

KOREA'S AEROSPACE INDUSTRY

1. Key Concepts

2. Overviews

3. Major Programs — Fixed Wing

4. Major Programs — Rotary Wing

5. Major Programs — Space

6. Korean Aerospace Companies

※ 이 자료는 내부 참고자료용으로 활용하시고, 대외 배포는 가급적 자제하여 주시기 바랍니다.

Key Concepts

➤ Growing Aviation Market

- Ranks 13th in the World for Passenger Traffic
- Ranks 6th in the World for Freight Traffic

➤ Defense-Driven Technology

- Strong Air Defense Force with 500+ Military Aircraft
- Only the 12th Country to Develop its Own Supersonic A/C (T-50 Advanced Trainer)

➤ Grand Vision

- To be the HUB of Emerging Far East Region
- Through International Collaboration and New Commercial Business & Exports

Korean Aerospace VISION has been materialized through the development roadmap to 2020, on the firm basis of a growing aviation MARKET and high TECHNOLOGY.

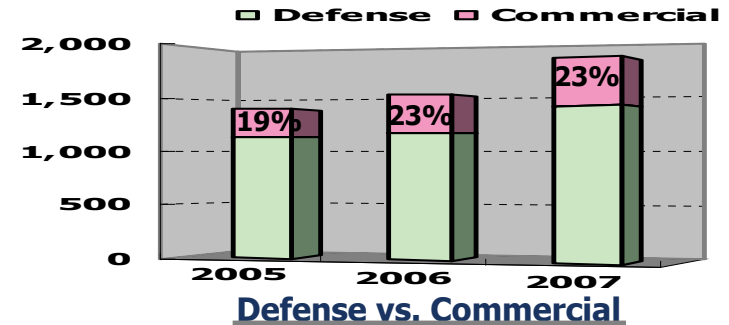
Now, the key-concept is...

"PARTNERSHIP" or "International Collaboration" for the Future.

- Technological Collaboration for Future Programs
- Strategic Partnership including Marketing & Customer Support.

Overview (Revenues)

- Revenue increased at an average annual rate of 7.2% for the past 3 years.
 - 70% from domestic and 30% from export market
- Commercial business under 25% of total revenue



- 80% of entire production is for military demands, mostly for domestic consumptions
- Completed aircraft for munitions and engine-related parts account for 70% of entire revenue. Fuselage-related components and partial materials account for 30%.
- Production of Avionics-related components and high-achievement of actual exports are urgent.

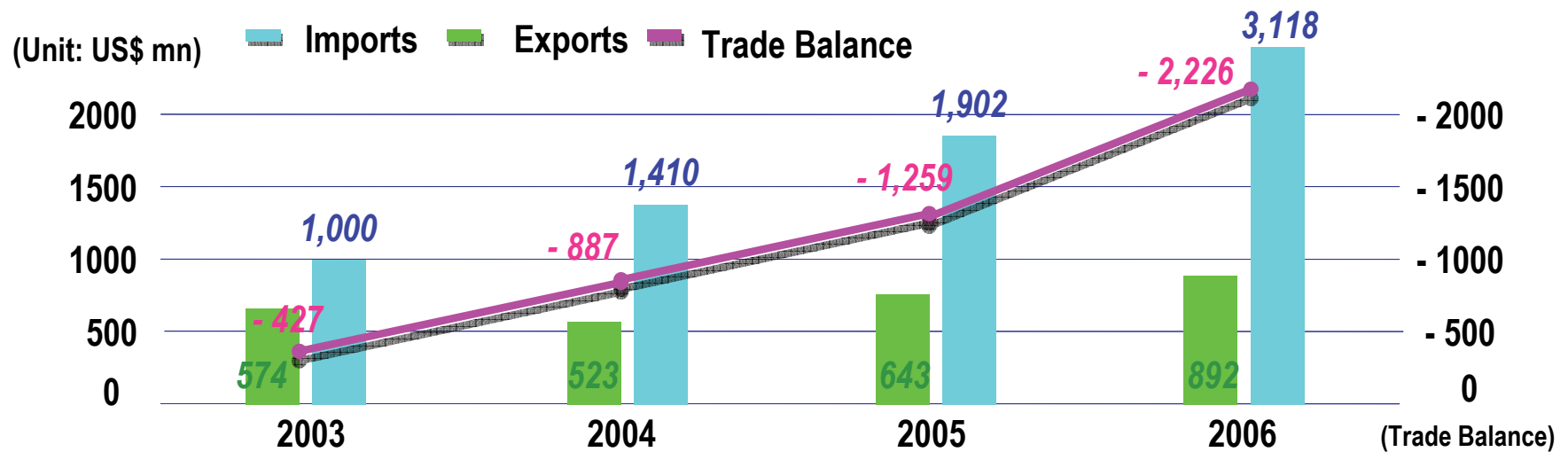
<Revenue Breakdown>

(Unit: US\$ mil.)

		2004	2005	2006	2007
AVIATION	FINISHED PRODUCTS	518	577	637	679
	AIRFRAMES (FUSELAGES)	235	261	317	388
	ENGINES	287	64	405	517
	AVIONICS	37	38	51	84
	MACHINERY	53	74	71	83
	MATERIALS	3	3	3	2
SUB TOTAL		1,163	1,347	1,484	1,753
SPACE	Projectiles	11	4	5	3
	Satellites	13	47	26	80
SUB TOTAL		24	51	31	83
TOTAL		1,187	1,398	1,515	1,836

Overview (Exports & Imports)

- Korean Aerospace Industry depends on imports of a major components (engines, etc.) to manufacture completed aircraft. This results in constant balance-of-trade deficit.
- Advanced technology of partial material and positive participation in international joint development projects to promote exports are required to redress trade balance.



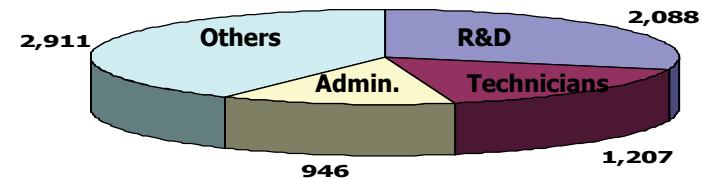
		2003		2004		2005		2006	
		Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Aviation	Finished products	174	307	50	570	12	933	102	2,039
	Components	393	677	464	799	619	956	731	1,016
Space		7	16	9	41	12	13	59	63
Total		574	1,000	523	1,410	643	1,902	892	3,118

Actual exports are based on custom clearance basis (MTI)

Overview (Companies and Locations)

- 40+ companies producing aircraft & aerospace components
- High quality human resources of over 7,000 persons — 12% with M.A./Ph.D degrees

Total Human Resources (Persons, as of 2006)



Major Locations

INCHEON INT'L AIRPORT NORTHEAST ASIA AVIATION CENTER

- AREA: 420 acres
- PROFESSIONAL MRO SERVICE AREA
- * INCHEON INT'L AIRPORT: SERVED BY MORE THAN 65 INT'L CARRIERS

DAEDOCK RESEARCH COMPLEX

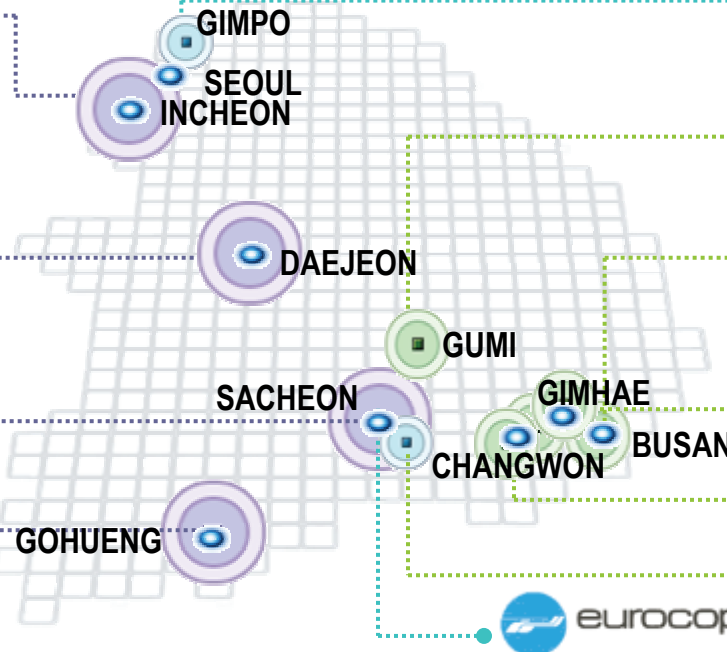
- KOREA AEROSPACE RESEARCH INSTITUTE
- AGENCY FOR DEFENSE DEVELOPMENT
- KOREA INSTITUTE OF MACHINERY&MATERIALS
- KOREAN AIR:
KOREA INSTITUTE OF AEROSPACE TECHNOLOGY

JINSA INDUSTRIAL COMPLEX

- GYEONGNAM AVIATION CLUSTER
- FOREIGN INVESTMENT ZONE (120 acres)
- CURRENT TENANTS: KAI
- RENTAL FEE: U\$400/1 acres

NARO SPACE CENTER

- Area: 1,234 acres
- Launch site, Launch Control facility,
Launcher & Satellite Assembly/Test facility etc.



WASHINGTON
TIMES AVIATION

LIG 넥스원
FACTORY

KOREAN AIR
FACTORY

WIA
HQ & FACTORY

SAMSUNG
TECHWIN
HQ & FACTORY

KAI KOREA AEROSPACE
INDUSTRIES, LTD.
HQ & FACTORY

eurocopter

Major Programs (Evolution)

1980

1990

2000

Fixed Wing

F-5



License Production

KF-16



KT-1, T-50



Indigenous Development

Rotary Wing

UH-60



License Production

SB427



Co-development

KHP



UAV

Night Intruder



Development

Smart UAV



Production

Major Programs – Fixed Wing

T-50/A-50 (Golden Eagle)



- ❖ **Advanced Trainer & Light Attack Aircraft for ROK Air Force & International Market**
- ❖ **KAI / LM Aero Co-Development Program**
- ❖ **Milestone**
 - Full Scale Development 1997-2005
 - Production 2003-
 - #1 A/C Delivery Dec. 2005
- ❖ **Upgrade to A-50 Light Attack Version Commences in 2007**
 - APG-67 Radar, Bombs/Missiles
 - RWR, CMDS, Night Attack Capability
- ❖ **Export Sales Forecast: 800 a/c till 2030**

KT-1/KO-1 (Woong Bee)



- ❖ **Basic Trainer & Forward Air Control Aircraft for ROK Air Force & International Market**
- ❖ **KAI Indigenous Development Program**
- ❖ **Milestone**
 - KT-1 Development 1988-1998
 - KT-1 Production (85A/C) 1999-2004
 - KO-1 Production 2003-
- ❖ **Upgrade to KT-1C Advanced Version**
 - Enhanced Avionics & Weapon System
- ❖ **Export Sales Forecast: 200 a/c for 10 years**
 - 12 KT-1 a/c Ordered by Indonesian Air Force
 - 55 KT-1C a/c Ordered by Turkish Air Force

Major Programs – Fixed Wing

Night Intruder 300 (UAV)



❖ **Reconnaissance Tactical Unmanned Aircraft**

- Aerial Surveillance, Reconnaissance, Target Acquisition, Bombing Guidance Missions (night/day use)

❖ **KAI Indigenous Development Program**

❖ **Milestone**

- Development 1991-2000
- Production 2001-2005

❖ **Future Upgrade or New Development of Medium Altitude Long Endurance UAV**

- EO/SAR Capability
(Electro-Optic/Synthetic Aperture Radar)

Civil Aircraft Programs



Firefly

Smart UAV

❖ **Small, High-speed Cruise & VTOL UAV with Smart Technologies as Fully Autonomous Flight**

❖ **KARI Indigenous Development Program**

❖ **Milestone**

- Advanced UAV Development 2002-2009
- Smart UAV Development 2009-2012

Major Programs – Fixed Wing

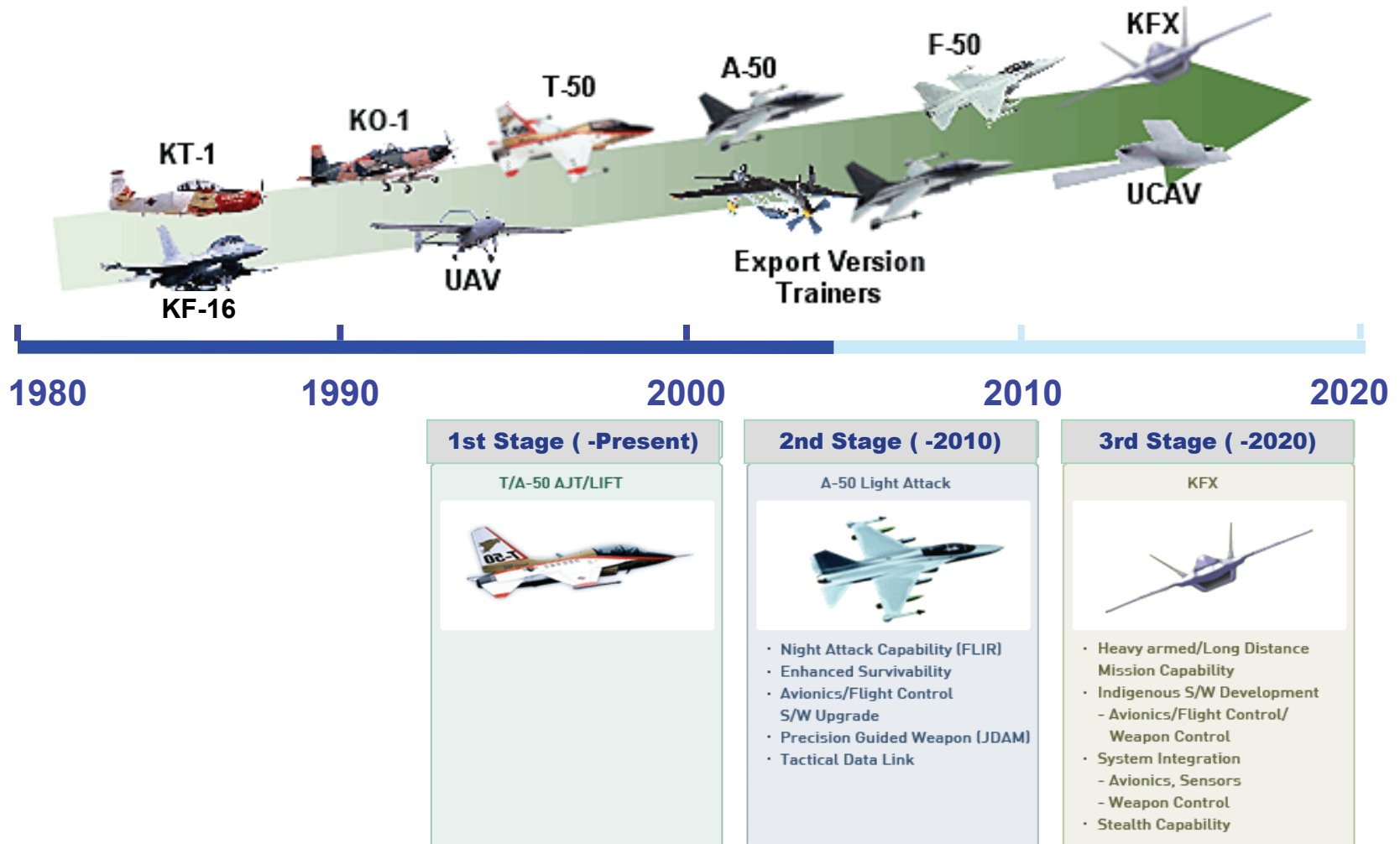
Aero Structure



- ❖ **Supplying Various Fuselage & Wing Packages to the World-Leading Aerospace Companies**
 - Boeing, Airbus, Bombardier, Lockheed Martin, Vought, others
- ❖ **Growing into One of the Most Competitive Partners for International Joint Development Business such as Risk-Sharing Participation in Next-generation Airliner Programs**

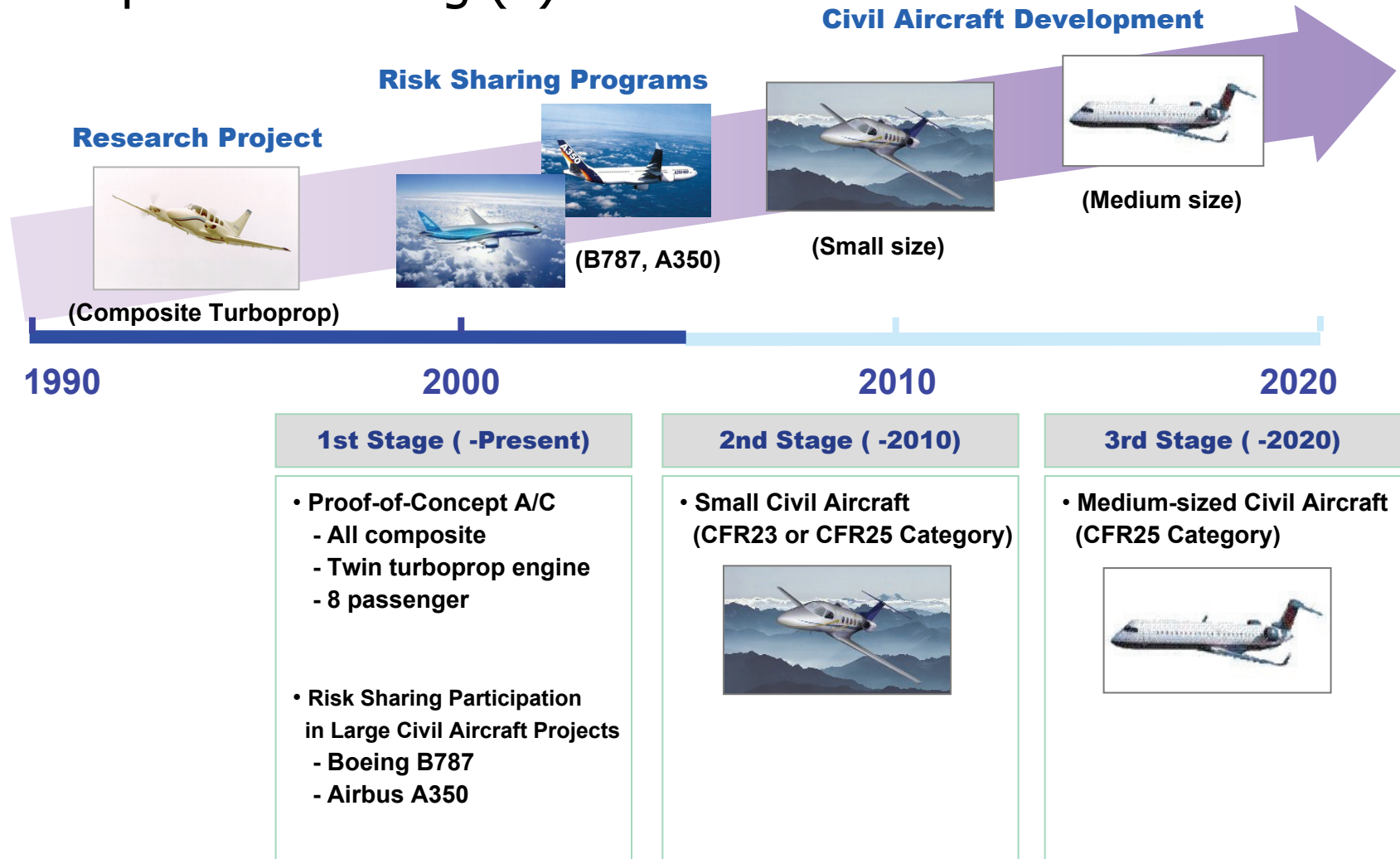
Major Programs – Fixed Wing

Roadmap – Fixed Wing (1)



Major Programs – Fixed Wing

Roadmap – Fixed Wing (2)



Major Programs – Rotary Wing

Korean Helicopter Program



Preliminary Design
Review Completed

❖ Utility Helicopter for ROK Army

- To replace UH-1H, 500MD for Tactical Air Assault, Transportation, Command Control Missions

❖ KAI Indigenous Development Program

❖ Milestone

- | | |
|----------------------|------------|
| • Development Launch | June. 2006 |
| • First Flight | 2010 |
| • Production | 2011- |

429 Helicopter



❖ Light Multi-Purpose Helicopter

❖ KAI / Bell Co-Development Program

- KAI is Responsible for Development & Production of Fuselage, and has the Exclusive Rights of Helicopter Sales & Production in Korea and China

❖ Milestone

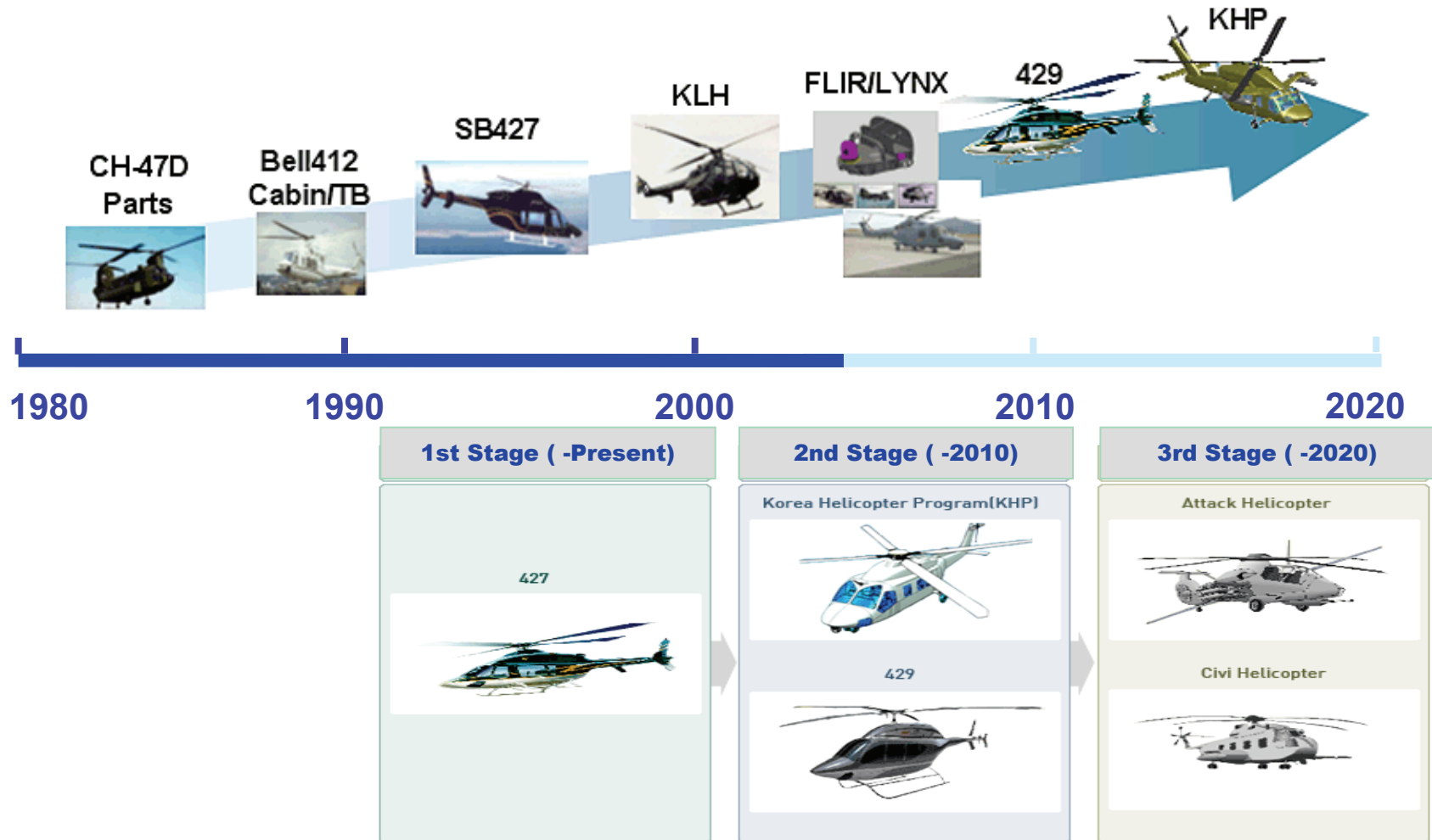
- | | |
|----------------------|-----------|
| • Development Launch | Feb. 2005 |
| • Certification | 2007 |

➤ Sales Forecast: 700 a/c for 10 years

- Around 200 a/c Ordered

Major Programs – Rotary Wing

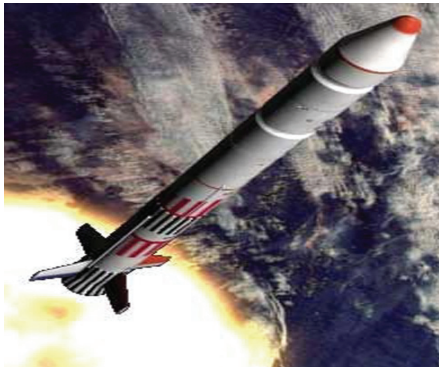
Roadmap – Rotary Wing



Major Programs – Space

Space Programs

◆ Launch Vehicles



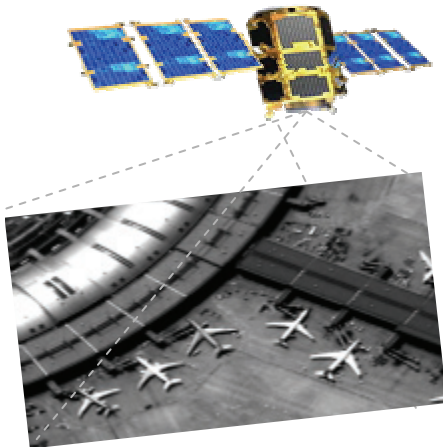
❖ Korean Satellite Launch Vehicle (KSLV)

- KSLV-I (2007): Small Class with Payload of 100kg
- KSLV-II (2015): Medium Class with Payload of 1.5t

❖ Korean Multi-purpose Satellite (Arirang Sat.)

- KOMPSAT-V (2008): SAR Capability
for All Weather Observation
- Seven (7) KOMPSAT will be Launched by 2015

◆ Satellites

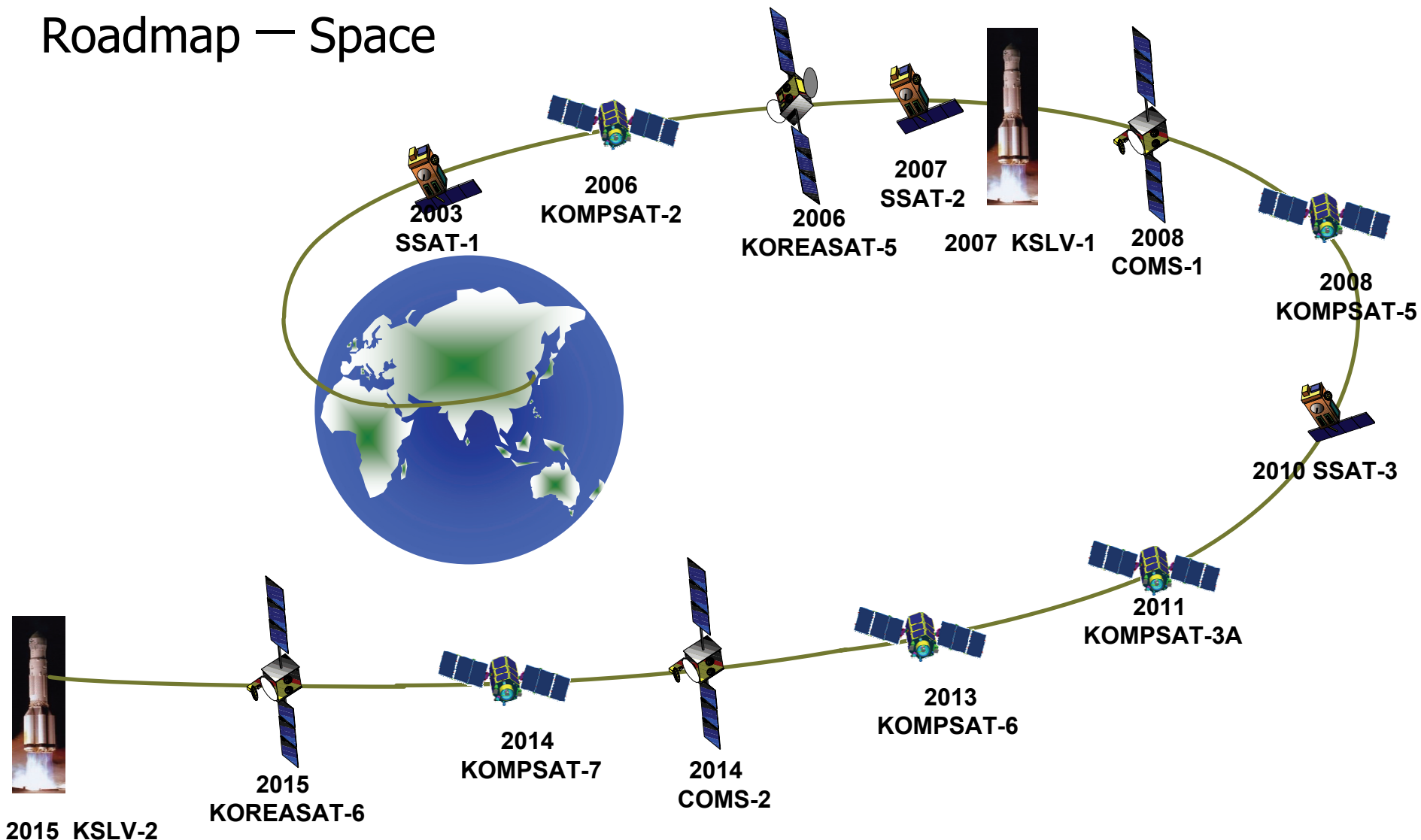


❖ Communication, Ocean & Meteorology Satellite

- COMS-1 (2008) : Observation & Meteorology
- Two (2) COMS' will be Launched by 2015

Major Programs – Space

Roadmap — Space



Korean Aerospace Companies

No.	Company	Head Office(Zip)	Product	Employee	Sales (\$Mn)
1	Korea Aerospace Industries, Ltd.	Planning Dept. 17F, Mung-ji Bldg., Seosomundong, Jung-gu, Seoul, Korea (100-737) yseok@korea-aero.com	KF-16, KT-1, T-50, UAV, Aircraft performance improvement, KMH, KLH, SB427, Multipurpose Satellite	2,724	741.7
2	Samsung Techwin Co., Ltd.	647-9, Yeoksam-dong, Gangnam-gu, Seoul, Korea (135-080) jh80.you@samsung.com	Aircrafts engine consolidation, Engine part, Turbine machinery, Light applied material	4,498	3,020
3	Korean Air	Planning Dept. 8F B Korean Air Bldg., 1370 Gonghang-dong, Gangseo-gu, Seoul, Korea (157-712) selbep@koreanair.co.kr	Modification/Improvement, B717 Aircraft's nose, A330/340 and ERJ-170/190 Body structure, KT-1 Mid and Rear part, B737/747/777 Wings part, Army aircraft consolidation/Repair	14,743	8,503
4	Nex1Future	Prudential Tower 11-12F, 838 Yoksam-dong, Gangnam-gu, Seoul, Korea (135-983) hswee2@nex1.co.kr	Electronic equipment, HUD(Head Up Display), Mission control computer, Electronic control computer	1,175	465
5	Hanhwa Corporation	Aerospace Division 24F, Hanwha Bldg., Janggyo-dong, Jung-gu, Seoul, Korea (100-797) sklee67@hanwha.co.kr	Aircraft's hydraulic parts, Fuel system, Flight control part.	2,796	2,414
6	STX Engine Co., Ltd	418 Changduk-ri, Gusung-eup, Yongin-si, Gyeonggi-do, Korea (449-915) jinwoo0311@hanmail.net	Navigator and marine search radar, Antenna, Remote control plane, Radar indicator, Sound detect equipment, Target detect system, Wireless communication system, Combat system, SI.	875	916
7	Seojin Instech Co., Ltd.	317-18, Seongsu2-ga 3-dong, Seongdong-gu, Seoul, Korea (133-835) sbcho@seojin.biz	Aircraft part (electric generator), Automatic control system	56	8.1
8	Korea Bell Helicopter Co.	4F Hanjong Bldg., 1460-10 Seocho1-dong, Seocho-gu, Seoul, Korea (137-071) management@kbhc.co.kr	Window consolidation, repair, and modification	120	13.5
9	Samsung Thales Co., Ltd.	Planning Dept. 17-10F, Daechi Bldg., 889-11, Daechi4-dong, Gangnam-gu, Seoul, Korea (135-284) Hyunku.ryu@samsung.com	Photoelectron communication equipment, Electronic communication, Guided arm, Photoelectron, Combat system for ship, Shooting control system	1,302	486
10	Wia Corporation	Aerospace Dept. 8F Hansol Bldg., Yeoksam1-dong, Gangnam-gu, Seoul, Korea (135-983) liszt513@wia.co.kr	Aircraft part, Landing gear	1,887	2,729
11	Aerospace Technology of Korea Inc.	422 Wolseong-ri, Sanam-myeon, Sacheon-si, Gyeongsangnam-do, Korea (664-942) webmaster@astk.co.kr	Aircraft stringer, Body structure parts	100	4.3

Korean Aerospace Companies

\$1=950원

No.	Company	Head Office(Zip)	Product	Employee	Sales (\$Mn)
12	Soosung Airframe Ltd.	578-20 Sinsan-ri, Sanin-myun, Haman-guum, Kyungnam, Korea (637-840) wjjung1@emk21.com	Aircraft body part, Machinery manufacturing part	100	0.03
13	Kyongju Aerospace Electrical Systems Co., Ltd.	1792 Seoul Gangnam P.O.Box, Gangnam-gu, Seoul, Korea (135-617) dscho@kaes.biz	Aircraft part (Electric generator, pump, motor)	33	2.8
14	Korea Lost-Wax Co., Ltd.	101, 4-ga, Jeongwang-dong, Siheung-si, Gyeonggi-do, Korea (429-450) jbpark@lostwax.co.kr	Gas turbine engine, Blade, Vane	202	18.1
15	Hankuk Fiber	50-11, 7F, Noksan Bldg., Yonggang-dong, Mapo-gu, Seoul, Korea (121-875) hfg2aero@fiber-x.com	Helicopter fairing, Wing tip, Engine cover, Body structure, Canopy	865	134
16	Bowon Light Metal Co., Ltd.	397-2, Donghwa-ri, Bongdam-eup, Hwaseong-si, Gyeonggi-do, Korea (445-893) yjh6006@hanmail.net	Aluminum extrusion, Drawing material	72	22
17	Chunji Co.	Chunji Bldg.809, Yeoksam1-dong, Gangnam-gu, Seoul, Korea (135-931) hqshin@chunji.co.kr	Impeller, Housing, Gear box, Supporting part, Cradle wheel	186	0.4
18	Oriental Co.,Inc	209-4, Yangjae-dong, Seocho-gu, Seoul, Korea (137-130) oricom@chollian.net	Aircraft compound material, Helicopter part, Camouflage support, Multiple rocket, Private bulletproof equipment	130	
19	Satrec Initiative	461-26 Jeonmin-dong, Yuseong-gu, Daejeon, Korea (305-811) iimkee@satreci.com	Small remote-sensing satellite and part, UAV communication/control system, Optic camera, Satellite image receiver system, High-speed data storage	44	9.3
20	Yeonhab Precision Co.,Ltd.	242-1,Sosa-ri,Mokcheon-eup, Cheonan-si, Chungcheongnam-do, Korea (330-844) dywon@yeonhab.co.kr www.yeonhab.com	Wire Harness and Cable assembly, Connector	261	
21	Rotem Company	Defense system Dept. 4F 837-36 Yeoksam-Dong, Gangnam-Gu, Seoul, 135-080, Korea (135-937) 247664@mail.rotem.to	Liquid-propelled rocket engine/Ground combustion application system/Turbine pump/reproduce cooling system/launcher, construction tower, Launching site	3,810	1,647
22	Firstec Co., Ltd.	456-8, Nae-dong, Changwon-si, Gyeongsangnam-do, Korea (641-050) sonkyse@hanmail.net	Wiring harness, engine hydraulic system and Altitude control system, other application equipment	71	14.6

Korean Aerospace Companies

\$1=950원

No.	Company	Head Office(Zip)	Product	Employee	Sales (\$Mn)
23	Tong Myung Heavy Industries Co.,Ltd	456-3, Nae-dong, Changwon-si, Gyeongsangnam-do, Korea (641-050) seoulms@tongmyung.co.kr	Hydraulic power control system, Controller, Servo test stand and hydraulic part for aircraft, ship	49	12.4
24	Doowon Heavy Industries Co.,Ltd.	DuWon Bldg., Sinsa-dong, Gangnam-gu, Seoul, Korea (135-746) wyki57@hanmail.net	Rocket gas, Satellite heat control part	333	158
25	Shinyoung Heavy Industries Co.,Ltd	Room 902, Dongwoo International Bldg., 13-4, Yoido-Dong, Youngdungpo-Gu, Seoul, Korea skshin@syhico.com	Rocket launcher, Thermal vacuum chamber, stratosphere airship, Space center material	116	22
26	ASA Co., Ltd.	202, Gueok-ri, Jewon-myeon, Geumsan-gun, Chungcheongnam-do, Korea (312-821) kimkyoon@hanmail.net	Aluminum wheels for vehicle, Aluminum and Titanium forged product	222	137.6
27	Dongseo Mechatronics Co., Ltd.	7-4, Jukgok-ri, Jinyeong-eup, Gimhae-si, Gyeongsangnam-do, Korea (621-801) yholee@dongseomecha.co.kr	Ground arms part for K1, M-series tank and Self-propelled gun, Aircraft part	53	11.3
28	Dong Jin Electric & Machinery Co., Ltd.	422, SangChun-Ri, Samnam-Myeon, Ulju-Gun, Ulsan, Korea (689-814) mjs9105@djelec.co.kr	Electric generator, Starter, Pump, Motor, Air blower, Hydraulic equipment	40	5.8
29	Sam Heung Precision Co., Ltd.	63-4 Ungnam-dong, Changwon-si, Gyeongsangnam-do, Korea (641-290) sh43197@hanmail.net	Aircraft body consolidation, Part and Measure equipment, CNC Machine tools part		
30	Ypelec Co., Ltd.	41-20, Paryong-dong, Changwon-si, Gyeongsangnam-do, Korea (641-847) ypekyn@ypelec.co.kr	Hydraulic Power Control system, Controller, Servo test stand and main hydraulic part for aircraft and ship		
31	Hansung ILS Co., Ltd.	20, Sinchon-dong, Changwon-si, Gyeongsangnam-do, Korea (641-370) purple@hsils.co.kr	ILS element development, Aircraft part		
32	Navicom Col., Ltd.	2F, Chungmyung Towntel, 1021-4, Yeongtong-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea (443-813) yangs29@navicom.co.kr	GPS receiver, GPS vision synchronization system for CDMA base station	52	2.3
33	Cana Airport Ind.,Inc.	201-503#, Buchun Technomart, 192 Yakdae-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, Korea (420-831) master@cana.co.kr	Plant, Special vehicle and special cargo for fuel	10	3.8