



New blood fuels the satellite market

The pace in the number of satellites being launched to Earth orbit in 2007 is faster than it has been in at least the past 10 years. Through the end of June, 65 satellites were carried aboard 31 launch vehicles, nearly as many as were launched in either 2004 or 2005. If the pace continues, we should easily surpass last year's total of 107 satellites. If you look at the number already launched during the second half of the year or manifested through December, it is likely that over 120 satellites will go up in 2007.

This growth is primarily attributable to the robustness of the civil and military segments of the market. While the number of commercial and university satellites being launched is about the same as it was in 2006, the world has been building and launching 30% more civil satellites and 21% more military satellites this year. During the first half of 2007, a total of 27 civil and 17 military satellites were orbited, compared to 21 and seven, respectively, for the same period last year.

The U.S., Europe, Russia, and Japan continue to build and launch civil satellites at about the same rate as always, a combined total of consistently more than 20 satellites per year. NASA and European space agencies, including ESA, again account for at least three quarters of these.

Through June, NASA had launched five THEMIS exploration spacecraft manufactured by Swales Aerospace and the Aeronomy of Ice in the Mesosphere scientific satellite produced by Orbital Sciences, while the Europeans had launched the Carlos Gavazzi Space-built AGILE astronomical research satellite, Thales Alenia Space-built Cosmo-Skymed 1 Earth observation satellite, and EADS' Astrium-produced TerraSAR-X imaging satellite.

Growth from newer players

What has changed this year is that China,



Europeans launched the TerraSAR-X imaging satellite earlier this year.

India, and other countries are launching at a combined rate of more than 25 civil satellites per year, compared with a traditional average of 10 annually. During the first six months this year, China and India launched seven satellites, and countries such as Argentina, Indonesia, and Saudi Arabia accounted for an additional eight.

That countries or regions other than the U.S., Europe, Russia, and Japan are beginning to demonstrate greater relative activity in the construction and launch of civil satellites should come as no surprise to anyone. Civil space budgets in China and India, for example, have been rising faster than in other countries, and they have not yet been largely consumed by one or two massive programs, as has been the case for NASA with the space shuttle and International Space Station.

Military launches grow

On the military side, the difference is that the U.S. has been launching noticeably more satellites than usual. Through the first half of the year, the U.S. launched 10 military satellites. All but three were de-

signed for technology development missions, including the General Dynamics C4 Systems-built NFIRE 1 satellite for early warning.

Two of the 10 satellites, NOSS-3 4A and NOSS-3 4B, manufactured by Lockheed Martin Astronautics, were for surveillance and reconnaissance, and one, FalconSat 3, produced by the Air Force Academy, was scientific.

In each of the previous four years,



In April 2007, an Air Force Minotaur 1 rocket launched the NFIRE satellite.

the U.S. had not launched more than six military satellites during the first six months of the year.

Newcomers to the game

A secondary reason for the higher pace of satellites being built and launched is the gradual growth in the diversity of players in the market. A total of 19 countries or regions accounted for the 65 satellites launched through June. In each of the past four years, an average of 12 countries or regions accounted for the satellites launched during the first six months.

The main countries or regions that launch satellites usually include the U.S., China, Europe, India, Japan, and Russia. It is also not unusual to see an occasional satellite from countries such as Argentina, Australia, Brazil, Canada, Chile, France, Indonesia, Israel, Italy, Malaysia, Mexico, South Korea, Spain, Taiwan, Thailand, Turkey, and the U.K.

But increasingly we are seeing satellites from countries that had never or rarely appeared on launch manifests, including Belarus, Colombia, the Czech Republic, Denmark, Germany, Egypt, Iran, Greece, Kazakhstan, the Netherlands, Nigeria, Norway, Saudi Arabia, the United Arab Emirates, and Ukraine.

And it is not only more countries that are building (or purchasing) and launching satellites, it is also a wider diversity of companies, organizations, agencies, institutes, and universities. A total of 40 different entities accounted for the 65 satellites launched through June, compared with an average of fewer than 25 entities for the satellites launched during a comparable period in each of the past four years.

Of the 40, about one-third were new or relatively new players in the satellite market, including Bigelow Aerospace, California Polytechnic State University,

Carlo Gavazzi Space, the Egyptian National Authority for Remote Sensing and Space Studies, Hampton University, the Nigerian National Space Research and Development Agency, Sino Satellite Communications, Tethers Unlimited, The Aerospace Corporation, the University of Louisiana, the University of Sergio Arboleda, and Zhejiang University.

Other new or relatively new players that launched satellites last year included Bauman Moscow State Technical University, Cornell University, Hankuk Aviation University, Hokkaido Space Union, KazSat, Lomonosov Moscow State University, Montana State University, Nihon University, the Norwegian University of Science and Technology, Torino Polytechnic University, and the Universities of Arizona, Hawaii, Illinois, Kansas, and Rome.

Cheaper rides, smaller payloads

So what is fueling all these new or relatively new players in the satellite market?

One answer, we think, lies in the growing realization that affordable access to space is much less problematic than it used to be. This realization has been around for many years, but it has taken some time for the launch companies offering these less expensive services to market themselves and develop relationships with prospective customers.

Now these efforts are starting to pay off, particularly for companies like the Russian/German joint venture Eurockot Launch

Services and its Rocket launch vehicle and especially the Russian/Ukrainian joint venture International Space Company (ISC) Kosmotras and its Dnepr vehicle. During the past five years, these two companies alone have launched (or have attempted to launch) satellites for 40 different customers.

Some of these customers, such as

ESA and the Japanese Aerospace Exploration Agency, could certainly have afforded to launch their satellites on other, more expensive rockets. However, the vast majority of them would have had a much harder time, not only affording higher launch prices but even finding launch service providers that could physically accommodate their small, micro, nano, or pico satellites or would even want to bother trying.

Of the roughly 140 different customers that contracted launch companies from 2003 to June 2007, more than one-third might not have launched had it not been for the availability of rockets like Dnepr, Rockot, and a handful of other relatively inexpensive vehicles like Russia's Cosmos and Start and the USAF's Minotaur, built by Orbital Sciences.

Granted, most satellites launched for these customers were either small, weighing less than 1,000 kg, or very small, weighing in at under 100 kg—not an awful lot of capital creation generated by these spacecraft. What we sense is more important, though, for the long-term dynamism and health of the market is what these satellites represent in terms of customer diversity.

Choosing a strategy

The satellite and launch services industries can choose to remain static and continue to rely only on known customers who can afford to pay the traditional launch prices and thus build mostly traditional kinds of satellites that focus on mostly traditional consumer applications. Or they can choose to expand, creating more business volume by targeting more customers—even if initially the revenue gained may not seem worth the trouble.

If the satellite and launch services industries opt for the former strategy, then there is a good chance that we will never realize the full potential of what can be done with satellites in orbit and what new applications, industries, and markets they could spawn.

If the latter strategy is sought, then there is a good chance that the satellite and launch services industries will be in-

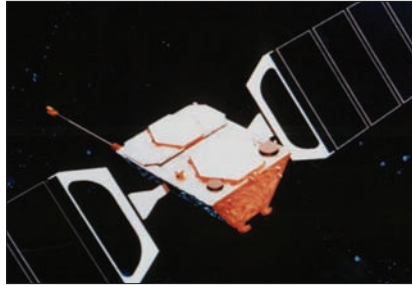


Many smaller countries or companies would not be able to launch their satellites were it not for the availability of rockets like the Rockot.

fused with hundreds, perhaps thousands, of new customers who will introduce an incalculable number of new ideas, technologies, discoveries, business opportunities, and thus excitement and interest in the market.

As it stands, it appears that both strategies are being undertaken naturally. The market is evolving by itself, with traditional satellite manufacturers and launch services providers taking the more conservative route and the newer competitors catering (largely by default) to nontraditional customers. Everyone is doing precisely what they feel they are capable of doing, given their products, financial situations, and market circumstances. No one is intentionally taking any risks in the short term for the sake of the long term. And no one is purposely sacrificing long-term opportunities for the sake of the short term.

At some point, it will become obvi-



Launches of replacements for systems like Globalstar will also keep business humming.

ous which strategy makes the most sense from the standpoint of the overall market—in other words, where the greatest potential for growth, both with regard to volume and sales revenue, lies. It is still too early to tell for sure, but we can plainly observe that there are many more players in the market than we might have imagined a decade ago.



A third and final contributing reason for the rising pace of satellites being built and launched this year has to do with the advent of the replenishment satellites for LEO mobile communications satellite systems such as Globalstar. Four Globalstar satellites, built by Space Systems/Loral, were launched on May 29 aboard a Soyuz FG rocket. Another four are scheduled to be launched by another Soyuz FG before the end of the year.

Some half-dozen or so LEO mobile Orbcomm replacement satellites should also go up on one or two Pegasus XL boosters later this year. Additional Globalstars and Orbcomms will probably follow in 2008-2009. These replenishments, together with the growing wave of civil satellites and new satellite operators, should help sustain the current up cycle in the market.

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