

# 1 The X-15

The space flights of the suborbital X-15 rocketplane are discussed here.

1-4-9 landed on S Lakebed, prob. RW25.

Launch alt 13.7 km

Launch mass

FLT L/kg Land/kg 1-4-9 15150 6577 1-5- 15149 6577 1-22-37 14787 6577 2-43-75 16510 (with tanks) 2-45-81 23586 (full tanks); 17517 (empty tanks); 16538 (after eject); ejected tanks 978 kg; 7393 kg landing.

X-15-2 crashed at Mud Lake on 1962 Nov 9. The wreckage was delivered to EAFB on Nov 12 and to NAA/Inglewood Dec 7. The refurbished X-15A-2 was delivered to EAFB on 1964 Feb 18. An extra 0.74m section was added containing extra LH2 tankage. Extra H2O2 tanks were added in the aft, and LOX/NH3 drop tanks were added. LOX drop tank carries 3400 kg; NH3 tank carries 2724 kg. Longer landing gear was added to accommodate a ventral ramjet.

X-15-3 was flown to Eglin AFB on NB-52 003 on 1962 May 2, with a return via Altus AFB on 1962 May 5. These flights are the only known ones away from the standard range.

An NB-52-003/X-15-1 flight on 1968 Nov 21 was cancelled prior to takeoff; it would have observed the Minuteman launch on that day.

## 1.1 X-15 space flights

### 1.1.1 X-15-1 (1965-S554)

Flight 1-61-101 was piloted by Capt. Joseph Engle, USAF.

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1-61-101

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Date	Time	Event	Orbit
1965 Oct		1-A-100 abort	
1965 Oct 14	1954	NB52 takeoff from EAFB RW04/22	
	2047	X-15 launch	13.7 km over DDL
	2047	XLR-99 85s burn	
		81.3 km apogee	
	2055	Landed at Rogers Dry Lake (09:18)	

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#### Payload

Horizon scanner  
Atmospheric pressure sensor

### 1.1.2 X-15-1 (1968-S467)

Flight 1-79-139 was piloted by NASA's William Dana.

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1-79-139

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Date	Time	Event	Orbit
1968 Aug 21	1452	NB52 takeoff from RW04/22	
	1605	X-15 launched 13.7 km over Railroad Valley	
	1605	83s burn 81.6 km apogee	
	1614	Landed at Rogers Dry Lake (09:23)	

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#### Payload

WTR launch monitor experiment  
MIT/Apollo horizon scanner

### 1.1.3 X-15-3 (1962-S244)

X-15-3's first spaceflight was 3-7-14, flown by Maj. Robert White, USAF.

This was a demo of the MH-96 control system, with ventral on. Partial loss of cabin pressure in descent.

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3-7-14

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Date	Time	Event	Orbit
1962 Jul 10		Flight 3-A-11, launch aborted SRL due to B-52 problem	
1962 Jul 11		Flight 3-A-12, launch aborted SRL due to APU failure	
1962 Jul 16		Flight 3-A-13, launch aborted Delamar, MH-96 failure	
1962 Jul 17	1646	NB52 takeoff from RW04/22	
	1731:10	Launch 13.7 km over Delamar	
	1731:10	X-15 82s burn (engine 103)	
		95.9 km apogee	
	1741	Landed at Rogers DL (10:21)	
	1803	NB52 landed	

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### 1.1.4 X-15-3 (1963-S14)

NASA's Joseph Walker flew an 82 km flight in Jan 1963. Rotation to climb attitude was faster than planned, and the engine burned 5 seconds longer than planned, so apogee was 6 km higher than expected.

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3-14-24

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Date	Time	Event	Orbit
1963 Jan 17	1808	NB52 takeoff RW04/22	
	1859:37	Launch 13.7 km over Delamar	
	1859	87s burn (engine 109)	
	1903	APU-1 failed	
		82.2 km apogee	
	1908	Hydraulic pressure problem	
	1909:21	Landed at Rogers DL (09:24)	
	2008	NB52 landed	

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### 1.1.5 X-15-3 (1963-S304)

The next spaceflight was 3-20-31, flown by Maj. Robert A. Rushworth, USAF.

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3-20-31

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Date	Time	Event	Orbit
1963 Jun 27	1707	NB52 takeoff from EAFB	
	1756	Launch 13.7 km over Delamar 80s burn 86.9 km apogee	
	1807	Landed Rogers DL (10:28)	

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### 1.1.6 X-15-3 (1963-S344)

Joseph Walker, NASA, made his second spaceflight in Jul 1963 to 106.1 km. This was the first X-15 from Smith's Ranch, and included a towed balloon experiment from Project Mercury; the balloon failed, just as it did on the Mercury orbital flights.

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3-21-32

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Date	Time	Event	Orbit
1963 Jul 19	1719	NB52 takeoff RW04/22	
	1820	X-15 launch 13.7 km over Smith's Ranch Lake	
	1820	85s burn 106.1 km apogee	
	1831	Landed at Rogers DL (11:25)	

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#### Payload

Air drag balloon  
Horizon scanner  
IR and UV photometers

### 1.1.7 X-15-3 (1963-S401)

The 3-22-36 flight was nicknamed 'Little Joe the Second'. Joe Walker reached an apogee of 108.0 km, a record for a piloted winged vehicle until the Shuttle. The mission continued the 'ventral off reentry' tests, and carried a photometer and a Barnes spectrometer.

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3-22-36

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Date	Time	Event	Orbit
1963 Aug 6		3-A-33 abort	
1963 Aug 13		3-A-34 abort	
1963 Aug 15		3-A-35 abort	
1963 Aug 22	1709	NB-52 003 takeoff RW04/22	
	1806	Launch 13.7 km over Smith's Ranch Lake 86s burn 108.0 km apogee	
	1817	Landed Rogers DL (11:09)	

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### 1.1.8 X-15-3 (1965-S392)

Flight 3-44-67 saw Capt. Joe Engle, USAF take X-15-3 to 85.6 km in a test of a horizon scanner.

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3-44-67

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Date	Time	Event	Orbit
1965 Jun 29	1737	NB52 takeoff	
	1821	Launch 13.7 km over Delamar DL	
	1821	81s burn	
		85.6 km apogee	
	1832	Landed at Rogers DL (10:32)	

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#### Payload

Horizon scanner  
NSL radiometer  
Boundary layer noise microphones

### 1.1.9 X-15-3 (1965-S461)

Flight 3-46-70 was another flight by Engle with the horizon scanner. The yaw damper malfunctioned; Engle accidentally then put the system into control stick steering mode making the X-15 hard to control. Engle was criticized for not going to the alternate flight plan after the yaw damper failure which would have given an early pushover and a lower apogee.

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3-46-70

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Date	Time	Event	Orbit
1965 Aug 10	1828	NB52 takeoff	
	1924	Launch 13.7 km over Delamar	
	1924	82s burn 82.7 km apogee	
	1934	Landed at Rogers DL (09:52)	

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Payload

Horizon scanner

### 1.1.10 X-15-3 (1965-S519)

Flight 3-49-73 from Delamar to Rogers was piloted by John McKay, NASA.

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3-49-73

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Date	Time	Event	Orbit
1965 Sep 28	1724	NB52 takeoff	
	1808	Launch 13.7 km over Delamar	
	1808	81s burn	
	1820	90.1 km apogee Landed at Rogers DL (11:57)	

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#### Payload

Horizon scanner  
Boundary layer noise expt

### 1.1.11 X-15-3 (1966-S579)

Flight 3-56-83, flown by NASA's William Dana, carried a micrometeorite collector. At engine shutdown Dana's checklist came loose, with pages floating around the cabin in free fall.

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3-56-83

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Date	Time	Event	Orbit
1966 Nov 1	2022	NB52 takeoff	
	2124	Launch 13.7 km over Smith's Ranch	
	2124	83s burn 93.6 km apogee	
	2135	Landed at Rogers DL (10:44)	

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#### Payload

Micrometeorite collector  
Dual channel radiometer  
Tip pod accelerometer  
Density and pressure measurements

### 1.1.12 X-15-3 (1967-S496)

Flight 3-64-95 was piloted by Maj. William Knight, USAF.

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3-64-95

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Date	Time	Event	Orbit
1967 Oct 17	1543	NB52 takeoff	
	1640	Launch 13.7 km over Smith's Ranch Lake	
	1640	84s burn	
	1650	85.6 km apogee Landed at Rogers DL (10:06)	

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#### Payload

- Micrometeorite collector
- UV plume measurements
- Solar spectrograph
- Tip pod camera
- Tip pod accelerometer
- ARC boost guidance

### 1.1.13 X-15-3 (1967-S535)

Flight 3-A-96 was aborted just prior to launch from Delamar when the engine igniter start failed. Flight 3-65-97 was the last flight of the X-15-3. Maj. Michael Adams, USAF, flew the winged rocket to 81 km, but on the way down entered a spin and was killed when the craft disintegrated 4min 51s after launch. The debris impacted over a wide area 5 km northeast of Johannesburg, California.

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3-65-97

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Date	Time	Event	Orbit
1967 Oct 31		3-A-96 abort	
1967 Nov 15	1713	NB-52 takeoff RW04	
	1830	Launch 13.7 km over Delamar DL	
	1830	82s burn	
		81.1 km apogee	
		Entered spin at 70 km	
		Recovered from spin at 36 km	
		Entered pitch oscillation	
	1835	Disintegrated at 18 km (04:51)	
		Debris impacted	

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#### Payload

- UV plume measurements
- Micrometeorite collector
- Solar spectrograph
- Saturn V ablative material sample
- Wing tip bow shock detector