

# Modern Airships

## Consolidated Table of Contents

Peter Lobner, 3 April 2021

*Modern Airships* is a three-part document that contains an overview of modern airship technology in Part 1 and links in Parts 1, 2 and 3 to more than 130 individual articles on historic and advanced airship designs. Here are the links to the three parts:

- Modern Airships – Part 1: <https://lynceans.org/all-posts/modern-airships-part-1/>
- Modern Airships – Part 2: <https://lynceans.org/all-posts/modern-airships-part-2/>
- Modern Airships – Part 3: <https://lynceans.org/all-posts/modern-airships-part-3/>

The following consolidated Table of Contents for all three parts should help you navigate this large volume of material.

### **Contents of Modern Airships – Part 1**

#### **1. Introduction**

*Modern Airships – Part 1* begins with an overview of modern airship technology, which is followed by a summary table identifying the airships addressed in this part, and concludes by providing links to 38 individual articles on these airships.

- 2. Well-established benefits and opportunities, but a risk-averse market**
- 3. Status of current aviation regulations for airships**
- 4. Lifting gas**

## **5. Types of modern airships**

5.1 Conventional airships

5.2 Semi-buoyant hybrid airships

5.3 Semi-buoyant aircraft

5.4 Variable buoyancy airships

- Variable buoyancy / fixed volume airships
- Variable buoyancy / variable volume airships
- Variable buoyancy propulsion airships / aircraft

5.5 Helistats (airship / helicopter hybrid)

5.6 Stratospheric airships

5.7 Thermal (hot air) airships

5.8 Hybrid thermal (Rozier) airships

## **6. How does an airship pick up and deliver a heavy load?**

## **7. The scale of large cargo airships**

## **8. Specific airships in Part 1**

## **9. Links to the individual articles**

### **Conventional, rigid and semi-rigid airships:**

- Airfloat HL
- Shell / Aerospace Developments - Methane gas transporter
- CargoLifter - Joey & CL160
- Zeppelin NT
- Zeppelin ZET
- SAIC & ArcXeon International Airstation - UAS Carrier
- Airship do Brasil (ADB) – ADB 3-15/30

### **Conventional, non-rigid airships (blimps):**

- Science Applications International Corp. (SAIC) - Skybus 80K
- US Air Force - Blue Devil Bock II
- Airship do Brasil (ADB) - ADB 3-X01 & 3-3
- Voliris - V900

### **Variable buoyancy, fixed volume airships:**

- Walden Aerospace / LTAS - Lenticular, toroidal, variable buoyancy airships
- Aeros - Aeroscraft *Dragon Dream*
- Aeros - ML866 / Aeroscraft Generation 2
- Halo luxury airship

**Variable buoyancy, variable volume airships:**

- Voliris - V901, V902, V930, V932 NATAC & SeaBird

**Helistats (airship / helicopter hybrid):**

- Piasecki - PA-97, Boeing / Skyhook International - SkyHook JLH-40 and other helistats

**Semi-buoyant hybrid aircraft:**

- Megalifter
- Ohio Airships - Dynalifters DL-100 & Patroller, Freighter & Cruiser, Drone Runner
- Aereon Corporation - Aereon III, Aereon 26 & Dynairships

**Semi-buoyant hybrid airships:**

- Goodyear - Dynamic lift airships
- ATG - SkyKitten & SkyCat
- US Navy - HULA program
- DARPA - Project Walrus
- Lockheed Martin - P-791
- Lockheed Martin - SkyTug & LMH-1
- Hybrid Air Vehicles / Northrop Grumman - HAV-3 & HAV-304 (LEMV)
- Hybrid Air Vehicles - Airlander 10 & 50
- Vantage Airship Manufacturing Co., Ltd. - CA-60T & CA-200T

**Stratospheric airships:**

- Walden Aerospace / LTAS - S.O.S.C.S.
- ATG - StratSat
- SwRI - HiSentinel
- Lockheed Martin - High-Altitude Airship (HAA)
- Lockheed Martin - HALE-D
- US Navy - StarLight

- DARPA / Lockheed Martin - ISIS
- Japan Stratospheric Platform (SPF) & SkyNet
- South Korea Stratospheric airship VIA-200
- Airship do Brasil (ADB) - SAGA

**Thermal (hot air) airships:**

- GEFA-Flug (Impacto Aereo) - AS-105GD/4 & AS-105GD/6
- Skyacht - Personal Blimp
- APEX Balloons - thermal airship

**Aerostats:**

- CargoLifter - CL75 AC (AirCrane)

## **Record of revisions to Part 1**

**Original issue, 18 August 2019:** 22 articles

**Revision 1, 21 December 2020:** Added 15 new articles, split the existing Aeros article into two articles and updated all of the original articles. Part 1 now has 38 articles.

**Revision 2, 3 April 2021:** Updated main text and 10 existing articles, expanded and reorganized the graphic tables

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## **Modern Airships – Part 2**

### **1. Introduction**

Modern Airships – Part 2 begins with a summary table identifying the airships addressed in this part, and concludes by providing links to 64 individual articles on these airships.

### **2. Specific Airships in Part 2**

### **3. Links to the individual articles**

#### **Conventional, rigid and semi-rigid airships:**

- Flying Whales - LCA60T
- Buoyant Aircraft Systems International (BASI) - MB-30T & -100T
- TP Aerospace - Atlas 80
- SkyLifter Ltd. - Flying Crane, SL150, SL50, SL25 & SL20
- Augur RosAeroSystems (RAS) - DZ-N1 & MD-900
- AIRSTAR - Alpha & LTA Corp. - Alizé lenticular airship
- The Hamilton Airship Company (THAC) - HA-44, -80 & -140
- Lightspeed USA Inc. - Lightships LS-12 & -60
- Solar Flight – Sunship
- SolarAirShip - High-Speed Solar Airship (HSSA)

#### **Conventional, non-rigid airships (blimps):**

- Worldwide Aeros Corp - Aeros 40 Sky Dragon
- Atlas LTA Advanced Technology - Atlas-6 and -11
- Blackwater Airships / Guardian Flight Systems - Polar 400 / 450 & Polar 600
- Augur RosAeroSystems (RAS) - Au-12M & -30
- Augur RosAeroSystems (RAS) - SOKOL
- Project Sol'R - Nephelios
- 21<sup>st</sup> Century Airships - Voyager
- E-Green Technologies (EGT) - Bullet 125 & 580
- 21<sup>st</sup> Century Airships & Techsphere - spherical blimps
- A-NSE - A-N400

### **Semi-buoyant hybrid airships:**

- Millennium Airship - SkyFreighter SF20T, SF50T & SF500T
- Dirisolar - DS 0.6, DS 12, DS 900, DS 1500 & DS 30
- Airship-GP - AeroTruck, AeroBoat & AeroYacht
- Turtle Airships
- Nautilus SpA - Elettra Twin Flyers (ETF)
- Flying-Yacht
- Magnus Aerospace Corp. – LTA 20-1 spherical Magnus effect airship

### **Hybrid thermal (Roziar) airships:**

- Aerosmena (AIDBA) - A20, A-60, A200 & A600
- LocomoSky – LokomoSkyner
- Design Bureau Thermoplan - Thermoplane ALA-40 & -200
- Thermo-Skyships Ltd. (TSL) - Thermo-Skyship
- Boeing - hybrid thermal airship

### **Variable buoyancy, fixed volume airships:**

- Atlas LTA Advanced Technology - ATLANT 30, 100 & 300
- Varialift Plc. – ARH-PT, ARH 50 & 250
- Euro Airship - Corsair & DGPAtt
- Airship-GP - “Super Hybrid” AeroTruck, AeroBoat & AeroYacht
- AeroVehicles, Inc. (AVI) - Minicat, Aerocat R-12 & R-40
- Global Airships - Atlas
- Skylite Aeronautics - GeoShip
- LTA Aerostructures - 10T & 70T
- Imaginative - Alert, Invitation & Kugaaruk
- Augur RosAeroSystems (RAS) – ATLANT

### **Variable buoyancy, variable volume airships:**

- Dynapod
- A-NSE tri-lobe airships & aerostats
- EADS - Tropospheric Airship

### **Variable buoyancy propulsion airships:**

- Solomon Andrews - Aereon I & II (1863)

- Walden Aerospace / Lighter Than Air Solar (LTAS) - Variable buoyancy propelled airships / aircraft HY-SOAR B.A.T & VAMPIRE
- New Mexico State University - Advanced High-Altitude Aerobody (AHAB)
- Hunt Aviation - Gravity Plane
- Phoenix

### **Stratospheric airships:**

- Thales Alenia Space – Stratobus
- TAO Group – SkyDragon
- Atlas LTA Advanced Technology - Propulsion Assisted High Altitude Platform (PAHAP)
- Sceye Inc. - stratospheric airship
- ESA / Lindstrand - High-Altitude Long-Endurance (HALE) aerostatic craft
- SkyStation International Inc. - Sky Station
- Sanswire / WSGI – Stratellite One & Argus One
- StratXX – X-Station
- Beijing Aerospace Technology Co. & BeiHang - Yuanmeng stratospheric airship
- Worldwide Aeros Corp. - G2R high altitude airship
- NASA 20-20-20 airship challenge
- EU CAPANINA
- Augur RosAeroSystems (RAS) - HAA Berkut

### **Semi-buoyant plane / airship hybrids:**

- Egan Airships - PLIMP Model D drone & Model J
- Solar Ship - Caracal, Wolverine & Nanuq

### **Electro-kinetically (EK) propelled airships:**

- Walden Aerospace / Lighter Than Air Solar (LTAS) - XEM-1, EK-1 & BBD
- Festo - b-IONIC Airfish

### **Small LTA drones:**

- Aerotain AG - Skye spherical blimp
- BAK - EM50 blimp

- DDBA (aka DKBA) - DP-27 & -29 airships
- Galaxy Unmanned Systems - GC-35, -60 & -75 blimps
- TAO Group - Lotte airship
- Airship Surveillance - R&D1 blimp & Airship Manufacturing - Sky Sentinel blimp
- Blackwater Airships / Guardian Flight Systems – RC-36 blimp

## **Record of revisions to Part 2**

**Original issue, 18 August 2019:** 25 articles

**Revision 1, 3 April 2021:** Added 37 new articles, split the original variable buoyancy propulsion article into three articles, and updated all of the 27 original articles. Also updated and reformatted the summary graphic table. Part 2 now has 64 article



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## **Modern Airships – Part 3**

### **1. Introduction**

Modern Airships – Part 3 begins with a summary table identifying the airship concepts addressed in this part, and concludes by providing links to 32 individual articles on these airship concepts. Many of the design concepts in Part 3 are quite exotic in comparison to the more utilitarian airships that dominate Modern Airships – Parts 1 & 2.

### **2. Specific Airships in Part 3**

### **3. Links to the individual articles**

#### **Cargo & multi-purpose airships:**

- KNAAR heavy-lift cargo airship for wind turbine components
- Airship One medium, hybrid airship / semi-buoyant aircraft
- Airship Archangel large, multi-purpose airship
- Cloudea large, multi-purpose airship
- Rediscovery Presidential airship

#### **Mass transportation airships:**

- KLM WB-1010 Spruce Whale large buoyant passenger aircraft
- Airbia suburban passenger ferry airship
- Flight 2.0 basic air transportation
- Imaginative Aerostratos regional passenger transportation

#### **Flying hotel airships:**

- Avalon Airships Aether luxury airship hotel
- Manned Cloud luxury airship hotel
- Airship Traveling luxury airship hotel
- Dassault Systems commercial flying cruise liner
- Aircruise luxury airship hotel with land dock
- Hydrogenase bio-hydrogen airship / building with land dock

**Touring airships:**

- Avalon Airships Hemera luxury tourist ferry
- Airmotion scenic touring airship
- Stalker exploration airship

**Flying yacht airships:**

- Strato Cruiser luxury airship yacht
- Eunoia luxury airship yacht
- LZ-73 small luxury airship
- Renault Zep'lin solar-powered racing airship
- Aeolus personal airship yacht
- Wolke7 personal airship yacht / flying home
- Aeromodeller II personal hydrogen airship yacht
- Aerolabe solar-powered airship / ornithopter hybrid

**Remotely-piloted special purpose airship:**

- Avalon Airships EOS autonomous police support vehicle

**Personal airships:**

- Sky Voyage hybrid personal airship / glider
- Escape hybrid personal airship & land vehicle

**Thermal (hot air) airships:**

- Sunrise solar-powered thermal airship
- Sterling solar-powered thermal airship
- Tensairity thermal airship

**Other novel designs:**

- Imaginative Medusa and Cubozo
- Imaginative Templar

**Record of revisions to Part 3**

**Original issue, 18 August 2019:** 32 articles