

KPS,
KOREAN POSITIONING SYSTEM



KPS & KASS Status Updates

16 Sep. 2024

INAE JUNG
KOREA AEROSPACE RESEARCH INSTITUTE





OVERVIEW OF THE KPS(KOREAN POSITIONING SYSTEM)



Objective

Providing high-precision PNT information required in the era of the 4th industrial revolution

Goal

Development and construction of the KPS system that stably provides PNT services to meet various satellite navigation needs



Program

KPS R&D Program
(including Space, Ground, and User Segment)

Period

2022~2035 (14 years)

Governing

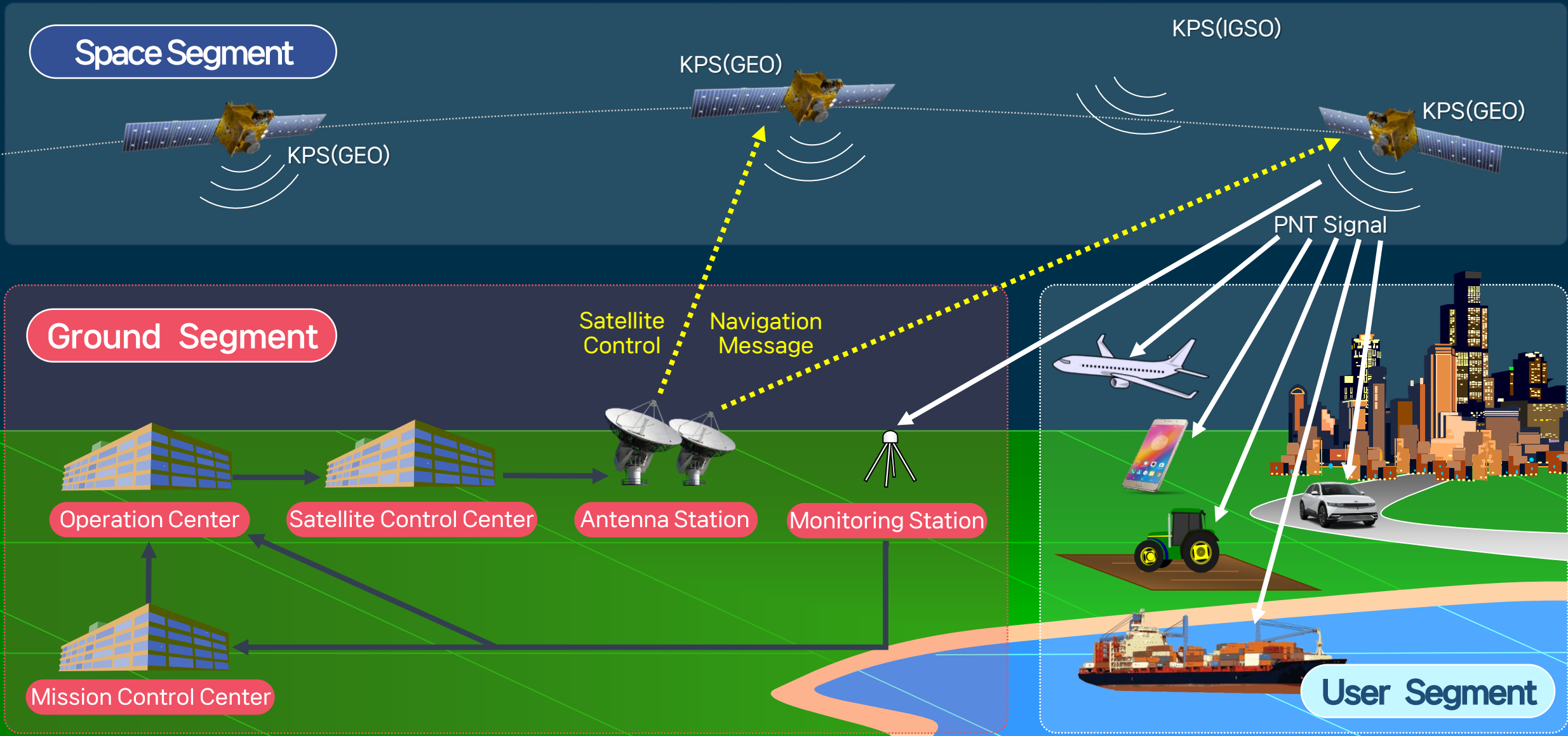


R&D



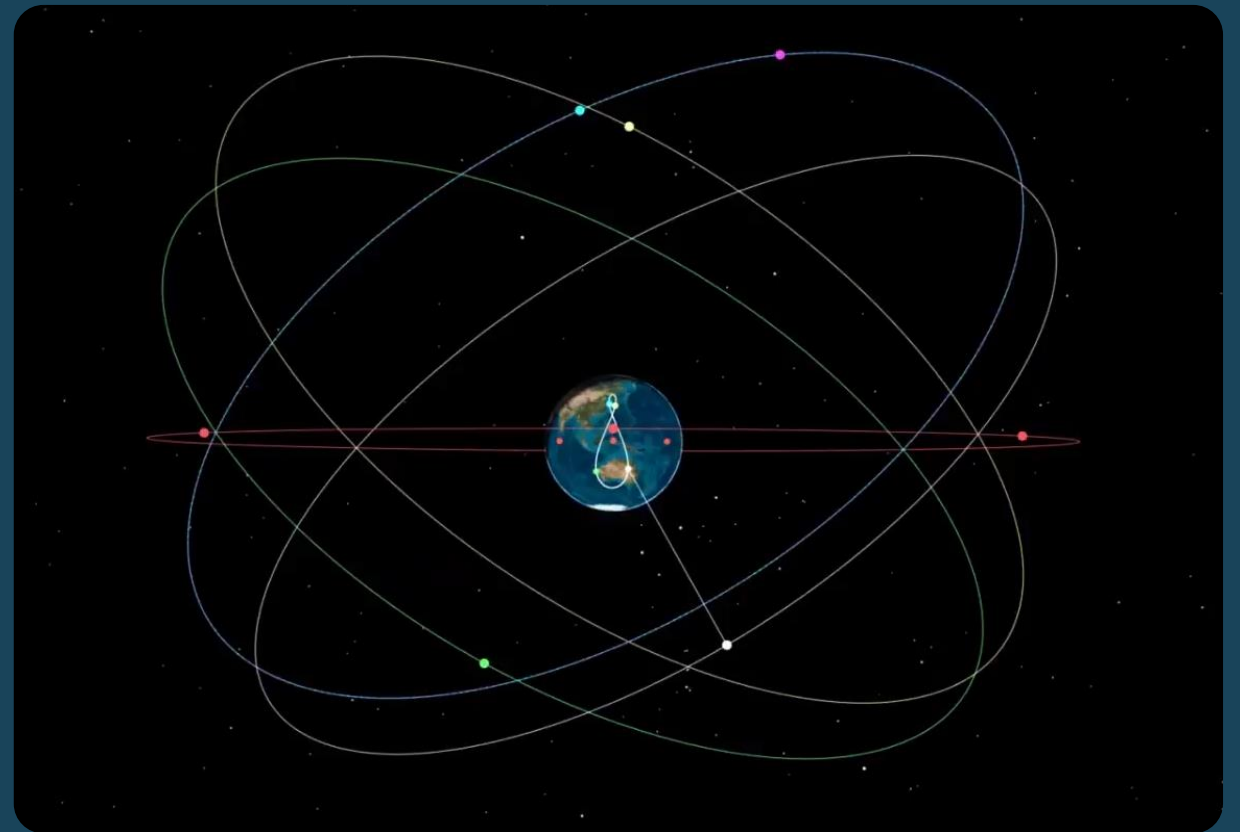
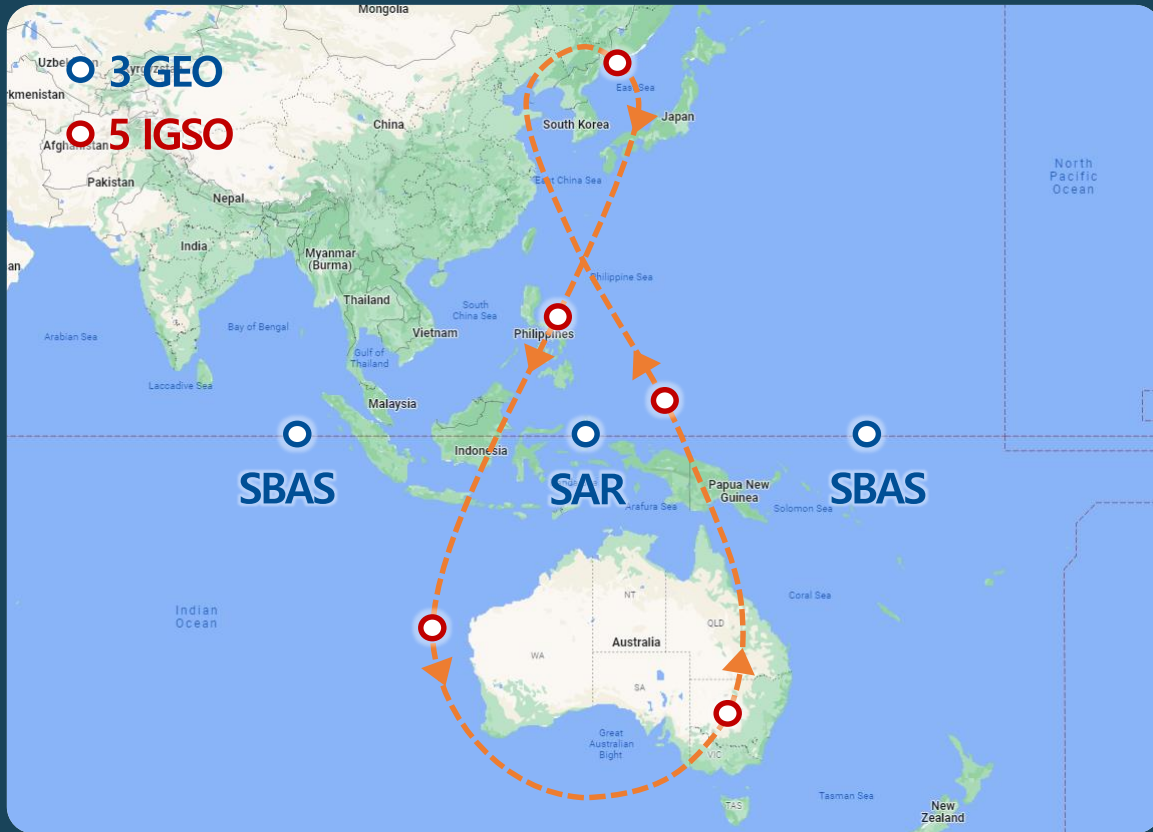


KPS SYSTEM CONFIGURATION





KPS SATELLITE CONSTELLATION

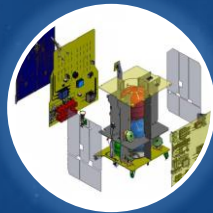




KPS DEVELOPMENT PLAN



Launching 1st KPS-IGSO in 2027, Full deployment completed until 2035



System Design ('22~'25)

- KPS R&D and international satellite coordination
- Design of navigation signals and the constellation



System Development ('26~'28)

- Development of satellite bus, payloads, and ground segments
- Launch of the 1st IGSO satellite in 2027



Deployment and Validation ('29~'35)

- Development and launch of the 4 IGSO and 3 GEO satellites
- Development of the entire ground segment, integration and testing





INTERNATIONAL COOPERATION



UN International Committee on Global Navigation Satellite Systems(ICG)

The Republic of Korea became an ICG member state in 2021 and will host the ICG-19 in 2025.



We are committed to enhancing interoperability and compatibility among global systems and welcome opportunities for international cooperation!



Current status of the KASS(Korea Augmentation Satellite System)

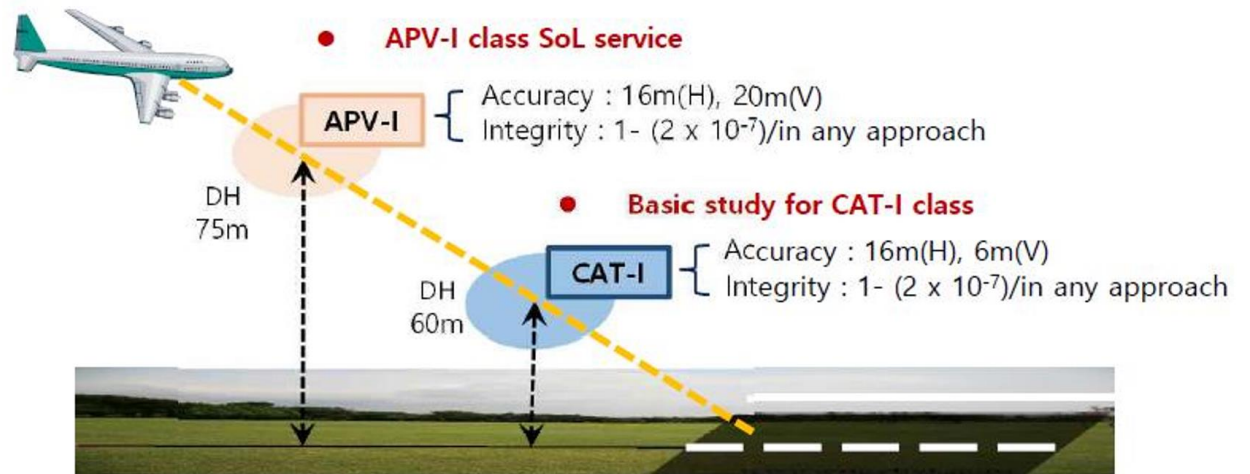


Update

- APV-I SoL class Service commenced on December 28th, 2023



- APV-I and NPA service provision within Incheon FIR
 - APV-I : around airports (land mass and Jeju Island)
 - NPA : Outside of the APV-I service area
- SoL service commencement
 - After 2023yr



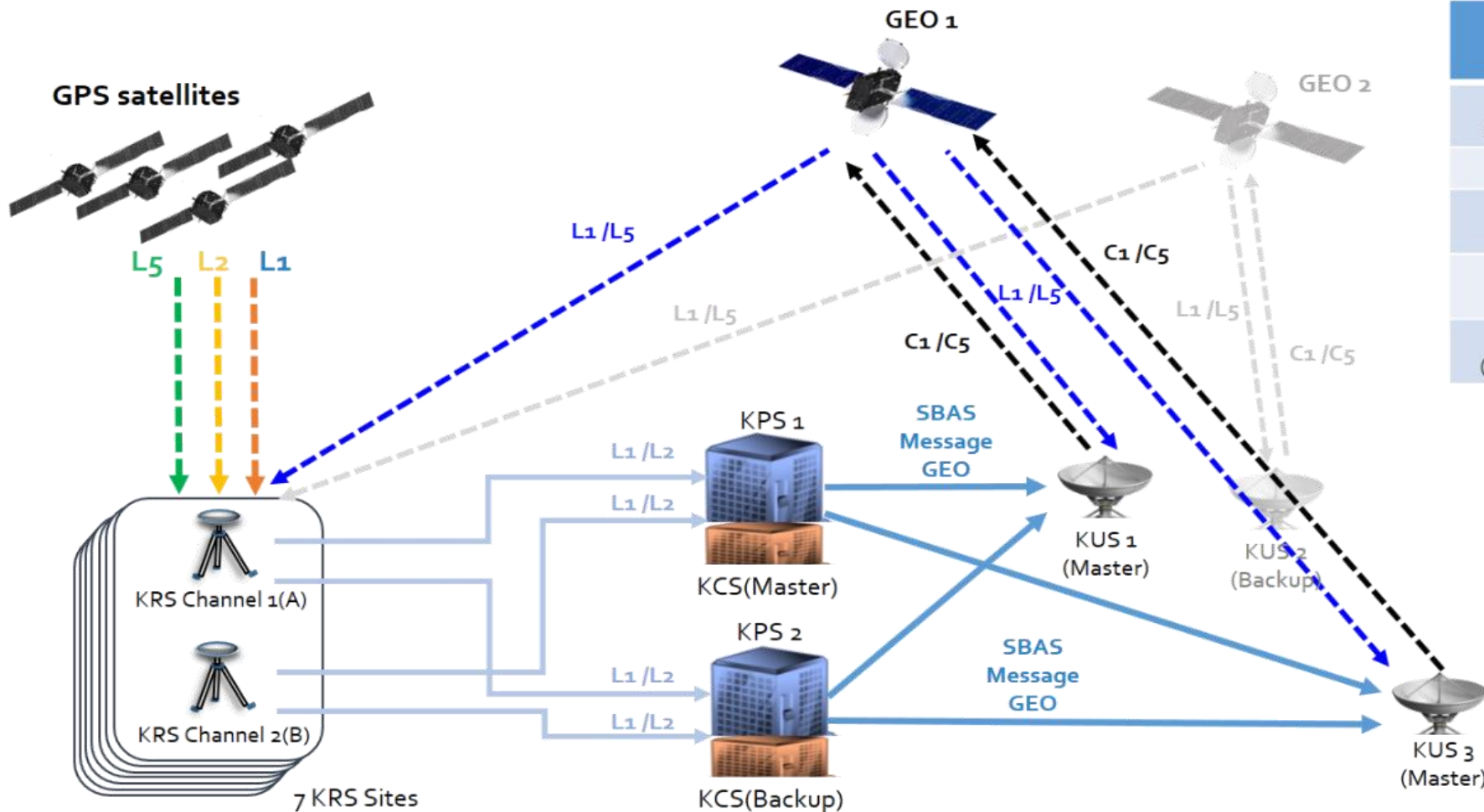
※ APV(APproach with Vertical guidance), CAT(CATegory), DH(Decision Height), SoL (Safety of Life)



Current status of the KASS(Korea Augmentation Satellite System)



KASS Architecture



S/S (Sub System)	Qty. (Baseline)
KRS (KASS Reference Station)	7
GEOs	2(1)
KUS (KASS Uplink Station)	3
KCS (KASS Control Station)	2
KPS (KASS Processing Station)	2



Current status of the KASS(Korea Augmentation Satellite System)



KASS System Deployment



KRS : KASS Reference Station

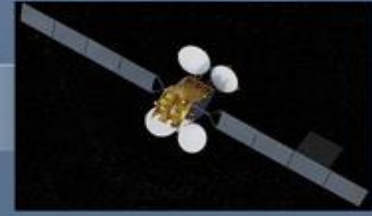


KUS : KASS Uplink Station

- : KRS
- : KPS, KCS
- : KUS
- : GEO Satellite

KPS : KASS Processing Station
KCS : KASS Control Station

GEO Satellite SBAS Message Broadcasting (2)



MEASAT-3d (91.5° East)



Launch Vehicle : Ariane-5ECA



KASS Performance



Performance Analysis using KASS KRS real raw measurements

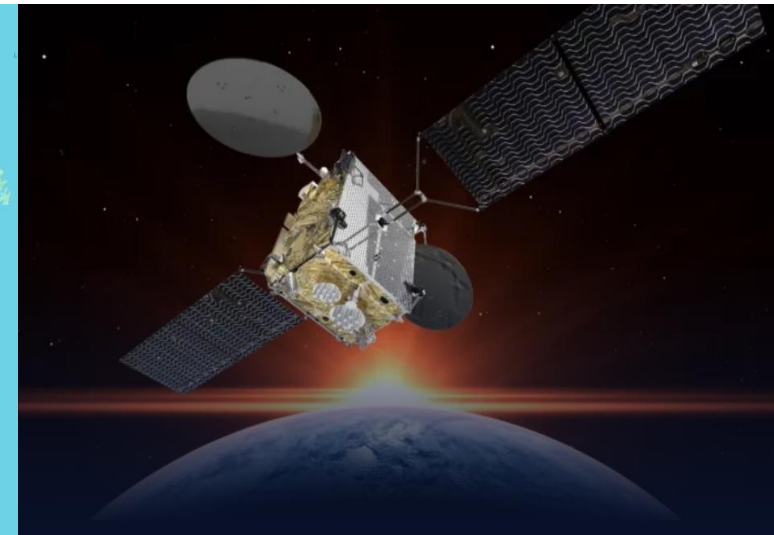
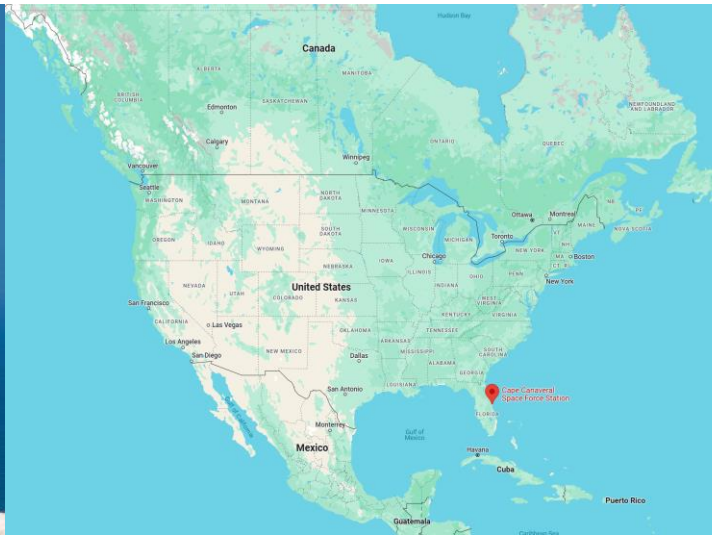
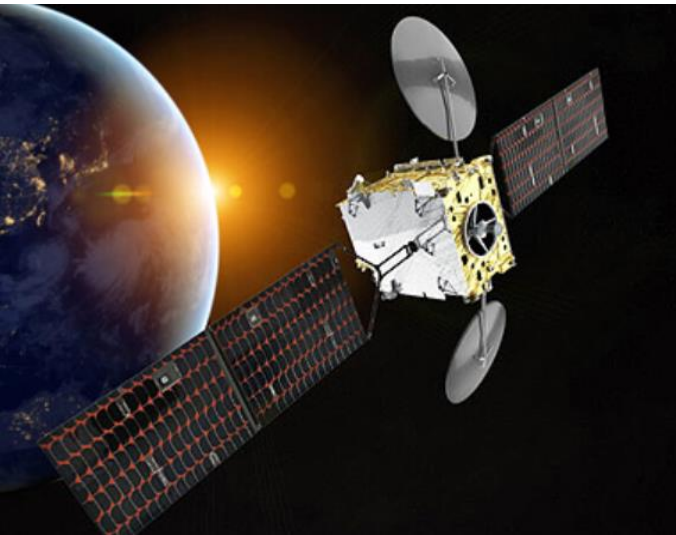
- Status : mono GEO satellite
- Period : 1st April, 2024 ~ 30th April, 2024
- Data Analysis through archived KRS data

KRS	Accuracy		Integrity (# of MI/HMI)		Availability (99%)	Continuity (8X1E12-06/15s)
	Horizontal (16m)	Vertical (20m)	Horizontal (0)	Vertical (0)		
YJV	1.1462	2.4498	0	0	99.5727	6.491E-04
YDN	1.5173	2.4755	0	0	99.1992	11.468E-04
JJA	1.5473	2.5579	0	0	98.0024	20.255E-04
JJT	1.6259	2.6213	0	0	97.9083	19.466E-04
GWL	1.3345	2.3815	0	0	98.6753	17.289E-04
DDL	1.5801	2.5387	0	0	99.3872	8.751E-04
YYA	1.0781	2.2350	0	0	99.5788	7.494E-04
Avr.	1.40	2.46	0	0	98.9034	1.303E-03



Launch of the KASS 2nd Satellite

- Date: October, 2024
- Vehicle: SpaceX (Falcon 9 block 5)
- Launch Location: Cape Canaveral, FL, USA
- GEO Location : 116°E
- Lifespan: 15 years



The background features a deep blue space scene with a view of Earth from orbit. Several satellites with solar panels are visible against the starry sky. At the bottom, a futuristic interface is overlaid on the Earth, showing a globe with glowing blue lines and two circular icons: one with a car and another with a ship.

THANK YOU!

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