Aerospace Readiness: Market Intelligence & Positioning for Success

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Introduction

Aerospace Readiness: Positioning Your Company to Seize Success

The Opportunity
• Unmanned
• Commercial
• Space

The Challenge
• Technology
• Workforce
• Vision/Innovation

The Response
• Strategy
• Knowledge
• Execution
The Supply Network/Chain is Critical to the Aerospace Enterprise!

- The Supply Base Is The Focal Point for Manufacturing (and Many Times MRO, Too)
Next Generation Supply Chain Characteristics

- Real time responsiveness to demand (agile and flexible)
- Performance based (customer is co-mgr of outcomes)
- Resilient (risk management/networked response/diagnostics)
- Dynamically configurable; analytical frameworks and tools
- Technology enabled visibility (process/factory floor/MRO)
- Co-management/co-creation of performance/innovation & metrics
- Real time status for recognition of performance leading indicators
- Knowledge and skills are source of advantage (build sustainable talent pipeline)

“Outsource capacity-never capability”
The Opportunity

• **Unmanned Market** – The Next 5 to 10 Years
  Market Value (Estimate) to 2025: $50b+

• **Commercial Market** – The Next 20 Years
  Market Value (Estimate) to 2037: $6T+

• **Space** – The Next 50 Years? 100 Years?
  Market Value (Estimate) to ??:
# Unmanned Aerial System Uses

<table>
<thead>
<tr>
<th>Military</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Targets and Decoys</td>
<td>• Power, Pipeline, Road, Rail Monitoring</td>
</tr>
<tr>
<td>• Intelligence, Surveillance and Reconnaissance</td>
<td>• Agriculture</td>
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<tr>
<td>• Search and Rescue</td>
<td>• Search and Rescue</td>
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<tr>
<td>• Security and Force Protection</td>
<td>• Law Enforcement and Investigation</td>
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<tr>
<td>• Air Refueling</td>
<td>• Pollution/Environmental/Wildlife Monitoring</td>
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<tr>
<td>• Communications</td>
<td>• Science and Research</td>
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<tr>
<td>• Logistics Missions</td>
<td>• Mail/Freight</td>
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<tr>
<td>• Munitions Delivery</td>
<td>• Disaster Response/Relief</td>
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<tr>
<td>• Counter UAS Operations</td>
<td>• Imagery and Mapping</td>
</tr>
<tr>
<td></td>
<td>• Maritime/Shipping Monitoring</td>
</tr>
<tr>
<td></td>
<td>• Communications</td>
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</tbody>
</table>
Number of Passenger Aircraft Will More Than Double in the Next 20 Years

Source: Airbus GMF 2018
MRO Global Spend 2019 – 2029
Raising to US$116B

Source: Oliver Wyman
Space: Market Growth Near Limitless?

- Countries now have satellites in space (80+)
- Invested in space start-ups since 2000 (US$16bn+)
- Space market (2016) (US$339bn)
- More advances than throughout human history (Next 20Y)
- Chance of “Carrington-level” solar storm (2020E) (1 in 8)
- Humans have ever been to space (560)
- World’s richest billionaires have space investments (16/500)
- Cislunar economy (2045E) (US$2.7tn)
- Planned human missions to Mars (2024-30s)
- Value of Mars/Jupiter asteroid belt (US$700 “quintillion”)

Source: BofA Global Research based on various sources.
A Quick Look at General Aviation

FIGURE 1.1 General Aviation Airplane Shipments and Billings Worldwide (1994–2018)

Source: GAMA
### 1.3 Customer Delivery Region (in Percent of Total) for General Aviation Airplane Shipments by Type of Airplane Manufactured Worldwide (2007–2018)

<table>
<thead>
<tr>
<th>Year</th>
<th>Piston</th>
<th>Turboprop</th>
<th>Business Jet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North America</td>
<td>Europe</td>
<td>Asia-Pacific</td>
</tr>
<tr>
<td>2007</td>
<td>66.5</td>
<td>16.3</td>
<td>9.2</td>
</tr>
<tr>
<td>2008</td>
<td>68.1</td>
<td>15.2</td>
<td>7.5</td>
</tr>
<tr>
<td>2009</td>
<td>59.4</td>
<td>21.2</td>
<td>9.5</td>
</tr>
<tr>
<td>2010</td>
<td>53.4</td>
<td>18.6</td>
<td>13.7</td>
</tr>
<tr>
<td>2011</td>
<td>57.7</td>
<td>12.0</td>
<td>15.6</td>
</tr>
<tr>
<td>2012</td>
<td>50.4</td>
<td>19.6</td>
<td>16.3</td>
</tr>
<tr>
<td>2013</td>
<td>52.8</td>
<td>17.2</td>
<td>15.1</td>
</tr>
<tr>
<td>2014</td>
<td>55.1</td>
<td>19.7</td>
<td>12.1</td>
</tr>
<tr>
<td>2015</td>
<td>66.7</td>
<td>11.4</td>
<td>13.5</td>
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<tr>
<td>2016</td>
<td>69.6</td>
<td>10.1</td>
<td>10.2</td>
</tr>
<tr>
<td>2017</td>
<td>65.6</td>
<td>9.5</td>
<td>13.4</td>
</tr>
<tr>
<td>2018</td>
<td>61.5</td>
<td>10.8</td>
<td>18.5</td>
</tr>
</tbody>
</table>

Source: GAMA
A Quick Look at General Aviation – Con’t

### 5.2b South Africa—Number of Registered by Type and Certification (2013–2018)

<table>
<thead>
<tr>
<th>Year</th>
<th>Piston-Engine Powered</th>
<th>Turboprop</th>
<th>Turbojet</th>
<th>Rotorcraft</th>
<th>Recreational</th>
<th>UAS</th>
<th>Type Certified</th>
<th>Non Type Certified</th>
<th>Total Aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>3,727</td>
<td>517</td>
<td>485</td>
<td>1,187</td>
<td>5,874</td>
<td>n/a</td>
<td>5,914</td>
<td>5,889</td>
<td>11,803</td>
</tr>
<tr>
<td>2014</td>
<td>3,774</td>
<td>516</td>
<td>492</td>
<td>1,207</td>
<td>5,992</td>
<td>n/a</td>
<td>5,994</td>
<td>5,992</td>
<td>11,986</td>
</tr>
<tr>
<td>2015</td>
<td>3,796</td>
<td>529</td>
<td>501</td>
<td>1,227</td>
<td>6,106</td>
<td>n/a</td>
<td>6,053</td>
<td>6,106</td>
<td>12,159</td>
</tr>
<tr>
<td>2016</td>
<td>3,805</td>
<td>532</td>
<td>511</td>
<td>1,268</td>
<td>6,198</td>
<td>252</td>
<td>6,126</td>
<td>6,203</td>
<td>12,589</td>
</tr>
<tr>
<td>2017</td>
<td>3,804</td>
<td>534</td>
<td>522</td>
<td>1,318</td>
<td>6,287</td>
<td>517</td>
<td>6,165</td>
<td>6,293</td>
<td>12,936</td>
</tr>
<tr>
<td>2018</td>
<td>3,823</td>
<td>552</td>
<td>521</td>
<td>1,357</td>
<td>6,332</td>
<td>796</td>
<td>6,253</td>
<td>7,128</td>
<td>13,381</td>
</tr>
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The data is updated on March 31 of the year listed. Source: South African Civil Aviation Authority, www.caa.co.za

The South African Civil Aviation Administration (CAA) changed how it publishes aircraft registration statistics. Table 5.1a shows the old data structure. Table 5.2b shows the new data structure. Non-Type Certified Aircraft (NTCA) are regarded as experimental aircraft. Not all NTCA are experimental aircraft. Experimental refers to construction being mainly amateur-built. There are also production built NTCA that are built to a standard.
The Challenge

- Technology
  Automation, Materials, Environmental, Manufacturing
- Workforce
  Skills, numbers, STEM
- Vision/Innovation
  Sense and Respond
Continued Technological Advancement

- Artificial Intelligence
- Augmented Reality
- Wider use of composites & “Smart” materials
- Robotics
- Sensors: Smart Machines and On-board Prognostics
- Additive Manufacturing (3d Printing)
- Data-Driven Manufacturing – security and sharing
- Process Transformation
Smart Workers for Smart Machines and Products

Skills Across Multiple Domains – Appropriate STEM+

• **Scientific literacy**: general knowledge and understanding of scientific concepts and processes
• **Technological literacy**: understanding about technology and how it can be used to achieve a specific purpose or goal.
• **Engineering literacy**: ability to use the systematic and creative application of scientific and mathematic principles to practical ends.
• **Mathematical Methods**: understanding basic mathematics (up to algebra) and how and when to use.
• **Information literacy**: ability to find, access, and use information as well as the ability to evaluate the credibility of the information.
• **Teaming and collaboration**: work in a structured environment, and exhibit trust and respect towards one another through cooperative interaction.
• **Adaptability and Managing Complexity**: ability to recognize and understand that change is a constant, and to deal with change positively.
Innovation or Invention?

• Innovation*, making processes and things better:
  • Has replaced price as basis of competition globally
  • Is best managed and routinized as a process
  • Is encouraged by economic incentives
  • Requires enforceable contracts and immunity from arbitrary expropriation
  • Benefits expanded by opportunities for profitable dissemination and rental (e.g. licensing)

• Invention, creating brand new things

• Innovation is also the ability to create and produce economic value from invention

The Response

- Strategic Planning
- Market Knowledge/Intelligence
- Execution Basics
Strategic Planning

• Strategic planning is an organization's **process** of defining its strategy, or direction, and **making decisions** on allocating its **resources** to pursue this strategy, including its capital and people - Wikipedia

• Strategic planning is the continuous **process** of making present entrepreneurial (risk taking) **decisions systematically** and with the greatest knowledge of their **futurity**; **organizing** systematically the effort needed to carry out these decisions; and **measuring** the results of these decisions against expectation through organized, systematic feedback - Peter Drucker, *Management Tasks and Responsibilities*

• The **science** of making good **decisions** about the **future** – The Science of Strategy Institute

“You have to be fast on you feet and adaptive or else a strategy is **useless**” - Charles de Gaulle
Vision, Mission & Value Proposition: Building Blocks to Good Strategy

• **Vision**: a guiding statement for the organization - internally focused that will “energize and excite” employees toward achievement of the desired end state.
  - vision statements that are best are short and easily remembered.

• **Mission**: is usually directed to how the vision will be accomplished and should be more directed to the customer/market base of the organization.
  - makes it clear what the organization is offering
  - excites the customer/market base about engaging the organization - clear and compelling

• **Value Proposition**: explains why a customer will benefit from dealing with the organization.
  - helps “sell” a customer on an engagement.
  - provide an understanding of how the vision and mission will make it successful in customers’ eyes
Market Intelligence: Sun Tzu May Have Said

“If you know the competition, and know your industry and business, you need not fear the result of globalization. If you know your industry and your business but not the competition, for every victory gained in the market place you will also suffer a defeat. If you know neither the competition nor your industry and business, you will succumb and cease to thrive.”
Execution is Critical

Align organization and structures to strategy.

Focus on and be clear about what matters most. Don’t get diverted by every good idea.

Focusing on leading outcomes/behaviors not solely on overall results.

Holding people accountable; for not only their own performance but that of the team. Shared accountability is powerful.
Geolocation Considerations
“I haven’t tried it yet,” the knight said, gravely; “so I can’t tell for certain – but I’m afraid it will be a little hard”

Lewis Carroll: Alice’s Adventures in Wonderland

“If where easy; why are we doing it?”
Thank you for your time!

Questions?

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