

Air Launched Satellite Attempts

Jonathan McDowell, Dec 2016

Date	Depart time	Launch UTC	Depart Site	RW	Carry vehicle	Launch Vehicle	Launch point, alt	Payload
1958 Jul 25			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Diagnostic
1958 Aug 12			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Diagnostic
1958 Aug 22			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Diagnostic
1958 Aug 25			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Radiation
1958 Aug 26			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Radiation
1958 Aug 28			China Lake		F4D-1 745	NOTS	34.0N 120.0W 12.5km	NOTS Radiation
1990 Apr 5	1803	1910:17	Edwards	RW04/22	NB-52 008	Pegasus F01	36.0N 123.0W 13.2km	Pegsat
1991 Jul 17	1625	1733:53	Edwards	RW22	NB-52 008	Pegasus F02	36.0N 123.0W 13.1km	Microsat/HAPS
1993 Feb 9	1317	1430	Kennedy	RW15/33	NB-52 008	Pegasus F03	29.0N 79.0W 13.3km	SCD-1
1993 Apr 25	1244	1356	Edwards	RW04/22	NB-52 008	Pegasus F04	36.0N 123.0W 13.3km	Alexis
1994 May 12	1550?	(1703?)	Edwards	RW04/22	NB-52 008	Pegasus F05	36.0N 123.0W 13.4km	STEP 2/HAPS
1994 May 19	1549	1703	Edwards	RW04/22	NB-52 008	Pegasus F05	36.0N 123.0W 13.4km	STEP 2/HAPS
1994 Jun 23	2017?	(2115?)	Vandenberg	RW30/12	L-1011	Pegasus XL F06	36.0N 123.0W 11.9km	STEP 1
1994 Jun 27	2017?	2115	Vandenberg	RW30/12	L-1011	Pegasus XL F06	36.0N 123.0W 11.9km	STEP 1
1994 Aug 3	1325	1438	Edwards	RW04/22	NB-52 008	Pegasus F07	36.0N 123.0W 12 km?	APEX
1995 Apr 3	1250?	1348	Vandenberg	RW30/12	L-1011	Pegasus F08	36.0N 123.0W 12 km?	Orbcomm
1995 Jun 22	1900	1958	Vandenberg	RW30/12	L-1011	Pegasus XL F09	36.0N 123.0W 12 km?	STEP 3
1996 Mar 9	0038	0133	Vandenberg	RW30/12	L-1011	Pegasus XL F10	36.0N 123.0W 12 km?	REX 2
1996 May 17	0346?	0244	Vandenberg	RW30/12	L-1011	Pegasus F11	36.0N 123.0W 12 km?	MSTI 3
1996 Jul 2	0650?	0748	Vandenberg	RW30/12	L-1011	Pegasus XL F12	36.0N 123.0W 11.6km	TOMS
1996 Aug 18	0850?	(0935)	Vandenberg	RW30/12	L-1011	Pegasus XL F13	36.0N 123.0W 12 km?	FAST
1996 Aug 21	0850	0947:26	Vandenberg	RW30/12	L-1011	Pegasus XL F13	36.0N 123.0W 12 km?	FAST
1996 Oct 30	1610?	(1709)	Wallops	RW04/22?	L-1011	Pegasus XL F14	37.5N 74.5W 12 km?	SAC-B
1996 Nov 4	1610?	1708:56	Wallops	RW04/22?	L-1011	Pegasus XL F14	37.5N 74.5W 12 km?	SAC-B
1997 Apr 21	1101	1159	Gando	RW21L	L-1011	Pegasus XL F15	27.0N 15.33W 11.9km	Minisat
1997 Aug 1	1922?	2020	Vandenberg	RW30/12	L-1011	Pegasus XL F16	36.0N 123.0W 11.6km	Orbview 2
1997 Aug 29	1400	1502:22	Vandenberg	RW30/12	L-1011	Pegasus XL F17	36.0N 123.0W 12 km?	FORTE
1997 Oct 22	1215	1313	Wallops	RW04/22?	L-1011	Pegasus XL F18	37.72N 73.37W 12 km?	STEP 4
1997 Dec 23	1813	1911:42	Wallops	RW04/22?	L-1011	Pegasus XL F19	37.72N 73.37W 12 km	Orbcomm/HAPS
1998 Feb 26	0605	0707	Vandenberg	RW30	L-1011	Pegasus XL F20	36.0N 123.0W 11.9km	SNOE/TI
1998 Apr 2	0144	0242:39	Vandenberg	RW30/12	L-1011	Pegasus XL F21	36.0N 123.0W 12 km?	TRACE
1998 Aug 2	1525	1624	Wallops	RW04/22?	L-1011	Pegasus XL F22	37.72N 73.37W 12 km	Orbcomm/HAPS
1998 Sep 23	0410	0506	Wallops	RW04/22?	L-1011	Pegasus XL F23	37.72N 72.37W 12 km	Orbcomm/HAPS
1998 Oct 23	2305	0002	Canaveral	RW30/12	L-1011	Pegasus F24	29.0N 78.50W 11.9km	SCD-2
1998 Dec 3	0043	(0153)	Vandenberg	RW30/12	L-1011	Pegasus XL F25	36.0N 123.0W 12 km?	SWAS
1998 Dec 5	2358	0057:54	Vandenberg	RW30/12	L-1011	Pegasus XL F25	36.0N 123.0W 12 km?	SWAS

1999 Mar 1	0155	(0256)	Vandenber	RW30/12	L-1011	Pegasus XL F26	36.0N 123.0W	12 km?	WIRE	Abort T-45s
1999 Mar 5	0155	0256	Vandenber	RW30/12	L-1011	Pegasus XL F26	36.0N 123.0W	11.9 km	WIRE	
1999 May 18	0412	0509	Vandenber	RW30/12	L-1011	Pegasus XL F27	36.0N 123.0W	11.9 km	TERRIERS/MUBL.	
1999 Dec 4	1756	1854	Wallops	RW22	L-1011	Pegasus XL F28	37.72N 73.37W	12.2 km	Orbcomm/HAPS	
2000 Jun 7	1221	1319	Vandenber	RW30/12	L-1011	Pegasus XL F29	36.0N 123.0W	11.9 km	TSX-5	
2000 Oct 9	0440	0538	Kwajalein	RW06/24	L-1011	Pegasus F30	7.65N 167.70E	11.9 km	HETE-2	
2002 Feb 5	1929	2058	Canaveral	RW30/12	L-1011	Pegasus XL F31	28.0N 78.50W	11.9 km	HESSI	
2003 Jan 25	1917	2013:35	Canaveral	RW31	L-1011	Pegasus XL F32	29.0N 78.50W	11.86m	SORCE	
2003 Apr 28	1103	1200	Canaveral	RW30/12	L-1011	Pegasus XL F33	28.0N 78.50W	11.9km?	GALEX	
2003 Jun 26	1757	1853	Vandenber	RW30/12	L-1011	Pegasus XL F34	36.0N 123.0W	? 11.9km	OV-3	
2003 Aug 13	0113	0209	Vandenber	RW30/12	L-1011	Pegasus XL F35	36.0N 123.0W	? 11.9 km	Scisat-1	
2005 Apr 15	1627	1726	Vandenber	RW30/12	L-1011	Pegasus XL F36	36.0N 123.0W	? 11.9 km	DART	
2006 Mar 14	1327	(1428)	Vandenber	RW30/12	L-1011	Pegasus XL F36	36.0N 123.0W	? 11.9 km	ST5	Abort
2006 Mar 22	1304	1403	Vandenber	RW30/12	L-1011	Pegasus XL F37	36.0N 123.0W	? 11.9 km	ST5	
2007 Apr 25	1928	2026	Vandenber	RW30/12	L-1011	Pegasus XL F38	36.0N 123.0W	? 11.9 km	AIM	
2008 Apr 16	1604	1702	Kwajalein	RW06/24	L-1011	Pegasus XL F39	10.52N 167.76E	12 km?	C/NOFS	
2008 Oct 19	1651	1747	Kwajalein	RW06/24	L-1011	Pegasus XL F40	10.50N 167.60E	12 km?	IBEX	
2012 Jun 13	1500	1600	Kwajalein	RW06/24	L-1011	Pegasus XL F41	6.74N 167.70E	12 km?	NuStar	
2013 Jun 28	0131	0227	Vandenber	RW30/12	L-1011	Pegasus XL F42	36.0N 123.0W	? 11.9 km	IRIS	
2016 Dec 12	1237	(1405)	Canaveral	RW13	L-1011	Pegasus XL F43	29.0N 78.50W	? 11.9 km	CYGNSS	Abort T-5min

0.1 Aircraft-Launched Suborbital Attempts

Rockoons not included here.

FFAR by NAOTS and U. Maryland; Rockaire Deacon by AFCRL. NASA's ALSOR from Edwards, and also one flight from Pt Mugu, probably in 1959-60 (Thompson's book says it was the year before Petersen's first X-15 flight; NOTS records indicate flights in support of them in Apr 1960). Model A payload was a 2.4m 0.5 kg Mylar balloon for falling-sphere meteo launched up to 240 km, plus a separable nose cone; Model B was a NOTS scanner payload launched for maximum range at elevation 38 deg.

USAF Jaguar was Recruit x 3 / Recruit / RTV motor, to study radiation belts.

Two F-15's were converted to support the ASAT ALMV program, I don't know which were on which flight. 76-086 and 77-084 appear to be the ones in question, although 76-083 may also be involved.

The SRAM test launches at ETR in the 1970s were carried out by B-52 and FB-111 airplanes in the vicinity of Grand Turk Island, to a nearby target. For the 1976 Dec 14 launches, the FB-111 took off from Plattsburg AFB, NY; the 1977 Apr 14 launch B-52 was from Ellsworth AFB, and the 1977 Dec 14 launch was from Barksdale AFB. These launches were within the atmosphere and are not included in my tables.

The two B-52s used by NASA were B-52A No. 003 and B-52B No. 008. A replacement B-52H, 61-0025, was loaned to NASA in 2001. The L-1011 Stargazer was an Air Canada plane converted at Marshall/Cambridge in 1992.

These listings do not include the piloted air-launched rockets, i.e. the X-15 and the lifting bodies, and Spaceship One and Two.

For a history of air launched rockets, see Keith Scala's article in Quest, Spring 1994, on which this section is partly based..

Table 2: ALBM and ASAT Firings

Date	Depart time	Launch	Depart Site	RW	Carry vehicle	Launch Vehicle	Launch point	Apogee
1958 May 26			CC		B-47	199-B Bold Orion	AMR 7.6km	7.9km
1958 Jun 27			CC		B-47	199-B Bold Orion	AMR 11.6km	12.2km
1958 Jul 18			CC		B-47	199-B Bold Orion	AMR	
1958 Sep 5			Eglin		B-58 55-660	199-C High Virgo	AMR 12.3 km	13 km
1958 Sep 25			CC		B-47	199-B Bold Orion	AMR	
1958 Oct 10			CC		B-47	199-B Bold Orion	AMR	
1958 Nov 17			CC		B-47	199-B Bold Orion	AMR	
1958 Dec 8			CC		B-47	199-B Bold Orion 2	AMR	
1958 Dec 16			CC		B-47	199-B Bold Orion 2	AMR	
1958 Dec 19			Eglin		B-58 55-660	199-C High Virgo	AMR 10.7 km	76 km
1959 Apr 4			CC		B-47	199-B Bold Orion 2	AMR	
1959 Jun 4			Eglin		B-58 55-660	199-C High Virgo	AMR	51 km
1959 Jun 9			CC		B-47	199-B Bold Orion	AMR	
1959 Jun 19			CC		B-47	199-B Bold Orion	AMR	
1959 Sep 22			Eglin		B-58 55-660	199-C High Virgo	AMR 11.4km	?
1959 Oct 13	0900		CC		B-47	199-B Bold Orion 2	AMR	
1962 Apr 19			CC?		B-52	Skybolt 20025	AMR 12.2	12 km
1962 Jun 29			CC?		B-52	Skybolt 20026	AMR	13 km?
1962 Sep 13			CC?		B-52	Skybolt 20027	AMR 12.2	
1962 Sep 25			CC?		B-52	Skybolt 20028	AMR 12.2	
1962 Nov 28			CC?		B-52	Skybolt 20031	AMR 12.2	12 km?
1962 Dec 22			CC?		B-52	Skybolt 20032	AMR	
1984 Jan 21			EAFB		F-15 76-086?	AMLV	WTR	
1984 Nov 13			EAFB		F-15 76-086?	AMLV	WTR	
1985 Sep 13			EAFB		F-15 77-084	AMLV	WTR 24km?	500 km
1986 Aug 22			EAFB		F-15 76-086?	AMLV	WTR	
1986 Sep 29	1045		EAFB		F-15 76-086?	AMLV	WTR	
1991 Jul 26			BALKH?		MiG-31D	Kontakt	BALKH	200?
1999 Mar 31	0015		KAU		C-130	SRALT Target	KAU 160.12W 22.78N 5.1 km	99 km
2000 Sep 14	0900		PALB		F-15D	Black Sparrow	Med. Sea	
2001 Aug 27			PALB		F-15D	Black Sparrow	Med. Sea	
2003 Dec 16			PALB		F-15D	Black Sparrow	Med. Sea	
2004 May 3	0406		KAU		C-17	LRALT Target	MID	
2005 Sep 26			KAU?		C-17	LRALT Target	MID2	
2005 Dec 2	0827?		PALB		F-15D	Black Sparrow	Med. Sea	
2007 Feb 11			PALB		F-15D	Black Sparrow	Med. Sea	

2007 Mar 6	0030	KAU	C-17	SRALT Target	KAU	100 km?
2008 Apr 15		PALB?	F-15D	Blue Sparrow	Medit.Sea	100?
2009 Jul 22	1945	EAFB?	C-17	LRALT Target/ CARAVAN	San Nic. I?	
2009 Dec 11		Hickam.?	C-17	SRALT Target	MID?	
2011 Jul 9	0204	EAFB?	C-17	SRALT Target	Pt Mugu	
2011 Oct 5	0556	KAU?	C-17	SRALT Target	KAU	
2011 Nov 15		Landes	F-15D	Black Sparrow	Landes	
2012 Feb 10	0900	PALB?	F-15D	Blue Sparrow	Medit.Sea	100?
2012 Oct 25?		Hickam.?	C-17	E-LRALT	N of Wake I?	
2013 Sep 5	0616	PALB?	F-15D	Silver Sparrow	Medit. Sea	
2013 Sep 10		Hickam.?	C-17	eMRBM	N of Wake I?	
2014 Sep 9		PALB?	F-15D	Blue Sparrow	Medit.Sea	100?
2014 Dec 16		PALB?	F-15D	Silver Sparrow	Medit.Sea	100?
2015 Jun 26		Hickam	C-17	IRBM-T1	SW of Hawaii	
2015 Oct 4		Hickam.?	C-17	eMRBM	SE of Wake I	
2015 Nov 1	0305	Hickam.?	C-17	SRALT	SE of Wake I	
2015 Nov 1	0309	Hickam.?	C-17	eMRBM	SE of Wake I, 177.4E 12.9N	
2015 Dec 10		Hickam	C-17	IRBM-T1	SW of Hawaii	
2015 Dec 10	0612	PALB?	F-15D	Silver Sparrow	Medit.Sea	100?
2016 Jan 28		Hickam	C-17	IRBM-T1	SW of Hawaii	

Table 3: Research Firings

Date	Depart time	Launch	Depart Site	RW	Carry vehicle	Launch Vehicle	Launch point	Apogee
1955 Aug 16			NAOTS Chincoteague		F2H2	Rockaite FFAR	Near WI 8.6km	0
1955 Aug 16			NAOTS Chincoteague		F2H2	Rockaite FFAR	Near WI 8.8km	55
1955 Aug 16			NAOTS Chincoteague		F2H2	Rockaite FFAR	Near WI 8.5km	0
1955 Nov			NAOTS Chincoteague		F2H2	Rockaite FFAR	Near WI 9.3km	50?
1955 Nov			NAOTS Chincoteague		F2H2	Rockaite FFAR	Near WI 9.0km	50?
1956 Dec 13			Holloman		F-86D	Rockaite Deacon	Holloman 11.9km	44
1956 Dec 14			Holloman		F-86D	Rockaite Deacon	Holloman 11.1km	42
1956 Dec 17			Holloman		F-86D	Rockaite Deacon	Holloman 12.2km	43
1956 Dec 19			Holloman		F-86D	Rockaite Deacon	Holloman 11.3km	45
1959?			Edwards		F-104 60-749	ALSOR Viper	Edwards	11.6 km
1959?			Edwards		F-104 60-749	ALSOR Viper	Edwards	11.9 km
1959?			Edwards		F-104 60-749	ALSOR Viper	Edwards	15.6 km
1959 Sep 14			Pt Mugu?		F-4D?	HPAG	Pt Mugu?	
1959 Oct 3			Pt Mugu?		F-4D?	HPAG	Pt Mugu?	
1959 Nov 14			Pt Mugu?		F-4D?	HPAG	Pt Mugu?	
1960 Mar 18			Pt Mugu?		F-4D	HPAG	Pt Mugu?	
1960 Apr 20			Pt Mugu		F-104 60-749	ALSOR Viper	Pt Mugu	8.7 km
1960 Apr 30			Pt Mugu		F-104 60-749	ALSOR Viper	Pt Mugu	10.4 km
1960 Jul 28			Pt Mugu?		F-4D-1	Caleb TV-1	PMR	
1960 Oct 24			Pt Mugu?		F-4D-1	Caleb TV-2	PMR	
1961			WSMR		B-57A	Jaguar	WSMR	
1961			WSMR		B-57A	Jaguar	WSMR	
1961 Oct 5		1910	Pt Mugu?		F-4H	Caleb NC17.116	PMR	
1962 Mar 26		1903	Pt Mugu?		F-4H	Caleb NC17.121	PMR	
1962 Jul 25		1541	Pt Mugu?		F-4H	Caleb NC17.117	PMR, 10.9 km	1167 km
1963					F-3H	SPAROAIR I		
1965 Jul 8			WSMR		F-4B	SPAROAIR III	WSMR	46
1966 Mar 28					F-4C	ALARR		
1966 May 26					F-4B	SPAROAIR III		
1966 Nov 16			WSMR?		F-4B	ALARR	WSMR	
2001 Jun 2	1930	2044	Edwards	04/22?	NB-52	Hyper X/X-43A	PMR??	7.4?
2004 Mar 27	2040	2200	Edwards	04/22?	NB-52	Hyper X/X-43A	PMR 33.4N 121.1W	29
2004 Nov 17	2130	2234	Edwards	04/22	NB-52	Hyper X/X-43A	PMR 33.2N 121.0W	33
2010 May 26		1710	Edwards	04/22	B-52H	X-51A	Pt Mugu?	
2011 Jun 13			Edwards	04/22	B-52H	X-51A	Pt Mugu?	
2012 Aug 14		1835	Edwards	04/22	B-52H	X-51A	Pt Mugu?	

2013 May 1	1755	Edwards	04/22	B-52H	X-51A	Pt Mugu?
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Note: NB-52 008 was retired on 2004 Dec 17.