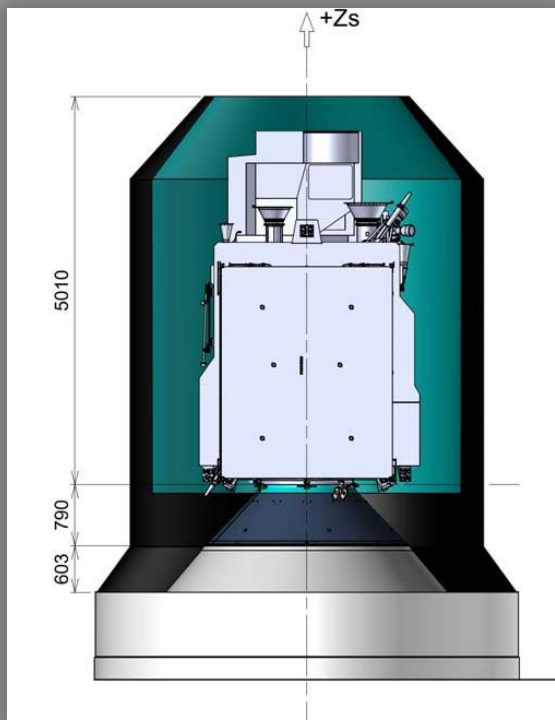
Dia 3600 mm
(Max. Envelope)



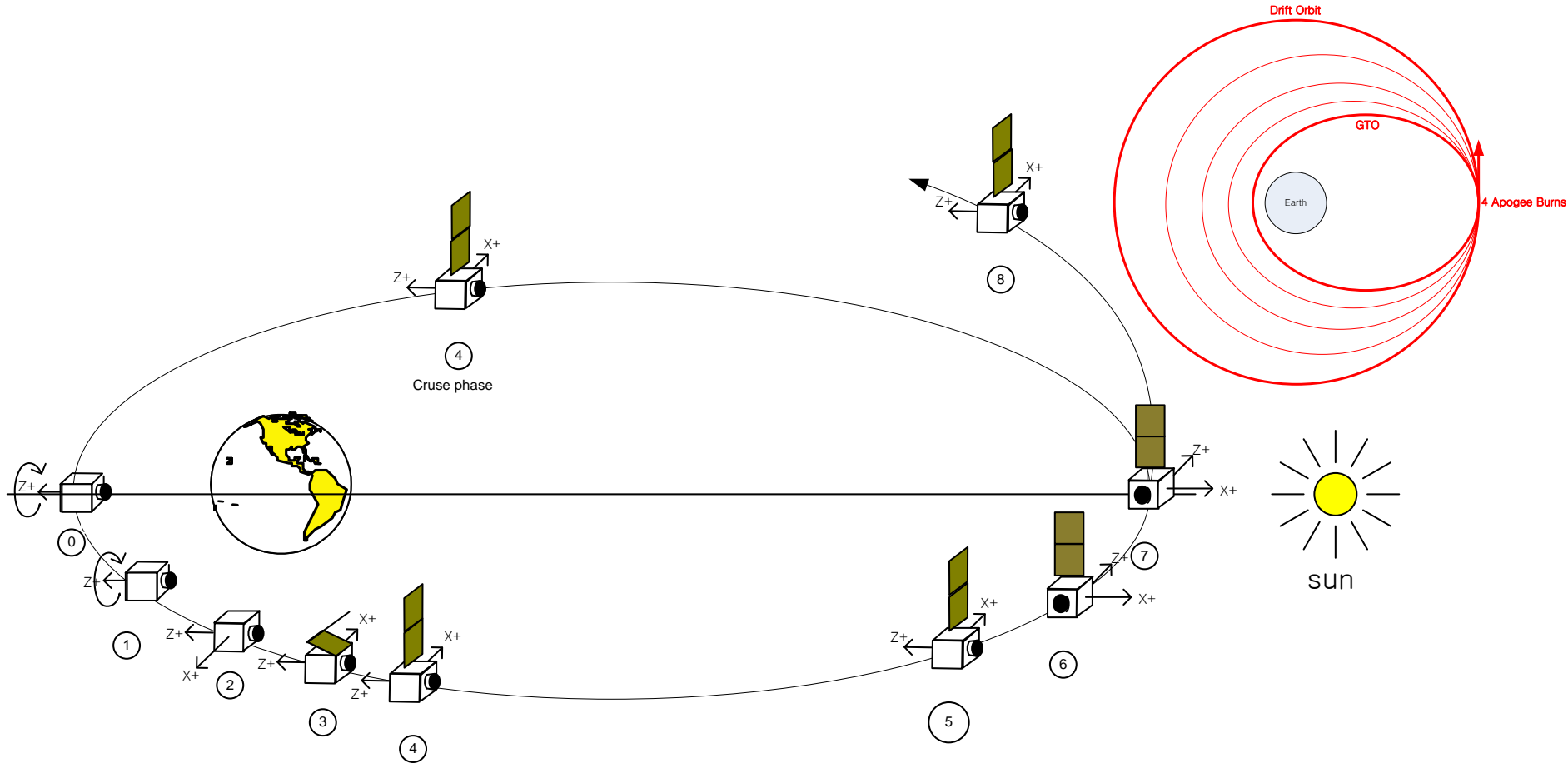
GEO-KOMPSAT-2B



GK2B Launch by Ariane 5 ECA

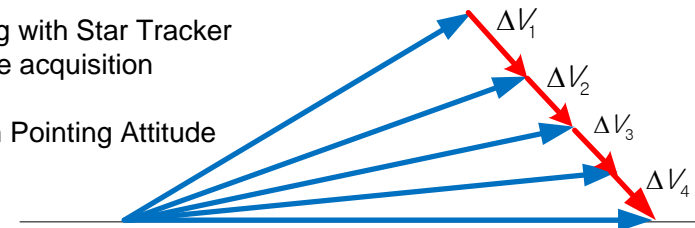


LEOP and LAE Burn



- 0: Transfer Orbit Injection
- 1: Initialization of AOCS and PS subsystem
- 2: Sun Acquisition with BASS
- 3: Solar Array deployment, cells pointed towards the Sun
- 4: Sun Pointing With BASS

- 5: Sun Pointing with Star Tracker
- 6: BAM attitude acquisition
- 7: LAE firing
- 8: Back to Sun Pointing Attitude

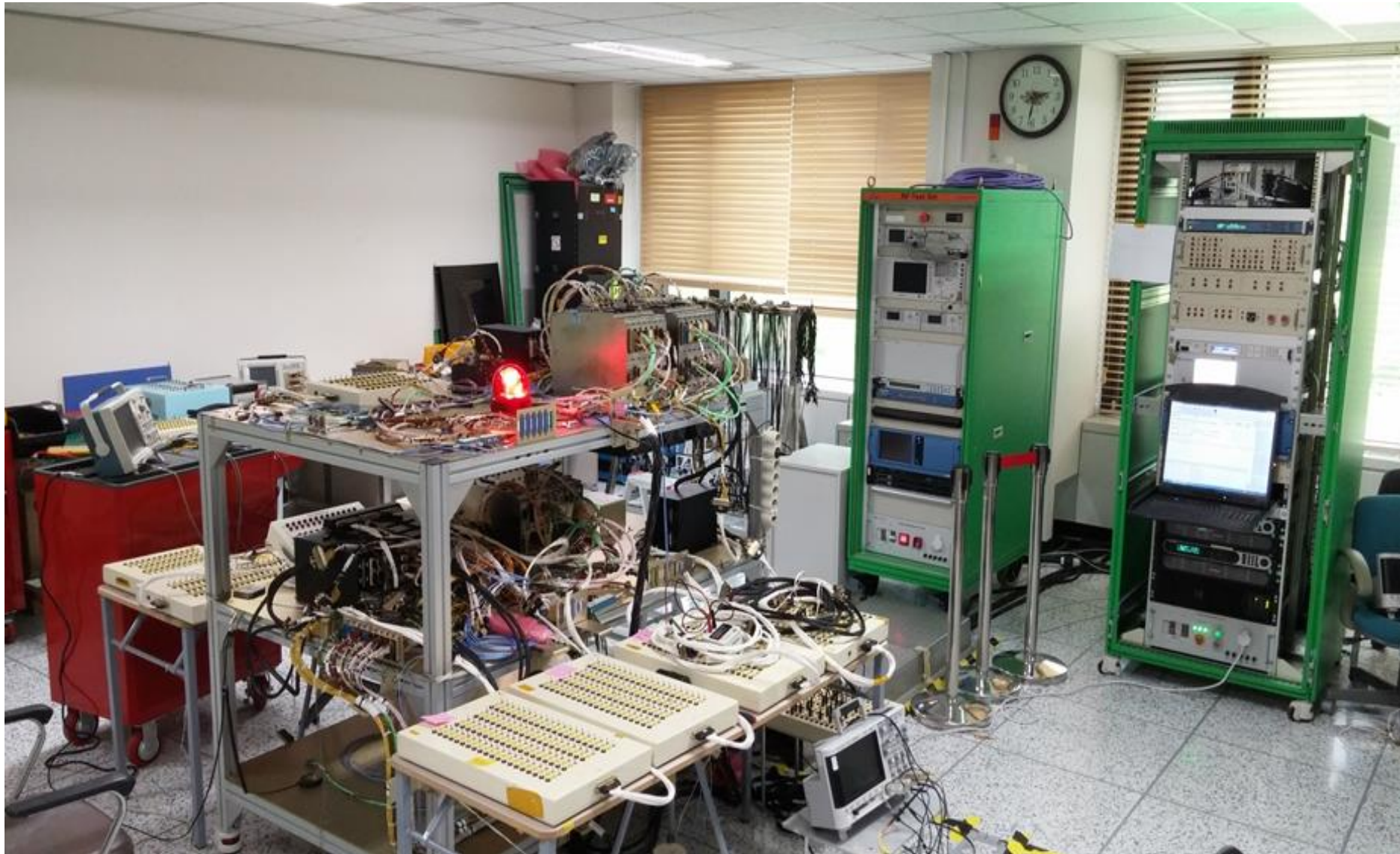


GK2 Program Status (1/2)

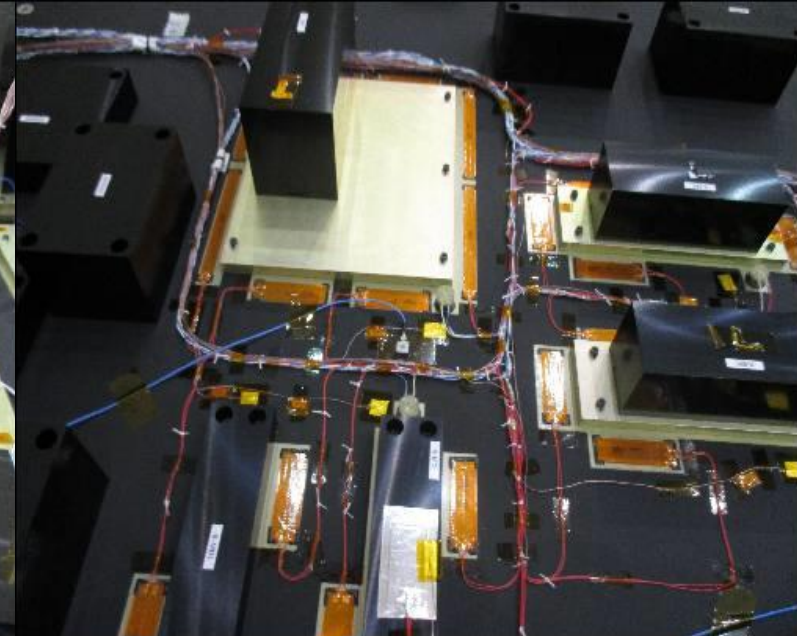
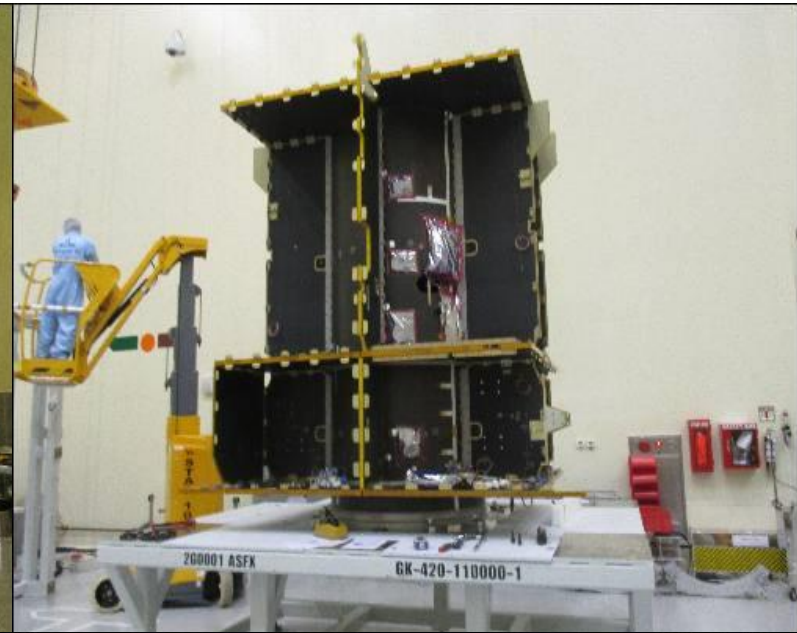
- Start of GK2 Program (Jul. 2011) ✓
- GK2 System Requirements Review [SRR] (Mar. 2012) ✓
- GK2A AMI Contract (Feb. 2013) ✓
- GK2 System Design Review [SDR] (Feb. 2013) ✓
- GK2B GEMS Contract (May 2013) ✓
- GK2B GOCI-II Contract (Jul. 2013) ✓
- GK2 Δ System Design Review [Δ SDR] (Oct. 2013) ✓
- AMI SRR in Oct. 2013 ✓
- GEMS SDR in Oct. 2013 ✓
- GOCI-II SDR in Nov. 2013 ✓
- GK2 Spacecraft Bus Preliminary Design Audit [PDA] (~Jan. 2014) ✓
- GK2A KSEM Contract (Jan. 2014) ✓
- AMI PDR in Feb. 2014 ✓
- GEMS PDR in Mar. 2014 ✓
- GOCI-II PDR in Jun. 2014 ✓

- KSEM SDR in Jul 2014 ✓
- GK2 System Preliminary Design Review [PDR] (Jul. 2014) ✓
- Finalization of Spacecraft equipment selection(Buy items)(~Sep. 2014) ✓
(*"Make items" together with KARI & Korean industries started in 2012*)
- GK2 Launch Vehicle Selection by 2014 Q4 and Contract in Feb 2015 ✓
- KSEM PDR in Jan. 2015 ✓
- AMI CDR in Feb. 2015 ✓
- GEMS CDR in Mar. 2015 ✓
- GK2 Spacecraft Bus Critical Design Audit [CDA] (~July. 2015) ✓
- GK2 ETB in Progress since Apr. 2015
- GK2 STM in Progress since May. 2015
- KSEM CDR in Sep. 2015 ✓
- GOCI-II CDR in 12-14 Oct. 2015
- GK2A Critical Design Review [CDR] (Sep. 2015) ✓
- GK2B Critical Design Review [CDR] (Jan. 2016)

GK2 ETB (Electrical Test Bed)



GK2 STM (Structure Thermal Model)







Thank You