Case Study

Orbital Sciences Corporation:
From Startup to Billion Dollar Company

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Orbital at 25: What Have We Become?

• Leading manufacturer of small satellites and launch vehicles
  – Focused on markets not served by larger suppliers
  – Distinctive strength in providing high reliability at affordable prices

• Over 778 satellites and rockets built or on contract for customers
  – 570 systems developed, built and delivered from 1982 - 2007
  – 208 systems under contract for deliveries from 2007 - 2014

• $4 billion, 10-year total contract backlog with premier customers

• 3,200 employees and 1.1 million square feet of state-of-the-art facilities

• Revenues of $1 billion for 2007, up 25% over 2006
Well-Balanced Product Lines

2007 Revenues ~$1 Billion

- Communications Satellites (31%)
- Science & Defense Satellites (15%)
- Advanced Space Systems (11%)
- Interceptor Vehicles (11%)
- Target Vehicles/Missiles (5%
- TMS Products (5%)
- Launch Vehicles (38%)

Satellites/Advanced Systems (57%)
• In the last 25 years, the company has developed and built, or is now under contract to produce 122 satellites
  – 106 satellites built and delivered during 1982-2006
  – 16 additional satellites under contract for 2007-2009 deliveries
• Orbital’s main satellite product lines are fully developed and in production
Orbital’s Main Facilities

Dulles, Virginia

- Corporate Offices, Satellite Engineering, Manufacturing, Test and Operations
- 1,500 Employees
- 575,000 Square Feet/77 Acres
- ISO-9001 and AS-9100 Certified
- $170 Million Capital Investment

Chandler, Arizona

- Launch Vehicle Engineering, Manufacturing and Test
- 1,400 Employees
- 400,000 Square Feet/44 Acres
- ISO-9001 and AS-9100 Certified
- $135 Million Capital Investment
But How Did We Get Here?

• Orbital’s history since 1982 shows that it helps to have mythic characteristics in order to be a space entrepreneur:
  – The Persistence of Jason (and his Argonauts)
  – The Fortitude of Hercules
  – The foresight of the Oracles of Delphi
  – The Treasury of Midas
  – The Ambition of Alexander the Great

• Orbital had the cast: three Harvard Business School grads, plus assorted “heroes” assembled along the journey

• **A Big Concept**: that a small, entrepreneurial company could do things better and faster than lumbering aerospace giants
  – Orbital to make its mark by focusing on products and services the bigger guys were ignoring or could not do cost-effectively

• **The Environment**: Reagan Administration supportive of private space ventures, some venture capital available
Growing Up Fast: the First 15 Years

• **First Product:** A launch vehicle called the Transfer Orbit Stage to boost larger Shuttle-launched satellites into higher orbits, an unserved market
  – NASA worked cooperatively with Orbital to find the right product (initial proposal for TOS was rejected)
  – Orbital outsourced heavy engineering and design work to experienced contractors
  – Space enthusiast oil men helped fund, other venture funding followed

• **Next:** bring it in-house and
  – Commercially pioneer low earth orbit with a network of low-data relay satellites
    Orbital would design and build itself for affiliate Orbcomm
    ➢ Pull in experienced telecom company investors to help fund and run (Teleglobe Canada)
    ➢ Develop inexpensive launch vehicle to put constellation into space, because none existed
      (Pegasus Rocket)
  – Along the way, pick up a lot of companies and divisions to help Orbital reach its revenue goals and support existing products and new services
  – Start services companies to implement the technologies (Orbcomm and Orbimage)
Surviving the Telecom Bust

• **Crisis**: Underestimated challenges of entering the commercial satellite services and remote sensing business:
  – Created serious financial difficulties for Orbital
  – Drastic action taken:
    - Sell-off some acquired operations and assets
    - Cease funding Orbcomm and Orbimage (reorganized through bankruptcy proceedings)

• **Refocus** on key products developed/acquired in company’s first 15 years:
  – Small rockets and missiles: Pegasus and its derivatives (rockets and missiles)
  – Small satellites based on Orbcomm and other earlier LEO designs for science and technology missions for governments
  – Build on geostationary satellite product line acquired in 1997 from CTA and assets from Fairchild – development of STAR 2
  – Take advantage of availability of skilled personnel as a result of industry consolidation and reorganization
Intelsat 11
- 18 Ku-band transponders, 12 C-band transponders for North/South America
- Payload power ~ 4.3 kW
- Launch – 4Q 2007 operational

Optus D2
- 24 Ku-band transponders for DTH and FSS in Australia and New Zealand
- Payload power ~ 3.8 kW
- Launch – 4Q 2007 operational

Optus D1
- 24 Ku-band transponders for DTH and FSS in Australia and New Zealand
- Payload power ~ 3.8 kW
- Launch – 4Q 2006 operational

TELKOM-2
- 24 C-band transponders for FSS services in Indonesia and South East Asia
- Payload power ~ 2.0 kW
- Launch – 4Q 2005 operational

GALAXY 12 and 14
- 24 C-band transponders for FSS services in US
- Payload power ~ 1.7 kW
- Launched - G12 – 2Q 2003, operational; G14 – 3Q 2005, operational

GALAXY 15
- 24 C-band plus 2 L-band navigation payload transponders for FSS services in US
- Payload power ~ 1.9 kW
- Launched - G15 – 4Q 2005, operational

N-STAR c
- S-band MSS services in Japan
- Payload power ~ 1.3 kW
- Launched - 3Q 2002, operational

BSAT-2a/2b/2c
- Ku-band DTH services in Japan
- Launched - 2a – 1Q 2001, operational; 2b – Launch failure; 2c – 2Q 2003, operational

CAKRAWARTA – 1
- S-band DTH for Indonesia
- Launched – 4Q 1997, operational
STAR Programs – On-going

**AMC-5R and FM-1**
- 24 Ku-band for CONUS and Caribbean
- 24 C-band for CONUS and Caribbean
- Payload power ~ 4.8 kW
- Launch – 2Q 2009

**Intelsat 16**
- 18 Ku-band for Mexico, Venezuela and Florida
- Payload power ~ 3.7 kW
- Launch – 1Q 2008

**Optus D3**
- 24 Ku-band transponders for DTH in Australia and New Zealand
- Ocean Regions and Russia
- Payload power ~ 5.0 kW
- Launch – 4Q 2008

**Intelsat 15**
- 22 Ku-band for Middle East, Indian Ocean Regions and Russia
- Payload power ~ 4.6 kW
- Launch – 1Q 2009

**NSS-9**
- 28 C-band for Pacific Ocean Region
- Payload power ~ 2.3 kW
- Launch – 4Q 2008

**AMC-21**
- 24 Ku-band transponders for U.S. FSS services
- Payload power ~ 4.4 kW
- Launch – 2Q 2008

**MEASAT-1R**
- 12 Ku-band on Malaysia and Indonesia
- 12 C-band transponders for Global coverage
- Payload power ~ 3.7 kW
- Launch – 2Q 2008

**THOR 5**
- 24 Ku-band for FSS and BSS services in Europe and Middle East
- Payload power ~ 3.9 kW
- Launch – 4Q 2007

**HORIZONS-2**
- 20 Ku-band payload transponders for CONUS coverage
- Payload power ~ 3.6 kW
- Launch – 4Q 2007
Lessons for the Space Entrepreneur

• Find an under-served niche where you may have some advantage
  – The big guys have only gotten bigger and slower
  – The diversity of possible products and services continues to grow, creating new
    niches and opportunities

• Make niche work for you and don’t jump too quickly into entirely new areas

• Keep the key ingredients in balance: financing, technology and marketing
  – Somebody has to buy your product
    ➢ Know who they are and stay in touch continuously
    ➢ Make them part of your product development
  – Always keep an eye on the bottom line and over-estimate (2X or 3Xs) how much
    time and money it will take to begin earning real revenue
  – Get friendly with folks who have deep pockets

Reference:
An Adventure Begins - Orbital’s First 25 Years