

## Commercial Space Transportation

# QUARTERLY LAUNCH REPORT

Featuring the  
launch results from  
the 2nd quarter 2004  
and forecasts for the  
3rd quarter 2004 and  
4th quarter 2004



## 3rd Quarter 2004

United States Department of Transportation • Federal Aviation Administration  
Associate Administrator for Commercial Space Transportation  
800 Independence Ave. SW • Room 331  
Washington, D.C. 20591



Introduction

The Third Quarter 2004 Quarterly Launch Report features launch results from the second quarter of 2004 (April-June 2004) and forecasts for the third quarter of 2004 (July-September 2004) and fourth quarter of 2004 (October-December 2004). 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 Associate Administrator for Commercial Space Transportation of the Federal Aviation Administration under 49 United States Code Subtitle IX, Chapter 701 (formerly the Commercial Space Launch Act)

Special Note

Previous Quarterly Launch Reports have focused solely on orbital launches. However, due to the recent emergence of commercial suborbital space activity in the United States, and the possibility that it may occur in other countries in the future, this and subsequent Quarterly Launch Reports will now record suborbital launches in addition to orbital space activity. Unless otherwise noted, the suborbital count will not include suborbital flights of expendable rockets.

Contents

Second Quarter 2004 Highlights .....2

Vehicle Use .....3

Commercial Launch Events by Country .....4

Commercial vs. Non-commercial Launch Events .....4

Orbital vs. Suborbital Launch Events .....5

Launch Successes vs. Failures .....5

Payload Use .....6

Payload Mass Class .....6

Commercial Launch Trends .....7

Appendix A: Second Quarter 2004 Orbital and Suborbital Launch Events .....A-1

Appendix B: Third Quarter 2004 Projected Orbital and Suborbital Launch Events .....B-1

Appendix C: Fourth Quarter 2004 Projected Orbital and Suborbital Launch Events .....C-1

Cover: A Taurus XL, marketed by Orbital Sciences Corporation, sends Rocsat 2, a Taiwanese remote sensing satellite, on its way to low Earth orbit (LEO) from Vandenberg Air Force Base on May 20, 2004. The Rocsat satellites are operated by Taiwan’s National Space Program Office (NSPO).

## Second Quarter 2004 Highlights

On April 1, 2004, the Federal Aviation Administration's Office of Commercial Space Transportation (FAA/AST) issued the world's first license for manned suborbital space flight. The license, awarded to Scaled Composites, authorizes the company to conduct a series of suborbital flights over a one-year period.

On April 23, 2004, the FAA/AST issued a license to XCOR Aerospace authorizing up to 35 suborbital test flights of its Sphinx test vehicle (a prototype of the company's Xerus rocket plane) through 2006.

Jean-Jacques Dordain, the Director-General of the European Space Agency (ESA), and Anatoli Perminov, the head of Russia's Federal Space Agency, have discussed the possibility of Russia joining ESA. However, Perminov has said that one potential obstacle to this arrangement is the issue of whether Russia would have co-equal status alongside the ESA's European member states; discussions thus far have only involved Russia joining as an associate member. Meanwhile, Russia and Europe continue to cooperate on the new Soyuz equatorial launch facility at Kourou. Russian companies are receiving 121 million of the 344 million euros allocated to the joint project.

In early May, Arianespace won its first contract for the commercial launch of a Russian Soyuz booster from Kourou. The launch is scheduled to take place in 2007 from Arianespace's new launchpad there, and will carry the Australian Optus D2 satellite.

Orbital Recovery announced a contract with Arianespace for the launch of five 1,400-kilogram Cone Express Orbital Life Extension (CX OLEV) vehicles between 2007 and 2008. The CX OLEV vehicles are essentially space tugboats designed to extend the useful life of existing spacecraft in geosynchronous orbit. Orbital Recovery has identified about 40 satellites that it believes could use such a service.

Chinese officials announced their intention to establish a manned space station in Earth orbit by 2015. Although China does not intend to launch a crewed lunar mission, it does plan to deploy a lunar satellite in 2006, a lander in 2010, and a sample return mission in 2020, according to human spaceflight chief Wang Yongzhi. China is thought to have spent \$2 billion on its space program in the past decade.

In early June, the President's Commission on Implementation of United States Space Exploration Policy (also known as the Aldridge commission) released a report that recommended sweeping organizational changes at NASA, including increased reliance on the private sector and a more company-like management culture. A few days later, NASA Administrator Sean O'Keefe announced plans to restructure and streamline NASA's internal organization.

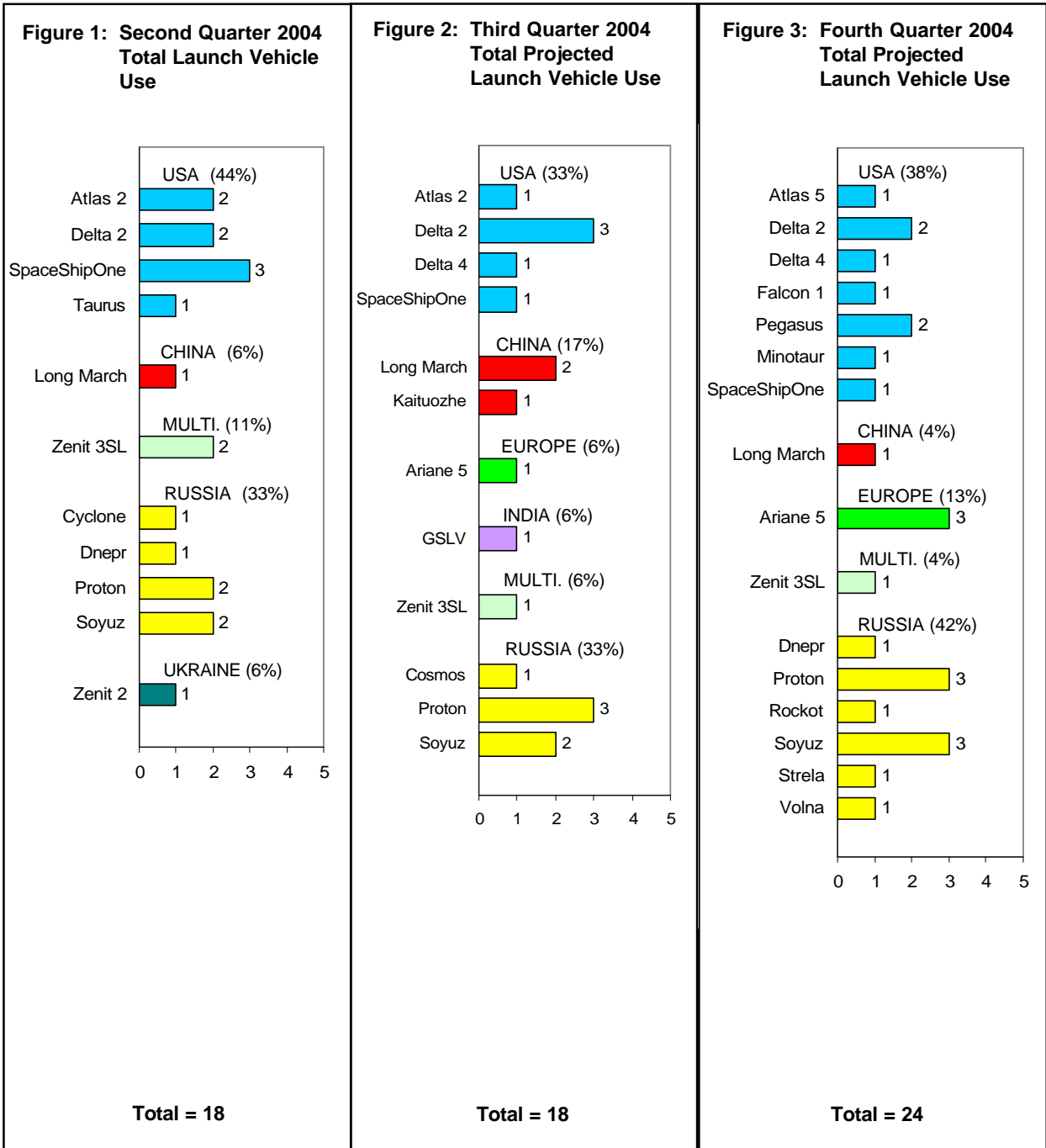
On June 17, 2004, the FAA licensed Mojave Airport as the first inland launch site in the United States. Mojave joins Spaceport Florida, Kodiak Island, California Spaceport, and Mid-Atlantic Regional Spaceport (formerly Virginia Space Flight Center) as the fifth FAA-licensed commercial spaceport in the U.S.

During the second quarter of 2004, Scaled Composites' SpaceShipOne reusable suborbital launch vehicle completed three powered test flights after separation from the White Knight carrier aircraft. The most recent of these flights, on June 21, 2004, saw SpaceShipOne become the first private manned vehicle to reach space. Despite a malfunction in the vehicle's control system, pilot Mike Melvill successfully brought SpaceShipOne to an altitude of just over 100 kilometers (62 miles) and then guided it back to a safe landing at Mojave Airport.

On June 28, 2004, a Zenit 3SL launcher deployed the payload APStar 5 (also called Telstar 18) at an altitude of 21,000 kilometers instead of the planned 36,000 kilometers. Launch controllers blamed the partial launch failure on a malfunction in the Zenit 3SL's Energia Block DM-SL upper stage. On July 13, 2004, Loral Space & Communications announced that APStar 5 had been lifted to GEO orbit using the spacecraft's propulsion system. This maneuver was not expected to shorten the satellite's operating life.

Vehicle Use

(April 2004 – December 2004)

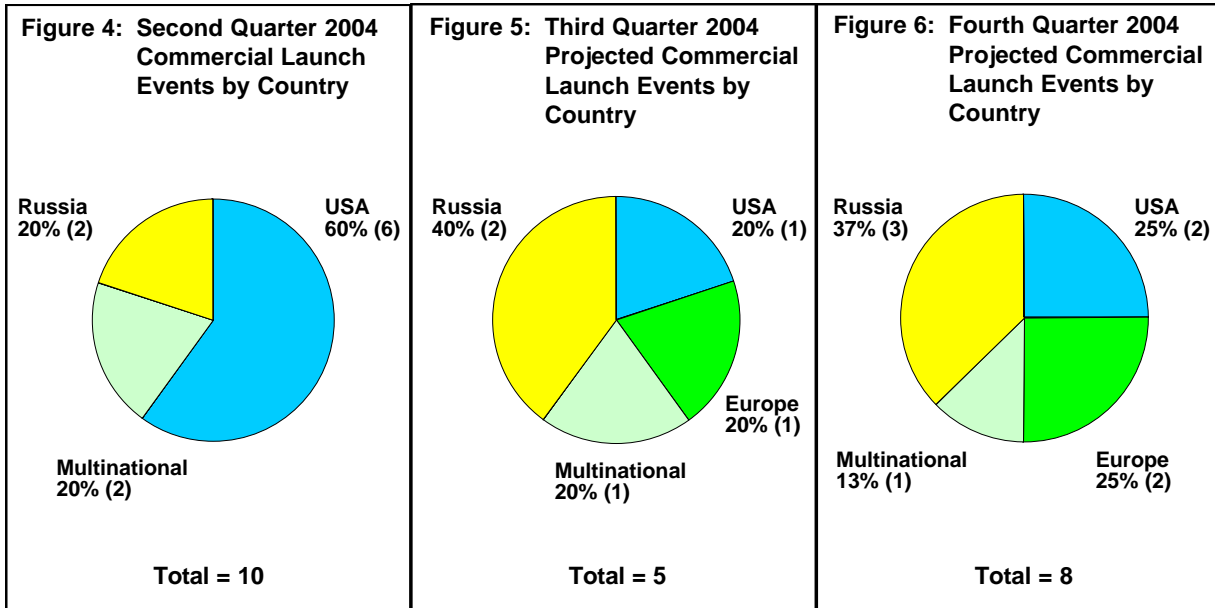


Figures 1-3 show the total number of orbital and suborbital launches (commercial and government) of each launch vehicle and the resulting market share that occurred in the second quarter of 2004, as well as projecting this information for the third and fourth quarters of 2004. The launches are grouped 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

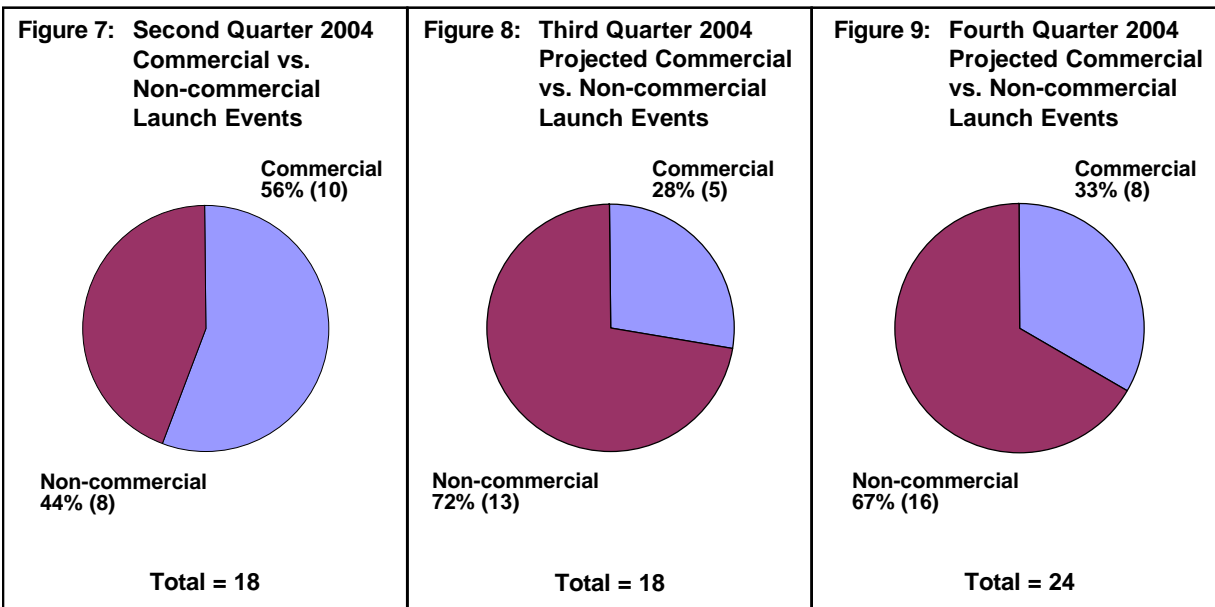
(April 2004 – December 2004)



Figures 4-6 show all *commercial* orbital and suborbital launch events that occurred in the second quarter of 2004 and are projected for the third and fourth quarters of 2004.

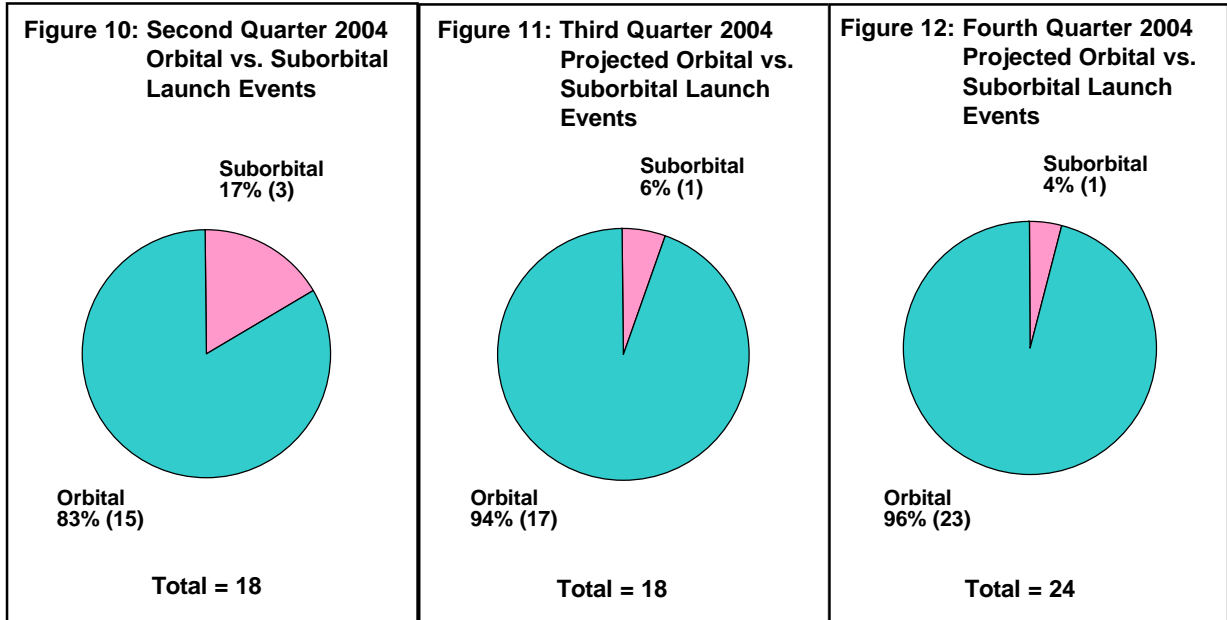
Commercial vs. Non-commercial Launch Events

(April 2004 – December 2004)



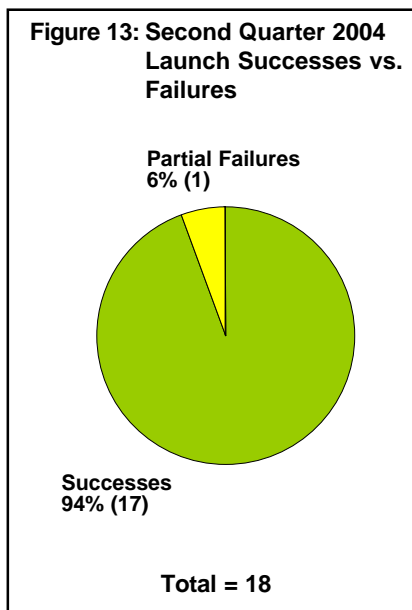
Figures 7-9 show commercial vs. non-commercial orbital and suborbital launch events that occurred in the second quarter of 2004 and that are projected for the third and fourth quarters of 2004.

**Orbital vs. Suborbital Launch Events**  
(April 2004 – December 2004)



**Figures 10-12** show orbital vs. suborbital launch events that occurred in the second quarter of 2004 and that are projected for the third and fourth quarters of 2004.

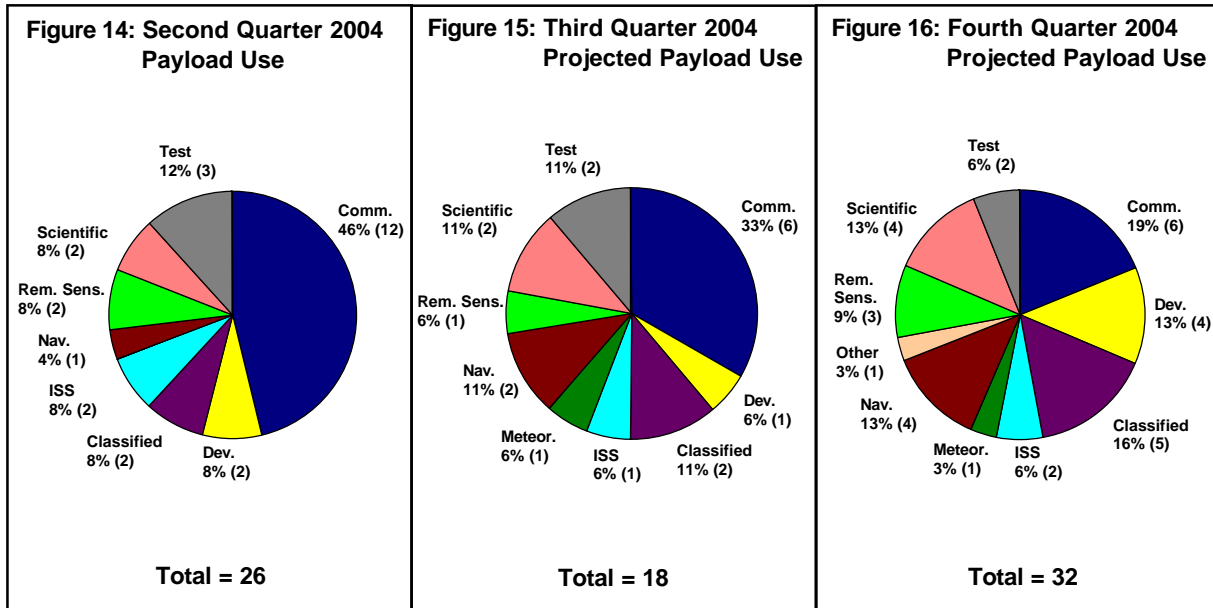
**Launch Successes vs. Failures**  
(April 2004 – June 2004)



**Figure 13** shows orbital and suborbital launch successes vs. failures for the period from April 2004 to June 2004. 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**

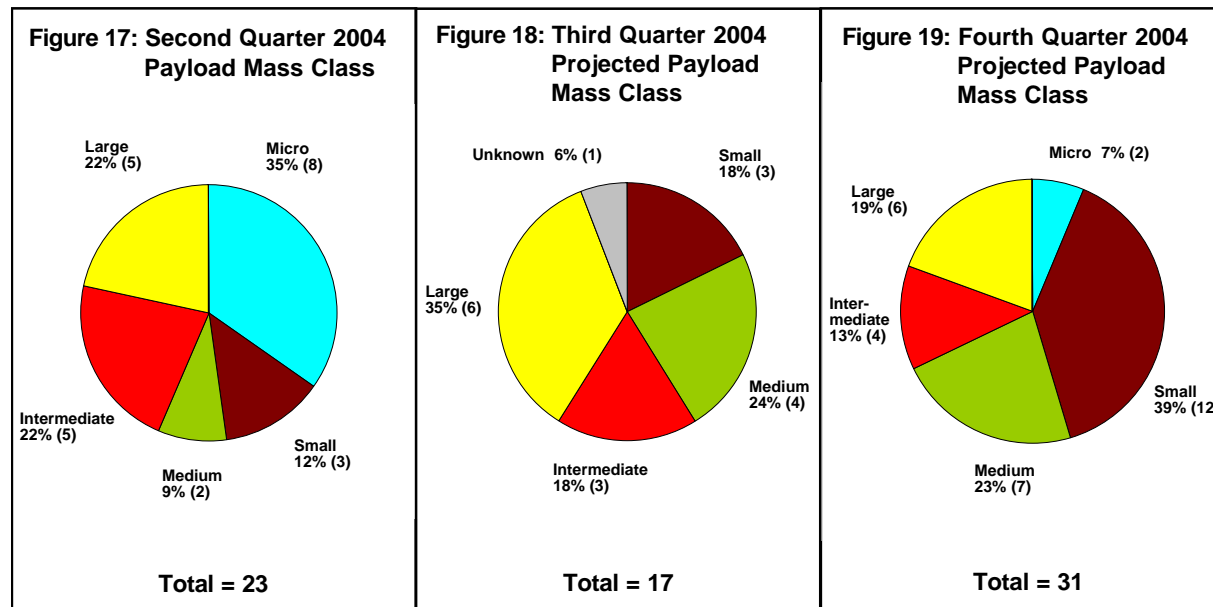
(April 2004 – December 2004)



Figures 14-16 show total payload use (commercial and government), actual for the second quarter of 2004 and projected for the third and fourth quarters of 2004. 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 2004 – December 2004)



Figures 17-19 show total payloads by mass class (commercial and government), actual for the second quarter of 2004 and projected for the third and fourth quarters of 2004. Because the purpose of the mass class measurement is to characterize payloads lifted into orbit, payloads carried on suborbital launches are not included in Figures 19-21. 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  
(July 2003 – June 2004)

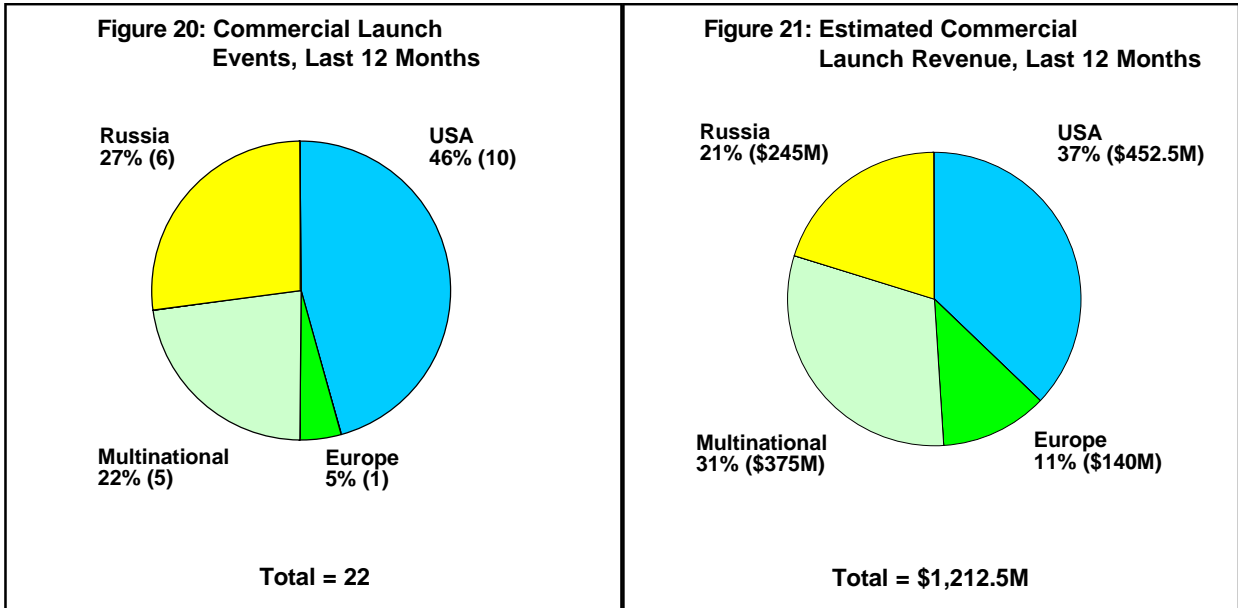


Figure 20 shows commercial orbital and suborbital launch events for the period of July 2003 to June 2004 by country.

Figure 21 shows estimated commercial launch revenue for orbital and suborbital launches for the period of July 2003 to June 2004 by country.

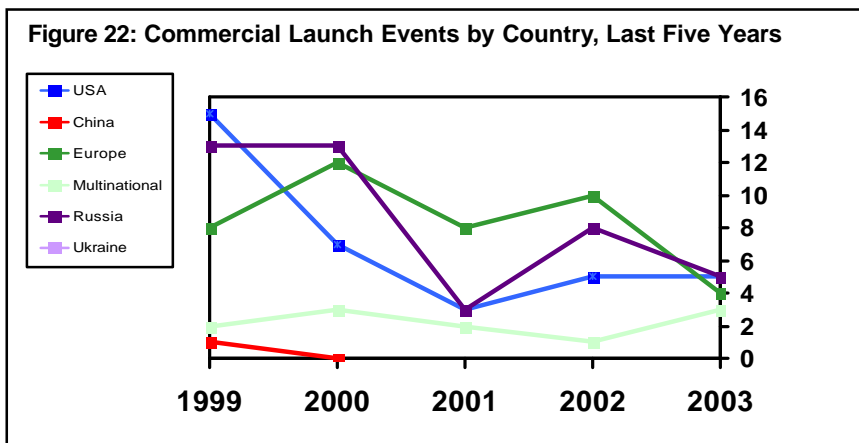


Figure 22 shows commercial launch events by country for the last five full years.

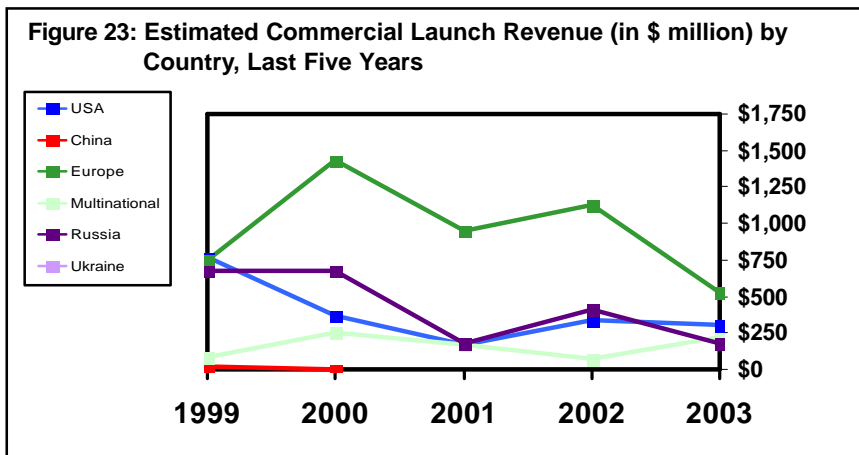


Figure 23 shows estimated commercial launch revenue by country for the last five full years.



Second Quarter 2004 Orbital and Suborbital Launch Events							
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	L M
4/8/2004	✓ + SpaceShipOne	Mojave	SS1 Flight 13P	Scaled Composites	Test	N/A	S S
4/15/04	✓ + Atlas 2AS	CCAFS	* Superbird 6	Space Communications Corp. (SCC)	Communications	\$65-75M	S S
4/18/04	Long March 2C	Xichang	Nano-satellite 1	Qinghua National University	Remote Sensing	\$20-25M	S S
			Experiment Satellite 1	China National Space Administration	Development		
4/19/04	Soyuz	Baikonur	Soyuz ISS 8S	Russian Federal Space Agency	ISS	\$65M	S S
4/20/04	Delta 2 7920	VAFB	Gravity Probe B	National Aeronautics and Space Administration (NASA)	Scientific	\$45-55M	S S
4/27/04	Proton K	Baikonur	* Express AM11	Russian Space Communications Corp. (RSCC)	Communications	\$60-85M	S S
5/4/04	✓ + Zenit 3SL	Odyssey Launch Platform	* DirecTV 7S	DirecTV, Inc.	Communications	\$65-85M	S S
5/13/04	✓ + SpaceShipOne	Mojave	SS1 Flight 14P	Scaled Composites	Test	N/A	S S
5/19/04	✓ + Atlas 2AS	CCAFS	* AMC 11	SES Americom	Communications	\$65-75M	S S
5/20/04	✓ + Taurus XL	VAFB	Rocsat 2	Taiwanese National Space Program Office (NSPO)	Remote Sensing	\$20-30M	S S
5/25/04	Soyuz	Baikonur	Progress ISS 14P	Russian Federal Space Agency	ISS	\$30-50M	S S
5/28/04	Cyclone 2	Baikonur	Kosmos 2405	Russian Ministry of Defense (MoD)	Classified	\$20-25M	S S
6/10/04	Zenit 2	Baikonur	Kosmos 2406	Russian MoD	Classified	\$30-45M	S S
6/17/04	✓ Proton M	Baikonur	* Intelsat 10 02	Intelsat	Communications	\$70-100M	S S
6/21/04	✓ + SpaceShipOne	Mojave	SS1 Flight 15P	Scaled Composites	Test	N/A	S S
6/23/04	Delta 2 7925-10	CCAFS	Navstar GPS 2R-12	U.S. Air Force (USAF)	Navigation	\$45-55M	S S
6/28/04	✓ + Zenit 3SL	Odyssey Launch Platform	* APStar 5	APT Satellite Co., Ltd.	Communications	\$65-85M	P S
6/29/04	✓ Dnepr 1	Baikonur	Demeter	Centre National d'Etudes Spatiales (CNES)	Scientific	\$8-11M	S S
			Unisat 3	University of Rome	Development		S S
			Saudisat 3	Space Research Institute	Communications		S S
			Saudisat 4	Space Research Institute	Communications		S S
			Saudisat 5	Space Research Institute	Communications		S S
			AMSat-Echo	Amateur Radio Satellite Corp.	Communications		S S
			* Latinsat 3	Aprize Satellite	Communications		S S
			* Latinsat 4	Aprize Satellite	Communications		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.

L and M refer to the outcome of the Launch and Mission (immediate status of the payload upon reaching orbit): S = success, P = partial success, F = failure

Note: All launch dates are based on local time at the launch site at the time of launch.

Third Quarter 2004 Projected Orbital and Suborbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
7/15/04	Delta 2 7920	VAFB	Aura	NASA	Remote Sensing	\$45-55
7/17/04	√ Ariane 5G	Kourou	* Anik F2	Telesat Canada	Communications	\$125-155M
7/22/04	Cosmos	Plesetsk	Kosmos TBA 15	Russian MoD	Navigation	\$12M
7/26/04	Long March 2C	Taiyuan	Double Star Polar	Chinese National Space Administration	Scientific	\$20-25M
8/2/2004	Delta 2 7925H	CCAFS	Messenger	NASA	Scientific	\$45-55
8/4/2004	√ Proton M	Baikonur	* Amazonas 1	Hispasat	Communications	\$70-100M
8/11/04	Soyuz	Baikonur	Progress ISS 15P	Russian Federal Space Agency	ISS	\$30-50M
8/29/04	√ Proton M	Baikonur	* AMC 15	SES Americom	Communications	\$70-100M
8/31/04	Soyuz	Plesetsk	Kosmos TBA 17	Russian MoD	Classified	\$30-50M
8/2004	Proton K	Baikonur	* Express AM1	RSCC	Communications	\$60-85M
9/10/04	Delta 4 Heavy	VAFB	Delta 4 Heavy Demosat	USAF	Test	\$140-170M
9/22/04	Delta 2 7925-10	CCAFS	Navstar GPS 2R-13	USAF	Navigation	\$45-55M
9/2004	Kaituoazhe 1	Taiyuan	KT 1 TBA	China National Space Administration	Development	\$10M
9/2004	Long March 3A	Taiyuan	Fengyun 2C	China Meteorological Administration	Meteorological	\$45-55M
9/2004	√ + Zenit 3SL	Odyssey Launch Platform	* Intelsat Americas 8	Intelsat	Communications	\$65-85M
9/2004	GSLV	Satish Dhawan Space Center	Edusat	Indian Space Research Organization (ISRO)	Communications	\$35-45M
9/2004	√ + SpaceShipOne	Mojave	SS1 Ansari X Prize Flight 1	Scaled Composites	Test	N/A
3Q/2004	Atlas 2AS	CCAFS	NRO A4	USAF	Classified	\$65-75M

√ 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.

Note: 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.

Fourth Quarter 2004 Projected Orbital and Suborbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
10/7/04	Delta 2 7320	CCAFS	Swift	NASA	Scientific	\$45-55M
10/15/04	Soyuz 2	Plesetsk	Oblik	Russian Federal Space Agency	Test	\$30-50M
10/18/04	Pegasus XL	VAFB	DART	NASA	Development	\$14-18M
10/28/04	Soyuz	Baikonur	Soyuz ISS 9S	Russian Federal Space Agency	ISS	\$30-50M
10/2004	✓ Proton M	Baikonur	* Worldsat 2	SES Americom	Communications	\$70-100M
10/2004	✓ + SpaceShipOne	Mojave	SS1 Ansari X Prize Flight 2	Scaled Composites	Test	N/A
11/9/04	Minotaur	VAFB	XSS-11	USAF	Development	\$12-17M
11/24/04	Soyuz	Baikonur	Progress ISS 16P	Russian Federal Space Agency	ISS	\$30-50M
11/2004	✓ Rockot	Plesetsk	Cryosat	European Space Agency (ESA)	Remote Sensing	\$12-15M
12/1/04	Delta 4 Medium	CCAFS	GOES N	National Oceanic and Atmospheric Administration (NOAA)	Meteorological	\$65-75M
12/6/04	✓ + Atlas 5 521	TBA	* AMC 16	SES Americom	Communications	\$70-85M
12/30/04	Delta 2 7925H	CCAFS	Deep Impact	Jet Propulsion Laboratory (JPL)	Scientific	\$45-55M
12/2004	Proton K	Baikonur	* Express AM2	RSCC	Communications	\$60-85M
12/2004	Pegasus XL	Kwajalein Island	C/NOFS	USAF	Scientific	\$14-18M
12/2004	Ariane 5G	Kourou	Helios (Intelligence) 2A	Délégation Générale pour l'Armement (DGA)	Classified	\$125-155M
			Essaim 1	French Ministry of Defense (MoD)	Classified	
			Essaim 2	French MoD	Classified	
			Essaim 3	French MoD	Classified	
			Essaim 4	French MoD	Classified	
			Parasol	CNES	Scientific	
4Q/2004	✓ + Zenit 3SL	Odyssey Launch Platform	* XM 3	XM Satellite Radio, Inc.	Communications	\$65-85M
4Q/2004	✓ Volna	Barents Sea	Cosmos 1	Planetary Society	Development	\$0.8-1.5M
4Q/2004	Falcon 1	VAFB	TacSat 1	USAF	Development	\$6M
			* Celestis 5	Celestis, Inc.	Other	
2004	Long March 3A	Xichang	Beidou 4	China Academy of Space Technology (CAST)	Navigation	\$45-55M
2004	Proton K	Baikonur	Glonass M R10	Russian MoD	Navigation	\$60-85M
			Glonass M R11	Russian MoD	Navigation	
			Glonass M R12	Russian MoD	Navigation	
2004	Dnepr 1	Baikonur	Egyptosat	Egyptian National Authority for Remote Sensing and Space Sciences	Remote Sensing	\$8-11M
2004	Strela	Baikonur	Kondor E	Russian Federal Space Agency	Remote Sensing	\$10M
2004	✓ Ariane 5 TBA	Kourou	TBA	TBA	Communications	\$125-155M
2004	✓ Ariane 5 TBA	Kourou	TBA	TBA	Communications	\$125-155M

✓ 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.

Note: 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.