



**Federal Aviation  
Administration**



## Quarterly Launch Report 3rd Quarter 2005

Featuring the Launch results from the 2nd Quarter 2005 and  
Forecasts for the 3rd and 4th Quarters of 2005

**Introduction**

*The Third Quarter 2005 Quarterly Launch Report features launch results from the second quarter of 2005 (April-June 2005) and forecasts for the third quarter of 2005 (July-September 2005) and fourth quarter of 2005 (October-December 2005). 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 references, 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 under 49 United States Code Subtitle IX, Chapter 701 (formerly the Commercial Space Launch Act)*

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Cover (Zenit 3SL photo copyright © 2005, courtesy of Sea Launch): A Zenit 3SL, marketed by Sea Launch, sends Spaceway 1, operated by DirecTV, on its way to geosynchronous orbit on April 26, 2005 from the Odyssey Launch Platform in the Pacific Ocean.

## Second Quarter 2005 Highlights

On April 5, the Russian space agency Roscosmos announced plans with Ukraine's NPO Yuzhnoye to launch a new, upgraded version of the Cyclone booster in 2006. The Cyclone 2K, equipped with an Apogee Propulsion Module, the APM 600, will launch from Baikonur and be able to deploy payloads of up to 2,000 kilograms (4,400 pounds) into a sun-synchronous orbit. The booster will be available commercially.

On April 15, ConeXpress announced its Orbital Life Extension Vehicle, CX-OLEV, had passed its Baseline Design Review milestone, clearing the way for the space tug to offer servicing missions for operational satellites starting in 2008. Over 70 communications satellites through 2012 have been identified as candidates for life extension using CX-OLEV.

The U.S. Air Force awarded SpaceX a \$100 million contract to provide a series of low-cost orbital launches using the company's Falcon booster.

The Air Force also awarded Orbital Sciences Corporation a contract to develop the Raptor 1 and 2 vehicles to provide rapid "responsive space launch capabilities." Based on Orbital's Pegasus vehicle, the Raptor 1 is a winged three-stage rocket, deployed from a carrier aircraft and igniting on release. The Raptor 2 will be deployed from a C-17 cargo plane.

EADS announced it would abandon plans to develop the upgraded Ariane 5 ECB booster due to a lack of potential customers. The Ariane 5 ECB was to feature a restartable Vinci cryogenic engine capable of carrying 12 metric tons (26,500 pounds) to geosynchronous transfer orbit. It was to have first flown in 2006.

In May, Khrunichev State Research and Production Space Center signed a contract with the Russian Ministry of Defense to conduct research, development and flight-testing of the Angara launcher through 2010. The Angara commercial launcher concept was unveiled at the 1999 Paris Air Show, but since then there had been little indication the project was still ongoing.

On May 16, American millionaire Gary Olsen, the third would-be space tourist, resumed cosmonaut training at Star City near Moscow. He is expected to fly to the ISS aboard a Soyuz scheduled for launch on October 1, 2005.

New NASA Administrator Mike Griffin announced that the Crew Exploration Vehicle would be ready to fly in 2010, the same year the Space Shuttle is slated for retirement. This marked a departure from Griffin's April comments, which called for the first CEV flight in 2014.

In June, Turkey announced the establishment of a 15-year National Space Program to be run by the country's Air Force and the Turkish Science and Technology Research Association, TUBITAK. The first 10-year phase calls for the establishment of a Turkish space agency. In the second phase, Turkey plans to send Air Force pilots abroad for training as astronauts, most likely to Russia to fly on Soyuz launches to the International Space Station. The country hopes to launch its own astronaut in 2015 using a "national launch vehicle."

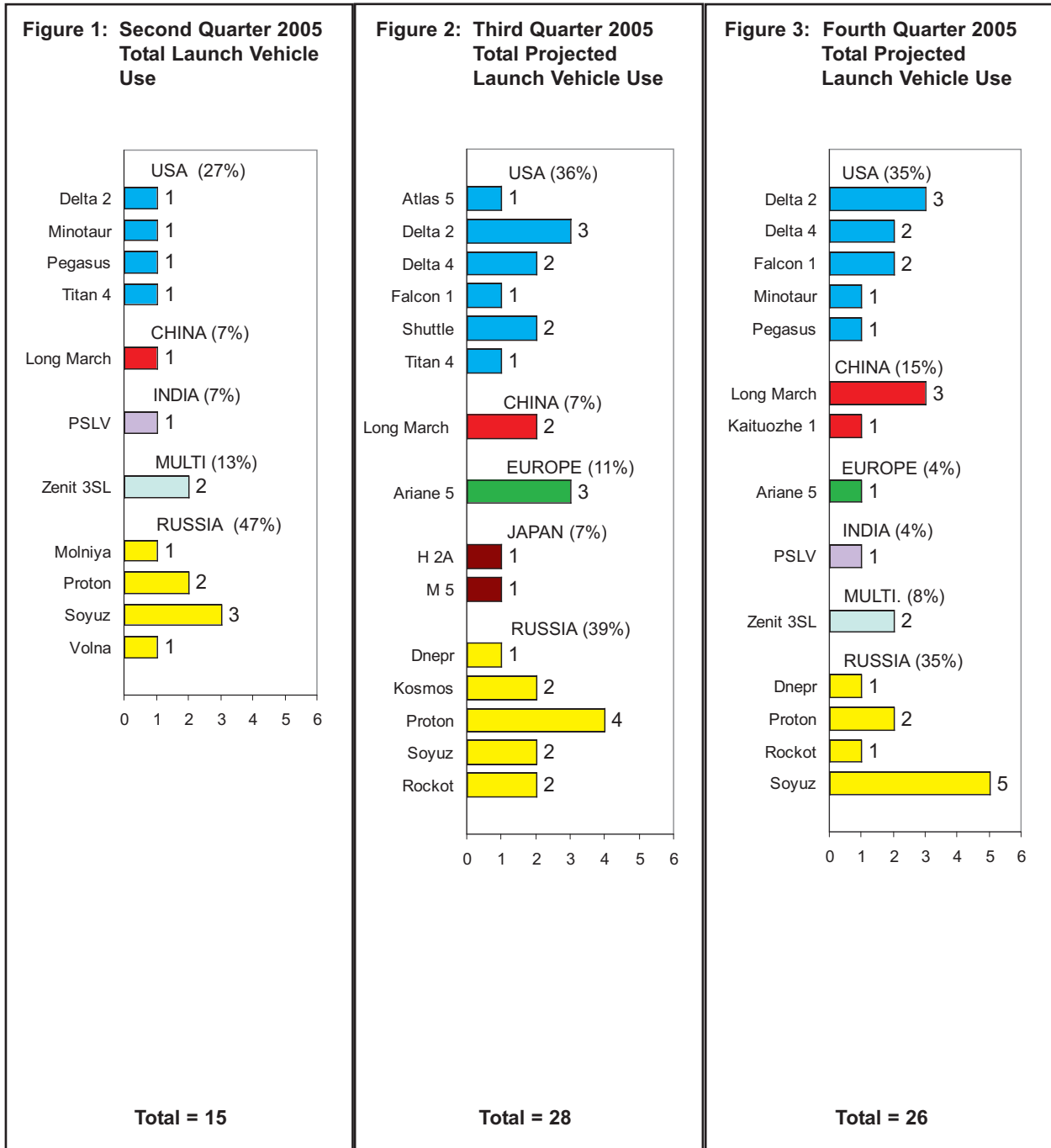
On June 21, after nearly three years of delays, a Russian Volna rocket launched the Planetary Society's Cosmos 1—the first solar sail demonstrator. Unfortunately, the payload was lost in the Barents Sea when the Volna's first stage separation failed 83 seconds into the flight. Cosmos 1 project director Louis Friedman has stated plans to "try again," though details remain unspecified.

Also on June 21, NASA Administrator Mike Griffin made a speech advocating commercialization of ISS resupply efforts. After the shuttle retires in 2010, Griffin said, NASA should buy ISS launches from private commercial providers. To facilitate this shift, Griffin plans to devote \$100 million of NASA's current budget toward studying and developing a requirements-driven vehicle procurement process.

In late June, two Senate committees approved authorization and appropriations bills for NASA. On June 24, the Senate Appropriations Committee unanimously passed a bill allocating \$16.4 billion for NASA for fiscal year 2006. The measure included \$250 million for a possible Shuttle mission to service the Hubble Space Telescope—a mission that had been deemed unlikely until NASA Administrator Mike Griffin expressed his openness to the idea in April. Separately, the Senate Commerce Committee unanimously passed an authorization bill setting NASA policy. The bill requires NASA to finish assembly of the ISS and continue operating the Space Shuttle until a successor vehicle is completed.

Vehicle Use

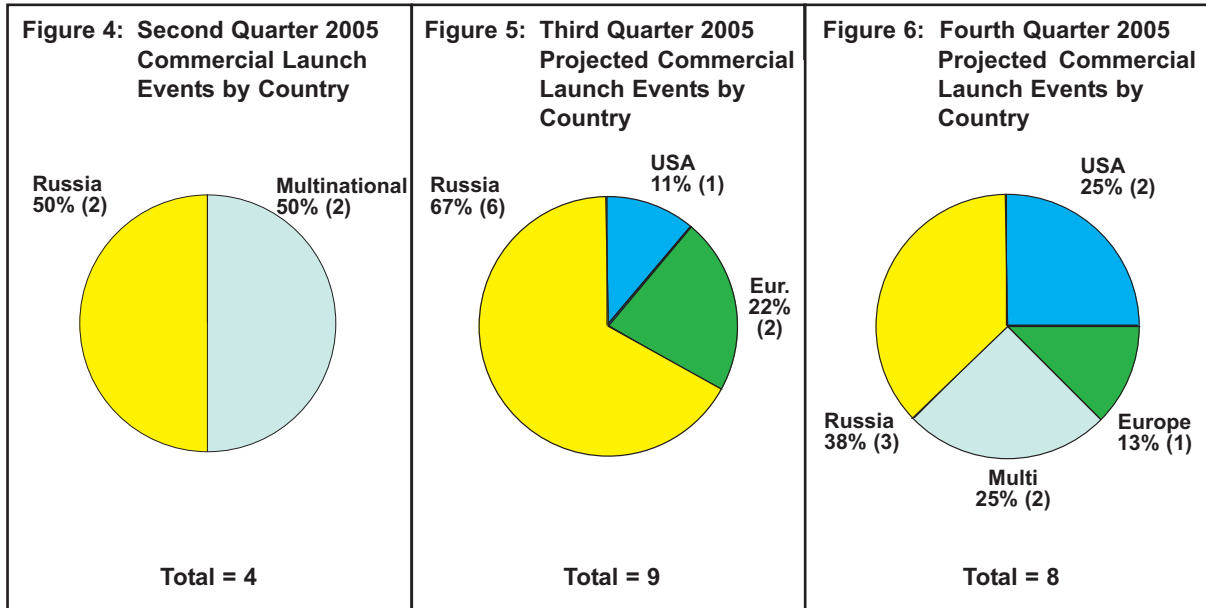
(April 2005 – December 2005)



Figures 1-3 show the total number of orbital and suborbital launches (commercial and government) of each launch vehicle and the resulting market share that occurred in the second quarter of 2005, as well as projecting this information for the third quarter of 2005 and fourth quarter of 2005. 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.

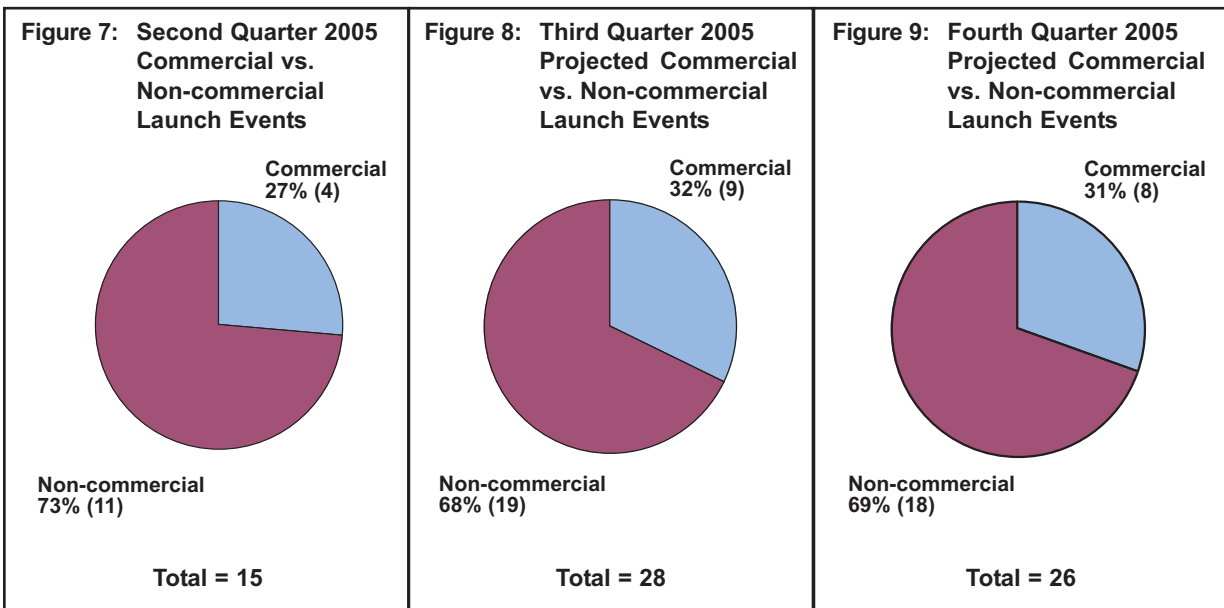
**Note:** Percentages for these and subsequent figures may not add up to 100 percent due to rounding of individual values.

**Commercial Launch Events by Country**  
(April 2005 – December 2005)



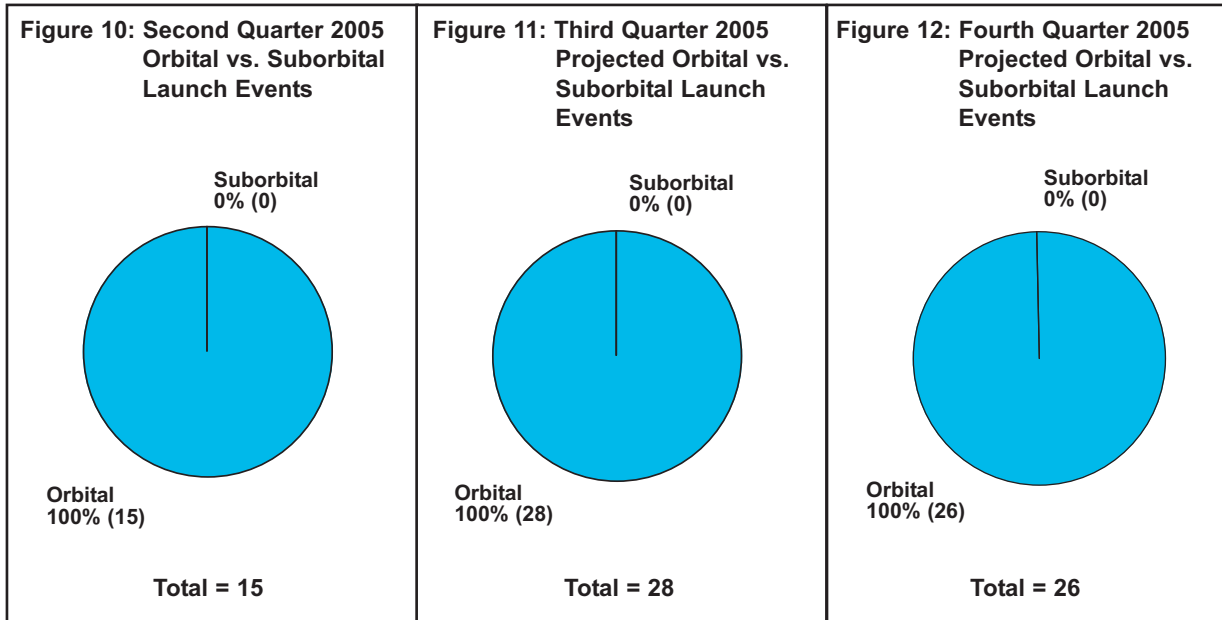
Figures 4-6 show all commercial orbital and suborbital launch events that occurred in the second quarter of 2005 and that are projected for the third quarter of 2005 and fourth quarter of 2005.

**Commercial vs. Non-commercial Launch Events**  
(April 2005 – December 2005)



Figures 7-9 show commercial vs. non-commercial orbital and suborbital launch events that occurred in the second quarter of 2005 and that are projected for the third quarter of 2005 and fourth quarter of 2005.

**Orbital vs. Suborbital Launch Events**  
(April 2005 – December 2005)



Figures 10-12 show orbital vs. suborbital launch events that occurred in the second quarter of 2005 and that are projected for the third quarter of 2005 and fourth quarter of 2005.

**Launch Successes vs. Failures**  
(April 2005 – June 2005)

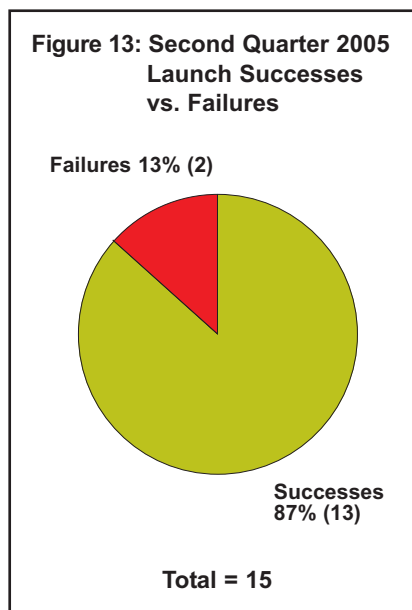
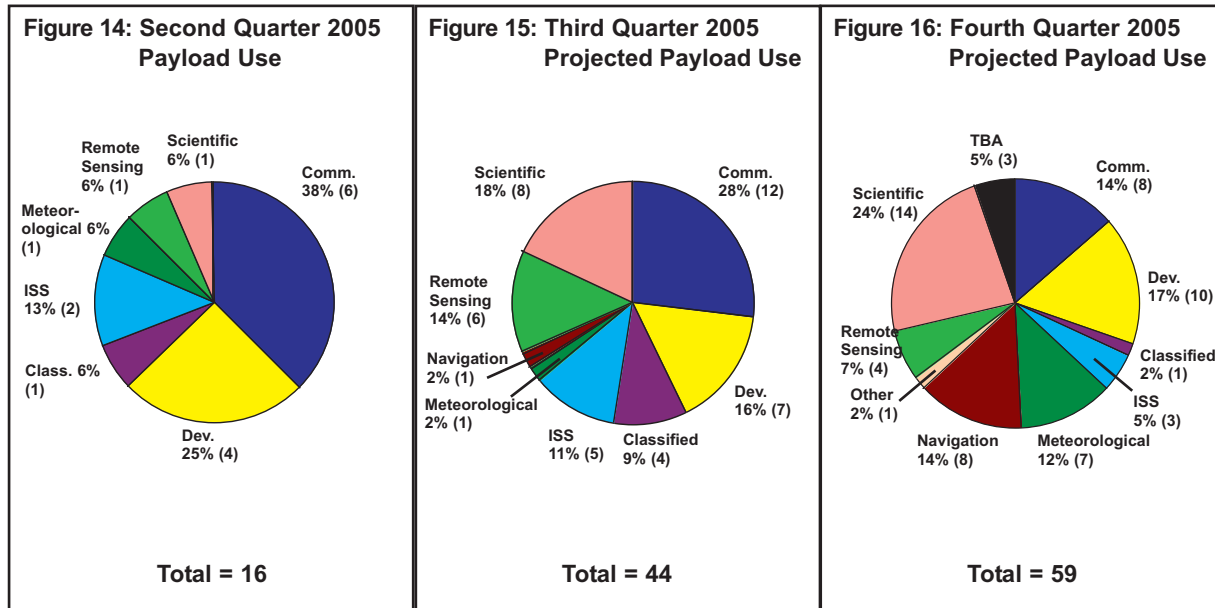


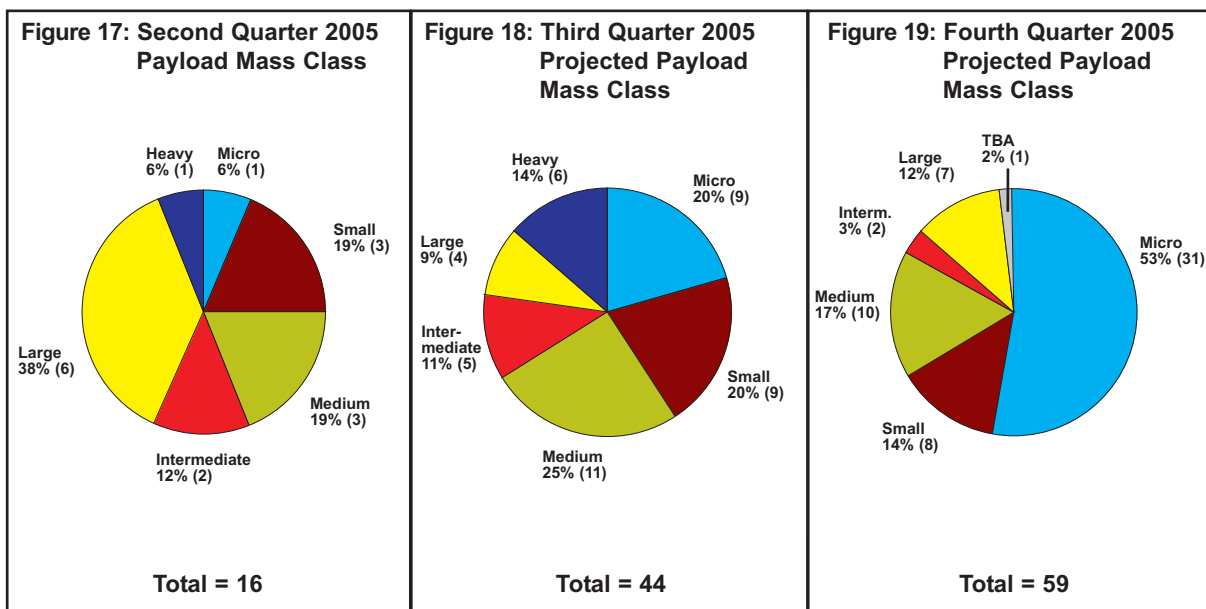
Figure 13 shows orbital and suborbital launch successes vs. failures for the period from April 2005 to June 2005. Partially-successful orbital launch events are those where the launch vehicle fails to deploy its payload to the appropriate orbit, but the payload is able to reach a useable orbit via its own propulsion systems. Cases in which the payload is unable to reach a useable orbit or would use all of its fuel to do so are considered failures.

**Payload Use (Orbital Launches Only)**  
(April 2005 – December 2005)



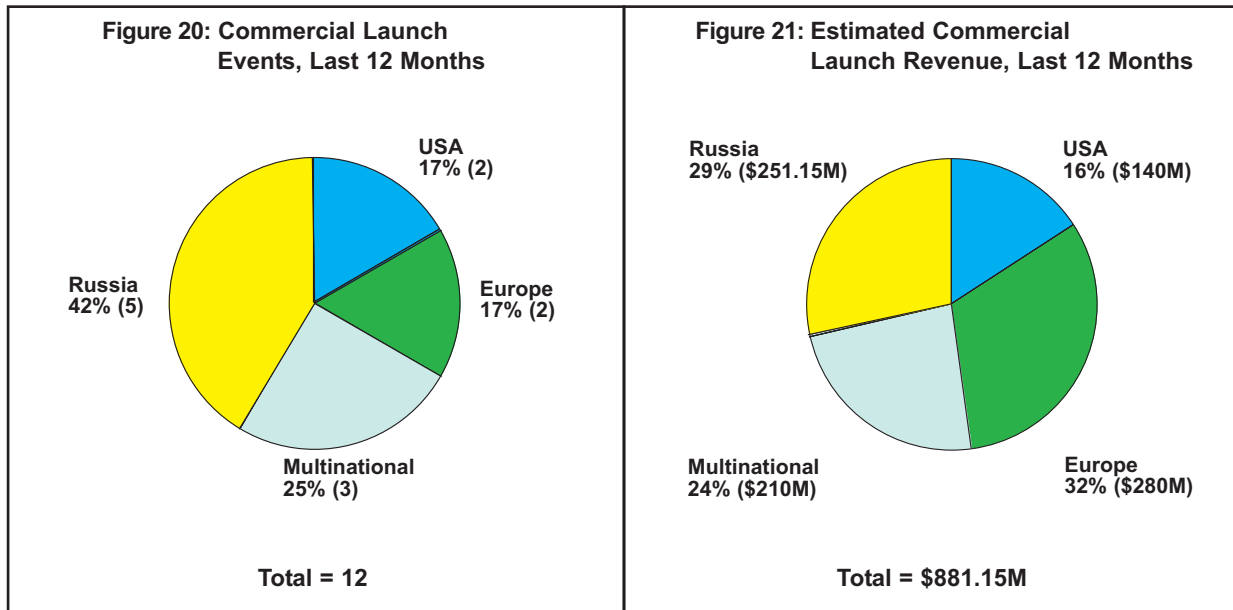
Figures 14-16 show total payload use (commercial and government), actual for the second quarter of 2005 and projected for the third quarter of 2005 and fourth quarter of 2005. The total number of payloads launched may not equal the total number of launches due to multi-manifesting, i.e., the launching of more than one payload by a single launch vehicle.

**Payload Mass Class (Orbital Launches Only)**  
(April 2005 – December 2005)



Figures 17-19 show total payloads by mass class (commercial and government), actual for the second quarter of 2005 and projected for the third quarter of 2005 and fourth quarter of 2005. The total number of payloads launched may not equal the total number of launches due to multi-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.).

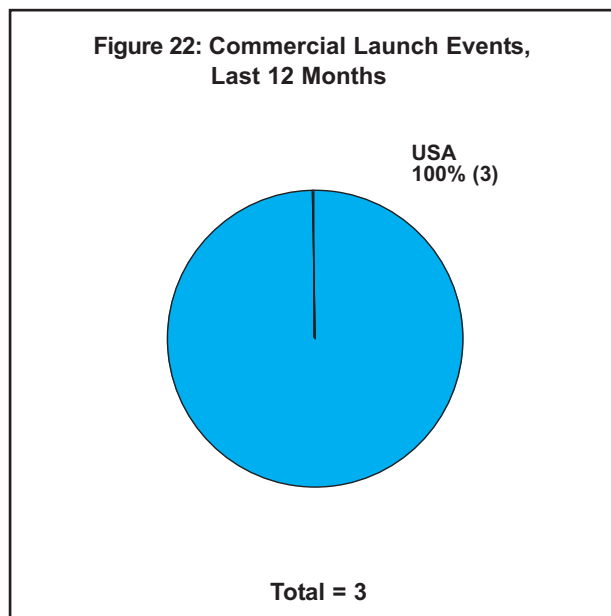
**Commercial Launch Trends (Orbital Launches Only)**  
(July 2004 – June 2005)



**Figure 20** shows commercial orbital launch events for the period of July 2004 to June 2005 by country.

**Figure 21** shows estimated commercial launch revenue for orbital launches for the period of July 2004 to June 2005 by country.

**Commercial Launch Trends (Suborbital Launches Only)**  
(July 2004 – June 2005)



**Figure 22** shows commercial suborbital launch events for the period of July 2004 to June 2005 by country.



**Commercial Launch History**  
(January 2000 – December 2004)

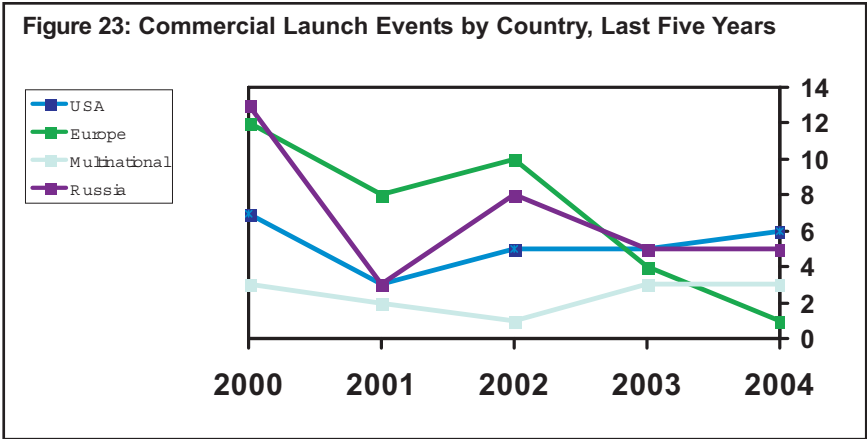


Figure 23 shows commercial launch events by country for the last five full years.

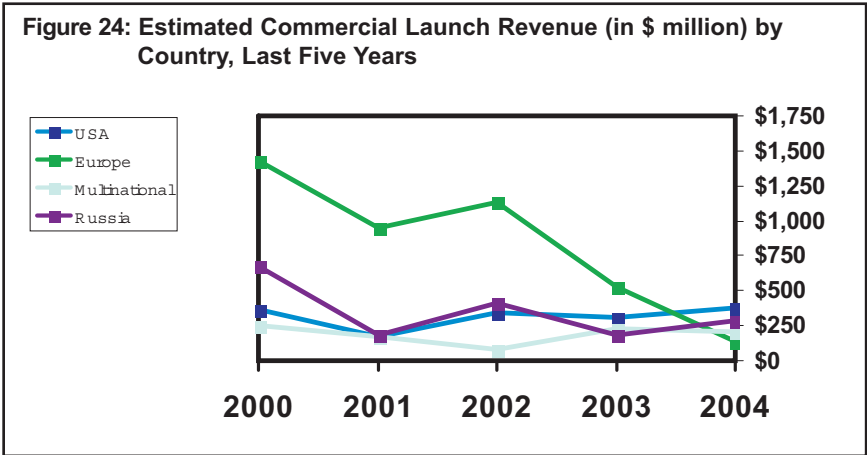


Figure 24 shows estimated commercial launch revenue by country for the last five full years.

Second Quarter 2005 Orbital and Suborbital Launch Events							
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	L M
4/11/2005	Minotaur	VAFB	XSS-11	U.S. Air Force	Development	\$14.5M	S S
4/12/2005	Long March 3B	Xichang	* APStar 6	APT Satellite Co., Ltd.	Communications	\$60M	S S
4/15/2005	Soyuz	Baikonur	Soyuz ISS 10S	Russian Federal Space Agency (Roscosmos)	ISS	\$40M	S S
4/15/2005	Pegasus XL	VAFB	DART	NASA	Development	\$16M	S F
4/26/2005	/ + Zenit 3SL	Odyssey Launch Platform	* Spaceway 1	Hughes Network Systems	Communications	\$70M	S S
4/29/2005	Titan 4B	CCAFS	NRO T1	National Reconnaissance Office (NRO)	Classified	\$400M	S S
5/5/2005	PSLV	Satish Dhawan Space Center	Cartosat 1	Indian Space Research Organization (ISRO)	Remote Sensing	\$20M	S S
			VUSat	Amsat India	Development		S S
5/20/2005	Delta 2 7320	VAFB	NOAA N	National Oceanic and Atmospheric Administration (NOAA)	Meteorological		S S
5/22/2005	/ Proton M	Baikonur	* DirecTV 8	DirecTV, Inc.	Communications	\$70M	S S
5/31/2005	Soyuz	Baikonur	Foton M2	European Space Agency (ESA)	Scientific	\$40M	S S
6/17/2005	Soyuz	Baikonur	Progress ISS	Roscosmos	ISS	\$40M	S S
6/21/2005	/ Volna	Barents Sea	Cosmos 1	The Planetary Society	Development	\$1.15M	F F
6/21/2005	Molniya	Plesetsk	Molniya 3K	Roscosmos	Communications	\$35M	F F
6/23/2005	/ + Zenit 3SL	Odyssey Launch Platform	* Intelsat Americas 8	Intelsat	Communications	\$70M	S S
6/24/2005	Proton K	Baikonur	* Express AM3	Russian Satellite Communication Co. (RSCC)	Communications	\$72.5M	S S

/ Denotes commercial launch, defined as a launch that is internationally competed or FAA-licensed.

+ 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 multi-manifested, but the pairing of satellites scheduled for each launch is sometimes undisclosed for proprietary reasons until shortly before the launch date.

Third Quarter 2005 Projected Orbital and Suborbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
7/6/2005	Long March 2D	Jiuquan	SJ 7	China Academy of Space Technology (CAST)	Development	\$22.5M
7/10/2005	M 5	Uchinoura	Astro-E2	Japan Aerospace Exploration Agency (JAXA)	Scientific	\$50M
7/28/2005 /	+ Delta 4 Medium	CCAFS	GOES N	NOAA	Meteorological	\$70M
7/2005	Shuttle Discovery	KSC	STS 114 ISS LF-1	NASA NASA	ISS ISS	N/A
7/2005 /	Ariane 5G	Kourou	* Thaicom 4 (IPstar)	Shin Satellite Public Co.	Communications	\$140M
7/2005	Proton K	Baikonur	* Yamal 203 * Yamal 204	Gazkom Joint Stock Gazkom Joint Stock	Communications Communications	\$72.5M
8/1/2005 /	Soyuz	Baikonur	* Galaxy 14	Panamsat	Communications	\$70M
8/10/2005 /	Proton M	Baikonur	* Anik F1R	Telesat Canada	Communications	\$70M
8/10/2005	Atlas 5 401	CCAFS	Mars Reconnaissance Orbiter	NASA	Scientific	\$75M
8/15/2005	Dnepr 1	Baikonur	OICETS INDEX	JAXA JAXA	Scientific Scientific	\$9.5M
8/18/2005	Rocket	Baikonur	Monitor E1	Roscosmos	Remote Sensing	\$13.5M
8/24/2005	Soyuz	Baikonur	Progress ISS 19P	Roscosmos	ISS	\$70M
8/25/2005 /	Kosmos 3M	Plesetsk	Topsat China DMC+4	British Defense Ministry Beijing Landview Mapping Information Technology Ltd	Development Remote Sensing	\$12M
			Mesbah	Telecommunications Company of Iran	Communications	
			Mozhayets 5	Mozhaiskiy Military Space Engineering Academy	Development	
			Ncube-2	Norwegian Student Satellite Project	Development	
			Sinah-1	Iran	Classified	
			SSETI Express	Aalborg University	Development	
			UWE-1	University of Wurzburg	Scientific	
			XI-V	University of Tokyo ISSL	Development	
8/30/2005	Delta 4 Medium Plus	VAFB	NRO L-22	DoD	Classified	\$77.5M
8/2005	Delta 2 7925-10	CCAFS	Navstar GPS 2RM-1	U.S. Air Force	Navigation	\$50M
8/2005	H 2A 202	Tanegashima	ALOS 1	JAXA	Remote Sensing	\$85M
8/2005 /	Ariane 5 ECA	Kourou	* Spaceway 2	Hughes Network Systems	Communications	\$140M
			* Telkom 2	PT Telekomunikasi	Communications	
8/2005	Long March 2D	Jiuquan	FSW 21	China National Space Administration (CNSA)	Scientific	\$22.5M
9/9/2005	Titan 4B	CCAFS	NRO T5	NRO	Classified	\$400M
9/11/2005	Delta 2 7420	VAFB	Calipso CloudSat	NASA NASA	Scientific Scientific	\$50M
9/15/2005 /	Rocket	Plesetsk	Cryosat	ESA	Remote Sensing	\$13.5M
9/30/2005	Delta 2 7920	VAFB	NRO L-21	NRO	Classified	\$50M
9/2005	Kosmos 3M	Baikonur	Vietnamsat	Vietnamese Ministry of Post and Telecommunications	Remote Sensing	\$12M
			Thai-Paht 2	Thai MicroSatellite Co.	Remote Sensing	
9/2005	Ariane 5G	Kourou	Syracuse 3 A * Galaxy 15	Delegation Generale pour Panamsat	Communications Communications	\$140M
9/2005 /	Proton M	Baikonur	* Astra 1KR	SES Astra	Communications	\$70M
9/2005	Shuttle Atlantis	KSC	STS 121 ISS ULF-1.1	NASA NASA	ISS ISS	N/A
9/2005	Falcon 1	Kwajalein Island	Falconsat 2	DoD	Development	\$6M
3Q/2005 /	Proton M	Baikonur	* Measat 3	Binariang Satellite Systems Sdn Bhd	Communications	\$70M

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+ 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.

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Fourth Quarter 2005 Projected Orbital and Suborbital Launch Events							
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	
10/12/05	Delta 2 7925-10	CCAFS	Navstar GPS 2RM-4	U.S. Air Force	Navigation	\$50M	
10/26/05	Soyuz	Baikonur	Venus Express	ESA	Scientific	\$40M	
10/28/05	Delta 4 Heavy	CCAFS	DSP 23	U.S. Air Force	Classified	\$155M	
10/2005	Soyuz	Baikonur	Soyuz ISS 11S	Roscosmos	ISS	\$40M	
10/2005 /	Dnepr 1	Baikonur	Egyptsat	National Authority for Remote Sensing	Remote Sensing	\$9.5M	
			* AKS 1	CNES	Development		
			* AKS 2	CNES	Development		
			* Cubesat TBA	The Aerospace Corporation	Development		
			HAUSat 1	Hankuk Aviation University	Scientific		
			ICEcube 1	Cornell University	Scientific		
			ICEcube 2	Cornell University	Scientific		
			ION	University of Illinois	Development		
			KUTESat	Kansas University	Scientific		
			Mea Huaka'l	University of Hawaii	Scientific		
			Merope	Montana State University	Scientific		
			Ncube	Norwegian Student Satellite Project	Scientific		
			Polysat 1	Cal Poly	Development		
			Polysat 2	Cal Poly	Development		
			Rincon 1	University of Arizona	Scientific		
			Sacred	University of Arizona	Scientific		
			SaudiComsat 3	Space Research Institute	Communications		
			SaudiComsat 4	Space Research Institute	Communications		
			SaudiComsat 5	Space Research Institute	Communications		
			SaudiComsat 6	Space Research Institute	Communications		
			SaudiComsat 7	Space Research Institute	Communications		
			Saudisat 3	Space Research Institute	Scientific		
			SEEDS	Nihon University	Scientific		
10/2005	Soyuz	Baikonur	Galileo System Test	ESA	Navigation	\$40M	
10/2005	Long March 2F	Jiuquan	Shenzhou 6	CNSA	ISS	\$60M	
10/2005	PSLV	Satish Dhawan	Cartosat 2	ISRO	Remote Sensing	\$20M	
			Anusat	ISRO	Communications		
			SRE 1	ISRO	Development		
11/25/05 /	+ Pegasus XL	Kwajalein Island	C/NOFS	U.S. Air Force	Scientific	\$16M	
11/2005 /	Proton M	Baikonur	* WORLDSAT-3	SES Americom	Communications	\$70M	
11/2005	Delta 4 Medium	VAFB	DMSP 5D-3-F17	DoD	Meteorological	\$70M	
11/2005 /	Ariane 5 TBA	Kourou	* Payload TBA	TBA	TBA	\$140M	
			* Payload TBA	TBA	TBA		
12/21/05	Soyuz	Baikonur	Progress ISS 20P	Roscosmos	ISS	\$40M	
12/2005 /	Rockot	Plesetsk	Kompsat 2	Korea Aerospace Research Institute (KARI)	Remote Sensing	\$13.5M	
4Q/2005	Delta 2 7925-10	CCAFS	Navstar GPS 2RM-2	U.S. Air Force	Navigation	\$50M	
4Q/2005	Delta 2 7925-10	CCAFS	Navstar GPS 2RM-3	U.S. Air Force	Navigation	\$50M	
4Q/2005	Minotaur	VAFB	Formosat 3 A	National Space Program Office (NSPO)	Meteorological	\$14.5M	
			Formosat 3 B	NSPO	Meteorological		
			Formosat 3 C	NSPO	Meteorological		
			Formosat 3 D	NSPO	Meteorological		
			Formosat 3 E	NSPO	Meteorological		
			Formosat 3 F	NSPO	Meteorological		
4Q/2005	Falcon 1	Kwajalein Island	TacSat 1	U.S. Air Force	Development	\$6M	
			Celestis 5	Celestis, Inc.	Other		
4Q/2005 /	+ Zenit 3SL	Odyssey Launch Platform	* Inmarsat-4 F2	Inmarsat	Communications	\$70M	
4Q/2005 /	+ Zenit 3SL	Odyssey Launch Platform	* TBA	TBA	TBA	\$70M	
2005	Soyuz	Plesetsk	Resurs DK 1	Roscosmos	Remote Sensing	\$40M	
2005	Proton K	Baikonur	Glonass K R1	Russian MoD	Navigation		
			Glonass K R2	Russian MoD	Navigation		
			Glonass K R3	Russian MoD	Navigation		
2005 /	+ Falcon 1	Kwajalein Island	RazakSAT	Malaysia National Space Agency	Development	\$6M	
2005	Long March 3A	Xichang	Beidou 2A (Compass)	CNSA	Navigation	\$50M	
2005	Kaituoze 1	Taiyuan	China Microsat TBA	CAST	Development	\$10M	
2005	Long March 2D	Jiuquan	FSW 22	CAST	Scientific	\$22.5M	

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