D-ORBIT

SPACE R-EVOLUTION
A NEW SPACE RACE HAS BEGUN

THE RAISE OF SMALL SATELLITES cheaper, faster, easy to update with new technology: ideal for commercial space
82 CONSTELLATIONS: 23,000+ SATELLITES
END-TO-END SERVICES

Launch Services, In-Orbit Transportation and precise positioning

Satellite Manufacturing

Orbital Operations

End-of-Life Management
OUR VISION: IN-SPACE LOGISTICS AND WASTE MANAGEMENT

D3, D-RAISE
Commissioning and decommissioning systems: patented, scalable, autonomous, independent, intelligent motors able to remove a satellite even if it is defunct.

D-SAT
Failsafe small satellites for large constellations, self-disposable.

FENIX
Propulsion for cubesat: +60% life extension, 4% volume occupied, plus rapid disposal.

ION
Free-flyer dispenser for precise delivery of smallsats and constellation phasing.

IOS
In-orbit Servicing for life extension, monitoring and active debris removal for GEO and LEO large constellations.

D-TRUCK
In-Space Transportation system: raw material, satellite positioning, life extension, people.

$9B market
$200B market
SELECT YOUR BOARDING PASS: FROM STANDARD TO FIRST CLASS

CubeSat Mass Allowance
- 3U, 3U+: 4.5 kg (Standard class) to 6 kg (First Class)
- 6U, 6U+: 9 kg (Standard Class) to 12 kg (First Class)
- 12U, 12U+: 24 kg

CubeSat Integration Sequence
- **Standard Boarding**: CubeSats are the first to be integrated
- **Late Boarding**: CubeSats integrated up to 2 weeks after Standard-Class
- **Last-minute Boarding**: CubeSats may be integrated up to the last day of integration

CubeSat Deployment Sequence
- **Standard Deployment**: within two weeks
- **Early Deployment**: within the first week
- **First Deployment**: within the first day

Access Port Availability
- **Standard Class**: top access port
- **Business Class**: top access and 1-6 lateral access port
- **First Class**: top access port and 2-12 lateral access port
TRUE ANOMALY PHASING – CASE STUDY

Constellation Geometry:

- 500km SSO
- 16 satellites per plane, to be spaced equally. One plane here considered.

<table>
<thead>
<tr>
<th>Deployment Approach</th>
<th>RIDESHARE / DEDICATED LAUNCHES</th>
<th>ION-MK01</th>
<th>ION-MK02</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Differential drag (1)</td>
<td>Antivelocity deployment, using ADCS for pointing and DPOD springs to provide separation push every 36 hours</td>
<td>16 Propulsive maneuvers for phasing. Low-speed deployment from DPOD.</td>
</tr>
<tr>
<td>Time to deploy</td>
<td>Up to 8 months (1)</td>
<td>3 months (2)</td>
<td>1 month</td>
</tr>
<tr>
<td>Tot Launch &amp; Deploy cost</td>
<td>Rideshare/dedicated launches cost.</td>
<td>Similar Cost</td>
<td>Similar Cost</td>
</tr>
</tbody>
</table>

50% to 86% reduced time from launch to full operation, at about the same cost

(1) Phasing executed by CubeSats through differential drag
(2) Deployment time can be further reduced
RAAN (LTAN) SHIFT – CASE STUDY

Constellation Geometry:

- 500km SSO
- 8 planes, equally spaced and 16 satellites per plane

<table>
<thead>
<tr>
<th>Deployment Approach</th>
<th>RIDESHARE LAUNCHES</th>
<th>DEDICATED LAUNCHES</th>
<th>ION OPTION 1 (SINGLE LAUNCH)</th>
<th>ION OPTION 2 (2 RIDESHARE LAUNCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/a (3)</td>
<td>Direct launch to each plane</td>
<td>IONs used to perform LTAN shift, then decommissioning.</td>
<td>2 launches on common LTAN and perform LTAN shifting through ION platforms.</td>
</tr>
<tr>
<td>Time to deploy</td>
<td>24 months (2), excluding phasing</td>
<td>Up to 8 months (1)</td>
<td>Launch 1: Up to 6 months</td>
<td>Launch 2: Up to 6 months</td>
</tr>
<tr>
<td># Launches</td>
<td>8</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tot Launch &amp; Deploy cost</td>
<td>Dedicated launches cost</td>
<td>16% lower cost</td>
<td>25% lower cost</td>
<td></td>
</tr>
</tbody>
</table>

66% to 75% reduced time from launch to full operation, at 16% to 25% lower cost

(1) Phasing executed by CubeSats; (2) Assuming one launch per quarter; (3) Not possible to deploy on all LTANs using simple rideshare
**Constitellation Geometry:**

- 1200km SSO
- 6 planes, equally spaced and 8 satellites per plane

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<tr>
<th>Deployment Approach</th>
<th>RIDESHARE LAUNCHES</th>
<th>DEDICATED LAUNCHES</th>
<th>ION (2 RIDESHARE LAUNCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/a (2)</td>
<td>Direct launch to each plane (limitation of microlaunchers on reaching higher altitudes).</td>
<td>2 launches on common LTAN and perform orbit raising and LTAN shifting through ION.</td>
</tr>
<tr>
<td>Time to deploy</td>
<td></td>
<td>18 months (1), excluding phasing</td>
<td>Launch 1: up to 7,5 months. Launch 2: up to 7,5 months</td>
</tr>
<tr>
<td># Launches</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tot Launch &amp; Deploy cost</td>
<td>Dedicated launches cost</td>
<td>38% lower cost</td>
<td></td>
</tr>
</tbody>
</table>

58% reduced time from launch to full operation, at 38% lower cost

(1) Assuming one launch per quarter; (2) Not possible to deploy on all LTANs using simple rideshare, no rideshare available at 1200km