

# Data Information of Aircraft & Space

## Product models of Aircraft and Engine (As of end-Dec. 2010)

### <1> Aircraft

#### ◇ Indigenous Development and Production

First Delivery Year	Model	Application	Development & Manufacture	No. of Aircraft
1953	KAL-1/-2	Piston liaison	KHI	4
1954	KAT	Piston trainer	KHI	2
1956	LM-1	Piston liaison	FHI	27
1958	KM-2	Piston trainer	FHI	66
1960	T-1	Intermediate jet trainer	FHI	66
1962	KH-4	General-purpose helicopter	KHI	203
1965	YS-11	Turboprop transport	NAMCO	182
1966	MU-2	Business turboprop	MHI	765
1967	FA-200	Piston light plane	FHI	299
1968	PS-1	Turboprop antisubmarine patrol	SMIC	23
1969	P-2J	Turboprop antisubmarine	KHI	83
1970	C-1	Jet transport	Dev.: NAMCO, Mfg.: KHI	31
1971	T-2	Supersonic jet trainer	MHI	96
1974	US-1	Turboprop rescue amphibian	SMIC	20
1975	FA-300	Business piston	FHI	47
1977	F-1	Jet support fighter	MHI	77
1977	T-3	Primary piston trainer	FHI	50
1980	MU-300	Business jet	MHI	103
1985	T-4	Intermediate jet trainer	KHI	212
1988	T-5	Primary turboprop trainer	FHI	47
1997	OH-1	Observation helicopter	KHI	30
1999	MH2000	Multi-purpose helicopter	MHI	7
2002	T-7	Primary turboprop trainer	FHI	49

#### ◇ Production under Technical License

First Delivery Year	Model	Application	Development & Manufacture	No. of Aircraft	
1953	Bell 47	Small general-purpose helicopter	Bell	KHI	236
1954	B-45 (T-34)	Single-engined propeller trainer	Beech Aircraft	FHI	162
1955	F-86F	Jet fighter	North American	MHI	300
1955	T-33A	Jet trainer	Lockheed	KHI	210
1957	L-19	Single-engined propeller liaison	Cessna	FHI	22
1958	S-55 (H-19)	Large general-purpose helicopter	Sikorsky	MHI	46
1959	P2V-7	Large antisubmarine patrol	Lockheed	KHI	48
1961	F-104J	Jet fighter	Lockheed	MHI	230
1962	V-107	Large general-purpose helicopter	Boeing Helicopters	KHI	160
1962	S-62	Medium general-purpose helicopter	Sikorsky	MHI	27
1963	Bell 204B (HU-1B)	Medium general-purpose helicopter	Bell	FHI	127
1964	S-61 (HSS-2)	Large general-purpose helicopter	Sikorsky	MHI	184
1968	Hughes 369 (OH-6)	Small general-purpose helicopter	McDonnell Douglas	KHI	387
1972	F-4EJ	Jet fighter	McDonnell Douglas	MHI	140
1973	UH-1H	Medium-size general-purpose helicopter	Bell	FHI	133
1981	F-15J/DJ	Jet fighter	McDonnell Douglas	MHI	199
1982	P-3C	Large antisubmarine patrol	Lockheed	KHI	98
1983	AH-1S	Medium-size antitank helicopter	Bell	FHI	89
1986	CH-47J/JA	Large general-purpose helicopter	Boeing Helicopters	KHI	86
1991	SH/UH-60J & SH-60K	Large antisubmarine helicopter / general-purpose helicopter	Sikorsky	MHI	214
1993	UH-1J	Medium-size general-purpose helicopter	Bell	FHI	122
2006	MCH-101	Minesweeping and heavy-lift helicopter	AgustaWestland	KHI	5
2006	AH-64D	Battle helicopter	Boeing	FHI	9

### ◇Co-Development and Production

First Delivery Year	Model	Application	Development & Manufacture	No. of Aircraft
1982	YX/767	Jet transport	Dev.: CTDC -Boeing, Alenia Mfg.: MHI, KHI, FHI -Boeing, ARTL	994
1982	BK117	Multi-purpose turbine helicopter	KHI - Eurocopter Deutsche	848
1994	777	Jet transport	Dev.: JADC-Boeing Mfg.: MHI, KHI, FHI -Boeing	910
1995	XF-2	Jet support fighter	MHI/Lockheed Martin	4
1995	205B	Multi-purpose helicopter	FHI/Bell	2
2000	F-2	Jet support fighter	MHI/Lockheed Martin	87
2010*	787	Jet transport	Dev.: JADC-Boeing Mfg.: MHI, KHI, FHI -Boeing	-

\* : to be scheduled

## <2> Engine

### ◇Indigenous Development and Production

First Delivery Year	Model	Application	Development & Manufacture	No. of Engines
1962	J3	Turbo jet engine	T-1B P-2J NJE	247
1965	JR100/J200/J220	Lift engine	R&D IHI	6
1973	FJR710	Turbofan engine	STOL (*) IHI, KHI, MHI	15
1975	XF3	ditto	XT-4 IHI	30
1987	F3	ditto	T-4 IHI	559
1992	XTS1	Turboshaft engine	XOH-1 MHI	30
1999	MG5-100	Gasturbine engine	MHI	14
1999	TS1	Turboshaft engine	OH-1 MHI	82

(\*) : Research Aircraft

### ◇Production under Technical License

First Delivery Year	Model	Application	Licensor & Licensee	No. of Engines
1961	J79-11	Turbojet	GE	IHI (*1) 600
1962	T58-10	Turboshaft	GE	IHI (*2) 800
1966	T64-10	Turboprop	GE	IHI 391
1967	T63	Turboshaft	Allison	MHI 217
	KT53-11A	ditto	Honeywell	KHI (*3) 634
1969	T58-140	ditto	GE	IHI (*2)
	J79-17	Turbojet	GE	IHI (*1)
1970	TF40 (Adour)	Turbofan	RR-Turbomeca	IHI 426
1971	JT8D-9	ditto	P&W (UTC)	MHI 72
1972	T53-K-13B	Turboshaft	Honeywell	KHI (*3)
1979	F100-100	Turbofan	P&W (UTC)	IHI 447
	T56-14	Turboprop	Allison	IHI 483
1982	T53-K-703	Turboshaft	Honeywell	KHI (*3)
1984	T55-K-712	ditto	Honeywell	KHI 206
1988	T700-401C	ditto	GE	IHI 621
1999	F110-129	Turbofan	GE	IHI 110
2005	RTM322	Turboshaft	RR-Turbomeca	KHI 21

◇Co-Development and Production

Model	Application	Development & Manufacture
CF34-8/-10	Turbofan engine	JAEC(IHI, KHI) -GE
GEnx *	ditto	IHI, MHI -GE
GE90	ditto	IHI -GE
HF118/HF120 *	ditto	Honda/GE
JT8D-200	ditto	MHI-P&W
PW4000	ditto	KHI,MKHI -P&W
PW6000	ditto	MHI -P&W
RB211-524	ditto	IHI, KHI -RR
Trent 500	ditto	IHI, KHI -RR
Trent 700/800	ditto	IHI, KHI -RR
Trent 1000 *	ditto	KHI, MHI -RR
Trent XWB *	ditto	KHI, MHI -RR
V2500	ditto	JAEC(IHI, KHI, MHI) -P&W, RR, MTU, FIAT
XJB/RJ500	ditto (for R&D)	IHI,KHI,MHI -RR

\* : under development

- (Remarks)
- CTDC : Civil Transport Development Corporation
  - FHI : Fuji Heavy Industries Ltd.
  - JADC : Japan Aircraft Development Corporation
  - JAEC : Japanese Aero Engines Corporation
  - KHI : Kawasaki Heavy Industries, Ltd.
  - MHI : Mitsubishi Heavy Industries, Ltd.
  - NAMCO : Nihon Airplane Manufacturing Company
  - NJE : Nippon Jet Engine Co., Ltd.
  - SMIC : ShinMaywa Industries, Ltd.

## Launch Records of Main Satellites in Japan (As of end-Jan, 2010)

Year	Satellite	Mission	Rocket
1970	(Osumi)	Japan's first artificial Satellite	L-4S
1971	MS-T1 (Tansei)	Experimental Satellite	"
	MS-F2 (Shinsei)	Solar system Observation Satellite	"
1972	REXS (Denpa)	"	"
1974	MS-T2 (Tansei-2)	Experimental Satellite	M-3C
1975	SRATS (Taiyo)	Solar X-ray Observation Satellite	"
	ETS-I (Kiku)	Experimental Satellite	N-I
1976	ISS (Ume)	Ionosphere Sounding Satellite	"
1977	MS-T3 (Tansei-3)	Experimental Satellite	M-3H
	ETS-II (Kiku-2)	Experimental Satellite	N-I
1978	EXOS-A (Kyokko)	Aurora and Space Plasma Observation Satellite	M-3H
	EXOS-B (Jikiken)	"	"
	ISS-b (Ume-2)	Ionosphere Sounding Satellite	N-I
1979	CORSA-b (Hakucho)	X-ray Astronomy Satellite	M-3C
1980	MS-T4 (Tansei-4)	Experimental Satellite	M-3S
1981	ASTRO-A (Hinotori)	Solar X-ray Observation Satellite	"
	ETS-IV (Kiku-3)	Experimental Satellite	N-II
	GMS-2 (Himawari-2)	Geostationary Weather Satellite	"
1982	ETS-III (Kiku-4)	Experimental Satellite	N-I
1983	ASTRO-B (Tenma)	X-ray Astronomy Satellite	M-3S
	CS-2a (Sakura-2a)	Communications Satellite	N-II
	CS-2b (Skura-2b)	Communications Satellite	"
1984	EXOS-C (Ohzora)	Atmospheric Observation Satellite	M-3S
	BS-2a (Yuri-2a)	Broadcast Satellite	N-II
	GMS-3 (Himawari-3)	Geostationary Weather Satellite	"
1985	MS-T5 (Sakigake)	Halley's Comet Observation Satellite	M-3S II
	PLANET-A (Suisei)	Halley's Comet Explorer	"
1986	EGS (Aijisai)	Experimental Geodetic Satellite	H-I
	MABES	Magnetic Bearing Flywheel Experimental System	"
	BS-2b (Yuri-2b)	Broadcast Satellite	N-II
	JAS-1 (Fuji)	Satellite for Amateur Radio	H-I
1987	ASTRO-C (Ginga)	X-ray Astronomy Satellite	M-3S II
	ETS-V (Kiku-5)	Experimental Satellite	H-I
	MOS-1 (Momo-1)	Marine Observation Satellite	N-II
1988	CS-3a (Sakura-3a)	Stationary Communications Satellite	H-I
	CS-3b (Skura-3b)	Stationary Communications Satellite	"
1989	EXOS-D (Akebono)	Aurora Observation Satellite	M-3S II
	GMS-4 (Himawari-4)	Geostationary Weather Satellite	H-I
1990	MUSES-A (Hiten)	Lunar Explorer	M-3S II
	Lunar Orbiter (Hagoromo)	Lunar Orbiter	"
	DEBUT (Orizuru)	Deployable Boom & Umbrella Test Satellite	H-I
	MOS-1b (Momo-1b)	Marine Observation Satellite	"
	JAS-1b (Fuji-1b)	Satellite for Amateur Radio	"
	BS-3a (Yuri-3a)	Broadcast Satellite	"
1991	SOLAR-A (Yohkoh)	Solar Observation Satellite	M-3S II
	BS-3b (Yuri-3b)	Broadcast Satellite	H-I
1992	JERS-1 (Fuyo-1)	Earth Resources Satellite	"
1993	ASTRO-D (Asuka)	X-ray Astronomy Satellite	M-3S II
1994	VEP (Myojo)	Vehicle Evaluation Payload	H-II
	OREX (Ryusei)	Orbital Re-entry Experiment	"
	ETS-VI (Kiku-6)	Experimental satellites	"
1995	SFU	Space Experimental Satellite	H-II
	GMS-5 (Himawari-5)	Geostationary Weather Satellite	"
1996	ADEOS (Midori)	Advanced Earth Observing Satellite	"
	JAS-2 (Fuji-3)	Satellite for Amateur Radio	"
1997	MUSES-B (Halca)	Radio-Astronomical Satellite	M-V
	ETS-VII (Orihime/Hikoboshi)	Engineering Test Satellite	H-II
1998	PLANET-B (Nozomi)	Mars Explorer	M-V
	COMETS (Kakehashi)	Communications and Broadcasting Engineering Test Satellite	H-II
2001	LRE (VEP-2)	Laser Ranging Equipment	H-IIA
2002	USERS	Next Generation of Unmanned Space Experiment Recovery System	"
	MDS-1 (Tsubasa)	Mission Demonstration test Satellite	"
	DRTS (Kodama)	Data Relay Test Satellite	"
	ADEOS-II (Midori-II)	Advanced Earth Observing Satellite	"
2003	MUSES-C (Hayabusa)	Asteroid Explorer	M-V
2005	ASTRO-EII (Suzaku)	X-ray Astronomy Satellite	"
	MTSAT-1R (Himawari-6)	Multi-Transport Satellite	H-IIA
2006	ALOS (Daichi)	Advanced Land Observing Satellite	"
	MTSAT-2 (Himawari-7)	Multi-Transport Satellite	"
	ASTRO-F (Akari)	Infrared Imaging Satellite	M-V
	SOLAR-B (Hinode)	Solar Observation Satellite	"
	ETS-VIII (Kiku-8)	Engineering Test Satellite	H-IIA
2007	SELENE (Kaguya)	SELenological and ENgineering Explorer	"
2008	WINDS (Kizuna)	Wideband InterNetworking engineering test and Demonstration Satellite	"
2009	GOSAT (Ibuki)	Greenhouse gas Observation SATellite	"
2010	PLANET-C (Akatsuki)	Venus Explorer	"
	IKAROS	Solar Sail Test	"
	OZSS (Michibiki)	Quasi-Zenith Satellite	"

## Planned Satellite Launch Programs (As of end-Jan, 2009)

### ◇Scientific Satellites

Satellite	Weight (approx.)	Orbit	Launch by	Schedule (fiscal year)
ASTRO-G (Radio-Astronomical Satellite)	910 kg	1,000 to 25,000 km (elliptical orbit)	H-IIA	2012
ASTRO-H (X-ray Astronomy Satellite)	2,400 kg	550km (circular orbit)	H-IIA	2013

### ◇Application and Engineering Test Satellites

Satellite	Weight (approx.)	Orbit	Launch by	Schedule (fiscal year)
GCOM-W1 (Global Change Observation Mission 1st - Water)	1,800 kg	sun-synchronous sub-recurrent orbit	H-IIA	2011
GCOM-C1 (Global Change Observation Mission 1st – Climate)	1,800 kg	sun-synchronous sub-recurrent orbit	H-IIA	2012~
ALOS-2 (Advanced Land Observing Satellite-2)	2,000 kg	628km/ sun-synchronous sub-recurrent orbit	H-IIA	2013
GPM (Global Precipitation Measurement)	TBD	400km/ non-sunsynchronous	H-IIA	2013

## Major Launch Vehicles in Japan

Specification		H-IIA (Standard)	H-IIB (Heavy Lift)
Length		53 m	57 m
Diameter		4.0 m	5.2 m
Engine	1 <sup>st</sup> stage	Liquid (LOX/LH2)	Liquid (LOX/LH2) x 2
	2 <sup>nd</sup> stage	Liquid (LOX/LH2)	Liquid (LOX/LH2)
Gross Weight		289 t	531 t
LEO Launch Capability (Low earth orbit)		10 t	
SSO Launch Capability (Sun synchronous orbit)		3.6 t (Summer) 4.4 t (Other Seasons)	
GTO Launch Capability (Geostationary transfer orbit)		4.0 t	8.0 t