

R&D1 and Sky Sentinel blimp drones

Peter Lobner, 3 April 2021

1. Introduction

This is a two-part story about similar unmanned, non-rigid drones that may have a common lineage: R&D1 and Sky Sentinel.

2. Airship Surveillance, Inc. (2008)



Paul Adams founded the firm Airship Surveillance, Inc. in Las Vegas, NV in 2008 and was the chief executive officer. In March 2008, the company reported that it was “developing a series of

advanced unmanned airships designed to fulfill a wide range of roles ranging from surveillance to environmental monitoring. The company's airships are built to be robust, yet simple to operate with the twin goals of providing highly reliable airborne platforms at an affordable cost.”

On 11 March 2008 Airship Surveillance flew its technology demonstrator R&D1 airship for the first time to establish baseline handling qualities in calm weather and demonstrate its thrust-vectoring technology and other systems that would be used for the company's production lighter-than-air (LTA) vehicles. The R&D1 made three 15-min flights that day. Adams stated to Flight Global, "The technology being tested on this flight is steering the airship via thrust vectoring to provide full control at low airspeeds when control surfaces are not effective - a major issue with airship operations."

The R&D1 airship has the following key features:

- A single large, stern-mounted, vectored thrust main propeller. In the only published photo, there is no visual evidence of a bow mounted lateral thruster.

- X-configuration tail stabilizers that initially did not have aerodynamic control surfaces.
- A Payload Support Structure (PSS) under the centerline of the envelope for easily mounting modular mission equipment.
- No gondola

In later flight tests, the R&D1 supported development of an autopilot system. It also was used to test alternate propulsion configurations and aerodynamic surfaces to enable precise handling in crosswinds.



Airship Surveillance Inc. technology demonstrator R&D1 airship on its first flight, 11 March 2008. Source: Flight Global

The company and its strategic marketing partner WENR Corp. offered three production model unmanned airships, the L2, L5 and L15, primarily for surveillance and monitoring applications. The general configuration of these airships is believed to be similar to the R&D1 technology demonstrator.

L2 was the first airship to be built, with delivery originally expected in the second quarter of 2008. The first L2 was being configured with a sensor suite designed to detect Improvised Explosive Devices (IEDs).

In May 2008, Airship Surveillance received a government contract to conduct integration studies for a range of biological, chemical and radiation sensors that could be flown on their airships and develop deployment concepts for airships equipped with such sensor suites.

The larger L15 was designed to operate at altitudes up to 15,000 ft (4,500 m) with payloads up to 454 kg (1,000 lb) at a top speed of 60 knots (110 kph) and a maximum endurance of up to 50 hours. Details on the design of the L2 and L5 were not made public.

After many press releases in the March to May 2008 period, I've been unable to find press releases or other reports on Airship Surveillance after June 2008 and no evidence of an L2, L5 or L15 airship ever being completed. It appears that the R&D1 technology demonstrator may have been their only airship. But the story may not end here.

3. Airship Manufacturing, Inc. (2013)



In 2013, Paul Adams founded the firm Airship Manufacturing, Inc. in the town of Mesquite, NV, near Las Vegas with the business objective of developing the unmanned Sky Sentinel family of non-rigid airships. The photo accompanying the 2013

news article about the formation Airship Manufacturing contained the following photo, which appears to be the Airship Surveillance, Inc. R&D1 unmanned blimp.



Sky Sentinel circa 2013 or R&D1 circa 2008? Source: New Atlas

The Sky Sentinel was described as a family of small blimps, with conventional blimp buoyancy and internal pressure controls (lift gas cell and an air ballonet) that allow the airship to maintain its shape as it ascends or descends. These unmanned airships were designed as cost-effective, large-payload, long endurance vehicles that require only a minimum ground crew to launch and recover. The product line of Sky Sentinel airships offered customers various engine configurations, determined by the mission being flown. Since US FAA regulations did not allow a UAV to be operated commercially in 2013, Adams expected the first sales would be outside the United States, in areas like South America, Africa, or Europe.

In the Fall 2016 issue of *Noon Balloon*, Mark Lunz, writing for the Naval Airship Association, described the Sky Sentinel product line as follows:

“There are multiple versions which are all manufactured by Airship Manufacturing, Inc., in Mesquite, Arizona.

Sky Sentinel-1 is 82 feet long with 25,000 cu-ft envelope volume, can handle a 300 pound payload, has a 6,000-foot ceiling, and max speed of 65 knots with two 30 hp motors.

Sky Sentinel-2 is 90 feet long, 35,000 cu-ft envelope, can handle a 400-pound payload, 10,000-foot ceiling, max speed 65 knots with 30 hp motors.

Sky Sentinel-1 and 2 are similar in size to the Goodyear Pony Blimps of the 1920s.....Sky Sentinel-1 and 2 are not stern propelled – their motors are mounted to their gondola.

Sky Sentinel 3 and 4, however, are going to be stern propelled. 3 and 4 will have an electric motor powering a stern propeller. A small, lightweight diesel generator in the gondola is to supply electric power. Sky Sentinel 3 and 4 are in the design and test phase...

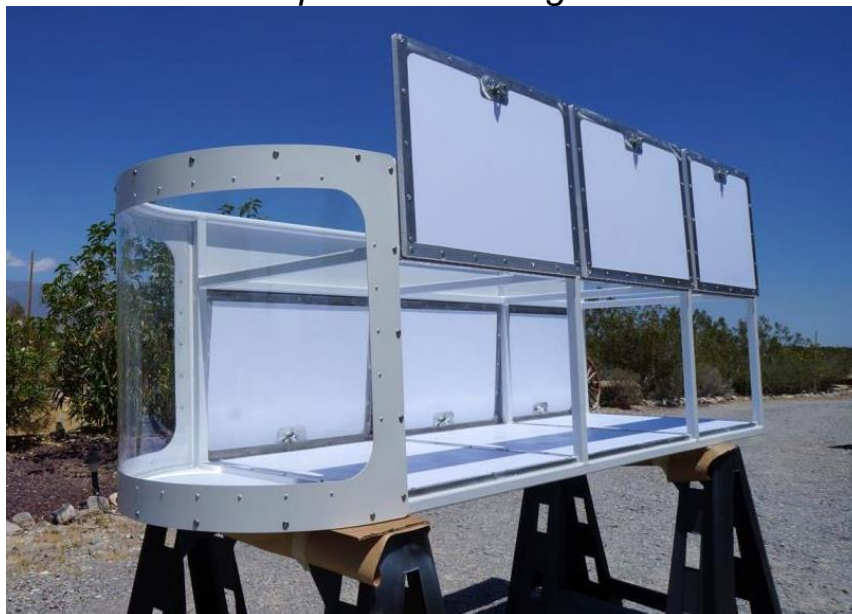
The company is also working on a completely silent stern drive for operation 500 feet up, for wildlife research. A civilian (Goodyear) “Silent Joe” (airship) 50 years later.”

Paul Adams reported that early testing demonstrated that the “introductory” model could operate safely in 20-35 knot winds.

The following Airship Manufacturing photos show a gondola under construction and a small pylon-mounted piston engine likely intended for mounting on a gondola (definitely not stern mounted).



*Above: Gondola structure with a fuel tank being installed.
Below: Another view of a gondola assembly.
Source: Airship Manufacturing via New Atlas*





*Assembled engine on a pylon, likely for a Sky Sentinel 1 or 2.
Source: Airship Manufacturing via New Atlas*

Airship Manufacturing appears to have gone out of business before flying any of its Sky Sentinel models in public. I've been unable to find any reports of test flights of airship sales.

4. For more information – Airship Surveillance Inc.

- “Airship Surveillance Inc. – new airship company,” Airshipworld Blog, 17 March 2008:
<http://airshipworld.blogspot.com/2008/03/airship-surveillance-inc-new-airship.html>
- Rob Coppinger, “PICTURE: Airship technology demonstrator makes maiden flight,” Flight Global, 18 March 2008:
<https://www.flightglobal.com/picture-airship-technology-demonstrator-makes-maiden-flight/79284.article>
- “Airship Surveillance Receives LOI From Auxilia,” Bloomberg, 20 March 2008: <https://www.bloomberg.com/press-releases/2008-03-20/airship-surveillance-receives-loi-from-auxilia>
- “More on Airship Surveillance Inc.” Airshipworld Blog, 23 March 2008: <http://airshipworld.blogspot.com/2008/03/more-on-airship-surveillance-inc.html>
- “Airship Surveillance Receives First Contract With Government,” Bloomberg, 5 May 2008:

<https://www.bloomberg.com/press-releases/2008-05-05/airship-surveillance-receives-first-contract-with-government>

- “Airship Surveillance - continues at high pace,” Airshipworld Blog, 28 May 2008:
<http://airshipworld.blogspot.com/2008/05/airship-surveillance-continues-at-high.html>

5. For more information – Airship Manufacturing Inc.

- Francis X Govers III, “Nevada company launches silent Sky Sentinel UAV airship,” New Atlas, 11 June 2013:
<https://newatlas.com/unmanned-airship-silent-sentinel/27867/>
- Mark Lunz, “Four Airships With Stern Propulsion,” Noon Balloon, Issue #111, pp. 21 – 22, Naval Airship Association, Fall 2016: https://650a8e8c-0be3-466b-9728-1ece39a725e3.filesusr.com/ugd/fbd712_c3041c1eab9143d4a7da7b3160941522.pdf