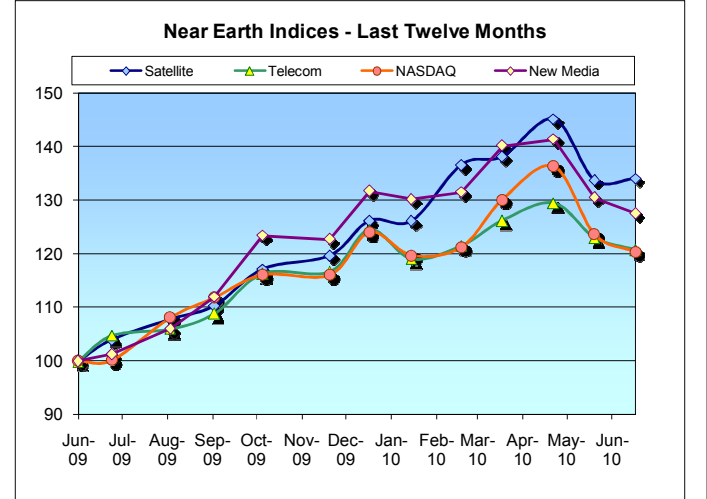


# FROM THE GROUND UP

July 2010

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## THE WAY WE SEE IT...

### Satellite:

It was reported that **Inmarsat** is in final negotiations with **Boeing Satellite Systems** to acquire a new constellation of 3-4 satellites that would include Ka band capability. Given how new **Inmarsat's** I-4 series of satellites is, we believe this is driven less by a need for more capacity and more by competitive pressure from the exploding use of mobile VSAT antennas that selectively poach **Inmarsat's** best customers. One of those sources of pressure is mobile VSAT provider **Vizada**, which closed a €116 million private equity injection from **Hutton Collins Partners** in late May. One of the others is **Iridium**, which got **Coface** backing for \$1.8 billion, which combined with other sources will fund the deployment of Iridium NEXT, currently in development by **Thales Alenia Space**. Not to be outdone in the transaction department, **Harris Corporation** announced that it intends to acquire **Caprock Communications** – for 9.5x EBITDA, illustrating the valuation managed satcom providers can command when they have healthy backlog.

### Telecom:

M&A in the sector continued to heat up, with CLEC **Speakeasy** set to join forces with fellow CLECs **Covad** and **Megapath**, which are also in the process of merging. **Best Buy**, which purchased **Speakeasy** in 2007, will remain a minority shareholder in the merged firm. With significant pressure from both mobile providers and ILECs, we expect CLECs to continue to seek scale as a defensive response. In the coax telecom world, New York based **Cablevision Systems Corporation** announced that it is acquiring **Bresnan Communications** for \$1.365 billion – about 8x EBITDA and 3.4x revenues – a nice deal for our friends at **Providence Equity Partners**, too. Given **Cablevision's** metro New York focus and **Bresnan's** Rocky Mountain focus, we were surprised a bit, but still expect synergies from greater bargaining power with equipment and programming vendors. Finally, as this went to press, reports emerged that **Harbinger** and **Skyterra** are set to announce a \$7 billion deal with **Nokia Siemens Networks** to build out its LTE network, now named **LightSquared**. Complete financing details continue to remain uncertain at this time. Also as this went to press, **Nokia Siemens Networks** agreed to acquire **Motorola's** wireless network infrastructure business for \$1.2 billion.

### Aerospace:

Hot off their financing news, and the successful demonstration launch of the Falcon 9 launch vehicle, Iridium awarded a \$492 million launch contract for Iridium NEXT to **SpaceX** – setting a record for a commercial launch contract at a cost per kilogram to orbit that hasn't been seen in a decade. It looks like **Tesla** may not be the only Elon Musk based IPO... Meanwhile, M&A heated up with **The Boeing Company** acquiring **Argon ST** for an eye opening 18x EBITDA – we knew the sector was hot, but wow!

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## ***Near Earth's investment thesis for today's market***

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The only clear fact is there is a great deal of justified anxiety and no easy solutions ...

Capital markets seem to be caught in a state of partial paralysis. This is not a “paralysis through analysis” as we used to say at MIT when one over analyzes a situation or is overwhelmed with conflicting data. This is a paralysis driven largely by the absence of good sound decisions to make after completing good sound analyses. Many investors and corporations are unsure as to whether we are experiencing a slow but volatile recovery out of a deep recession, on the precipice of a second and potentially deep dip into another recession or simply likely to bop along with pitifully low growth and high unemployment for a decade or so. None of these outcomes is particularly attractive and which view one adopts says almost more about one's personality than any reasoned evaluation of economic data and trends. In short, no one really has a clue as to what will happen to the global or even local economy over the next 5 to 10 years. The only clear fact is there is a great deal of justified anxiety and no easy solutions.

Go back to school, make yourself more valuable by investing in your education and then look to monetize that value in a better future market environment...

So in this period of fewer good mainstream investment options (i.e. stock market, real estate, bonds, Treasuries), no clear visibility and a general expectation that the economy could be bad or at least flat for an extended period, what is an investor to do? You can certainly stick a healthy proportion of your net worth in the relatively safer, more liquid and less volatile large cap value stocks, but if the goal is to reach for capital appreciation some amount of one's net worth may be better allocated to higher risk, higher return options. We think the answer for this part of one's portfolio is similar to the advice often given to graduating students who are faced with a difficult employment market. Go back to school, make yourself more valuable by investing in your education and then look to monetize that value in a better future market environment. For investors, we think this analogy means placing a larger share of net worth into private alternative investments like private equity funds and venture capital funds where the exits can be delayed until better market conditions return. The analogy works particularly well for venture capital, where one is basically investing in knowledge creation (i.e. technology) and hard working, motivated entrepreneurs and trying to position companies for attractive exits in a few years at hopefully higher valuations.

We also believe the timing for venture capital is quite good because private market valuations are still reasonable as we are not that far from the trough of the last bubble. All else being equal, would you want your money in a 2006/2007 vintage venture fund or a 2010/2011 vintage fund? The amount of capital flowing into venture funds is also down considerably from recent peaks while an explosion of innovation continues. In short, less supply of capital, but plenty of demand for it means more investment options.

## ***Near Earth's investment thesis (cont.)***

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... the value of liquidity to investors should be a function of the likelihood of more desirable investments becoming available ...

But, isn't it better to be in more liquid investments in times of high uncertainty like today? We would argue NO, not if you are paying too much for that liquidity. The liquidity premiums investors are paying to be in public securities or funds may now be too high versus the value of that liquidity. In explanation, we would argue that an investor desires liquidity for two primary reasons: (1) to have the ability to switch to a more attractive investment opportunity with superior risk/reward characteristics and (2) to go to the safety of cash. As to the first reason, the value of liquidity to investors should be a function of the likelihood of more desirable investments becoming available within the investment horizon of the non-liquid alternatives. If public market volatility over the investment horizon is more likely to be volatility around a flat or downward trend line, then there should be fewer superior investments requiring liquidity in order to reallocate capital. There will of course always be some superior investment opportunities requiring liquidity for capital reallocation, but our argument is there is likely to be fewer such opportunities and therefore the liquidity premium should be lower than if the volatility was around an upwardly biased trend line, as has been true for most of history and much of the recent past (both the boom and the bounce back).

As to the second reason for desiring liquidity, the ability to move to the sidelines and sit on cash is of less value to investors if the interest rates being paid on cash and cash equivalents are as historically low as they are now. We would even argue these rates may not truly compensate investors for the risks of inflation. The rates are more of a blended average of the risks of deflation and inflation, and if the government is determined to fight deflation as the worse of the two evils, the primary risk to consider when sitting on cash is inflation. Is a 0.6% 2-year Treasury rate adequate?

If everyone is rushing for the exits at the same time, you will pay a steep price for that liquidity ...

Lastly, we would argue that the liquidity an investor believes he is paying for is often illusory. Many hedge fund investors found this out in the last market downturn. If the desire for hedge fund liquidity is individual, the liquidity has far greater value than if the desire for liquidity is widespread as during a market melt down. If everyone is rushing for the exits at the same time, you will pay a steep price for that liquidity. In this market, we would argue, the reason to invest in a hedge fund is largely to get positive alpha, not because the fund offers liquidity. We would also argue that the value of liquidity is also diminished to a considerable extent for traditional public market investors. For public market investors seeking liquidity to switch from one liquid investment to another, the increasing correlation of public securities driven by globalization and the increasing market share of ETFs and index funds makes it less likely there will be as many investment alternatives moving in an uncorrelated direction as the investment being sold. Again, there will always be alternative investments available, but if there are fewer such alternatives then the liquidity

## ***Near Earth's investment thesis (cont.)***

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premium should be less valuable as those fewer uncorrelated investment opportunities will be bid up to higher valuations.

Hopefully, the above views will lead you to reconsider the relative value of liquidity in this market environment and open your mind to a greater allocation to private investments, particularly venture capital which focuses on technology driven growth which can be incubated even in poor economic times.

like staying in college to get that advanced degree, it does critically matter where one focuses one's studies ...

Of course, like staying in college to get that advanced degree, it does critically matter where one focuses one's studies (e.g. technology versus art history) and then diligently positioning oneself to be attractive to those firms likely to be hiring in the future. The student also has to apply him or herself and get good grades versus hanging out at the beach. Likewise, a fund manager must be either great at "stock picking" or choose to focus in the "right" sectors where the probability of success is inherently higher. A combination of both is the best strategy and our view at Near Earth. First, we would choose to invest in those sectors that are experiencing long-term secular growth and growth that is largely uncorrelated with the general economy. Luckily, many of the sectors we have covered for years have these exact characteristics.

What really mattered was a key innovation that fit perfectly with changing market demand ...

Here is an example of what we mean by "long-term secular growth largely uncorrelated with the general economy". If you grew up in the 1960's you could track the number of burgers McDonald's sold on its signs. Every time they sold another million burgers the signs would change and people would look in amazement. With countless billions and billions of burgers sold, McDonald's has long sense bothered to count them. If you were to have purchased shares of McDonald's at the beginning of 1970 your split adjusted stock price would have been roughly \$0.30 versus today's stock price of roughly \$70.00. That represents an average return of over 14% for a period of 40 years. That is a long-term secular trend largely uncorrelated with the general economy. In some periods, McDonald's even did better in recessionary periods as people shifted to lower cost food options. Basically something, in this case franchised fast food, was introduced into the economy and forever changed our way of life. A patient investor only needed to consider whether or not future generations would consume more or less franchised fast food and if other people in other countries might one day also want this service. Corporate management continued to matter in the medium term, but where the Dow happened to be trading was, in hindsight, largely irrelevant over moderate time periods. What really mattered was a key innovation that fit perfectly with changing market demand. In the case of McDonalds, it was consistent menu, food quality and even store appearance offered to increasingly time pressed two-earner households and a more mobile populace.

## ***Near Earth's investment thesis (cont.)***

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Finding companies that are likewise positioned for long-term secular growth and then looking to back the best management teams is the strategy we think will generate superior returns in today's environment. Investment timing, however, is also important. McDonald's growth was slow at first, but then a tipping point was reached as network effects increased the demand for franchises. The presence of a near term tipping point or inflexion point in the growth curve is therefore also important in the timing of any private investment. Good investment opportunities will be ones where a well defined tipping point was recently passed or can be seen on the immediate horizon.

The presence of a near term tipping point or inflexion point in the growth curve is therefore also important ...

So how does this apply to the industries we cover: commercial satellite, wireless telecom and aerospace? Within each of these industries are sectors we believe demonstrate a potential for long-term uncorrelated secular growth with a near term tipping point. Here are a few examples:

- **Satellite Broadband**: It is often said that broadband access is no longer a luxury, it is a necessity. Clearly, it is difficult for satellites to compete with terrestrial alternatives where they are offered. It is also true that many millions of sufficiently affluent households and small businesses reside outside of regions where terrestrial broadband alternatives are available or likely to be available for decades. The geographic area suitable for satellite broadband may decrease over time as terrestrial alternatives expand their coverage areas, but this decrease in territory may very well be compensated for by increasing population, increasing affluence and/or increasing average bandwidth consumption. In any event, are there many people who would bet against long-term global rural broadband penetration going up dramatically in the next decades? By dramatically, we mean by a factor of 10x or 100x. In Africa, people have been talking for years about the 100%+ annual growth in cellular traffic, but only recently have people started to focus on the 1,000%+ growth in broadband traffic, growth that would be even higher if it were not being constrained by network bottlenecks.

... people have been talking for years about the 100%+ annual growth in cellular traffic, but only recently have people started to focus on the 1,000%+ growth in broadband traffic

...

The question then becomes, how will this rural broadband demand be economically satisfied for both user and provider. The answer and the tipping point from our point of view is the emergence of High Throughput Satellites (HTS) like ViaSat-1. These mostly Ka-band spot beam satellites provide 10x or more of the bandwidth of traditional GEO satellites enabling higher bandwidth availability for satellite users and comparable monthly service charges versus terrestrial alternatives. There are also no technical barriers to expanding 10x satellite capacity to 100x. Another tipping point is the increasing commercial availability of lower cost and easy to self deploy customer premise equipment (CPE). What we see evolving is a slow but accelerating proliferation of HTSs and low cost CPE with global

## Near Earth's investment thesis (cont.)

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subscriber counts going from hundreds of thousands to tens of millions. Still a drop in the bucket versus the billions of eventual terrestrial broadband users, but a very attractive investment opportunity nonetheless for the entire value chain supporting the millions of satellite broadband consumers we see on the horizon.

- **Mobile Broadband & Cellular Backhaul:** There are currently over 3 billion cell phones in use globally and according to a recent Pew Survey roughly one third of U.S. adults now use mobile broadband. As smart phones get ever smarter, cheaper and more numerous and as 3G networks evolve to 4G, LTE and WIMAX, mobile broadband will become ubiquitous and commonplace. The only question is the compound average growth rate over the next several decades, not whether or not there will be substantial growth. Does anyone seriously doubt this projection? Even in the deepest part of the recession sales of new iPhones skyrocketed. This mobile broadband future does, however, assume we find enough wireless spectrum to handle the increased traffic and solve the all important middle mile problem. The first mile is simply a fiber link from an aggregating node to the Internet or PSTN. Adding fiber capacity at existing nodes is relatively easy and cost effective. The last mile is from the tower to the cell phone and can be solved with more spectrum on current cell towers or, if necessary, more towers. The government seeking to find or reallocate 500 MHz of spectrum for wireless broadband may solve the spectrum part of the looming capacity problem in the U.S. and is one of the tipping points to monitor.

This mobile broadband future does, however, assume we find enough wireless spectrum to handle the increased traffic and solve the all important middle mile problem ...

The trick is the high bandwidth link from the towers to the aggregating nodes: the "middle mile". Historically, this traffic has been carried by T-1 lines over copper, and today in many cases, fiber transport networks accomplish this connectivity. However, copper has limited capacity and it is not always economical to lay fiber – meaning that it is these over the air middle mile links that can create the worse bottlenecks and contribute the highest costs to broadband connectivity. With ARPU growth likely to face resistance, the cost of the middle mile has to be brought down. Currently, the over the air links are accomplished largely through microwave systems. These microwave links typically provide 100s of Megabytes per second of connectivity. Newer and higher frequency millimeter systems now offer 1 Gigabyte per second connectivity. That capacity appears to be fine for now, but most telecom carriers are predicting capacity bottlenecks within a few years and are looking for technologies that can provide 10 Gigabytes per second. To reach those levels may require a new generation of millimeter wave systems or laser based systems called free space optics. Free space optics to date has not demonstrated the reliability in all weather conditions or range required to be effective for most applications. If a company can overcome those obstacles, it will find a

... That capacity appears to be fine for now, but most telecom carriers are predicting capacity bottlenecks within a few years ...

## ***Near Earth's investment thesis (cont.)***

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large and open market. Technologies employing super fast laser pulsing are showing promise. This is another tipping point to monitor.

- **Unmanned Aerial Vehicles (UAVs)**: At the National Space Symposium a few years ago, I heard a top Air Force General declare that the U.S. had probably just agreed to procure its last manned fighter plane. Now we may be buying copies of existing models of those fighters for decades to come, but the point was that the future was in unmanned aerial vehicles like the Predator, Global Hawk and dozens of other designs of all shapes and sizes currently being fielded or tested. I used to think the primary reasons for using UAVs were lower cost and avoidance of risk to pilots. Turns out that's only part of the picture. The primary motivation is performance. For many missions, UAVs simply get the job done better than manned systems. This is in part due to a UAV's ability to combine the reconnaissance or surveillance mission with the strike mission. Air dropping a special forces team into a hostile area to call in an air strike can now be accomplished with a UAV firing a missile after a guy in a trailer watches a satellite linked video feed. But while this capability seems easy to field, in practice there are hundreds of soldiers and specialists in the chain of operations for mission planning, training, flight preparation, flight operations, maintenance and logistics, and communications. It is not cheap or easy.

For many missions, UAVs simply get the job done better than manned systems.

What will make UAVs really take off and be fielded in truly large scale numbers are a whole series of innovations currently being pursued by entrepreneurs and aerospace companies. These innovations involve, to name a few, more survivable and lighter airframes, greater maneuverability, greater autonomy, quieter engines, engines with more power per pound of mass, autonomous landing in any environment with or without GPS, in-air refueling, and higher quality and higher bandwidth communication links. Much work is also being done to create smaller, portable and deployable systems that still retain much of the performance capabilities of the larger systems.

Applications are numerous, including enhanced border patrol, police and FBI applications, traffic and news reporting, aerial photography, monitoring pipelines and utility corridors, and FEMA applications...

We believe the investment opportunity is two fold. First, seek to back those component and subsystem companies with category winning and game changing technologies likely to be adopted across multiple UAV platforms. Second, focus on companies that can market components or UAV systems suitable and affordable by non-military customers, such as Federal, State and Municipal agencies and corporations. Applications are numerous, including enhanced border patrol, police and FBI applications, traffic and news reporting, aerial photography, monitoring pipelines and utility corridors, and FEMA applications. Manufacturing scale is the key here, so the tipping point will be the military settling on one or two small systems and ordering thousands of them.

## ***Near Earth's investment thesis (cont.)***

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The best management teams and best technical solutions that come out of this process are likely to attract the lion's share of NASA financial support...

- **Commercial Space:** NASA's new space policy calls for billions of dollars to be invested over the next several years in developing the commercial space industry. While the magnitude of this activity may get reduced by Congressional action, some significant financial support is still likely to be approved. In many cases, companies receiving NASA financial support will have to first prove their worth through contractual studies or in sponsored competitions with other contenders. The best management teams and best technical solutions that come out of this process are likely to attract the lion's share of NASA financial support. As part of this process, NASA will also be providing, directly or indirectly, valuable due diligence guidance for prospective investors as it uses its own considerable expertise to vet the companies, technologies and management teams. It is as if prospective investors are able to hire the leading industry consultant onto their due diligence teams for no compensation. Even better, NASA is also likely to be the first and largest customer for these companies and contribute to the funding of these companies in a manner that reduces the investors' risks while enhancing expected returns on investment. NASA is willing to do all of this because otherwise these companies might never attract sufficient private capital and NASA would have to spend far larger amounts to achieve the same desired capabilities.

These funds and backlog have been instrumental in allowing SpaceX to raise private capital ...

The perfect example of this commercialization support process is SpaceX, which competed against five other companies for one of two Commercial Orbital Transportation Services (COTS) awards. Through these awards, NASA "invested" significant funds into SpaceX without burdening the company with debt or diluting the founder and subsequent private equity investors. As part of COTS, NASA has also entered into contracts with SpaceX for launches to deliver cargo to the International Space Station. These funds and backlog have been instrumental in allowing SpaceX to raise private capital to complete the first successful launch of its Falcon 9 rocket and this success has in turn allowed SpaceX to attract additional backlog from commercial customers. If SpaceX can make further progress on its Falcon 9 development program and get closer to commercial operation, it will be well positioned to go public or raise additional private capital on attractive terms, thus freeing NASA from the need to provide any further financial support. The tipping point in this case was clearly the COTS award. If you could have invested in SpaceX contingent upon them winning one of the two COTS awards, you would have made a good risk/reward investment. If the NASA commercialization policy continues as currently envisioned, there may be many more attractive investment opportunities like SpaceX and these opportunities will have to do with rockets, satellites, cargo and even humans going up and down, not the stock market.

## Near Earth's investment thesis (cont.)

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- Other Sectors:
  - **Machine to Machine (M2M) Communications:** Cost of embedded chips declining toward a tipping point. Wireless networks expanding coverage and capabilities. Iridium, Globalstar and Orbcomm have secured financings for their next generation fleets.
  - **Geospatial:** GPS becoming ubiquitous. Location based services exploding. Navigation becoming standard application for phones and automotive vehicles. Information being geo-tagged (digital photos, Tweets). Web-based free global imagery databases. Enabling this growth has been free GPS signals and a government anchor tenant that covers and de-risks the capital employed for the space imagery infrastructure. The tipping point is cheap processing power and powerful software tools, often in the “cloud”, that can turn a mash of geospatial linked data sets into user friendly and actionable information. Every new set of geo-linked content, whether professionally create or user created, adds to the growing network effect.
  - **Non-Industrial Robotics:** Most robots today automate manufacturing, serve some menial consumer function like cleaning or are for purely entertainment purposes. Advancing technology will allow a new generation of robots to perform a broader range of valuable services on an economical basis. Some of these advances are being driven by military and police applications while others are flowing out of labs focused on operating in harsh environments like space, the deep-ocean or areas of extreme heat. The intelligence, mobility and survivability of these new robots will eventually reach a level where they can be applied to more mass market government, corporate and consumer applications.

...cheap processing power and powerful software tools, often in the “cloud”, that can turn a mash of geospatial linked data sets into user friendly and actionable information ...

We believe they each show long-term secular growth potential largely uncorrelated with the general economy ...

These are some of the sectors we have spent years, and in some cases decades, covering, learning and analyzing. We believe they each show long-term secular growth potential largely uncorrelated with the general economy and have recently or will soon reach important tipping points. They are also sectors in which we have developed significant relationships with companies and entrepreneurs and see a high degree of potential deal flow. In many cases, however, the opportunities lie somewhere between the friends and family or angel stage and a typical first VC round. This means initial investment sizes often in the \$1 - \$5 million range, which is a good sweet spot for a smaller first venture fund. We believe there are many “diamonds in the rough” that get orphaned at this stage. In other cases, the deal flow we see represents later stage growth companies still too small for the private equity firms or not yet easily leverageable, and in industries not well covered by the VC industry (e.g. satellite equipment/services and aerospace). There are also special opportunities

## ***Near Earth's investment thesis (cont.)***

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that crop up from time to time that are attractive, but hard to categorize. Some of these may be co-investment opportunities on private equity buy-outs, distressed debt or VC investments. Others may relate to secondary sales from existing funds or undervalued PIPE transactions.

Taken together, we believe the sectors we cover represent a unique investment opportunity for a new fund, and perhaps especially in these challenging market conditions. We also recognize that success is not just a matter of being in the right sectors, but largely dependent on screening numerous opportunities for the best technologies and management teams, negotiating and structuring favorable deals and combining the fund's investments with reasonable exit flexibility and enough staying power to support the companies to cash flow breakeven or further funding events. This is the investment strategy we think makes sense for this market and we have spent decades developing just the kinds of due diligence, valuation and structuring skills required while serving some of the top corporations, private equity funds and hedge funds in our industries.

We feel strongly enough in this investment thesis to be launching our own venture fund and are taking the first steps to make that a reality. We also feel strongly that our team's blend of academic training (technical and finance), corporate experience (engineering and management), and financial expertise (investment banking and equity research) provide unique insight into recognizing both value and risk. We will not be soliciting funds for some time, but if you have any advice for us as we move forward, we welcome your input.

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By Hoyt Davidson  
Near Earth LLC

## Scaling for success in space

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For the operators  
... the financing is  
the *pièce de*  
*resistance* ...

On this Bastille Day 2010, the executive suites of satellite operators around the world would be excused if they spent their time practicing the lyrics to *la Marseillaise*. Early last month, the French export-credit agency Coface, came to the assistance of mobile satellite operator Iridium, with a guarantee for a \$1.8 billion package to help finance its next-generation NEXT constellation, initiating a \$2.9 billion project for 81 satellites to be built by French/Italian manufacturer Thales Alenia Space (TAS). For Coface, this was only the latest in just over a year of almost unprecedented financings, including guarantees of \$586 million for 48 Globalstar satellites and \$465 million for as many as 24 O3b satellites, both constellations also to be built by the same TAS. For the operators, while the satellite system may be the *table d'hôte*, the financing is the *pièce de resistance*.

... these numbers  
are about an order  
of magnitude  
greater than  
anything we've  
seen in the space  
industry for the last  
decade...

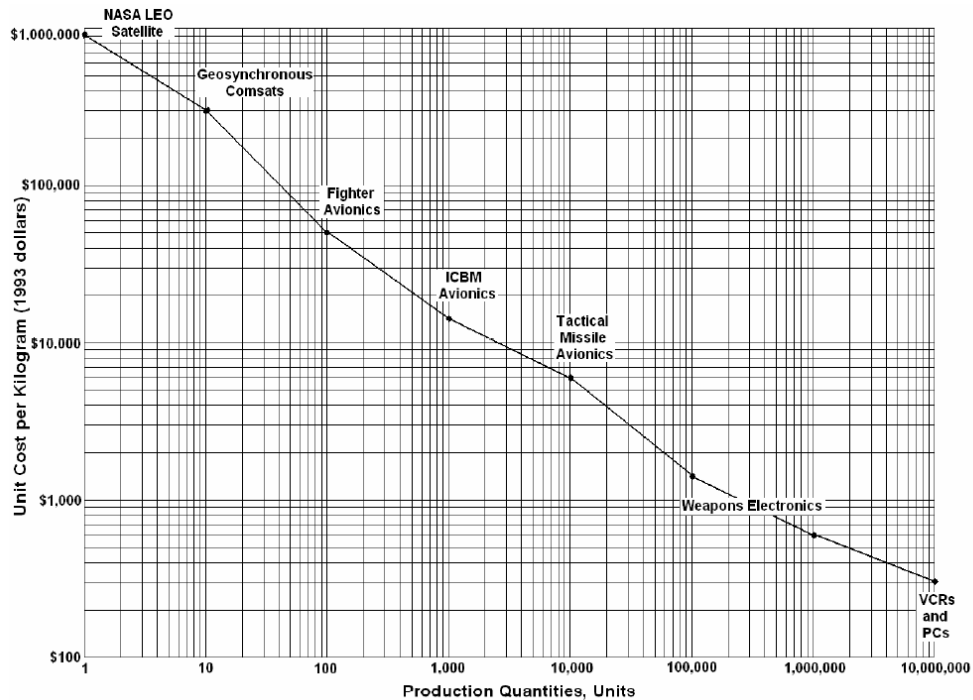
More startling than just the dollar number involved is the sheer number of satellites being built. For an industry where four or five satellites is considered a large order and eight to ten satellites a good year, those three contracts combined represent at least 153 satellites. Granted, these satellites will be smaller than the typical GEO satellite, but the aggregate kilograms to be launched into space is still very impressive and more importantly, the number of parts and components should allow for more efficient purchasing and manufacturing. Undoubtedly, TAS is intensely studying how to ramp up a line for the production of so many individual spacecraft. For others, this will have effects both up and down the supply chain as the surge will cascade across the many suppliers of components and subsystems for space systems. Even in launch systems too – witness the half a billion dollar contract Iridium signed with SpaceX to launch its system, likely to involved eight to ten launches of the Falcon 9. Assuming SpaceX hasn't yet achieved full reusability by then, that's as many as 100 identical Merlin engines in the production pipeline to add to the couple hundred already needed for pre-existing orders. Lest we think that this is limited to TAS and these three constellations, Sierra Nevada Corp, contractors of the next generation ORBCOMM constellation, is planning its own assembly line for small satellites, potentially producing batches of satellites a couple dozen at a time. All these numbers are about an order of magnitude greater than anything we've seen in the space industry for the last decade. Has mass production in this industry arrived?

If we are seeing the beginning of a new phase in the space industry, one where there is movement from one-off projects or single-digit volumes per year to an industry producing an order of magnitude more units, then that has implications across the board. First, procurement practices on all levels of the supply chain will have to adapt to batch orders and design for manufacturability. Second, it has potentially phenomenal implications for cost, throughput and economies of scale. As much as new technology has

# Scaling for success in space (cont.)

mass production is the real game changer ...

the promise to drive down cost, far more often, as Henry Ford and others a hundred years ago showed, mass production is the real game changer. To illustrate, the graph below, graciously provided by Ed Tuck of the Falcon Fund, was developed by Dr. James R. Stuart (of KitComm, Teledesic, Ball, Orbital and others; an expert on satellite mass-production) in 1993 to show the effects of production scale on cost, even for highly complex aerospace products. While the figures are dated to early '90s, little has fundamentally changed in that time. Almost to a tee, unit cost per kilogram is almost directly correlated (on a logarithmic scale) to the production quantity of the item produced. On an equal-sized basis, a component built in a factory intended for 10,000 units per year is an order of magnitude lower cost than built in a factory built for 1000.



economies of scale are not limited to consumer products and simple parts, but for any product ...

Furthermore, there is undeniable evidence that economies of scale are not limited to consumer products and simple parts, but for any product as long as the method of production is optimized for the magnitude of production. The standard modern automobile today bears tens of thousands of often complex parts and electronics, yet a plant like the NUMMI automobile plant in California (which Elon Musk's Tesla Motors recently acquired) produced at the peak of its operation about a half a million affordable vehicles per year. Similarly for seemingly more complex aircraft, the Ford Willow Run factory, the embodiment of the Arsenal of Democracy, produced 428 B-24 Liberator bomber aircraft in August of 1944, or about 14 each and every day. Although not near that production, Boeing alone still managed to deliver almost 500 commercial aircraft last year, some of which are built with millions of individual parts. As long as the market is there to justify production and the initial CAPEX, there's no telling how far

## ***Scaling for success in space (cont.)***

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we can take this, even for something as complex as a modern satellite or spacecraft. As with many things in life, the reward for success is more success.

So, are we now moving down that line to lower costs and greater inspiration? The key phrase was, "As long as the market is there". Longtime industry observers might be feeling as though it was déjà vu all over again. In the late nineties, in the midst of the tech boom, investors were dazzled by plans for constellations comprising of hundreds of satellites driving the need for launch vehicles launching dozens of times a year. This was driven by massive optimism on the future of satellite telecommunications and further driven by spaceflight enthusiasts who hoped that the massive organic demand would help propel lower costs for their own dreams of cheap, reliable and accessible space travel. Unfortunately, most of those ventures went bankrupt with the bust, cursing investors and dreamers alike. Market risk, or the lack of the top line unfolding as forecasted was where dreams met harsh reality. Why should it be different this time?

Longtime industry observers might be feeling as though it was déjà vu all over again ...

For one, the industry is a lot stronger and more established now than it was then, with many of the new satellite constellations belonging to existing companies with real revenues and sometime profits. At the very least, the Coface guarantees will keep them from insolvency. Companies like Iridium and Globalstar are more likely to get acquired or acquire each other than to go bust. Demand for existing mobile satellite services is growing nicely, but there is little obvious room for new entrants into this already crowded field. Other satellite services are growing nicely, even greatly in the case of high throughput satellites, but not by an order of magnitude, not for the industry as a whole. So we ask again, where will these production rates come from?

If we were to only see the satellite industry on its own, we would be inclined to say that this was a giant pig in a python ...

If we were to only see the satellite industry on its own, we would be inclined to say that this was a giant pig in a python. But luckily for the industry, Coface and the MSS operators have unwittingly chosen a perfect moment to surge their replacement satellites, just as interest in commercial cargo and commercial crew delivery to the space station has reached new heights. The International Space Station may be only one satellite, but it's a big one and consumes a lot of material that up until now was only serviced by NASA through the Shuttle and by other governmental partners. Now, that is changing. As we've discussed in prior articles, NASA has already awarded contracts for twenty cargo servicing flights to the ISS, with the number likely to rise as the Station's life is prolonged (to 2020 in the latest Congressional Bill). A move to commercial crew service may double that number again. This is not merely a transfer of activity from government to commercial, but a new market for business. With commercially operational spacecraft, any company would be free to pursue new opportunities with its R&D costs already amortized over

## ***Scaling for success in space (cont.)***

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government contracts. SpaceX is already planning for this, offering commercially available payload capacity on standalone DragonLab flights – others may follow. Moreover, Mr. Bigelow, the mega-rich space enthusiast with his own plans for commercially operated space stations has hinted (with the concurrence of the FAA) that his plans may generate as many as 150 launches through 2020. If he has the capability and the seriousness of purpose (and various news reports as well as his two prototype module already in space, bear this out), this would be a significant jump up in launch and systems demand, even at a fraction of this number. If the business bears out, again, others may follow.

this would be a significant jump up in launch and systems demand, even at a fraction of this number ...

While cargo or crew carriers are not the same as comsats, they contribute to substantially the same industrial base. Truly, whether we are entering this new era of commercial space activity is directly related to the answer of whether we are expanding the demand for space and opening new markets. The current debate over commercial space, for all its sound and fury, is really a debate over the direction of the no more than the 0.1-0.2% of US GDP that Congress and the US taxpayer base has shown willing to spend on civil space projects. If the industry truly wants scale and gets beyond the never-ending political debates, then it must follow the path of the commercial satellite communications industry and the commercial satellite imaging industries and access the other part of the over \$14 trillion US economy.

Bigelow is targeting sovereign clients, meaning countries without an active astronaut corps, to give them the opportunity to operate a space program at lower cost and lower difficulty than current spacefaring nations. If even a few are willing to pay the just-over-\$500 million per year figure that is floating around to lease one of his space station modules, that's a market of another few billion dollars a year, to be shared amongst an array of aerospace firms along with a new breed of developers, operators and brokers that always accompany a new market. Then there's the so called tourist market, which has already launched passengers eight times to the ISS in the last decade, certainly a larger market if the \$30 million price per ticket and the 8-10 month training period come down – maybe another few hundred million per year more at least. And what of the biotech and pharmaceutical markets? There's a whole lot of rack space on the ISS that's underutilized, and we haven't even begun to explore the medical possibilities of biotech production and research in microgravity. It's been talked about for decades, but it's still yearning for truly open, affordable, turnkey access to space facilities useable by commercial researchers. If someone can achieve that, that could open the commercial space industry to a truly new and large market. Still others have suggested transport markets to access regions beyond earth orbit (such as the Moon or the Lagrange points) or even, if costs and technology advance far enough, energy and resource markets beyond our closest orbits. The market possibility: billions, maybe even trillions.

If the industry truly wants scale ... then it must ... access the other part of the over \$14 trillion US economy...

## Scaling for success in space (cont.)

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Economies of scale not only bring affordable infrastructure, but also widen and deepen pools of talent and capability ...

What do you need to build an industry? For good measure, you need industrialists, engineers, designers, marketers, salesmen, investors, businessmen, educators, lawyers and even hyperactive export credit agencies. Economies of scale not only bring affordable infrastructure, but also widen and deepen pools of talent and capability, strengthening society's ability to take on markets not so easily accessed before. The essential ingredient, however, for any growing industry pushing the frontier will always be the supply of visionaries; the dreamers and the entrepreneurs that break the mold. Without them, we cannot even think of accessing new markets. The space industry has never lacked for entrepreneurs, but the stark realities of business, economics and physics have long trod on many plans. For those who have gotten discouraged, who have banged their head against the wall many times as the cost and immaturity of the industry have stumbled with many business plans, we say: The business of space may be getting big, and it may be here to stay, but even as it corporatizes and systematizes, it still needs the entrepreneur more than ever to enter a new commercial space age. So today, just a few days after Bastille Day, we may add, along with Coface, another *bon mot* for which we can thank the French for inventing: The entrepreneur.

By Ian Fichtenbaum  
Near Earth LLC

## ***Is MHR preparing for an exit from Loral?***

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Operationally, SS/L has done very well the last few years – becoming the largest commercial manufacturer of satellites in the United States ...

With Space Systems Loral's recent IPO filing, here at Near Earth we decided to look at that pending transaction from a more strategic perspective, and particularly in light of SS/L's relationship with its parent Loral Space and Communications. But first, let's consider the relevant background – starting with the details of the IPO itself. While terms have yet to be announced, the filing identifies an intended size of up to \$100 million, including over-allotments, with all proceeds from the sale of shares going to the company for general purposes.

Operationally, SS/L has done very well the last few years – becoming the largest commercial manufacturer of satellites in the United States, growing its revenues from \$814 million in 2007 to over \$1 billion in 2009. But this growth has come at the price of an increasing need for capital, forcing the company to dip into its \$100 million credit line periodically. While the company had just over \$100 million in cash at the end of Q1/2010, the potential proceeds from the IPO would significantly liquefy the firm and enhance its competitive posture.

Depending on terms, the offering will dilute their 100% ownership but still leave SS/L's parent Loral in control with over 80% ownership – implying an intended pre-money target valuation for SS/L in the ballpark of approximately \$800+ million. For a growing firm with over \$1 billion in sales, \$1.6 billion in backlog and a strong market presence and technology base, this valuation looks reasonable.

... the offering helps the overall liquidity of Loral the parent ...

Taken in greater context, the offering helps the overall liquidity of Loral the parent by essentially eliminating any potential need for SS/L to call upon it for capital – which given the highly levered nature of Loral's other investments (principally Telesat) does provide some comfort. More importantly, however, it opens the door for Loral to consider divesting itself of SS/L entirely. This is because by establishing a public market for the shares, and garnering research coverage and trading volume, Loral's remaining 80% stake becomes more liquid, and could be offered to the public through a secondary. By placing a concrete value on that 80% stake it retains, Loral also helps put a value on itself – with any luck a higher value.

So if Loral is getting all dolled up for the prom, does that mean other plans are afoot? Perhaps – look at the five year chart below and consider that Loral's stock chart represents an impressive comeback following a "near death" experience and subsequent recovery. (As an aside, the company never actually had any existential operational or liquidity issues, but the market reflects perceptions about the future, which ran wild during the period where anything with high leverage was assumed to be doomed) Certainly the round trip in valuation has some bearing on the position of

## Is MHR preparing for an exit from Loral? (cont.)

the folks at MHR that effectively control Loral and have a 59% economic ownership stake.



What other factors could be driving MHR's thinking with respect to Loral itself?

Starting with SS/L, we note that after years of losses, it appears to have found the path to profit. While the sustainability of those profits remains to be demonstrated, the effect they have on valuation today is indisputable, and may make today a good time to consider a transaction at the parent level as well.

Given Telesat's heavy debt load, a buyer may need to inject significant amounts of equity...

It certainly doesn't hurt that valuations in the fixed satellite sector are near an all time high. In addition to Loral's appreciation as evidenced in the chart above, Loral's competitors SES, Inmarsat and Eutelsat are all trading at or near their highs as well.

While the debt markets are far from fully healed, credit is more available than at any time since the market meltdown, and interest rates (at least in dollars) remain near all time lows. Given Telesat's heavy debt load, a buyer may need to inject significant amounts of equity to acquire Telesat if much of the debt can not be refinanced. No problem: Echostar has nearly a billion in cash on hand, and Eutelsat with leverage of only 3x EBITDA is also well positioned. There are also cash rich firms outside the satellite industry that are likely to find the steady cash flows, global marketing footprints and technical savvy of Telesat to be attractive.

In addition to having the means, Echostar, Eutelsat and others also have the motivation to pull off a Telesat acquisition. Both of these regional players need a global footprint that Telesat helps to provide, especially for

## ***Is MHR preparing for an exit from Loral? (cont.)***

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Eutelsat with which it has little overlap. And, EchoStar needs additional scale and access to Loral's selling apparatus.

... while we believe that SS/L's IPO makes good sense in Palo Alto, we think the real drivers for the transaction lie in New York.

Perhaps most importantly, in the Speech from the Throne delivered on March 3<sup>rd</sup>, Canada's Conservative government raised expectations by revealing the federal government's intention to "open Canada's doors further to venture capital and to foreign investment in key sectors, including the satellite and telecommunications industries, giving Canadian firms access to the funds and expertise they need." They could as easily have said "giving American hedge funds access to more potential exits, especially to strategic investors like Eutelsat and EchoStar". The exact timing and nature of this access remains to be demonstrated, however, and governments do change their minds or fail to act.

So in conclusion, while we believe that SS/L's IPO makes good sense in Palo Alto, we think the real drivers for the transaction lie in New York. There are still a lot of moving parts, but the end game is becoming a bit more apparent. Is MHR really headed towards the exit? We don't know. What we do know is that, for the moment, the stars are lining up so that if they *want* to, the exit will be there.

By John Stone  
Near Earth LLC

# NEAR EARTH ANALYSIS: MARKET COMPARABLES

## Public Market Valuation Analysis of Selected Companies in the NEAR EARTH MEDIA INDEX

(\$ in millions, except per share data)		Stock Price:		Enterprise Value as a Multiple of:			Price as a Multiple of:				
		7/19/10	Market Value of Equity	Enterprise Value (a)	LTM Sales	LTM EBITDA	LTM EBIT	LTM EPS	Trailing EPS (b)	Forward EPS (b)	
<b>Satellite Broadcast (DBS and DARS)</b>											
BSY.L	British Sky Broadcasting (f)	£	6.98	\$18,653.78	\$21,442.57	2.4x	13.4x	17.4x	20.5x	35.2x	27.7x
DISH	Dish Network Corp	\$	19.16	\$8,553.60	\$12,595.66	1.1x	4.8x	7.6x	10.7x	9.8x	8.6x
DTV	DirecTV Group Inc.	\$	35.94	\$34,389.55	\$40,099.55	1.8x	6.9x	12.4x	22.2x	15.2x	11.9x
SIRI	Sirius XM Radio	\$	0.92	\$3,574.38	\$6,934.79	2.7x	10.8x	20.1x	n/m	n/m	n/m
					Mean	2.0x	9.0x	14.4x	17.8x	20.1x	16.0x
<b>Cable Television</b>											
CMCSA	Comcast Corporation	\$	19.01	\$53,639.00	\$81,279.00	2.3x	5.9x	11.1x	14.3x	15.1x	13.5x
MCCC	Mediacom Communications Corp.	\$	6.72	\$456.89	\$3,728.38	2.5x	6.9x	12.3x	0.6x	8.6x	7.3x
TWC	Time Warner Cable Inc.	\$	55.71	\$19,637.78	\$41,224.78	2.3x	6.3x	12.1x	n/m	16.2x	13.2x
CVC	Cablevision Systems Corp	\$	25.65	\$7,839.15	\$18,775.86	2.4x	7.4x	12.6x	20.6x	17.1x	13.6x
					Mean	2.4x	6.6x	12.0x	11.8x	14.2x	11.9x
<b>Television</b>											
TVL	LIN TV Corp.	\$	5.11	\$270.37	\$928.01	2.6x	7.3x	13.0x	16.4x	5.9x	9.0x
SBGI	Sinclair Broadcast Group	\$	5.46	\$438.38	\$1,733.35	2.6x	6.0x	11.0x	11.8x	6.6x	8.8x
FSCI	Fisher Communications Inc	\$	15.74	\$138.20	\$216.09	1.5x	9.8x	n/m	n/m	n/m	n/m
					Mean	2.2x	7.7x	12.0x	n/m	n/m	8.9x
<b>Radio</b>											
CMLS	Cumulus Media Inc.	\$	2.54	\$106.71	\$712.69	2.8x	9.8x	11.5x	n/m	n/m	n/a
ETM	Entercom Communications	\$	8.27	\$307.31	\$1,033.51	2.7x	10.5x	12.3x	7.7x	6.7x	5.9x
					Mean	2.8x	10.1x	11.9x	n/m	6.7x	5.9x
<b>New Media</b>											
MSFT	Microsoft Corporation	\$	25.23	\$221,065.26	\$187,394.26	3.1x	7.6x	8.4x	13.1x	12.3x	10.9x
AAPL	Apple Inc.	\$	245.58	\$223,389.39	\$181,685.39	4.1x	15.6x	16.6x	27.0x	17.7x	14.8x
YHOO	Yahoo! Inc.	\$	15.10	\$20,921.96	\$17,843.10	2.8x	13.9x	32.0x	27.0x	22.2x	19.6x
GOOG	Google Inc.	\$	466.18	\$148,371.11	\$121,857.11	4.9x	11.7x	13.7x	21.0x	17.1x	14.9x
IACI	Interactive Corporation	\$	22.61	\$2,581.61	\$1,178.22	0.8x	10.3x	n/m	n/m	30.6x	20.7x
ERTS	Electronic Arts Inc.	\$	15.09	\$4,979.70	\$2,983.70	0.8x	n/m	n/m	n/m	23.2x	17.3x
					Mean	2.7x	11.8x	17.7x	22.0x	20.5x	16.4x
<b>Satellite Imagery</b>											
GEOY	GeoEye	\$	31.32	\$691.23	\$844.92	2.8x	5.2x	8.7x	13.2x	17.8x	17.5x
DGI	DigitalGlobe Inc.	\$	25.48	\$1,161.12	\$1,362.92	4.7x	8.2x	16.7x	27.0x	n/m	19.9x
					Mean	3.7x	6.7x	12.7x	20.1x	17.8x	18.7x

### MEDIA SERVICES INDEX

High	4.9x	15.6x	32.0x	27.0x	35.2x	27.7x
Mean	2.6x	8.9x	13.9x	16.9x	16.3x	14.2x
Low	0.8x	4.8x	7.6x	0.6x	5.9x	5.9x

(b) EPS estimates from Thompson FirstCall. Near Earth does not estimate EPS and does not condone or validate these estimates.

n/m Not Meaningful.

(c) Converted to US \$ from Euro at an exchange rate of 1.2967 US \$ per Euro.

n/a Not Available

(d) Converted to US \$ from C\$ at an exchange rate of 0.9516 US \$ per C\$.

(f) Converted to US \$ from British Pound at an exchange rate of 1.5256 US \$ per British Pound.

Member of NEAR EARTH SATELLITE INDEX

# NEAR EARTH ANALYSIS: MARKET COMPARABLES

## Public Market Valuation Analysis of Selected Companies in the NEAR EARTH TELECOM INDEX

(\$ in millions, except per share data)		Stock Price:		Enterprise Value as a Multiple of:			Price as a Multiple of:			
	7/19/10	Market Value of Equity	Enterprise Value (a)	LTM Sales	LTM EBITDA	LTM EBIT	LTM EPS	Trailing EPS (b)	Forward EPS (b)	
<b>Fixed Satellite Services (FSS)</b>										
ETL.PA	Eutelsat Communications ( c)	€ 27.51	\$7,835.05	\$11,133.28	8.4x	11.8x	18.3x	24.0x	29.2x	26.2x
SESG.PA	SES Global S.A. ( c)	€ 18.20	\$9,430.11	\$14,059.07	6.4x	9.1x	15.5x	15.8x	19.7x	18.0x
				Mean	7.4x	10.4x	16.9x	19.9x	24.5x	22.1x
<b>Mobile Satellite Services (MSS)</b>										
ISAT.L	Inmarsat (f)	£ 7.19	\$5,040.83	\$6,327.33	6.1x	10.6x	17.4x	31.9x	14.1x	12.4x
IRDM	Iridium Communications Inc.	\$ 9.71	\$682.13	\$536.47	1.7x	5.9x	7.4x	16.0x	17.0x	11.0x
ORBC	ORBCOMM Inc.	\$ 1.83	\$77.70	(\$10.64)	n/m	n/m	0.7x	n/m	n/m	n/m
GSAT	Globalstar Inc.	\$ 1.73	\$516.87	\$1,011.49	15.6x	n/m	n/m	n/m	n/a	n/a
				Mean	7.8x	8.3x	8.5x	24.0x	15.6x	11.7x
<b>Satellite Ground Segment</b>										
CMTL	Comtech Telecommunications	\$ 30.99	\$877.33	\$509.05	0.8x	4.8x	5.3x	14.2x	15.2x	14.2x
GCOM	Globecom Systems Inc.	\$ 7.83	\$167.80	\$143.22	0.7x	11.1x	20.1x	34.1x	23.7x	15.7x
GILT	Gilat Satellite Networks	\$ 5.00	\$201.55	\$86.53	0.4x	5.6x	n/m	n/m	n/m	n/a
HUGH	Hughes Communications, Inc.	\$ 24.13	\$521.93	\$1,049.57	1.0x	6.0x	16.1x	n/m	n/m	13.5x
ISYS	Integral Systems Inc.	\$ 7.67	\$133.76	\$151.74	1.0x	n/m	n/m	n/m	20.7x	11.8x
VSAT	ViaSat Inc.	\$ 32.64	\$1,298.75	\$1,544.67	2.2x	16.7x	33.8x	n/m	17.9x	18.9x
				Mean	1.0x	8.8x	18.8x	24.2x	19.4x	14.8x
<b>Satellite Space Segment</b>										
ORB	Orbital Sciences	\$ 15.71	\$905.21	\$654.71	0.6x	8.4x	11.2x	23.4x	20.1x	13.0x
CDV.TO	COM DEV International (d)	\$ 1.96	\$142.05	\$147.06	0.7x	6.5x	11.9x	11.9x	n/a	n/a
MDA.TO	McDonald Dettwiler and Associates (d)	\$ 46.70	\$1,811.36	\$2,065.32	2.2x	11.6x	14.6x	17.4x	n/a	n/a
OHB.DE	OHB Technologies ( c)	€ 14.61	\$329.64	\$230.42	0.5x	5.6x	8.5x	16.9x	27.1x	19.9x
				Mean	1.0x	8.0x	11.6x	17.4x	23.6x	16.5x
<b>Towers</b>										
AMT	American Tower	\$ 44.13	\$17,814.84	\$21,675.89	12.2x	19.3x	30.3x	n/m	n/m	n/m
CCI	Crown Castle	\$ 36.45	\$10,615.33	\$16,921.90	9.8x	16.7x	35.0x	n/m	n/m	n/m
SBAC	SBA Communications	\$ 34.30	\$4,013.44	\$6,351.49	11.2x	19.2x	n/m	n/m	n/m	n/m
				Mean	11.1x	18.4x	32.6x	n/m	n/m	n/m
<b>General Telecom</b>										
S	Sprint Nextel Corporation	\$ 4.62	\$13,762.98	\$30,442.98	0.9x	4.9x	n/m	n/m	n/m	n/m
T	AT&T	\$ 24.88	\$147,015.92	\$214,302.92	1.7x	5.2x	9.8x	12.4x	11.0x	10.2x
VZ	Verizon Communications, Inc.	\$ 26.72	\$75,530.23	\$177,716.23	1.6x	4.9x	9.2x	10.3x	12.2x	11.9x
				Mean	1.4x	5.0x	9.5x	11.3x	11.6x	11.0x

### TELECOM SERVICES INDEX (excludes Towers stocks)

High	15.6x	16.7x	33.8x	34.1x	29.2x	26.2x
Mean	2.8x	7.6x	13.3x	19.0x	20.7x	15.1x
Low	0.4x	4.8x	0.7x	10.3x	11.0x	10.2x

(b) EPS estimates from Thompson FirstCall. Near Earth does not estimate EPS and does not condone or validate these estimates.

n/m Not Meaningful.

(c) Converted to US \$ from Euro at an exchange rate of 1.2967 US \$ per Euro.

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Member of NEAR EARTH SATELLITE INDEX

# NEAR EARTH ANALYSIS: M&A TRANSACTIONS

## Selected Satellite, Telecom, Media & Aerospace Transactions

(US\$ in millions)

Date Announced	Acquiror	Target	Equity Value (a)	Transaction Value (b)	Transaction Value/	
					LTM Sales	LTM EBITDA
<b>Satellite Operators</b>						
08/29/05	Intelsat Ltd.	PanAmSat Holding Corporation	3,065.0	6,271.1	7.5x	9.7x
12/14/05	SES Global	New Skies Satellites NV	760.0	1,160.0	5.0x	8.0x
12/05/06	Abertis Telecom	EutelSat (32% share)	1,000.0	1,838.0	7.3x	9.7x
12/18/06	Telesat (new)	Telesat/SkyNet Combined	3,491.0	3,990.0	7.1x	13.4x
06/19/07	BC Partners	Intelsat	5,000.0	16,400.0	7.7x	11.3x
08/02/07	Abertis Telecom	Hispasat (28.4% share)	199.0	199.0	5.8x	7.9x
09/23/09	GHL Acquisition Corp	Iridium Satellite LLC	500.0	517.3	1.6x	5.6x
10/01/09	ViaSat, Inc	WildBlue Coimunications, Inc.	568.0	500.0	2.4x	6.6x
				Mean	5.5x	9.0x
<b>Ground Equipment &amp; Systems Integrators</b>						
03/19/07	CIP Canada Investment Inc.	Stratos Global Corporation	293.3	621.5	1.2x	2.9x
05/03/07	Globecomm Systems Inc.	GlobalSat	18.4	18.4	0.9x	n/d
05/12/08	Comtech	Radyne	201.9	223.6	1.5x	16.0x
05/09/09	Rockwell Collins	Datapath	130.0	130.0	0.5x	n/d
06/01/09	Globecomm Systems Inc.	Telaurus Communications LLC	7.6	7.6	0.6x	n/d
11/23/09	Inmarsat plc	Segovia, Inc.	110.0	110.0	1.6x	n/d
03/08/10	Globecomm Systems Inc.	Carrier to Carrier Telecom BV	15.0	15.0	0.8x	n/d
05/10/10	Comtech Telecommunications Co	CPI International, Inc.	272.8	472.3	1.4x	8.4x
05/21/10	Harris Corporation	CapRock Communications	525.0	525.0	1.5x	9.7x
				Mean	1.1x	9.2x
<b>Aerospace and Defense</b>						
04/23/07	Kratos	SYS Technologies	49.3	49.3	0.6x	n/m
07/31/07	LMI Aerospace, Inc.	D3 Technologies, Inc.	65.0	65.0	1.0x	7.2x
11/29/07	Finmeccanica SPA	VEGA Group PLC	59.2	56.2	0.9x	9.6x
05/12/08	Finmeccanica SPA	DRS Technologies Inc	3,358.0	4,930.0	1.4x	11.0x
05/13/08	Cobham plc	M/A-COM	425.0	425.0	0.9x	6.8x
06/04/08	Cobham plc	Sparta Inc	416.0	416.0	1.4x	12.1x
12/16/08	Sierra Nevada Corporation	SpaceDev, Inc.	31.7	26.6	0.7x	23.3x
03/05/10	Integral Systems	CVG-Avtec	34.7	34.7	1.0x	n/d
03/05/10	Orbital Sciences Corp.	GD Advanced Information Systems	55.0	55.0	1.1x	n/d
06/30/10	Boeing	Argon ST, Inc	807.1	775.0	2.3x	18.0x
				Mean	1.1x	12.6x
<b>Video Distribution</b>						
04/23/07	Motorola	Terayon Communication Systems Inc.	139.7	127.2	1.9x	n/m
12/07/07	Macrovision Corp	Gemstar-TV Guide Intl Inc	2,842.1	2,325.1	3.7x	21.9x
03/12/09	Harmonic Inc.	Scopus Video Networks	78.3	47.6	0.8x	n/m
10/01/09	Cisco	TANDBERG ASA	3,322.0	3,622.0	4.0x	18.7x
05/06/10	Harmonic Inc.	Omneon, Inc.	274.0	274.0	2.6x	n/d
				Mean	2.6x	20.3x
<b>Towers</b>						
03/17/06	Crown Castle	Trintel Communications	145.0	145.0	10.1x	n/d
03/17/06	SBA Communications Corp	AAT Communications Corp	1,002.0	1,002.0	12.0x	17.9x
05/08/06	Crown Castle	Mountain Union Telecom LLC	309.0	309.0	11.9x	n/d
10/06/06	Crown Castle	Global Signal	4,000.0	5,800.0	12.1x	26.6x
07/21/08	SBA Communications Corp	Optasite Towers	253.2	428.2	14.8x	n/m
				Mean	12.2x	22.2x
<b>General Telecom (Wireless)</b>						
01/05/05	Alltel	Western Wireless	4,300.0	6,181.0	3.2x	10.7x
07/01/05	Sprint Nextel Corporation	US Unwired, Inc.	1,000.0	1,266.0	2.9x	13.2x
03/06/06	AT&T (new)	Bell South	67,000.0	89,000.0	4.3x	10.7x
08/07/08	Verizon Wireless	Rural Cellular Corp	728.0	2,757.0	4.1x	9.7x
01/10/09	Verizon Wireless	Alltel	5,900.0	28,100.0	2.9x	8.3x
12/24/09	Sprint Nextel Corp.	Virgin Mobile USA	348.0	509.0	0.4x	4.4x
				Mean	3.0x	9.5x
<b>Television</b>						
03/31/05	Lin TV Corp.	WNDY-TV, WWHO-TV	\$85.0	\$85.0	4.3x	12.9x
05/10/05	Various Acquirors (d)	Emmis Comm TV Portfolio	1,350.0	1,350.0	5.2x	14.6x
06/30/05	Univision Communications	WLII (2 TV Stations in Puerto Rico)	190.0	190.0	4.0x	16.7x
01/18/07	Citadel Investment Group LLC	ION Media Networks Inc	98.8	1,654.3	7.1x	16.9x
03/29/07	Umbrella Holdings LLC	Univision Communications	12,300.0	13,700.0	6.3x	18.1x
				Mean	5.4x	15.8x
<b>Radio</b>						
07/29/08	Sirius Satellite Radio Inc.	XM Satellite Radio Holdings Inc.	2,301.7	3,957.7	3.4x	n/m
07/30/08	Bain Capital	Clear Channel	17,923.8	23,724.1	3.5x	10.8x
05/29/09	Cox Enterprises, Inc	Cox Radio	381.5	704.3	1.8x	6.2x
				Mean	2.9x	8.5x

(a) When Equity Value was not disclosed, Transaction Value was used

(b) Calculated as Value of Equity plus interest bearing liabilities and preferred stock, less cash & equivalents

n/d Not Disclosed

(d) Transaction includes the divestiture of Emmis' TV portfolio to: Lin TV (\$260M), Journal Comm (\$235M), Gray (\$186M), Blackstone (\$259M)

n/m Not Meaningful

It also includes estimated transaction value of \$410M for the final sale of 3 TV stations.

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