Europe-China Cooperation in Space

Gongling Sun

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Contents

1. Capability and Future Development
2. Cooperation between Europe and China
1. Capability and Future Development
Launch Vehicles

Spacecrafts

Satellite Service Operation
12 Types of Long March Launchers Developed since 1970

Success Rate: over 98.9% *(from 2001 to 2011 out of 91 launches)*

Launch Capability:

- 5,500 kg (GTO)
- 2,800 kg (SSO)
- 9,500 kg (LEO)
International Launch Service

- First commercial launch: April 1990, Asiasat-1 (Hughes 376)
- By the end of 2011, 39 commercial launches
  e.g. W3C for Eutelsat on Oct. 07, 2011
- Customers:
Spacecrafts

- Telecom
- Remote Sensing
- Meteorological
- Recoverable
- Navigation
- Science Exploration
- Manned Spaceship
## Satellite Launched in 2012

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Satellite</th>
<th>Application</th>
<th>Launch Site</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 09</td>
<td>ZY-3</td>
<td>Remote Sensing</td>
<td>TY</td>
<td></td>
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<tr>
<td>2</td>
<td>Jan 13</td>
<td>FY-2F</td>
<td>Meteorology</td>
<td>XC</td>
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<td>3</td>
<td>Feb 25</td>
<td>Beidou-G5</td>
<td>Navigation</td>
<td>XC</td>
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<td>4</td>
<td>March 31</td>
<td>ApStar-7</td>
<td>Telecom</td>
<td>XC</td>
<td></td>
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<tr>
<td>5</td>
<td>April 30</td>
<td>Beidou M3, M4</td>
<td>Navigation</td>
<td>XC</td>
<td></td>
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<tr>
<td>6</td>
<td>May 06</td>
<td>TH-1B</td>
<td>Remote Sensing</td>
<td>JQ</td>
<td></td>
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<tr>
<td>7</td>
<td>May 14</td>
<td>YG-14, TT-1</td>
<td>Remote Sensing</td>
<td>TY</td>
<td></td>
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<tr>
<td>8</td>
<td>May 25</td>
<td>ChinaSat-2A</td>
<td>Telecom</td>
<td>XC</td>
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<tr>
<td>9</td>
<td>May 29</td>
<td>YG-15</td>
<td>Remote Sensing</td>
<td>TY</td>
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<tr>
<td>10</td>
<td>June 16</td>
<td>SZ-9</td>
<td>Manned Space</td>
<td>JY</td>
<td></td>
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</tbody>
</table>
CASC, the sole telecommunication satellite operator in the mainland, China

- **Chinasatcom**
  - Subsidiary of CASC
  - 12 satellites in orbit (1 Lockheed Martin, 1 Boeing, 2 Loral, 5 TAS)

- **APT**
  - CASC holds 4/7 shares of APT
To develop a new generation of launch vehicles, and start services in 2014.

**LM-5**
- Non-toxic and environmentally friendly
- High reliability
- Low cost
- LEO: 10-25t, GTO: 6-14t

120t LOX/Kerosene engine
50t LOX/LH2 engine
COMPASS Program for Navigation

- To build up a 15-satellite regional navigation and positioning system by 2012. (13 satellites in orbit now)
- To further expand it into a global satellite navigation and positioning system comprising 37 satellites in different orbits by 2020.
Manned Space Program

- Deploy space lab. before 2016, TG-2 and TG-3
- Launch space station by 2020
Implement Phases II and III of the Lunar Exploration Program:

- To launch a lunar rover to realize lunar soft landing
- To achieve lunar sample back to the Earth
2. Cooperation between Europe and China
## Launch Service

<table>
<thead>
<tr>
<th>No.</th>
<th>Payload/SC</th>
<th>Customer</th>
<th>Launch Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Micro-gravity Test Instrument</td>
<td>MartraMaconi, France</td>
<td>5 Aug. 1987</td>
<td>Piggyback</td>
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<tr>
<td>2</td>
<td>Micro-gravity Test Instrument</td>
<td>Intospace , Germany</td>
<td>5 Aug. 1988</td>
<td>Piggyback</td>
</tr>
<tr>
<td>3</td>
<td>Freja</td>
<td>SSC, Sweden</td>
<td>6 Oct. 1992</td>
<td>Piggyback</td>
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<tr>
<td>4</td>
<td>Livebox</td>
<td>ESA/DLR</td>
<td>1 Nov. 2011</td>
<td>Piggyback</td>
</tr>
<tr>
<td>5</td>
<td>W3C</td>
<td>Eutelsat</td>
<td>07 Oct. 2011</td>
<td>Dedicated</td>
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</tbody>
</table>
Two satellites of the CNSA/ESA Double Star mission;

Launched on 29 December 2003 and 25 July 2004, respectively;

Study closely the interaction between the solar wind and the Earth’s magnetic field.
European Space Tracking (ESTRACK) provided tracking support to Chang’E-1 and Chang’E-2 with 3 tracking stations.

China shared lunar exploration data with ESA.
Telecommunication Satellites

- Joint Design
  - DFH-3 bus development in collaboration with DASA since 1987

- Satellite Purchase
  - SinoSat-1 built by Aérospatiale and launched on July 18, 1998
  - ChinaSat-6B manufactured by TAS and launched on July 5, 2007
  - ChinaSat-9 manufactured by TAS and launched on June 9, 2008
  - ChinaSat-10 manufactured by TAS and launched on June 21, 2011
  - Apstar-7 manufactured by TAS and launched on March 31, 2012
Facilities

- **120/100 Compensated Compact Range**
  - A joint project in collaboration with Astrium
  - The largest compensated compact range in the world
  - Used for telecommunication satellite system, payload and antenna RF performance test
  - Follow-on projects: Xi’an, Tianjin
Ground Facility

- Diameter: 10m
- Height: 13.5m
- Pressure: $10^{-6}$Topp

Thermal Vacuum Environment Simulation Chamber
(Exported to Russia in July 2011)
Thanks for Attending!

For more information, please visit our website at

http://www.spacechina.com/english