

SPACE NEWS

Top 50

Space Industry Manufacturing and Services

Lockheed Martin Soars To Top of Space Industry

The biggest change in this year's survey of the Top 50 space industry manufacturing and services companies is right at the top, where Lockheed Martin moves far past Boeing to take over the No. 1 position.

The survey is based on annual revenue — in this case revenue companies brought in during 2006. Lockheed Martin's space-related revenue in 2005 was \$9.010 billion — just \$90 million behind Boeing. For 2006 Lockheed Martin posted \$9.8 billion in space-related revenue, an 8.8 percent increase.

By contrast, Boeing brought in \$8.15 billion in space-related revenue during 2006, nearly \$1 billion less than the \$9.1 billion it achieved the previous year. Boeing

spokesman Joe Tedino said in an e-mail that the lower 2006 amount reflected lower volume in the company's government and commercial satellite manufacturing business and its 2005 divestiture of Rocketdyne, which was sold to United Technologies' Pratt & Whitney division.

In an industry that has shrunk to just a few large prime contractors, Boeing and Lockheed Martin are both rivals and partners. Divisions in each company frequently team together to bid on different programs. The two also cooperate at a high level on joint ventures like United Space Alliance (USA),

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Rank	Company	2006 Space Sales	2005 Space Sales	Total 2006 Sales	Total 2005 Sales	Comments
1	Lockheed Martin	\$9,809	\$9,010	\$39,620	\$37,213	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket components; launch services; ground systems; engineering systems and/or software; missile defense; imagery sales and services; satellite communication services.
2	Boeing	\$8,150	\$9,100	\$61,530	\$53,621	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket components; launch services; ground systems; engineering systems and/or software; and missile defense.
3	Northrop Grumman Corp.	\$4,953	\$4,858	\$30,148	\$30,067	Satellite manufacturing; satellite and rocket components; ground systems; engineering services and/or software; missile defense.
4	EADS Astrium	\$4,220	\$3,198	N/A	N/A	Strategic missiles; satellites; space services and space transportation divisions. Formerly EADS Space, the company was renamed EADS Astrium in 2006.
5	Raytheon	\$4,190	\$3,934	\$20,291	\$19,038	Satellite and rocket components; launch services; ground systems; engineering services and software; missile defense.
6	Thales Alenia Space	\$2,180	\$1,776	N/A	N/A	Satellite manufacturing and space infrastructure divisions. Formerly Alcatel Alenia Space, the company was renamed Thales Alenia Space following majority-share purchase by Thales Group.
7	Science Applications International (SAIC)	\$1,970	\$1,850	\$8,300	\$7,800	Launch services; ground systems; engineering services and/or software; missile defense; imagery sales and services; satellite communication services.
8	United Space Alliance	\$1,921	\$1,981	\$1,921	\$1,981	Satellite and rocket components; launch services; ground systems; and engineering services and software.
9	Garmin	\$1,774	\$1,027	\$1,774	\$1,027	GPS hardware and software.
10	Alliant Techsystems Inc. (ATK)	\$1,485	\$1,238	\$3,665	\$3,217	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket components; launch services; and missile defense. Includes \$100 million in revenue from Swales, which the company purchased June 8, 2007.
11	L-3 Communications	\$1,300	\$1,200	\$12,477	\$9,445	Launch vehicle manufacturing; launch services; ground services; engineering services and/or software; missile defense; imagery sales and services; and satellite communication services.
12	Arianespace	\$1,298	\$1,410	\$1,298	\$1,410	Launch services.
13	Computer Sciences Corp.	\$1,250	\$1,400	\$14,700	\$14,600	Launch services; ground systems; engineering services and/or software; missile defense; and satellite communication services.
14	United Technologies Corp.	\$1,060	\$695	\$47,800	\$42,700	Satellite and rocket components.
15	Honeywell	\$1,000	\$1,000	\$31,400	\$27,700	Missile defense; satellite manufacturing; satellite and rocket hardware; ground services; engineering services and software.
15	ITT Corp.	\$1,000	\$1,122	\$7,807	\$7,041	Satellite and rocket components; launch services; ground systems; engineering services and/or software; imagery sales and services; and satellite communication services.
16	General Dynamics	\$953	\$720	\$24,063	\$20,975	Satellite manufacturing; satellite and rocket components; ground systems; engineering services and/or software; missile defense; imagery sales and services; and satellite communication services.
17	Trimble	\$940	\$775	\$940	\$775	GPS hardware and software.
18	Hughes Network Systems	\$839	\$786	\$858	\$806	Ground systems and satellite communication services.
19	Orbital Sciences Corp.	\$803	\$703	\$803	\$703	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket hardware; launch services; ground systems; engineering services and/or software; and missile defense.
20	Loral Space & Communications	\$797	\$626	\$797	\$626	Satellite manufacturing; satellite and rocket components; and satellite communication services.
21	Safran (Snecma)	\$669	\$638	\$14,300	\$12,531	Ballistic and space propulsion division, which includes ballistic missile systems, Ariane 5 rocket and motor segments, and satellite onboard propulsion.
22	Ball Aerospace and Technologies Corp.	\$604	\$629	\$672	\$695	Satellite manufacturing; satellite and rocket components; launch services; ground systems; engineering services and/or software; missile defense; and imagery sales and services.
23	Israel Aerospace Industries	\$571	\$484	\$2,814	\$2,341	Satellite manufacturing; launch vehicle manufacturing; ground systems; and missile defense.
24	BAE Systems North America	\$573	\$565	\$14,000	\$10,000	Satellite and rocket components; ground systems; engineering services and software; and missile defense.

TOP 50 SPACE INDUSTRY MANUFACTURING AND SERVICES COMPANIES

The Top 5



Lockheed Martin's space business in 2006 was helped by the delivery of an unusually large number of commercial telecommunications satellites — five in total — that boosted revenue and helped nudge the company into the No. 1 position in this year's rankings.

Most of the Bethesda, Md.-based company's space sales are lodged in the Space Systems division, which in 2006 reported revenue of \$7.9 billion, a 16 percent increase over 2005.

The U.S. government was the cus-

tommer for 91 percent of the Space Systems division's sales in 2006. Satellite programs accounted for 66 percent of sales. Major programs for the U.S. Defense Department include at least three Advanced Extremely High Frequency communications satellites; the Space Based Infrared System (SBIRS), consisting of at least three and possibly four dedicated satellites and four SBIRS sensors hosted by classified satellites; and the five-satellite Mobile User Objective System for the U.S. Navy, whose first launch is scheduled for 2010.

Lockheed Martin reports revenue from commercial satellite sales only after the product is delivered. Company

officials have said recently that they will remain prudent in their approach to the commercial satellite market because prices remain at levels where profit margins are slim. They warned investors to expect fewer sales in this segment of the business, at least in the near term.

Space and Defensive Missiles is the second-largest component of the Space Systems division, accounting for 18 percent of sales in 2006. Space transportation is the third leg, accounting for 16 percent of the revenue. Lockheed Martin is the prime contractor for NASA's Orion crew-transport vehicle, whose initial contract value is \$4 billion.

Lockheed Martin in late 2006 sold its

stake in International Launch Services (ILS), a commercial-launch venture that sells Russian Proton rockets. Lockheed Martin reported Proton-related revenue in 2006 of \$110 million.

The ILS sale was followed in December by the creation of United Launch Alliance, a 50-50 joint venture with Boeing that will remove Lockheed Martin's Atlas rocket sales to the U.S. government from the company's books in 2007.

Lockheed Martin's Information Technology and Global Services division also performs work maintaining NASA centers. The NASA work for this division accounted for \$230 million in revenue in 2006.



For Boeing's space business, 2006 was in part devoted to clearing the books of one-time charges concerning ethics violations related to the Delta 4 program, which resulted in payments of more than \$600 million; and in closing down its satellite-linked airline passenger Internet service, called Connexion by Boeing — a \$320 million charge.

The creation of the United Launch

Alliance 50-50 joint venture with Lockheed Martin in December also is removing the Delta rockets' government business from Boeing's books, as some \$1.9 billion in Delta government inventory is being sold, at cost, to the joint venture.

Boeing retains the rights to sell Delta rockets commercially, as demonstrated by the June launch of Italy's first Cosmo-Skymed Earth observation satellite. Boeing is contracted to launch a second Cosmo-Skymed by early 2008 and is considered likely to launch at least one of the two remaining satellites

in this series.

Most of Boeing's space work is part of the company's Network and Space division, which is a part of the Integrated Defense Systems segment. The Network and Space division reported \$11.98 billion in revenue in 2006, down 2 percent from 2005 because of lower contract volume for classified U.S. government work and lower revenue from the Ground-based Midcourse Defense program for the U.S. Missile Defense Agency.

Major government satellite programs

include the five Wideband Global Satcom satellites, the first of which is scheduled for launch this summer.

Partly offsetting the revenue declines in 2006 were deliveries of three Delta 4 and two Delta 2 rockets in 2006, compared to just two Delta 2 rockets in 2005.

On the commercial front, Boeing Satellite Systems International continues to be selective in the bids it chooses to compete out of concern that commercial satellite profit margins are insufficient to justify a major effort in this market.



The acquisition of TRW's aerospace business in 2003 made Northrop Grumman a major player in the space business, and space-related programs have been solid contributors to the company's bottom line, providing 16.4 percent of the company's total revenue.

Space work is spread out through a number of Northrop Grumman's divisions. The bulk comes from the Space

Technology division in Redondo Beach, Calif., the former TRW Space & Electronics. In 2006 that division accounted for \$3.35 billion, a slight drop from \$3.39 billion in revenue in 2005. In filings with the U.S. Securities and Exchange Commission, the company attributed the decline to reduced revenue on some classified programs, the "wind-down of a software defined radio program" and lower revenue on the National Polar-orbiting Environmental Satellite System (NPOESS) program, which was the subject of numerous con-

gressional hearings in 2006 for schedule delays and a cost overrun of nearly \$1 billion. Those losses, the company reported, were slightly offset by higher revenue on its contracts for the Airborne Laser and Advanced Extremely High Frequency satellite program.

While the company has had problems with cost overruns and schedule delays on NPOESS, a project involving the U.S. Air Force, the National Oceanic and Atmospheric Administration and NASA, its revenue on that program has been increasing over the long term. The

company received a \$2.35 billion contract extension from the Air Force for NPOESS July 30. That brings Northrop Grumman's total contract value on the program to \$5.8 billion through 2016. The contract extension was a result of the 2006 restructuring of the NPOESS program.

In its fourth quarter, the Space Technology segment grew 4 percent on the strength of higher revenue on its contracts for the Space Radar program, the James Webb Space Telescope and some classified programs.



EADS' Astrium division reported a 19 percent increase in revenue in 2006 when measured in euro-to-euro terms on the strength of a fresh crop of satellite orders and the sharp growth of its satellite-services division.

Astrium's business is divided into three divisions: Satellites, Space Transportation and Services. In 2006, the

space transportation division, which includes work on the French M51 strategic missile, accounted for 51 percent of Astrium's total revenues of 3.2 billion euros (\$4.4 billion).

The space division reported pretax earnings of 130 million euros, or 4 percent of revenues, compared to 2.1 percent in 2005. The profitability of the division has been a high priority for Astrium management.

Astrium Space Transportation is prime contractor for the Ariane 5 rock-

et and is expected to sign a 35-rocket contract in late 2007 with the Ariane-space commercial-launch consortium.

The satellite division accounted for 40 percent of revenue in 2006. Deliveries during the year included four commercial telecommunications satellites and three science satellites for European governments.

Astrium Services accounted for 9 percent of the company's revenue. It is this division whose growth is expected to drive Astrium's overall profitability in

the coming years. Services revenue grew 50 percent in 2006, mainly on the strength of the multiyear Skynet 5 contract with the British Defence Ministry.

Astrium signed a similar long-term services contract with the German Defense Ministry in 2006 for the two-satellite Satcom Bw project, in which Astrium has a 74.9 percent stake.

The German order helped increase overall Astrium backlog by more than 12 percent, to 12.3 billion euros, as of Dec. 31, 2006.

Raytheon

Raytheon's space work accounted for about 20 percent of the company's \$20.3 billion in revenue in 2006. The company is a major supplier of satellite sensors and components, including radar, radio frequency (RF), infrared and electro-optical sensors and systems, command, control communication and intelligence (C3I), and missile systems.

During 2006 the company delivered

the first Block 6 sensor payload for the Space Surveillance and Tracking System for missile tracking. Other Raytheon space programs include work on the Kinetic Energy Interceptor, Exoatmospheric Kill Vehicle, the Patriot air and missile defense system, the Standard Missile 3, the Terminal High Altitude Area Defense battle management command, control and communication system, the National Polar-orbiting Operational Environmental Satellite System and a number of classified programs.

The company spent \$464 million, or about 2.3 percent of sales, on research and development in 2006.

Space work is spread throughout several Raytheon divisions, including Integrated Defense Systems, which does ballistic missile defense; Intelligence and Information Systems, which provides ground systems for air and space systems including NPOESS; Missile Systems; and Space and Airborne Systems, which includes the company's work on intelligence, surveillance and reconnaissance, and other space systems.

Raytheon Space and Airborne Systems announced in October 2006 that it would close in 2008 its Santa Barbara Remote Sensing facility in Goleta, Calif., which builds sensors for civil space programs. Raytheon encountered major problems with the Visible Infrared Imager Radiometer Suite, a key instrument for the civil-military National Polar-orbiting Operational Environmental Satellite System. Those problems were cited in 2006 congressional hearings as primary reason for cost overruns on the program.

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which maintains the shuttle fleet for NASA (USA revenue is counted separately in the Top 50 survey. The company's 2006 revenue earned it the No. 8 spot on this year's chart).

In late 2006 Lockheed Martin and Boeing formed another large joint venture, United Launch Alliance, which sells Atlas and Delta launchers to U.S. government customers, primarily the U.S. Air Force and NASA.

Both companies retained the rights to sell launches to commercial customers. Boeing will market commercial sales of the Delta 2 launcher, while Lockheed Martin will commercially market the Atlas 5.

In late 2006 Lockheed Martin also sold its interest in International Launch Services (ILS), a joint venture with Russian companies that had been responsible for

marketing both the Russian Proton launch vehicle and the Lockheed Martin-built Atlas 5. Lockheed Martin sold its stake in ILS to Space Transport Inc., a group of private investors.

Lockheed Martin's ILS-related revenue up through the closing of that deal in October 2006 is included in this year's chart. Similarly, the 2006 rocket-manufacturing revenue figures for Boeing and Lockheed Martin are included up through the formal creation of United Launch Alliance Dec. 1, 2006.

About the List

Putting together a list of the top space companies in the world takes a lot of research. The list is based on surveys *Space News* sends to companies in the business, interviews with company officials and in some cases, the filings that public companies make with financial regulatory agencies like the

U.S. Securities and Exchange Commission.

Because most companies in the space field also have other lines of business and do not always break out space revenue in their financial reports, determining what business is space-related can be difficult. In recent years, with the advent of so much private-equity investment in space businesses, there are no public records to go by. That was the case this year with Magellan, one of the largest manufacturers of satellite navigation equipment, which is privately owned by Shah Capital Partners. It was also the case with imaging satellite operator DigitalGlobe.

Space-related revenue for some large companies with a small amount of space business is nearly impossible to determine. This year that was the case with Mitsubishi Electric, which builds satellites and satellite components, so it was left off the list.

The categories of space-related revenue include launch vehicle and satellite manu-

facturing, satellite and rocket component manufacturing, launch services, ground systems, engineering services and/or software, missile defense, satellite communication ground equipment and imagery sales and services.

Some categories of space activity are not included. Direct-to-the-consumer services, such as DirecTV, Echostar, Sirius Satellite Radio, WorldSpace and XM Satellite Radio, are not included because those companies derive most of their revenue not from satellite services but from subscription revenue and advertising. As such they are more like cable companies or broadcasters. We also do not include companies in the business of providing fixed satellite services, like IntelSat or SES Americom, because we do a separate feature on those companies at a different time of the year.

— Lon Rains, Editor

Rank	Company	2006 Space Sales	2005 Space Sales	Total 2006 Sales	Total 2005 Sales	Comments
25	Stratos Global	\$538	\$381	\$538	\$381	Reseller of Inmarsat service and related equipment.
26	Harris	\$525	\$450	\$3,500	\$3,000	Satellite and rocket components; ground systems; engineering services and software; missile defense; imagery sales and services. 2006 space sales is a <i>Space News</i> estimate only.
27	Aerojet	\$501	N/A	\$614	\$615	Launch vehicle manufacturing; satellite and rocket components; launch services; and missile defense. 2006 space sales is a <i>Space News</i> estimate only.
28	Inmarsat	\$500	\$491	\$500	\$491	Satellite communication services. Inmarsat recently debuted a handheld satellite telephone service.
29	Telespazio	\$425	\$403	\$425	\$403	Launch services; ground systems; engineering services and/or software; imagery sales and services.
30	Macdonald Dettwiler and Associates	\$377	\$369	\$903	\$715	Satellite manufacturing; satellite and rocket components; ground systems; engineering services and/or software; missile defense; imagery sales and services; and satellite communication services.
31	Jacobs Technology Inc.	\$375	\$312	\$1,000	\$898	Launch services; ground systems; engineering services and/or software; missile defense; and satellite communication services.
32	EchoStar	\$362	\$367	\$9,375	\$7,986	Includes only the revenue associated with manufacturing of satellite ground hardware.
33	Mitsubishi Heavy Industries Ltd.	\$332	\$350	\$20,389	\$18,542	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket components; launch services; ground systems; and engineering services and/or software.
34	ViaSat	\$322	\$391	\$517	\$434	Ground systems; engineering services and/or software; and satellite communication services.
35	Elbit Systems Ltd.	\$314	\$217	\$1,520	\$1,070	Engineering services and/or software; imagery sales and services; space camera manufacturing; and C4ISR.
36	Avio Group SpA	\$294	\$221	\$1,900	\$1,517	Builds missile systems and aeronautical engines and is prime contractor for Europe's Vega small-satellite launcher.
37	Gilat Satellite Networks	\$249	\$209	\$249	\$209	Builds satellite ground terminals and provides satellite communications services.
38	Iridium Satellite LLC	\$212	\$188	\$212	\$188	Satellite communication services.
39	OHB Technology AG	\$186	\$148	\$245	\$155	Satellite manufacturing; satellite and rocket components; launch services; ground systems; engineering services and/or software; and satellite communication services.
40	GeoEye	\$151	\$166	\$151	\$166	Engineering services and/or software; and imagery sales and services.
41	Globalstar Inc.	\$137	\$137	N/A	N/A	Satellite services, missile defense, software and ground equipment.
42	Radyne	\$134	\$103	\$134	\$103	Builds satellite communications and satellite television ground gear.
43	ComDev Ltd.	\$132	\$107	\$132	\$107	Satellite and rocket components; and engineering services and/or software.
44	Goodrich Corp.	\$122	\$129	\$5,900	\$5,400	Satellite manufacturing; launch vehicle manufacturing; satellite and rocket components; ground systems; engineering services and/or software; missile defense; imagery sales and services; satellite communication services.
45	Artel Inc.	\$118	\$106	\$154	\$150	Satellite communication services.
46	Integral Systems Inc.	\$117	\$117	\$98	\$98	Ground systems; and satellite communication services.
47	Globecomm	\$107	\$93	\$126	\$110	Ground systems; and satellite communication services.
48	ND SatCom	\$100	\$100	\$100	\$100	Ground systems; engineering services and/or software; satellite communication services.
49	Spot Image	\$96	\$80	\$96	\$80	Imagery sales and services.
50	Saab Space	\$93	N/A	\$103	\$98	Satellite and rocket components.