



**Federal Aviation
Administration**



Quarterly Launch Report 1st Quarter 2009

Featuring Launch Results from the 4th Quarter 2008 and
Forecasts for the 1st and 2nd Quarter 2009

Introduction

The *First Quarter 2009 Quarterly Launch Report* features launch results from the fourth quarter of 2008 (September - December 2008) and forecasts for the first quarter of 2009 (January - March 2009) and the second quarter of 2009 (April - June 2009). This report contains information on worldwide commercial, civil, and military orbital and commercial suborbital space launch events. Projected launches have been identified from open sources, including industry contacts, company manifests, periodicals, and government sources. Projected launches are subject to change.

This report highlights commercial launch activities, classifying commercial launches as one or both of the following:

- Internationally-competed launch events (i.e., launch opportunities considered available in principle to competitors in the international launch services market);
- Any launches licensed by the Office of Commercial Space Transportation of the Federal Aviation Administration (FAA) under 49 United States Code Subtitle IX, Chapter 701 (formerly the Commercial Space Launch Act).

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Cover photo courtesy of The Boeing Company Copyright © 2009. The Boeing Company, through its commercial launch business, launches the third Italian-built constellation of Small Satellites for Mediterranean basin Observation, or COSMO-SkyMed 3, satellite at 7:28 p.m. Pacific Time on Oct. 24, 2008. The Delta II vehicle was procured from United Launch Alliance. (Photo by William G. Hartenstein for Boeing)

Fourth Quarter 2008 Highlights

Richard Garriott Visits International Space Station

A Soyuz spacecraft launched on a Soyuz rocket on October 12 carrying a crew that included space tourist Richard Garriott, a computer game developer and son of former NASA astronaut Owen Garriott. During his mission, Garriott conducted educational outreach as well as scientific and environmental research. Through one of his experiments, scientists can begin to understand the molecular components of proteins that could facilitate the process of protein engineering and drug design. The experiment was assisted by twenty students from Huffman and Indian Springs High Schools in Alabama who helped set up the experiments during a workshop at the University of Alabama at Birmingham.

COSMO-Skymed 3 Launches

On October 24, an FAA-licensed ULA Delta II 7420, operated commercially by The Boeing Company, launched from Vandenberg Air Force Base and placed the COSMO-Skymed 3 satellite into orbit. This is the third spacecraft for Italy's Earth observing system, a constellation of radar satellites built for civil and military reconnaissance.

Armadillo Aerospace Wins Level One of the Northrop Grumman Lunar Lander Challenge

Armadillo Aerospace won first prize in Level One of the Northrop Grumman Lunar Lander Challenge on October 24. The Armadillo Aerospace Mod-1 vehicle was used to win the Challenge, which was held at the Las Cruces International Airport in New Mexico. Armadillo received \$350,000 in prize money from NASA's Centennial Challenges prize program. Awards for Level Two of the Challenge and second prize for Level One, together totalling \$1.65 million, are still open for competition.

Armadillo Aerospace and Rocket Racing Inc. Announce Partnership

Armadillo Aerospace and Rocket Racing Inc. announced a joint venture on October 24 to develop vertical takeoff and landing suborbital piloted vehicles. The state of New Mexico agreed to provide \$3 million to help the joint venture establish development and test facilities in Las Cruces, New Mexico.

Spaceport America Tax Vote Narrowly Rejected in Otero County, New Mexico

On November 4, voters in Otero County, New Mexico, which includes the city of Alamogordo, narrowly rejected a gross receipts tax increase that would have helped fund development of Spaceport America. However, Spaceport America's development will not be impacted by Otero County's vote. Sierra County's approval in April 2008 and Doña Ana County's approval in 2007 of similar taxes allowed the creation of a regional taxing district that will provide approximately \$49 million from Doña Ana and \$2.4 million from Sierra for construction of the spaceport.

Fourth Quarter 2008 Highlights

SpaceX Conducts Nine-Engine Test Firing

On November 22, SpaceX conducted a nine-engine “mission duty cycle” static test firing of the first stage of its Falcon 9 launch vehicle at its test facility in McGregor, Texas. The static test firing lasted for nearly three minutes, simulating the climb of the large rocket from Earth into orbit. During the test, two engines were shut off to validate the ability to shutoff engines without affecting the remaining seven engines. This engine out capability will allow the Falcon 9 to lose an engine and still be able to complete its mission without loss of crew or spacecraft.

XCOR Aerospace Announces First Lynx Operator

XCOR Aerospace announced its first customer for its Lynx vehicle on December 2. Danish investment banker Per Wimmer, will be the first spaceflight participant to fly on the Lynx vehicle. The ticket for the flight was sold by Phoenix, Arizona-based RocketShip Tours, who began selling tickets for \$95,000 per flight. The founder of RocketShip Tours, Jules Klar, is the founder of a high-end boutique operation specializing in luxury cruises and tours.

SpaceX Announces DragonLab Missions

SpaceX announced that it has added two missions to its manifest for DragonLab, a reusable free-flying laboratory developed by SpaceX for research and technology demonstration applications. The announcement was made on December 2 and followed a workshop held in November that introduced the DragonLab. The spacecraft is reusable and will be capable of hosting pressurized and unpressurized payloads and returning them to the Earth.

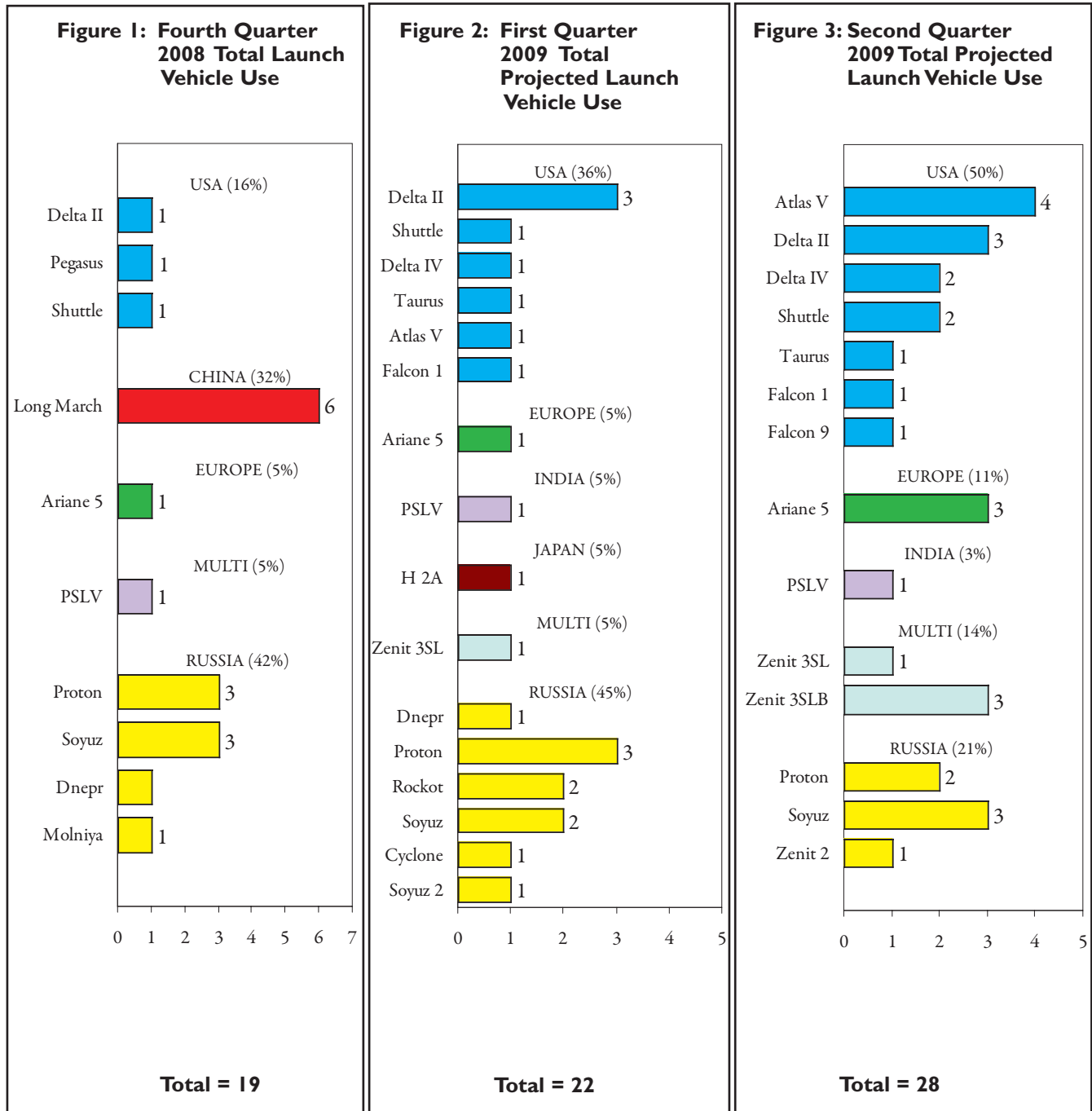
Spaceport America Receives Launch Site Operator License

The FAA issued to the New Mexico Spaceport Authority on December 15 a launch site operator license for Spaceport America. The license covers suborbital vertical launches from the planned facility. Spaceport America continues to work toward developing horizontal launch operations through 2009 and 2010. Spaceport America expects 2009 to show an increase in vertical launch activity. It plans to begin construction in 2009, with terminal and hangar facilities to be completed by late 2010.

NASA Awards ISS Commercial Resupply Services Contracts

NASA awarded ISS Commercial Resupply Services contracts on December 23 to Orbital Sciences Corporation and SpaceX. The contract with Orbital is for eight launches at a cost of \$1.9 billion, while the contract for SpaceX is for 12 launches at a cost of \$1.6 billion. The contracts are effective through 2016 and require delivery of a minimum of 20 metric tons of upmass cargo to the International Space Station.

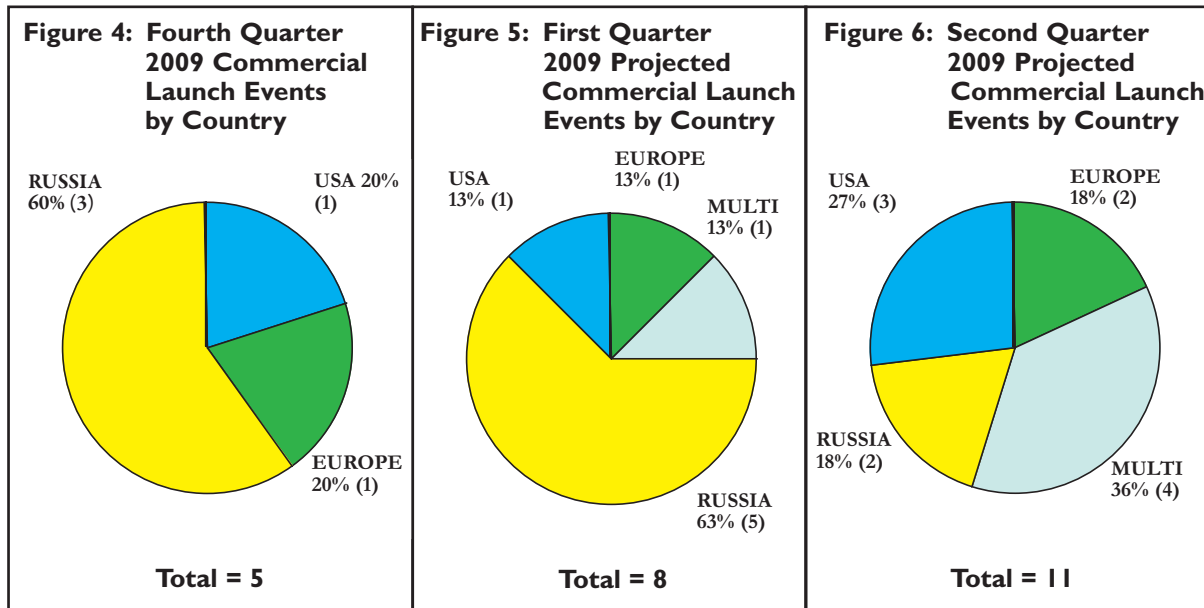
Vehicle Use (July 2008 – March 2009)



Figures 1-3 show the total number of orbital and commercial suborbital launches of each launch vehicle and the resulting market share that occurred in the fourth quarter of 2008. They also project this information for the first quarter of 2009 and second quarter of 2009. The launches are grouped by the country in which the primary vehicle manufacturer is based. Exceptions to this grouping are launches performed by Sea Launch, which are designated as multinational.

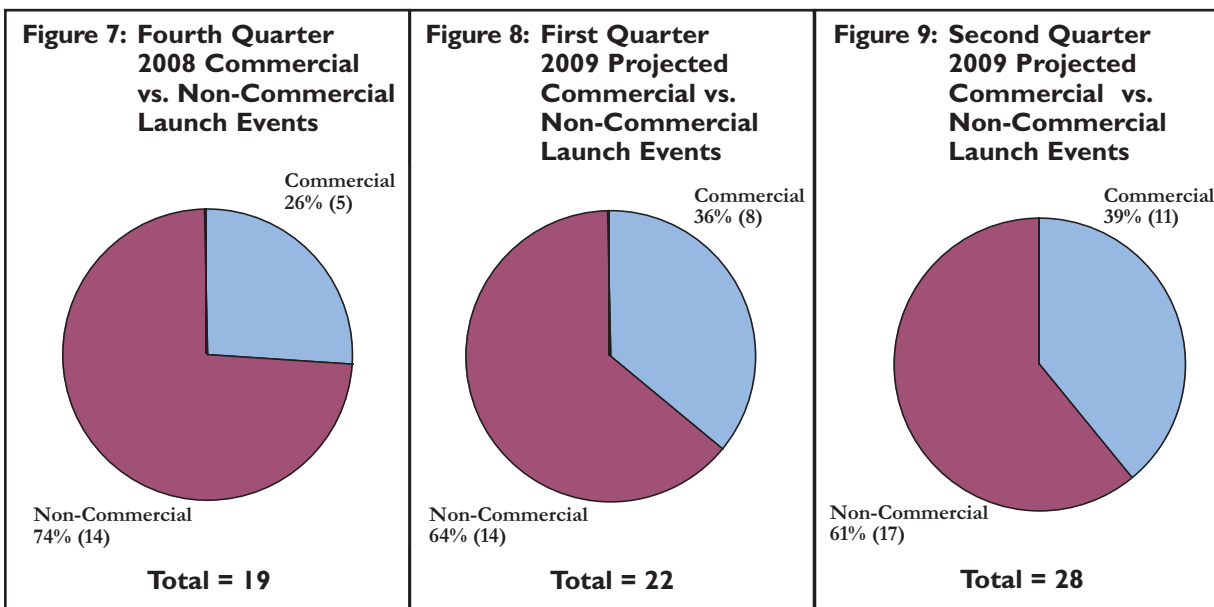
Note: Percentages for these and subsequent figures may not add up to 100 percent due to rounding of individual values.

Commercial Launch Events by Country (October 2008 – June 2009)



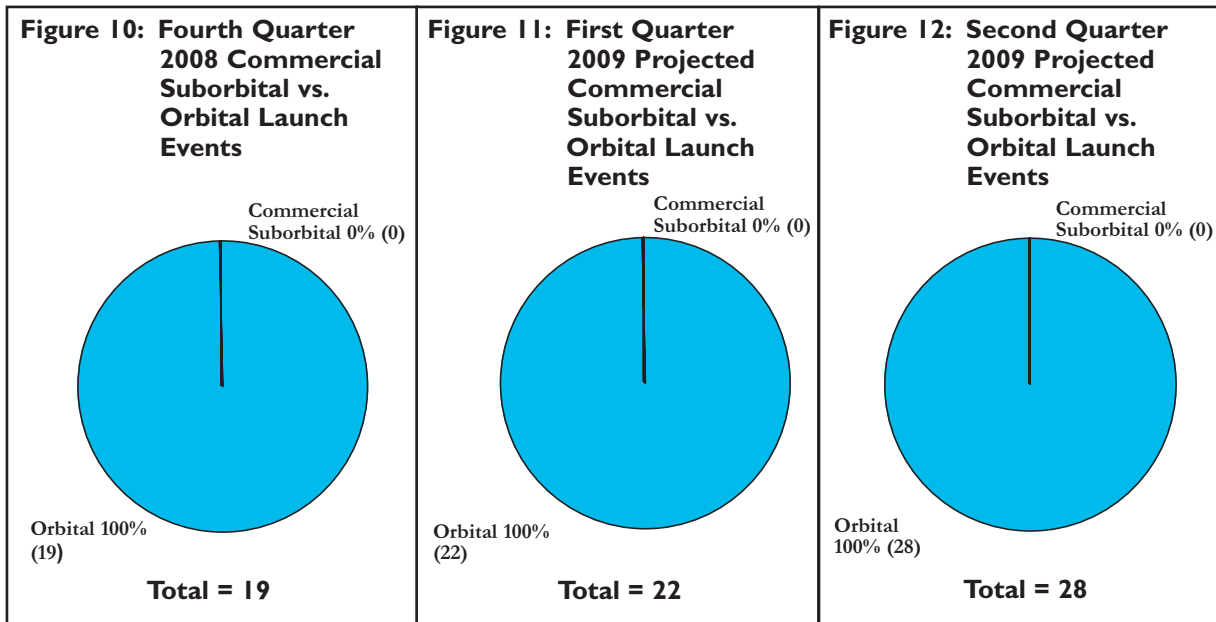
Figures 4-6 show all commercial orbital and suborbital launch events that occurred in the fourth quarter of 2008 and that are projected for the first quarter of 2009 and second quarter of 2009.

Commercial vs. Non-Commercial Launch Events (October 2008 – June 2009)



Figures 7-9 show commercial vs. non-commercial orbital and suborbital launch events that occurred in the fourth quarter of 2008 and that are projected for the first quarter of 2009 and second quarter of 2009.

Orbital vs. Commercial Suborbital Launch Events (October 2008 – June 2009)



Figures 10-12 show orbital vs. FAA-licensed commercial suborbital launch events (or their international equivalents) that occurred in the fourth quarter of 2008 and that are projected for the first quarter of 2009 and second quarter of 2009.

Launch Successes vs. Failures (October 2008 – December 2008)

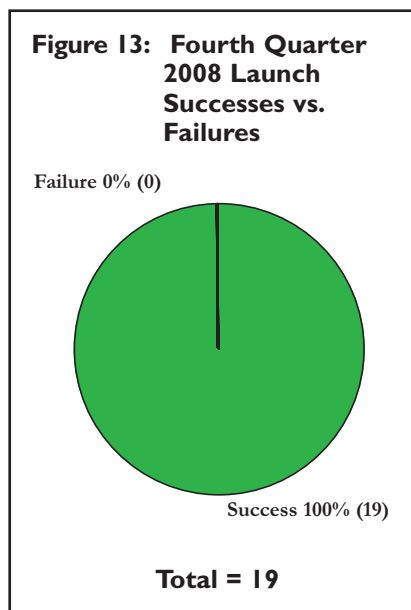
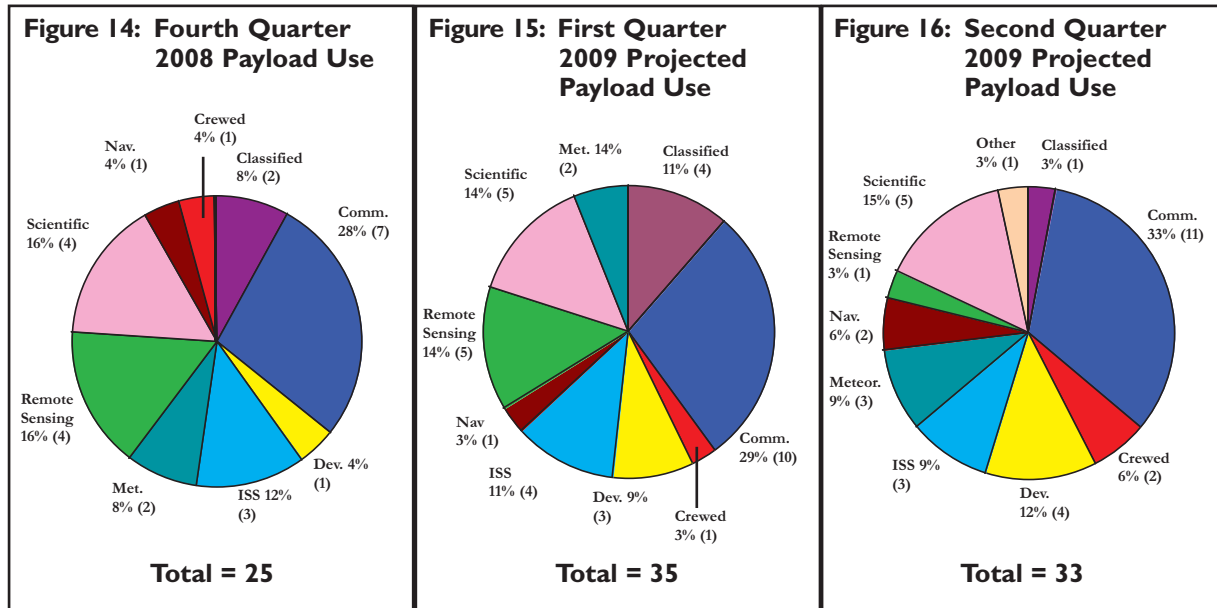


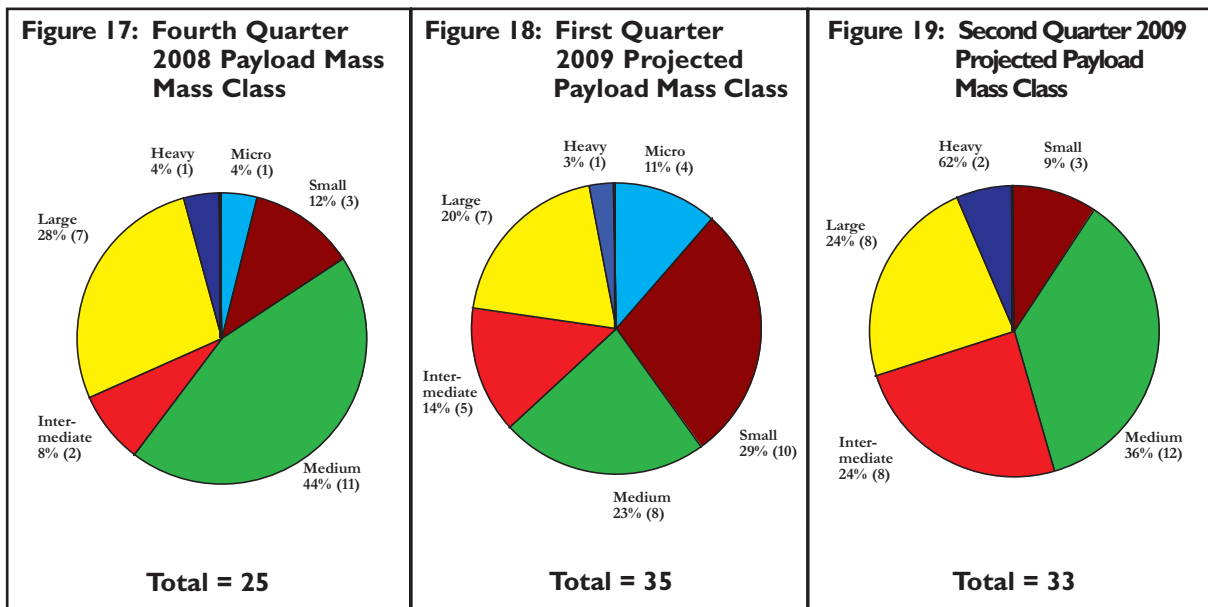
Figure 13 shows orbital and commercial suborbital launch successes vs. failures for the period from October 2008 to December 2008. Partially-successful orbital launch events are those where the launch vehicle fails to deploy its payload to the appropriate orbit, but the payload is able to reach a useable orbit via its own propulsion systems. Cases in which the payload does not reach a useable orbit or would use all of its fuel to do so are considered failures.

Payload Use (Orbital Launches Only) (October 2008 – June 2009)



Figures 14-16 show total payload use (commercial and government), actual for the fourth quarter of 2008 and projected for the first quarter of 2009 and second quarter of 2009. The total number of payloads launched may not equal the total number of launches due to multiple manifesting, i.e., the launching of more than one payload by a single launch vehicle.

Payload Mass Class (Orbital Launches Only) (October 2008 – June 2009)



Figures 17-19 show total payloads by mass class (commercial and government), actual for the fourth quarter of 2008 and projected for the first quarter of 2009 and second quarter of 2009. The total number of payloads launched may not equal the total number of launches due to multiple manifesting, i.e., the launching of more than one payload by a single launch vehicle. Payload mass classes are defined as Micro: 0 to 91 kilograms (0 to 200 lbs.); Small: 92 to 907 kilograms (201 to 2,000 lbs.); Medium: 908 to 2,268 kilograms (2,001 to 5,000 lbs.); Intermediate: 2,269 to 4,536 kilograms (5,001 to 10,000 lbs.); Large: 4,537 to 9,072 kilograms (10,001 to 20,000 lbs.); and Heavy: over 9,072 kilograms (20,000 lbs.).

Commercial Launch Trends (Orbital Launches Only) (January 2008 – December 2008)

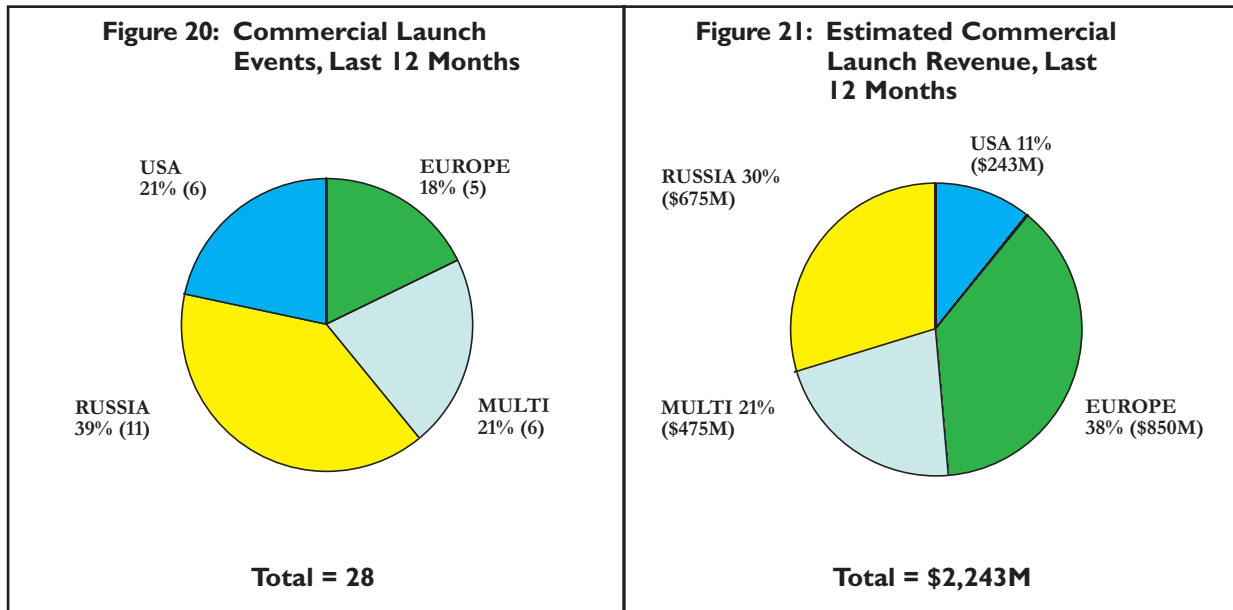


Figure 20 shows commercial orbital launch events for the period of January 2008 to December 2008 by country.

Figure 21 shows estimated commercial launch revenue for orbital launches for the period of January 2008 to December 2008 by country.

Commercial Launch Trends (Suborbital Launches and Experimental Permits) (January 2008 – December 2008)

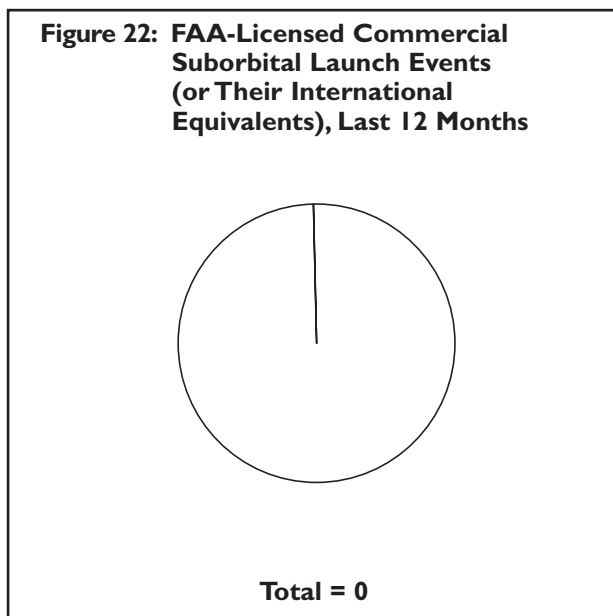


Figure 22 shows FAA-licensed commercial suborbital launch events (or their international equivalents) for the period of January 2008 to December 2008 by country.

Figure 23: FAA Experimental Permit Flights, Last 12 Months

Flight Date	Operator	Vehicle	Launch Site
10/25/2008	Armadillo Aerospace	Pixel	Las Cruces International Airport, NM
10/24/2008	Armadillo Aerospace	MOD-1	Las Cruces International Airport, NM
10/24/2008	Armadillo Aerospace	MOD-1	Las Cruces International Airport, NM
10/24/2008	Armadillo Aerospace	MOD-1	Las Cruces International Airport, NM
10/24/2008	TrueZero	Ignignokt	Las Cruces International Airport, NM

Figure 23 shows suborbital flights conducted under FAA experimental permits for the period of December 2008 to January 2009 by country.

Commercial Launch History (January 2004 – December 2008)

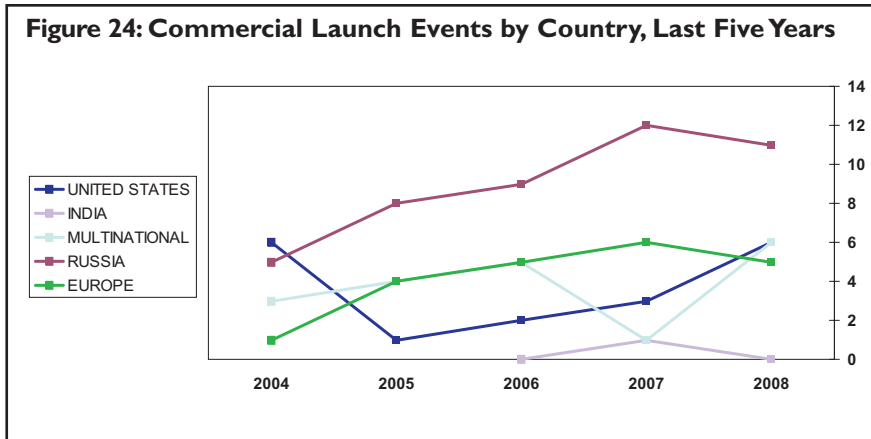


Figure 24 shows commercial launch events by country for the last five full calendar years.

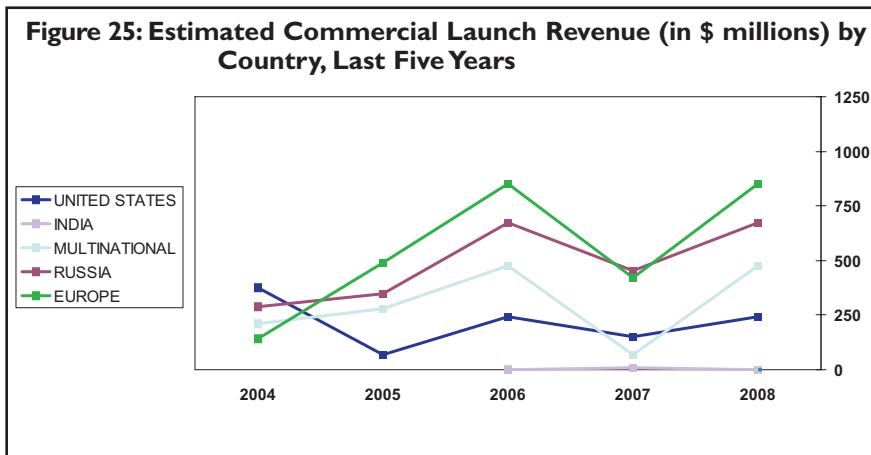


Figure 25 shows estimated commercial launch revenue by country for the last five full calendar years.

Fourth Quarter 2008 Orbital and Suborbital Launch Events							
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	L M
10/1/2008	✓ Dnepr 1	Dombrovskiy	THEOS	GISTDA	Remote Sensing	\$9.5M	S S
10/12/2008	Soyuz	Baikonur	Soyuz ISS 17S	Roscosmos	ISS	\$40M	S S
10/19/2008	Pegasus XL	Kwajalein Island	Interstellar Boundary Explorer	NASA	Scientific	\$16M	S S
10/22/2008	PSLV	Satish Dhawan Space Center	Chandrayaan 1	ISRO	Scientific	\$20M	S S
10/24/2008	✓ + Delta II 7420-10	VAFB	Cosmo-Skymed 3	ASI	Remote Sensing	\$50M	S S
10/25/2008	Long March 4B	Taiyuan	Shijian 6E	CNSA	Scientific	\$50M	S S
			Shijian 6F	CNSA	Scientific		S
10/30/2008	Long March 3B	Xichang	VENESAT 1	Venezuelan Ministry of Science and Technology	Communications	\$60M	S S
11/5/2008	Long March 2D	Jiuquan	Shiyan Weixing 3	China - TBA	Development	TBA	S S
			Chuangxin 1-02	China Meteorological Administration	Meteorological		S
11/6/2008	✓ Proton M	Baikonur	* Astra 1M	SES Astra	Communications	\$85M	S S
11/14/2008	Shuttle Endeavour	KSC	STS 126	NASA	Crewed	N/A	S S
			MPLM 5	NASA	ISS		S
11/14/2008	Soyuz	Baikonur	Kosmos 2445	Russian MoD	Classified	\$40M	S S
11/26/2008	Soyuz	Baikonur	Progress ISS 31P	Roscosmos	ISS	\$40M	S S
12/1/2008	Long March 2D	Jiuquan	Yaogan 4	CNSA	Remote Sensing	TBA	S S
12/2/2008	Molniya	Plesetsk	Kosmos 2446	Russian Space Forces	Classified	\$35M	S S
12/10/2008	✓ Proton M	Baikonur	* Ciel 2	Ciel Satellite	Communications	\$85M	S S
12/15/2008	Long March 4B	Taiyuan	Yaogan 5	CNSA	Remote Sensing	\$50M	S S
12/20/2008	✓ Ariane 5 ECA	Kourou	* Hot Bird 9	Eutelsat	Communications	\$85M	S S
			* Eutelsat W2M	Eutelsat	Communications	\$85M	S
12/23/2008	Long March 3A	Xichang	Fengyun 2E	China Meteorological Administration	Meteorological	\$50M	S S
12/25/2008	Proton (SL-12)	Baikonur	Glonass M R16	Russian MoD	Navigation	\$72.5M	S S
			Glonass M R18	Russian MoD	Communications		S
			Glonass M R17	Russian MoD	Communications		S

✓ Denotes commercial launch, defined as a launch that is internationally competed or FAA-licensed. For multiple manifested launches, certain secondary payloads whose launches were commercially procured may also constitute a commercial launch. Appendix includes suborbital launches only when such launches are commercial.

+ Denotes FAA-licensed launch.

* Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity.

Notes: All prices are estimates, and vary for every commercial launch. Government mission prices may be higher than commercial prices.

Ariane 5 payloads are usually multiple manifested, but the pairing of satellites scheduled for each launch is sometimes undisclosed for proprietary reasons until shortly before the launch date.

Projected First Quarter 2009 Orbital and Suborbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
1/17/2009	Delta IV Heavy	CCAFS	NRO L-26	NRO	Classified	\$155M
1/23/2009	H 2A 202	Tanegashima	GOSAT	JAXA	Scientific	\$85M
			SDS-1	JAXA	Development	
1/29/2009	Cyclone 3	Plesetsk	Coronas Photon	Roscosmos	Scientific	\$22.5M
2/4/2009	Delta II 7320	VAFB	NOAA N Prime	NOAA	Meteorological	\$50M
2/10/2009	Soyuz	Baikonur	Progress ISS 32P	Roscosmos	ISS	\$40M
2/11/2009	Proton M	Baikonur	* Express AM44	RSCC	Communications	\$85M
			* Express MD 1	RSCC	Communications	
2/12/2009	Shuttle Discovery	KSC	MPLM 4	NASA	ISS	N/A
			STS 119	NASA	Crewed	
			ISS 15A	NASA	ISS	
2/12/2009	✓ / Ariane 5 ECA	Kourou	* Hot Bird 10	Eutelsat	Communications	\$85M
			SPIRALE 1	DGA	Classified	
			SPIRALE 2	DGA	Classified	
			* NSS 9	SES New Skies	Communications	\$85M
2/20/2009	Proton M	Baikonur	Kosmos TBA 1	Russian MoD	Classified	\$85M
2/23/2009	Taurus XL	VAFB	Orbiting Carbon Observatory	NASA GSFC	Scientific	\$25M
02/2009	✓ + Zenit 3SL	Odyssey Launch Platform	Sicral 1B	Italian MoD	Communications	\$85M
3/5/2009	Delta II 7925-10	CCAFS	Kepler	NASA	Scientific	\$50M
3/9/2009	Atlas V 421	CCAFS	WGS 2	DoD	Communications	\$85M
3/11/2009	✓ / Rockot	Plesetsk	GOCE	ESA	Scientific	\$13.5M
3/24/2009	Delta II 7925	CCAFS	Navstar GPS 2RM-7	USAF	Navigation	\$50M
3/25/2009	Soyuz	Baikonur	Soyuz ISS 18S	Roscosmos	ISS	\$40M
03/2009	✓ + Falcon 1	Kwajalein Island	RazakSAT	Malaysia National Space Agency	Development	\$7M
03/2009	PSLV	Sriharikota	Oceansat 2	ISRO	Remote Sensing	\$20M
03/2009	✓ / Rockot	Plesetsk	Cryosat 2	ESA	Remote Sensing	\$13.5M
03/2009	✓ / Soyuz 2 TBA	Baikonur	* Meteor M1	VNII Elektromekhaniki	Meteorological	\$40M
			Sumbandila	University of Stellenbosch	Development	
1Q/2009	✓ / Dnepr 1	Dombarovskiy	DubaiSat-1	Emirates Institution for Advanced Science and Technology	Remote Sensing	\$9.5M
			* AprizeStar 3	Aprize Satellite	Communications	
			* AprizeStar 4	Aprize Satellite	Communications	
			DEIMOS	Deimos Imaging	Remote Sensing	
			Nanosat 1B	INTA	Communications	
			UK DMC 2	British National Space Centre	Remote Sensing	
1Q/2009	✓ / Proton M	Baikonur	* Eutelsat W2A	Eutelsat	Communications	\$85M

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Notes: All prices are estimates, and vary for every commercial launch. Government mission prices may be higher than commercial prices.

Ariane 5 payloads are usually multiple manifested, but the pairing of satellites scheduled for each launch is sometimes undisclosed for proprietary reasons until shortly before the launch date.

Projected Second Quarter 2009 Orbital and Suborbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
4/12/2009	Ariane 5 ECA	Kourou	Herschel Space Observatory	ESA	Scientific	\$85M
4/22/2009	Soyuz	Baikonur	Planck Surveyor	ESA	Scientific	\$85M
4/24/2009	Atlas V 401	VAFB	Progress ISS 33P	Roscosmos	ISS	\$40M
			Lunar Reconnaissance Orbiter	NASA	Remote Sensing	\$85M
4/28/2009	✓ + Delta IV Medium-Plus (4,2)	CCAFS	LCROSS	NASA	Scientific	
			GOES O	NOAA	Meteorological	\$85M
04/2009	Delta II 7920	CCAFS	STSS Demo 1	USAF	Development	\$50M
			STSS Demo 2	USAF	Development	
04/2009	PSLV	Satish Dhawan Space Center	Astrosat	ISRO	Scientific	\$20M
04/2009	✓ Zenit 3SLB	Baikonur	* Telstar 11N	Loral Skynet	Communications	\$50M
04/2009	Zenit 2	Baikonur	Meteor 3M N2	Russian Meteorological Service	Meteorological	\$37.5M
5/5/2009	Delta II 7920	VAFB	STSS-ATRR	Missile Defense Agency	Classified	\$50M
5/12/2009	Shuttle Atlantis	KSC	STS 125	NASA	Crewed	N/A
			Hubble Servicing Mission 4	NASA	Other	
5/15/2009	Shuttle Endeavour	KSC	STS 127	NASA	Crewed	N/A
5/25/2009	Soyuz	Baikonur	ISS 19S	Roscosmos	ISS	\$40M
05/2009	✓ Zenit 3SLB	Baikonur	* Asiasat 5	Asiasat	Communications	\$50M
6/15/2009	Taurus XL	VAFB	GLORY	NASA GSFC	Scientific	\$25M
6/24/2009	Soyuz	Baikonur	Progress ISS 34P	Roscosmos	ISS	\$40M
6/30/2009	✓ Ariane 5 GS	Kourou	* TerreStar 1	TerreStar Networks	Communications	\$85M
06/2009	✓ + Falcon 1	Kwajalein Island	* SpaceDev Trailblazer	SpaceDev	Development	\$7M
06/2009	Atlas V 401	CCAFS	Navstar GPS 2F-1	USAF	Navigation	\$85M
2Q/2009	+ Falcon 9	CCAFS	* Demo Payload	USA - TBA	Development	TBA
2Q/2009	✓ Proton M	Baikonur	* Sirius FM-5	Sirius Satellite Radio	Communications	\$85M
	✓ Proton M	Baikonur	* Protostar II	Protostar Ltd.	Communications	\$85M
2Q/2009	✓ Ariane 5 ECA	Kourou	* TBA	TBA	Communications	\$85M
			* TBA	TBA	Communications	\$85M
2Q/2009	✓ Zenit 3SLB	Baikonur	* Intelsat 15	Intelsat	Communications	\$50M
2Q/2009	Delta 4 Medium-Plus (5,4)	CCAFS	WGS 3	DoD	Communications	\$90M
2Q/2009	✓ + Zenit 3SL	Odyssey Launch Platform	* Eutelsat W7	Eutelsat	Communications	\$85M
2Q/2009	✓ + Atlas V 431	CCAFS	* Intelsat 14	Intelsat	Communications	\$85M
2Q/2009	Atlas V 401	VAFB	DMSP F18	DoD	Meteorological	\$85M
2Q/2009	Delta II 7925	CCAFS	Navstar GPS 2RM-8	USAF	Navigation	\$50M

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