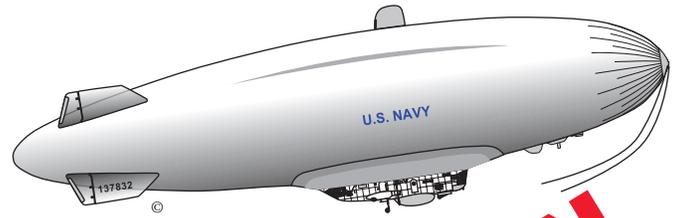
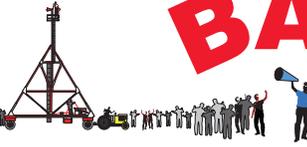


# THE NOON



# BALLOON



The Official Publication of THE NAVAL AIRSHIP ASSOCIATION, INC.

No. 115

Fall 2017



# GOODYEAR'S NEW AIRSHIP HANGAR



Found on the internet at [gorillasdontblog.blogspot.com](http://gorillasdontblog.blogspot.com) – Anyone recognize where ZSG-2-71 is masted? Or why?



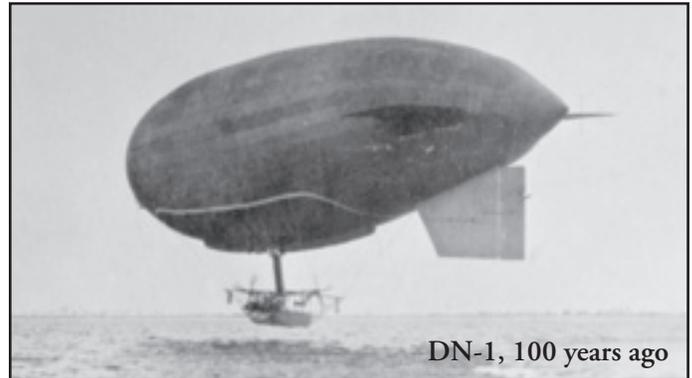
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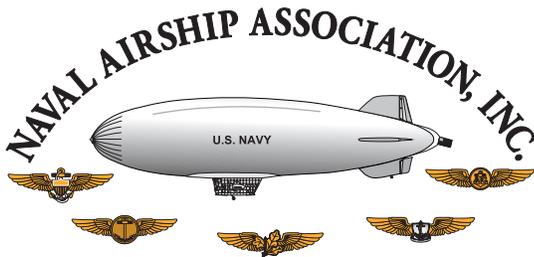
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DN-1, 100 years ago

Optimists and pessimists contribute to aerospace. Optimists invent the airplane; pessimists, the parachute. ☺

On the Cover: Goodyear California's new and unique hangar near Los Angeles. Lindstrand Technologies reports it is 107m/351ft long, 40m/131ft wide, 26m/85ft high, & contains 20 tons of fabric.



THE NOON BALLOON  
Newsletter of the NAA  
Volunteer Staff

**Contributing Editors:** NAA Members

**Masthead Artwork:** Bo Watwood  
www.navyblimps.tripod.com

**Editor:** Richard G. Van Treuren  
www.airshiphistory.com  
www.zrsthemovie.com

**Publisher:** David R. Smith  
www.gyzep.com

*All material contained in this newsletter represents the views of its authors and does not necessarily represent the official position of the Naval Airship Association, Inc., nor its officers or members.*

The Naval Airship Association  
[www.naval-airships.org](http://www.naval-airships.org)

President

Fred Morin  
PO Box 1926, Lecanto, FL 34460-1926  
E-mail: frmorin@verizon.net

Vice President

William Wissel  
E-mail: willyum54@comcast.net

Secretary/Treasurer

Deborah P. Van Treuren  
PO Box 700, Edgewater, FL 32132  
E-mail: deborah\_v@cfl.rr.com

Executive Committee Member-at-Large

George Allen  
E-mail: faxco77@att.net

Immediate Past President

Ross F. Wood  
E-mail: rfwood@cox.net

Technical Committee Chair

Juergen Bock  
E-mail: slta.bock@web.de

History Committee Chair

Mark Lutz  
E-mail: airshiphistory@centurylink.net

Historical Liaison Webmaster

Don Kaiser  
E-mail: don.kaiser@gmail.com

NNAM Liaison

Mort Eckhouse  
E-mail: mortusn@yahoo.com

Emil Buehler Library Liaison

Steve Kozlovski  
E-mail: 9987806@gmail.com

Education Director

Anthony Atwood  
E-mail: aatwo001@fiu.edu

## EDITORIAL

Richard G. Van Treuren, PO Box 700, Edgewater, Florida 32132-0700, [rgvant@juno.com](mailto:rgvant@juno.com)



With this photo by EAA Chapter 866 member Larry Gilbert we happily report our Twister N600ZF achieved first flight about 9 am on 7 JUL 17. Test pilot Jim Guldie took her around the pattern and reported no serious concerns (though our oil filler door popped open). With no more test time available we packed her in her trailer and pulled her up to Oshkosh for Airventure. We pitched our tents on two of some 11,600 campsites.



There at last we met pen pal Andy McKee, who'd just arrived after flying his Twister from his home near Bedford, UK. Andy had been instrumental in helping our assembly effort over the years. Andy was one of a record 2,527 international visitors registered from a record-tying 80 nations. During the show we gave a joint talk about our Twister-build experiences. We found many kindred spirits in the owners and operators of the more than 2,990 show planes (up 5% from last year). There were 1,162 vintage airplanes (up 12 percent), 351 warbirds (including both flying B-29s), 168 ultralights and light-sport aircraft, 79 seaplanes, 54 rotorcraft, 60 aerobatic aircraft, and 10 hot air balloons.

Yours truly of course gave his usual spiel about airships in Forum #1, one of a total of 1,050 sessions attended by more than 75,000 people. Total AirVenture attendance was up over 5% to more than half a million. Hundreds came by our parking space and we talked up the Twister's role of the airship's fighter in the movie we want to make, exploring the flying carriers that almost were.

Andy visited the Pacific North West before making his return TransAtlantic without incident. We returned home to reassemble Twister for (as of this writing) test flight #2 before pausing for Irma. Sadly, for all the cards with our web address

[zrsthemvovie.com](http://zrsthemvovie.com) that we passed out, we got but a single book order. Clearly, this is not the way to pay for animation representing what the movie would look like as our USS *Long Island* launched and recovered planes.

But I digress. Getting back to real NAA business here, we continue our 100 years of USN LTA coverage with four pages from our French friend Mayor Roch Cheraud's celebration program he was so kind to send. We had supplied some photos but you see they found many others. Impossible to break up into our format, they kindly supply English captions on each of their pages. Enjoy images from that time a century ago when Americans first flew hydrogen-borne airships against enemy submarine boats. We also have a new study of Naval Zeppelin statistics which we contrast with David Ingalls' 1930 prediction that the rigid airship would become a flying aircraft carrier.

Recently our overworked reviewer, CP Hall, covered a book which claimed the *Roma* blew up because its operators were too lazy/stupid/cheap to fill it with anything but dangerous/flammable/explosive hydrogen. Next issue we'll cover yet another new book that reiterates the *Hindenburg* blew up because its operators were too lazy/stupid/cheap to fill it with anything but dangerous/flammable/explosive hydrogen. This issue CP reviews a new book which shows the *Shenandoah* blown to pieces over the Ohio countryside because its operators were too... uh, wait, ZR-1 was helium-filled, wasn't it? That book's author, an NAA member who gave proper credit for photos he received and used, declined Ed.'s suggestion he mention Anton Heinen's insisting "Those valves were put there for a purpose!" Each to his own.

You can't change human nature and you can't blame authors and publishers for, if not receiving fame and fortune, than at least hedging their bets by repeating long entrenched dogma. By contrast when CAPT MH Eppes published the first TNB in 1984, he dared to suggest it more important to retain the knowledge and expertise gained in USN LTA operations of more than 40 years. Likewise CDR Charlie Mills started an effort to put that experience into textbook form, and others joined him with research papers and experimental results. However, the result only appeared in Germany. There has been scant interest in translating and publishing it here, so again we're trying to do it ourselves. Hopefully we'll complete the book which, though dogma-disrespectful and unprofitable in the marketplace, might offer help to anyone considering LTA technology in the future. I was encouraged that not just one, but two new LTA builders have ordered Navy airship footage on our DVDs, which will certainly help them in the meantime.

– R G Van Treuren

## VIEW FROM THE TOP – PRESIDENT’S MESSAGE

Fred Morin, PO Box 1926, Lecanto, Florida 34460-1926, frmorin@verizon.net

In a prior issue of The Noon Balloon we included a survey card about the 2018 Reunion as we are trying to determine how many members intend to come to the Reunion. As I write this we have had a very good response:

“I am planning on attending...” - 41

“I would not be attending...” - 44

“I have no interest in attending...” - 11

We would certainly hope that the number of those planning on attending proves accurate and note that it only counts members, not spouses nor dependents. As I wrote in my letter, we need to determine an anticipated attendance so we can accurately predict our expenses, prepare an entertaining and informative Reunion and determine if there is sufficient interest from the membership to continue planning Reunions. If attendance continues to decrease we may have to cancel future Reunions as our contributing expenses increase and we do not have the membership dues to cover those expenses and reduced attendance puts us at a disadvantage in negotiating pricing for hotels, admission fees at attractions, as well as banquet facilities and food costs.

Still to be resolved is a final date for our Reunion. Saturday, September 29<sup>th</sup>, looks good for the banquet and a detailed schedule for prior days activities is still being composed. We have been in close contact with the Lighter Than Air Society and it looks very promising that we will be able to have our Reunion banquet in conjunction with the LTAS Annual Dinner. This is very exciting and a great opportunity to work with the LTAS. Complete details and registration info will be mailed to every NAA registered member soon.

We have also begun a general belt tightening beginning with our general expenses and The Noon Balloon. Over the past few years our page count has increased and the printing and postage costs have also increased proportionately and from general economics. The new issues will continue to provide world-class coverage of all things LTA, solid historic coverage of Navy LTA from our members, and a good assortment of technical articles of interest. The goal is still to publish the best LTA magazine at a reasonable cost, not to just fill pages.



Meanwhile, we are looking for someone to take on the responsibility of processing and shipping orders for Small Stores products. Postage and shipping package expenses will be reimbursed. Person needs to take orders over the phone, deposit checks, and ship merchandise promptly. A small amount of inventory will be provided and replenished as merchandise is sold. All we ask is for prompt reporting of sales, directed to the NAA Treasurer.

As I reported earlier, my idea for an LTA Hall of Fame has passed an historic milestone in its passage to fruition. The delays in getting into full-scale production to date fall squarely under my responsibility. We have some details concerning the screening process and organization of the Hall to resolve and those should be resolved very soon. I am still targeting the 2018 Reunion as our first inaugural installation date. Please think of potential candidates and we will have a nominating form available for you to submit very soon.

Thank you for your continued support of the Naval Airship Association and I hope to see many of you at the next reunion.

– **Frederick R. Morin**

## TREASURER'S STRONGBOX

As your Treasurer and Secretary, I am very pleased to let you know that our situation, thanks to the generosity of many members who have donated to our Association, is that we are solvent and can say that as of August 31, 2017, our funds total \$6,034.28 in checking and \$18,846.17 in savings. These numbers represent all funds accounted for and all expenses deducted. This does **not** include Small Stores Inventory. Happily, this balance will enable us to publish the current *Noon Balloon*, #115, without taking from savings.

So far this year, we have received \$1205 in donations, including a monthly donation in memory of Charles Tuffield from his daughter and her husband. This is a matching gift through her work. Thank you to everyone who has given to the Association! Small Stores have brought in \$497.23. If there are shirts, hats or other logo items you desire, please fill in the Small Stores order form and send it in.

I am also happy to report that the Quickbooks Software we are using allows us to keep better records with an idea of how we spend our funds and where those funds originate. Up Ship!

– Deborah Van Treuren

## PIGEON COTE



An e-mail query came into History Chair Mark Lutz:

“Do you know anything about this type of WWI Veterans Cap? Do you know anything about how difficult they are to find or what they are worth? This guy was obviously on the *Los Angeles*.” (See photo, page 3)

Mark and Ed. concluded this cap predated the Naval Airship Association, the initials thereon belonging to the National Aeronautic Association. Nor had it anything to do with the ZR-3, but rather the location of that chapter of The Balloon Corps Veterans. They were a very active group and even had a newsletter for many years. Sadly, we can't find any evidence they still exist. Ω



Allison Markey e-mailed webmaster Don Kaiser, “The K-14 accident [above] is definitely interesting and I agree, there is a high likelihood there is a level of cover-up involved by the military due to WWII. I have read the crash analysis on your website. Are there other official reports? It's a shame that all of the witnesses have passed on. However, if there are any left I would be honored to be able to talk with them about the crash. I would appreciate seeing the other photos you have that are not on your website. Thank you. My interest in the crash is both personal and for my blog. I have always been interested in blimps, dirigibles, and zeppelins. I have visited the Zeppelin museum in Zeppelinheim outside of Frankfurt, Germany and am planning to visit the Zeppelin museum in Friedrichshafen, Germany later this year. My hope is to be able to write a detailed, researched story regarding the events of that night to interest others.” Ω

Roy Mize followed up his floating hangar article in the last issue, “Have been doing more searches. Found that the barge traveled to Pensacola in three stages. The small towboat *Fallie* picked up the barge cut (8 empty coal barges and the hangar barge) at Ambridge and delivered them upriver to Huntington, West Virginia, where one of the three largest towboats on the Ohio River, the *J. B. Finley*, was waiting. The *Finley* was shepherding a large tow of coal barges to New Orleans. At New Orleans the hangar barge was turned over to a tug to be towed to Pensacola. It's logical to believe that it was a Navy tug, but so far I haven't found any news reports or official documents about how the barge traveled from New Orleans to the Wet Basin. Ω



Our hardworking NMNA Library Liaison Steve Kozlovski recently scanned early photos of the very K-ship on display in the Museum, now in its “3K” configuration. The photos are from that short period in US Naval history defined as post-Richmond hurricane but pre-Korean War. The few remaining Ks retained their late WWII equipment levels but sported their actual K-numbers on their tails, quickly completed with the K designation and their station assignment (at least those at Lakehurst). So here we have it, the K-47 in the final wartime trim: twin MAD sensors upward on the envelope, but with no car modifications which began shortly to convert to the “2K” configuration (inside cover photos). One of the clues to a date/config in any such photos are the accessories mounted- or not mounted - on

the envelope forward of the car. Tom Cuthbert e-mailed he had a photo of such a K-ship in transit (with Black Dog!). “It was in 1951 when we moved ZP2 to Georgia. There were no forward under-bag antennas on that ship or K-47.” Tom offered another photo that “you see a K-ship in 1955 having two antennas in front of the car toward the battens. They were ECM antennas: a Yagi (we called long dong) and a more squat round enclosure with a rotating scanner antenna.”

Another photo shows a 2K in flight at Glynco. Mark Lutz asked George Mitchell about ECM airship equipment that listened for enemy communications, and possibly radar; nothing active, such as broadcasting interference signal. George Mitchell said in their frequent training missions they turned it on, but that was it - he never remembers receiving anything. Anyone else have any recollections?  $\Omega$



A Canadian innovator was connected with our Tech Com Chair Juergen Bock, generating some interesting message traffic concerning LTA applications in resource harvesting in the far north. These are selections from Bock's messages:

As an introduction into the well-defined project requirement, please allow me to take a deep breath and travel several decades back, when in the 1980s my SLTA-Partner, the late US Navy Commander Charlie Mills, received the inquiry for a short-range airship to carry single selected trees out of a forest to a depot for further transportation. I recognized at first glance that a conventional airship would not represent a viable solution, especially w.r.t. the stress path caused by a concentrated load. Therefore we put a fat zeppelin structure vertically with the stern tip pointing downward as a load concentration point. Statically a perfect solution, but at the expense of a terrible drag coefficient for horizontal movement. Nevertheless, for reasons of the low transfer speed and short transfer ranges, it was realistic to assume that conventional vectored thrusters would suffice. The carrier balloon was supposed to take ballast water at a near-by lake and would be exactly positioned above the selected tree and tied to it. Then the ballast water was released and the trunk was cut by the ground crew and transferred to the lake; here new ballast was taken and the trunk released for further processing. Parking of this type of balloon by loggers could be conveniently accomplished by means of a ground anchor because the aerostatic lift could resist the power of the wind pressure from all directions. This concept, however, was neither accepted by the prospective customer nor by other airship specialists, because "it does not look like an airship"!!- Unfortunately, all documentation of that project, including a cartoon showing the lumberjacks being sprinkled by the ballast water, got lost due to several household moves and other circumstances.

I have come to the conclusion that glossy paper producers and development money wasters have terribly failed to meet the complexity of requirements you had meticulously identified in your transport chains, e.g.:

- they did not produce a thorough requirements analysis, which would have shown that at least two different types of carriers are required to meet the full spectrum of requirements;
- they have stressed the term "Hybrid" without understanding the philosophy and technology of the Lifting Body Airship, which was established already half a century ago;
- alternative Canadian experimental airships, which

already demonstrated the feasibility of their concept on a smaller scale, were brushed aside at an early stage on the grounds of superficial arguments and nostalgic prejudice - in my eyes, a tragically wasted chance!

- the presented concepts apparently ignore all experiences of classical experiences w.r.t. airship construction on a large scale (minimum size, rigid structure etc.).....

Take a sufficiently dimensioned aerostat for sequential exchange of lumber and ballast water, then you have only to account for the power of the transferring and station keeping thrusters; an ideal situation for a forest/lake scenario! Moreover, you have obviously missed a further lifting potential, i.e. the aerodynamic lift of the elliptical hull which will be generated even at a moderate breeze and adequate angle of attack (kite effect).

- (a) A combination of a helicopter system with a lighter-than-air system has been proven to be utterly hazardous in practice; e.g. the destruction of Piasecki's "HeliStat" due to unforeseen resonance vibrations. Also the cyclic pitch controlled helicopter rotor blade on the experimental rigid airship "AEREON III" turned out to be extremely dangerous w.r.t. vibrations at several resonance frequencies. Also, a Russian project of combining of a helicopter with a flying-saucer-type aerostat has been totally given up.

(b) The induction air stream of the helicopter system is encumbered by the shape of the hole in the elliptical aerostat, thus generating a suction field pulling the aerostat downward.

(c) There will be an additional adverse effect of aerodynamic forces on the hull, whenever the induction air flow of the helicopter becomes asymmetric in horizontal flight and during positioning maneuvers.

(d) The necessity to provide a hole in the aerostat for the induction airstream of the helicopter reduces the volume of the aerostat, hence the available aerostatic lift, and increases the surface area, in other words, the dead weight.

(e) The elliptical shape of the aerostat apparently does not contribute to the generation of aerodynamic lift.

Our recommendations are in principle:

- (1) Decoupling the aerostatic subsystem from the propulsion subsystem.
- (2) Optimize the shape of the aerostat for minimum drag coefficient, comparable aerodynamic lift coefficient and stall-free characteristics.
- (3) Provide a vector thruster system for precise positioning.
- (4) Provide an efficient mooring and cargo hauling system.  $\Omega$

## SHORE ESTABLISHMENTS

### Lakehurst

The US Army's LEMV program, whose build and initial flight was at Lakehurst, is of course now history. Other Government LTA efforts, like Blue Devil, have been scrapped as soon as their champion was unseated. In a most unusual transaction, LEMV was sold to Hybrid Air Vehicles where it has evolved to become AIRLANDER (see next page "Cardington").

However not every piece of the program got on the boat; during a local Government surplus sale, at least a few remaining items were sold at auction.



One of these was a control panel (above) that would appear to be the method by which the onboard laser rangefinder could be put into safe mode. Whatever its function, this panel was once as part of LEMV. (The MX-15 laser system itself, being government furnished, is likely to have been removed before the airship was shipped to the Brits.) Happily, New Smyrna Beach, Florida's "Planet Surplus" retailer was so kind as to donate the panel to the Navy Lakehurst Historical Society. Ω

### Moffett Field

No further information has been published following the Bloomberg News Report that an airship is being constructed in Hangar Two, but locals note there is considerable activity, so something must be going on in there! Ω

### Tustin / Santa Ana



Aeros Aeronautical Systems Corp. Receives Multiple Award Schedule (Mas) 066 Contract From The General Services Administration Agency (GSA) On June 16, 2017, Aeros Aeronautical Systems Corp. (Aeros) announced its GSA Federal Supply Schedule contract award. With this award, U.S. Government customers now have the ability to contract directly with Aeros to purchase Airships and Aerostats. U.S. Government customers can now achieve and maintain effective aerial intelligence and security, whether air, land or sea-based, with Airships and Aerostats, that are manufactured to their particular budgetary and mission-specific requirements. Aeros advanced tethered aerostats, non-rigid airships, and elevated ground-based platforms, have been engineered to be the most cost effective, persistent and vigilant surveillance products available. The GSA Schedule award adds the Aerostats and following Aeros products to the schedule catalog:



'Sky Dragon:' (Above) A mobile aerial sensor platform that provides mission endurance and integrates the latest technology to deliver situational awareness and actionable information to operators. The Sky Dragon serves varied missions including Intelligence, Surveillance, and Reconnaissance (ISR), border and security applications, maritime patrol, and search and rescue, among others. Ω

## Akron



Above: With the Akron Airdock as a backdrop, *Wingfoot Two* departs after its flyover and maneuvering demonstrations. (All photos by Alvaro Bellon)

In late August Goodyear Tire & Rubber Co. invited a group of members of The Lighter-Than-Air Society and of the Helium Heads group for a tour of the Wingfoot Hangar near Akron. The group had the opportunity of seeing the third LZ N07-101 zeppelin semi-rigid airship during assembly. At this point the longerons had been installed and the ballonets were in place. Further assembly will continue once *Wingfoot Two* departs for California, freeing up space allowing the assembly of the new airship to move to the center of the hangar.



Above: In the foreground the longerons and other parts of the internal structure including the ballonets of the third Goodyear Zeppelin. In the background, in addition to the new airship, *Wingfoot Two* was in the hangar undergoing the final stages of its annual overhaul. The presence of the two airships afforded a rare opportunity for photographs.

Top right: Detail of the ducts for wiring going to the stern of the airship, as it wraps around one of the structures that hold the longerons in place.



During the weekend of September 9 and 10, the Props and Pistons Air Festival took place at the Akron Fulton (Municipal) Airport. The Lighter-Than-Air Society was invited to participate with an exhibit of items from its collection. The exhibit focused on the Akron Airdock, which served as a backdrop to the Festival, as well as on the USS *Akron* and *Macon* which were built at this location between 1929 and 1932. On the second day of the Festival, Goodyear's *Wingfoot Two* did a fly-by and some maneuvering demonstrating the airships capabilities. These included hovering in place, ascending and descending vertically, steep climbs and dives. In closing it demonstrated its yawing capabilities, which was its farewell wave before heading off to cover that night's Indians Baseball game for ESPN.



The model of the USS *Akron*'s internal structure, which was used by Dr. Karl Arnstein to explain how the airship would be constructed. (Left:) A fuel tank from the USS *Akron* and *Macon* era. In spite of its size, approximately 6 feet high and 3 feet in diameter, it only weighs 21 pounds.

– Alvaro Bellon

## Cardington



Technicians recently completed a full hull inspection of Airlander using simple, safe and spectacular rope access techniques developed to make maintaining our unique aircraft routine. As expected, no major problems were found and Airlander got the thumbs up to continue its flight test program. This was the first time this access process has been used outside on the hull following development inside our hangar. This technique is key to enabling Airlander to demonstrate its ability to be maintained outside, without need for a permanent hangar.

We now benefit from remarkably easy access to all the upper surfaces and systems of the Airlander, using the same ascender system as the technician team uses for routine engine maintenance and inspection. Airlander is 26m (85ft) tall (around the same height as four stacked double-decker buses) which means that great care and thought has been put into maintenance techniques. Safety ropes are permanently attached to the hull and our technicians undertook rigorous training to ensure the highest safety standards. Access is gained to the hull via power ascenders supplied by ActSafe, the world leaders in this kind of equipment. Safety is the priority for Airlander and we always ensure the highest standards are adhered to.



Anyone living close to Cardington cannot help but notice the huge changes that have happened since HAV moved in nearly four years ago. We now have over 100 people on the site most days, and share our hangar with a very busy Warner Bros film studio and storage site. Our focus now is on building from the great success of the initial Airlander 10 testing, and preparing to produce Airlander aircraft and deliver them all over the globe. So this is a natural time for us to make sure that we are set up for the future with the right site and the right facilities and we have been reviewing our needs to ensure that we can do just that. As a result we have concluded that we now need to begin a process of moving HAV to a new site, away from Cardington. We have worked with everyone on and around the site to make every effort to find a way to stay here, but after that extensive exercise we believe that moving is the right and pragmatic decision for us.



You will also hear in the coming weeks that we will start to use other airfields a little further away to undertake testing and other operations of Airlander. We have been preparing for this transition for a long time – including right from the start by designing Airlander to be maintained and supported outside without need for a hangar after it is built. We've been busy this year proving all of our maintenance techniques work without coming back in to the hangar. With extended flight testing and customer demonstrations about to start, some of which need more take-off and landing distance than Cardington allows, this is the right time for Airlander to start visiting some new locations. Finally, we hope to announce at a later date where our planned production location for Airlander will be sited. This location will be the focal point of new employment both in HAV and our supply chain providing nearly 2,000 additional jobs in the UK, delivering parts and sub-assemblies for building, testing and delivering 12 or more aircraft per year. Ω



**Brazil: The Inaugural Flight of the First Latin America - Built Airship**

On July 24th, 2017, about 800 people attended the 3-X01's inaugural flight (above), the first manned airship built in Latin America by Airship do Brasil (ADB). The development of the project relied with the participation of the electrical sector, with prominent actors such as ANEEL and Eletronorte which greatly contributed to prototype's applicability to the electrical industry.

With this feat, Airship do Brasil finds itself within the six companies in the world that possess the full aeronautical technological knowledge applied to the lighter than air R&D cycle. The aircraft is ready to be used with the Brazilian Armed Forces and its offspring, which will be the certified 3-3 model will permit its commercialization in 2018. Concomitantly, the cargo family under the name ADB-3-30 is under development, which permits the transport of 30 tonnes and a gondola that has a capacity of 330m<sup>3</sup>.

The event happened at ADB's operations hangar (the H-2), which attracted aviation enthusiasts, professionals of the aeronautical industry, the company's development partners, various media outlets and the illustrious presence of São Carlos' mayor Ailton Garcia, Brazilian Postal Services Guilherme Campos Jr. and the President of the Municipal Chamber of São Carlos, Júlio César.

Dr. Irani Bertolini, president of the Bertolini Company Group which ADB is part of, emphasized the importance of the great step taken by Brazil. Airship's president, Dr. Paulo Vicent Caleffi buried a time capsule entitled "Message to the future" with envelopes and pictures of employees and partners that will be opened in 2037.

During the ceremony, Brazilian Post proceeded with the philatelic event, cancelling the commemorative stamp of the first airship built in Latin America, a great pride which will always be part of national history. Ω



## Paris Air Show Roundup (Internet-based reporting)



The airship market, that tantalizing aviation niche that for decades has failed to pan out in a big way, saw some business maneuvering at the Paris Air Show aimed at solving the marketing and technical hurdles that have prevented these craft from seizing roles in transportation, communications and Earth imaging.

Hybrid Air Freighters signed a nonbinding agreement at the Paris Air Show to purchase up to 12 LMH-1 hybrid airships (above) from Lockheed Martin subsidiary Hybrid Enterprises. Hybrid Enterprises CEO Rob Binns said they are also negotiating a deal to sell airships with Straightline Aviation. Binns said that the company has “a certification plan agreed with the FAA and Transport Canada,” and that, “Now we will have to talk further with EASA.” The non-legally binding agreement will be worth approximately \$500 million if it leads to an official contract. The LMH-1 hybrid airships, designed by Lockheed Martin Skunk Works, would fly cargo and up to 19 passengers to remote places, said Hybrid Air Freighters CEO Hubert de Contenson during a press conference.

These cargo services could include shuttling mining equipment and engineers from site to site in places like Alaska, said Jean-Paul Troadec, Hybrid Air Freighters’ head of aviation and flight operations. He said flights in remote locations could ease the path to public acceptance elsewhere. According to the story, 80 percent of the hybrid ship’s lift “comes from helium gas buoyancy and 20 percent comes from aerodynamic lift generated by its shape and four propeller engines.” The lift from helium should give it an energy-saving advantage over gasoline-powered planes.

Rob Binns, CEO of Hybrid Enterprises predicted that once a full-scale LMH-1 demonstrator starts flying, Hybrid Enterprises could begin delivering airships within 30 months. That would mean 18 months for production and 12 months for flight test certification.

Lockheed Martin Skunk Works originally tried to sell the concept to the Army in 2010 as an intelligence, surveillance and reconnaissance aircraft and communications relay for troops in Afghanistan. Lockheed flew a subscale prototype of the hybrid airship in 2006, but was passed over in a contract competition. Lockheed began exploring commercial opportunities for its design and the Pentagon eventually decided not to buy airships.

Shipping freight and broadcasting wireless signals by hybrid airships could one day lead to passenger travel, but first people need to shake off perceptions that they are not safe. Responding to a question about an advertising blimp that deflated, burst into flames and crashed during the US Open last week, Binns suggested



that such incidents feed what he called a misconception about safety. An airship “is far safer than a fixed-wing aircraft,” he said.



At the Paris Airshow, Brazil’s ALTAVE announced its agreement in Europe with French partner Airstar Aerospace. In a ceremony held during the Le Bourget International Saloon, the companies signed the partnership in the presence of Brig Gen Paulo Roberto de Barros and Capt Leonardo Jos Trindade de Gusmo, both from the Department of Defense Products, who were representing the Brazilian Ministry of Defense. Also present were Marcelo Safadi, Business Director of the Technological Park of Sao Jos dos Campos and the Brazilian Aerospace Cluster, as well as two officials from the Ministry of Interior of France, Ms. Calba and Mr. Fichet.



(Above) The Altave Explorer 2 aloft

This industrial partnership consists in the introduction of ALTAVE’s tactical aerostats and ISR (Intelligence Surveillance Reconnaissance) solutions to Airstar Aerospace’s portfolio, with licensing and certification of these solutions to the European market. As a result, Airstar Aerospace becomes ALTAVE’s exclusive distributor in Europe. Airstar’s products include tethered surveillance balloons for military customers including the Eagle Owl, which was also on display at the air show.

The Paris Air Show also saw two French companies forge a deal to create a different kind of airship, one that would stay aloft in the stratosphere for months to provide satellite-type services, including Earth observation and communications. Thales Alenia Space is proposing a maritime version of its Stratobus surveillance airship. The variant can be equipped with L3 Wescam MX-25 high-definition long-range multispectral sensors. Thales Proposes Maritime Version Of Stratobus Airship With L3 Wescam MX-25 Sensors.



The companies aim to solve “certain technological roadblocks” with the Stratobus airships that Thales has been developing, Thales said in statement. The goal will be to complete a prototype of the Stratobus by 2020. The current Stratobus design has an overall length of 115 m, a 62,000 m<sup>3</sup> volume, a 34 m diameter, and a payload capacity of 250 kg. The system will be capable of operating at an altitude of 20 km and is able to remain in a stationary position for a year. By floating at 65,000 feet a Stratobus would provide lower latency than telecommunications satellites for wireless signals and could be ideal as a platform for fifth generation, 5G, mobile services , says Jean-Philippe Chessel, head of the Stratobus product line at Thales Alenia Space. Chessel signed the agreement with Airstar Aerospace CEO Romain Chabert.

It can be equipped with the Thales Searchmaster 400 X-band multichannel rotating radar, incorporating active electronically scanned array (AESA) technology; avionics; satcom antennae; L3 Wescam MX-25 high-definition long-range multispectral sensors; advanced communications; GPS; an automatic identification system (AIS); or any mission payload up to 250 kg. The radar provides 360° field-of-view scanning and can track up to 1,000 targets within a range of 200 n miles. Ω

The Financial Post reports a Quebec company called Quest Rare Minerals plans to use a fleet of seven Lockheed airships to transport supplies to its Strange Lake mine near Labrador, and then to carry ore out. Ω



Hybrid Airship: Big Impact, Small Environmental Footprint (Lockheed)

More than two-thirds of the world's land area and more than half of the world's population have no direct access to paved roads. How then do you access remote sites safely, affordably and with a small environmental footprint? Planes are an option, but you need runways. Helicopters are an option, but cannot carry large freight, cargo or many passengers. Ships are an option, but you need major waterways. Enter the Hybrid Airship. While deceptively simple, the Hybrid Airship deploys a sophisticated flight control system and a proprietary air cushion landing system (ACLS), enabling safety, affordability and flexibility in accessing remote locations.

In fact, with the ability to carry up to 20 tons of cargo and 19 passengers, the possibilities seem endless for the Hybrid Airship: cargo delivery, humanitarian aid, mobile hospitals, eco-tourism and more—all while driving major benefits to environmental and economic sustainability. Rain or snow, hot or cold, calm or blustery, the Hybrid Airship offers day-to-day flying capability to operating sites worldwide.

Emissions from commercial transport today account for approximately 1.5 percent of the global carbon dioxide footprint, and are expected to increase as air traffic and trade grows. This is what makes the Hybrid Airship's tiny environmental footprint so valuable. "Developing resource sites without most of the environmental footprint impacts is a complete game changer for a huge number of resource projects," said Jonathan Molyneux, sustainability consultant at Environmental Resources Management. "If you can take 80 percent of those footprint impacts out of the equation in the lifetime of the asset, and even more out of the construction phase, you could not only accelerate the lead-time for construction, you transform the economics and significantly reduce environmental concerns." When it comes to operating in remote locations, several technologies give the Hybrid Airship unmatched capabilities.

The Hybrid Airship is non-rigid, with no internal structure providing its shape, and it is heavier than air. Meaning, 80 percent of its lift is generated by helium (and the efficiencies that come with helium), and 20 percent is from the aerodynamic design of the envelope. "Basically, the envelope is one giant wing creating lift," said Bob Boyd, Hybrid Airship program manager at Lockheed Martin. "And, the envelope is made from strong, lightweight material that can withstand internal pressure loads and external wind forces while keeping the structural weight low, a key component for cost efficiency."

Perhaps one of the most critical of the Hybrid Airship technologies is the ACLS—three hoverpads that create a cushion of air, allowing it to float along the ground nearly friction free. "With the ACLS, the Hybrid Airship requires little to no fixed ground infrastructure to take off and land, which means you can land virtually anywhere—dirt, grass, ice, snow and even water," said Boyd. "Once you've landed, the ACLS essentially acts like a suction cup, gripping the ground, providing additional stability for operations." Then there's the power. Flying with a 4-liter piston engine (essentially a car engine), the Hybrid Airship uses one-tenth the power of a fixed-wing aircraft, enabling fuel economy, and the engine's thrust can be vectored up or down to augment lift. Plus, its propellers spin at relatively low revolutions per minute, making it a quiet cargo delivery aircraft. "Believe it or not, remote areas are also concerned with noise," said Boyd. "Imagine you're waiting for a visitor who is driving a mid-size 4-cylinder sedan. At a half mile away, how loud is that car? Can you even hear it? Barely, if at all. That's what the Hybrid Airship does for noise... Clearly, this is not your grandfather's airship,"

In addition to the sustainability benefits, Boyd believes that Hybrid Airships have humanitarian aid implications as well. "With the Hybrid Airship, humanitarian aid can reach zones nearly inaccessible by limited infrastructure, and they make for easy loading or unloading of patients—those who can walk, in wheel chairs or stretchers," said Boyd. "In the future, even a mobile hospital could become a reality." The possibilities for the Hybrid Airship are as plentiful as its benefits. And, the program is well on its way to becoming operational as early as 2019, having received Federal Aviation Administration approval on its unique certification plan. **Ω**

## How the Qatar Crisis Shook Up the World's Supply of Helium by Sarah Zhang

Helium has two special abilities. It is extremely light, and it can get extremely cold without freezing. Largely for these reasons, the element is needed to use or make all sorts of things: semiconductors, rocket fuel, computer hard drives, the Large Hadron Collider, magnets in MRI machines, airships, scuba tanks, arc welding, anything that needs to be super cold, and of course, balloons.



So when helium shortages hit in 2006 to 2007 and 2011 to 2013, the consequences rippled far beyond birthday parties. The Earth is not actually running out of helium, but imbalances in the market, especially around a U.S. government helium reserve, did cause those shortages. Thankfully, relief was on the way. New helium plants came on line in Qatar, and the country quickly went from producing a small sliver of the world's helium to 25 percent of it in 2016.

Now, Qatar is at the center of a regional crisis that seems to be about many different things, none of them helium. Yet the helium supply chain is tangled up in it. Qatar usually sends its supply over land through Saudi Arabia to a large port in the United Arab Emirates, from which the helium goes out to Singapore and then factories and labs around the world. Saudi Arabia and the UAE have cut off this route as part of the dispute.

It got bad. Because its helium had nowhere to go, Qatar suspended helium production in early June. Production resumed around July 2, and helium will probably take a more complex and expensive route via a port in Oman, according to Phil Kornbluth, a helium industry consultant. Furthermore, it'll take a few more weeks for helium production to get back to normal due to the logistics of getting specialized liquid helium canisters back to Qatar and slowly cooling them before they can be used again.

"The thing this really highlights," says Kornbluth, "is that the helium supply chain, even though there's ample supply when everything is running, is inflexible and fragile." The challenges of handling liquid helium and the fact that it's only made as a byproduct of natural gas in a few places around the world all make helium a tricky product to source. Qatar is producing helium

again, but the political crisis is not over. It's been a wake-up call.

The industry has been trying to make the helium supply more reliable. That could mean severing the link between helium and natural-gas extraction. Helium makes up a minuscule amount of natural gas. While Qatar's natural gas doesn't exactly have high concentrations of helium (0.05 percent), the country produces so much natural gas that it has accumulated helium byproduct for a tidy second business. The U.S., the world's top helium producer ahead of Qatar, extracts helium from natural-gas fields around the Texas panhandle.

Since helium is only a by-product, it's hard for other helium suppliers to step up when something like the Gulf crisis happens. Producing a little bit more helium requires producing a lot more natural gas, and energy. Companies aren't going to do that for the sake of their secondary helium businesses.

That's why the helium industry has gotten excited about the recent discovery of a giant helium deposit in Tanzania. This discovery has nothing to do with natural gas. Instead, the gas trapped underground is as high as 10 percent helium, with nitrogen accounting for the rest. A company called Helium One has formed to tap the deposit. "Because we're pure helium, we could potentially act as a buffer to the world's helium supply," says Thomas Abraham-James, CEO of Helium One. If a political crisis deepened in the Middle East or ExxonMobil temporarily shut down its U.S. helium plant for maintenance, he says, then Helium One could step in.

Past helium shortages have also taught users to conserve helium. "The context is anxiety and instability in the market," says Richard Clarke, a helium industry consultant. Labs, for example, have started to recycle helium. The element likes to float off, but it is possible to recover via ventilation systems. Clarke notes that makers of MRI machines, which require liquid helium to make their magnets cold enough to superconduct, also recover helium when old machines are decommissioned. The element is too important to let go to waste.

The country provides 25 percent of helium used on Earth. The interruption of Qatar's helium production is, in the big picture, just a small and unintended part of the current political crisis. Yet the supply chain of just one element touches so many industries—energy, medicine, electronics, rocketry—and the consequences can go far beyond the Gulf. **Ω**

## SHORT LINES



Pilot injured when blimp (sic) goes down near US Open in Wisconsin (news ) A small blimp [actually a hot air airship - Ed.] crashed near the U.S. Open on 16 JUN 17. The pilot had some burns, but was in stable condition, according to Pamela S. Sullivan, a senior air safety investigator with the National Transportation Safety Board. He had just taken off on his second flight of the day in a hybrid of a typical blimp and a balloon envelope when he decided it was too windy and planned to return to a private airstrip. He encountered an updraft on his way down and vented some of the air from the envelope so he could drop back down. “He turned off the manifold, the fuel to the burners. However, the envelope started collapsing and the burners were still burning the residual fuel. The envelope caught fire.” The blimp, operated by Florida-based AirSign, was being used for advertising as it floated above the tournament. **Ω**

US Air Force: First Enlisted Female To Pilot Aircraft Fox News (8/29) reports that a female enlisted service member will become an RQ-4 Global Hawk UAV pilot later this month, the first female enlisted pilot in US Air Force history. Tech Sgt. Courtney said that she’s proud to break down gender barriers in the service, and that, “It’s an equal playing field, not about gender anymore, (it’s) about qualifications and that’s exciting looking forward.” **Ω**

Following up on our report of LTA on the eclipse: On August 21, 2017, the MnSGC / U of MN stratospheric ballooning team captured video of the eclipse shadow from far above the clouds near Grand Island, Nebraska.

[http://www.aem.umn.edu/people/faculty/flaten/EclipseBallooningWebsite/eclipse\\_trip.html](http://www.aem.umn.edu/people/faculty/flaten/EclipseBallooningWebsite/eclipse_trip.html) **Ω**

Feds OK’d To Reopen Evidence In \$65M Blimp Damage Suit (Chuck Stanley) A California federal judge has granted the government’s request to reopen evidence from the testimony of Aeros Aeronautical Systems Corp.’s chief financial officer in a suit over damages to an experimental blimp [Aeroscraft] caused by the collapse of a Navy hangar.

The granting of the motion came after the government requested Carrie Cass’ testimony be reopened following the conclusion of an April bench trial over how much the government owes ASC for negligence that led to the hangar’s collapse.



The government claims it has documents and witness testimony suggesting Cass doctored invoices to inflate purported costs associated with production of the blimp, contradicting her statements at trial. The litigation is grounded in a suit Aeros filed in 2015 alleging that the Navy neglected for years to make critical repairs to a hangar roof that collapsed on its airship prototype. Aeros was already handed a partial win in the case in June 2016, when the court granted the contractor summary judgment on negligence and premises liability claims. Aeros has said at the time of the collapse it was test-flying the aircraft and meeting with investors in order to take the project to its next planned step: the creation of a larger, 66-ton commercial cargo blimp for mass production. The government claims it has identified at least one other invoice that appears to have been altered by Cass, indicating “pervasive” misconduct by the Aeros CFO. Aeros, in its effort to quash the rehash of Cass’ testimony said the \$6,000 invoice at issue is immaterial to the company’s \$65 million claim and is only being contested now as part of an effort to smear Cass’ credibility. **Ω**

Emirates Seeks Airbus Assurances On A380's Future Before Placing Additional Order Bloomberg News (9/7) reports that Emirates Airlines has asked Airbus for assurances “about the future of Airbus SE’s A380 program” before it will commit to an \$8 billion order for additional planes. Emirates is concerned that if the “slow-selling” model is canceled, the value of the planes will plummet, and the airline considers it “a major sticking point, together with the proposed price.” Airbus announced in July that it would reduce A380 production to eight jets a year in 2019, a reduction from 15 planes this year and 28 in 2016. Ω

The Associated Press ran a story “New fleet of Goodyear “blimps” poses new challenges for pilots” in the summer of 2017. [www.cbsnews.com/news/new-fleet-of-goodyear-blimps-poses-new-challenges-for-pilots/](http://www.cbsnews.com/news/new-fleet-of-goodyear-blimps-poses-new-challenges-for-pilots/) Ω

Are Airships The Best Way To Replace Hudson Bay Rail Line? (Martin Cash & excerpts from Winnipeg Free Press) What with the sketchy nature of information currently available on the extent of the damage it’s anyone’s guess as to how much it will cost to get it fixed. But there is little argument that the rail line is not heavily used and that it is losing money both from a freight and a passenger traffic perspective. The fact remains, Via loses 80 cents on every dollar it spends hauling passengers to Churchill and Omnitrax says it has been losing money for years on the freight business. No matter how large a subsidy the federal government proffers to entice grain handlers to ship through Churchill, it is not likely going to change the fact that international trade has shifted. Canadian grain handlers now export a large majority of the Canadian crop out of the West Coast and the port of Thunder Bay operates at about 50 per cent capacity. And while the residents of Churchill are justifiably feeling on edge about their future livelihood, its current status as a fly-in community puts them in the company of hundreds of other communities in Canada, including several in Manitoba with much larger populations. (Having said that, most of those communities are probably jealous of Churchill’s opulent air strip — capable of landing jets the size of Boeing 737s — not to mention its sea port.)

Prentice has no problem imagining replacing the rail line from Gillam to Churchill with an all-weather roadway (acknowledging, as he does, that it would have a hefty price tag — in the order of magnitude of close to \$1 billion). Another option, he said, is “If the rail line is to be sustained in perpetuity, then some day that track has to be relocated, because climate change is

going to make the current route even worse over time. I do not see any future for that.” In a presentation by members of the Look North provincial task force on economic development in the North, there was lots of talk about the need for all-weather roads. “The public does not generally understand rail lines deteriorate and wear out and have to be replaced,” Prentice said. “You can’t just build it and it’s there forever. If you do not have traffic you cannot sustain a railway. Where would the money come from just to do simple maintenance let alone catastrophic repairs?” The same argument would need to be made for the construction of a road to Churchill. And Prentice wonders, after all other options are considered, why not try airships.

It’s long been a compelling dream to imagine huge balloons gliding silently over Manitoba’s northern bush and muskeg, carrying tons of freight to isolated communities and worksites, using only one-quarter the fuel of airplanes, needing only an open field to land. The dream has been kept aloft in Manitoba by Barry Prentice, a professor of supply management at the University of Manitoba, who invested five years and his own money in an airship prototype called the Sky Whale. Tragically, a powerful storm last July destroyed his prototype and its airship hangar. It’s to be hoped Mr. Prentice will find the wherewithal, and outside funding, to continue to pursue his passion because, frankly, no one is offering better ideas, and northern transportation is woefully inadequate.

Climate change has shrunk the ice-road season in half, and the planet is only getting warmer. The railway has been used for decades, but it’s broken and no one is hurrying to fix it. Sections of the Hudson Bay Railway to Churchill are washed out, stranding communities without land transportation. So what about airships? They could never totally replace other modes of northern transportation because they’re generally designed for freight, not commercial passengers. When it comes to freight, governments and businesses around the world are investing serious money in airships, hoping for reliable and cost-effective cargo transportation to isolated communities.

In his most recent opinion column in the Free Press (“Airships? time has come in the north,” May 29), Mr. Prentice laid out the next step: cargo airships won’t be insurable in Manitoba until proven reliable in winter, and development of that proof requires a large hangar for cold-weather testing. Manitoba should take a lesson from the professor. Ω



**26 juin 1917,  
Les américains arrivent à Saint-Nazaire**

*« Nous sommes heureux de combattre ainsi pour la paix définitive du monde, pour la libération de tous les peuples sans en excepter l'Allemagne elle-même, pour les droits des nations grandes et petites, et pour le droit de tous les hommes de choisir les conditions de leur existence et de leur obéissance. La démocratie doit être en sûreté dans le monde. La paix du monde doit être établie sur les fondements éprouvés de la liberté politique. »*  
*Discours du Président Wilson au Congrès le 2 avril 1918*

**L**e 26 juin 1917, au matin, c'est à Saint-Nazaire que les premiers contingents américains posent le pied sur le sol français. Les Etats-Unis viennent d'entrer en guerre aux côtés des Alliés. Ils ont choisi Saint-Nazaire, ainsi que l'Estuaire comme base n°1 pour leur dispositif de débarquement. Commence alors pour Saint-Nazaire l'époque de la présence des « Sammies ». Entre 1917 et 1919, près de 198 000 hommes et une moyenne journalière de 4 400 tonnes de marchandises débarquent à Saint-Nazaire quotidiennement, 30 000 Américains cohabitent avec 35 000 Nazairiens. On June 26, 1917, in the morning, the first American contingent foot on French soil at Saint-Nazaire. The United States has just entered the war with the Allies. They chose Saint-Nazaire, as well as the Estuary as the No. 1 base for their landing gear. Between 1917 and 1919, nearly 198,000 men and a daily average of 4,400 tons of goods landed in Saint-Nazaire. On a daily basis, 30,000 Americans live with 35,000 Nazairiens.

No. 5-895

**HEADQUARTERS**  
*Quartier Général*  
**HOTEL D'ÉNA, PLACE D'ÉNA, PARIS**  
**United States Naval Aviation Force**  
**FOREIGN SERVICE**  
*Aviation Maritime*  
*des Etats-Unis*  
*Services Expéditionnaires*

**IDENTITY CARD**  
*Carte d'Identité*

*Roy B. Rodgers*  
 NAME  
*Sea 2<sup>c</sup>*  
 RANK OR RATE  
 Grade

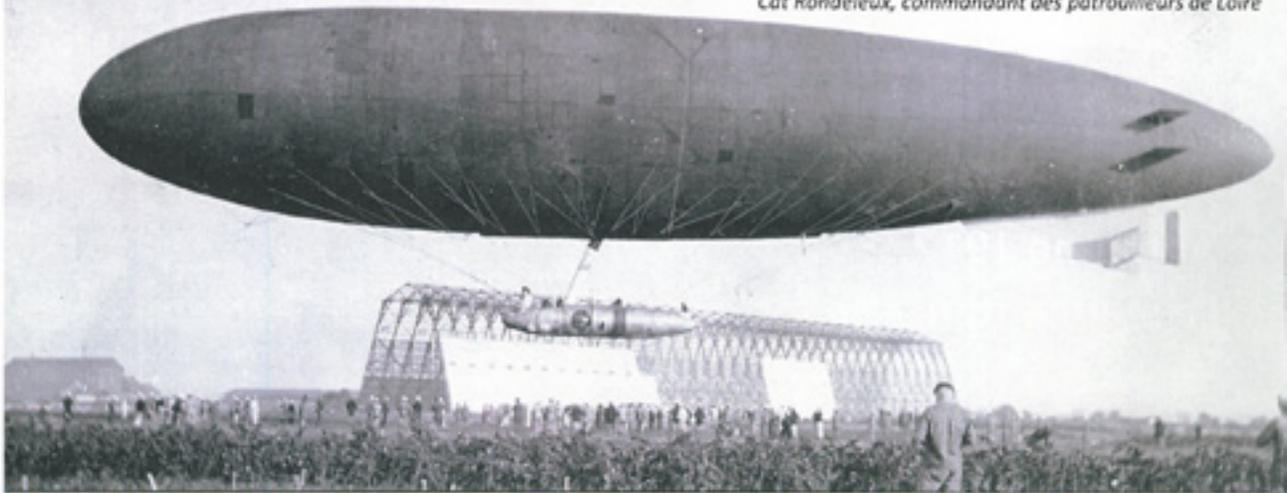
*A.S. Clark*  
 DUTY  
 Fonction  
*Lieut. U.S.N.*



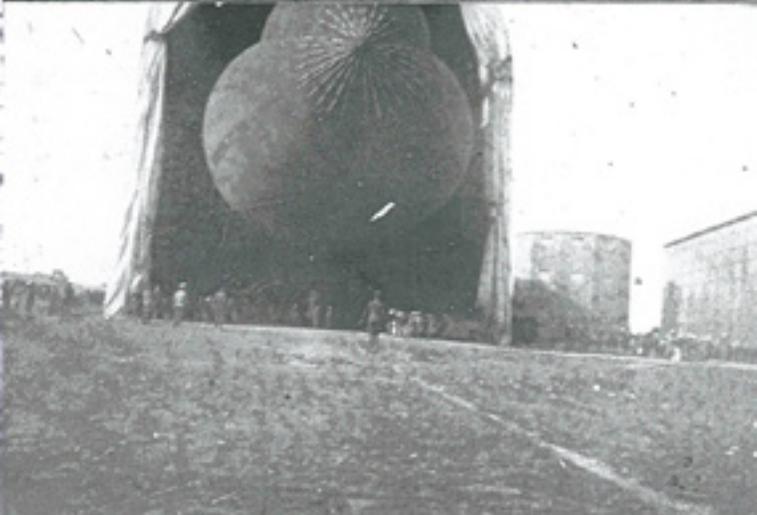
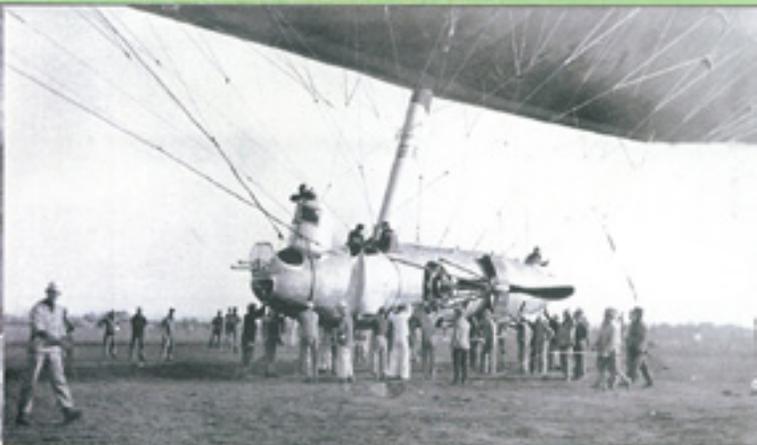
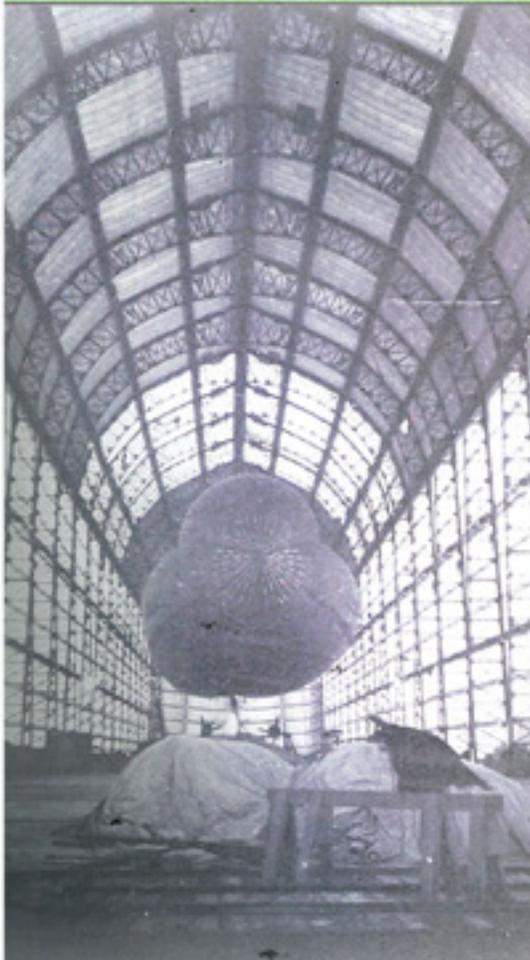
**Eté 1917,**

## Une mission de protection essentielle pour les convois

28 juillet, la Chevette drague une mine à 8 milles dans le sud 20° ouest d'Arzic et le lendemain l'Albatros en cueille une seconde dans les mêmes parages. Sans le Capitaine Caussin, leur existence n'aurait pu être révélée, que par la perte d'un navire sautant sur l'une d'elles. »  
Cdt Rondeleux, commandant des patrouilleurs de Loire



Le 2 juillet 1917, le dirigeable Capitaine Caussin effectue ses premières missions « sur un périmètre de protection jusqu'à 60 milles au large de Saint-Nazaire ; patrouilles en marge de Belle-Ile et l'île d'Yeu. » Huit mines furent relevées grâce aux ballons dirigeables de Paimboeuf, sur un total d'une centaine pour toute l'aérostation française pour la durée de la guerre. De nouveaux terrains sont réquisitionnés pour permettre l'agrandissement du centre dès septembre 1917. On July 2, 1917, the airship in Caussin carried out his first missions "on a perimeter of protection up to 60 miles off Saint-Nazaire; Patrois on off the Belle-Ile l'île d'Yeu islands. » Eight mines were raised in thanks to Paimboeuf's dirigible balloons, out of a total of one hundred for all French aviation for the duration of the war. New and grounds were requisitioned to allow the expansion of the center in September 1917.



# Les pionniers de l'aéronautique navale américaine

Tout juste formés à Akron (Ohio), ils servirent avec panache sur nos côtes

*« The Navy Cross is presented to Merrill P. Delano, Lieutenant, U.S. Navy (Reserve Force), for distinguished service in the line of his profession as Commanding Officer of a dirigible engaged in patrol and convoy flights, in the War in which operations he did exceptional work, pushing his flights to the limits of physical and material endurance.*



La plupart des officiers américains qui pilotèrent les dirigeables palmbotins furent les précurseurs de l'aéronautique navale américaine. Après une rapide formation au centre de Goodyear à Akron (Ohio) dès le début de l'année 1917 sous la direction de L.H. Maxfield, puis le passage par l'Angleterre, ils arrivèrent en France à Pauillac, Guipavas ou Paimboeuf pour y faire leur première armes. Le contingent américain eut néanmoins à compter deux décès, par accident au sol, pendant l'exploitation en septembre 1918, les matelots de seconde classe Craig Norman et Nathan Lamport. Most of the American officers who piloted the Palmbotins airships were the precursors of the American naval aeronautics. After a brief training at the Goodyear center in Akron, Ohio, at the beginning of 1917 under the direction of LH Maxfield, and the passage through England, they arrived in France at Pauillac, Guipavas or Paimboeuf begin their first career. The American contingent, however, two deaths, by accident on the ground, during the operation in September 1918, the second-class seamen, Craig Norman and Nathan Lamport.



**MANFIELD, L. H.**  
*Commander*  
627 Goodrich Ave., St. Paul, Minn. Pensacola, Akron, Paimboeuf, Fr., Washington, U. S. N. N. A. No. 17. LTA. HTA.



**GARTZ, RICHARD C.**  
*Lieutenant*  
Pasadena, Cal. Akron, Cape May, Rockaway, Paimboeuf, Paris. N. A. No. 332. LTA.



**HAMLEN, W. L.**  
*Lieutenant*  
1563 Mission St., San Francisco, Cal. Akron, Rochester, Paris, Paimboeuf, Washington. N. A. No. 191. LTA.



**CORBETT, M. Q.**  
*Lieutenant*  
Carnegie, Pa. Pensacola, Akron, Hampton Roads, Washington, Paimboeuf, USNRF. N. A. No. 549. LTA.



**WHITEHOUSE, W.**  
*Lieutenant*  
108 Vaughan St., Port Mr., Paimboeuf, Paris, London. USNRF. N. A. No. 99. LTA.



The first class of LTA students from Akron. Standing: Gartz, Whitehouse, Delano, Williams, Talbot, Little, Brewer, Hamlen, Strader, Cropton and Chadwick. Sitting: Pennoyer, Norfleet, Culbert, Preston (of Goodyear), Maxfield (C.O.) and Col. The mascot is Maxfield's "Lansy."



**BAEHR, MAX J.**  
*Lieut. (j.g.)*  
923 Locust Ave., Beach, Cal. M. I. T., Lowell, E. Fortune, Paimboeuf, H. O. London. No. 1985. LTA.

# Les premières vues aériennes du Sud Estuaire des paysages exceptionnels à travers le temps!

« La guerre était très loin. Au fait y avait-il bien une guerre ? Il n'y avait pas de guerre ici... »  
L'Adieu aux armes de Ernest Hemingway

Avec l'avancée de la technologie en 1917 apparaît aussi le début de la photographie aérienne. La présence des dirigeables sur le territoire permet de compléter les collections de cartes postales, mais vues du ciel. Les images livrées nous laissent apparaître de drôles de paysages qui ont traversé l'Atlantique pour s'endormir dans les tiroirs ou albums des familles des militaires. Elles nous reviennent cent ans après pour notre plus grand bonheur. With the advance of technology in 1917 appears the beginning of aerial photography. The presence of the airship on the territory makes it possible to complete the collections of postcards, but seen from the sky. The images delivered reveal strange landscapes that have crossed the Atlantic to sleep in the drawers or albums of military families. They come back to us a hundred years later for our greatest happiness.



Saint-Viaud



Saint-Père en Retz



Pornic



Saint-Nazaire





**German Naval Airship Division Zeppelin Losses  
1914 to 1918: A Quantitative Analysis**

by C. Michael Hiam,

Author of “Dirigible Dreams:  
The Age of the Airship” (ForeEdge, 2014)

Enchanted by Count Ferdinand von Zeppelin’s flying creation as they had been since 1900 with the flight of LZ 1, the German people fully expected that his magnificent “zeppelins” would bring a quick and satisfactory conclusion to the war with Great Britain. Failing this, the German people wished that at least the zeppelin would wreak terror and death on the English populace, hitherto so safe and smug on its island fortress. For Germany, however, the zeppelin brought neither a quick nor a satisfactory conclusion to the war, but the “baby killers” (as the English dubbed the “zepps”) did kill 577 Britons, the vast majority of them civilians. The zeppelins were also responsible for a significant amount of damage as they blasted English cities and towns with near impunity, at night and often from heights that made precision bombing impossible. But then starting in 1916 with advances in British defensive measures, including phosphorous-laden machine gun bullets, “the zeppelin menace” was tamed and ultimately came to an end with the final zeppelin raid of the war on August 5, 1918, not long before Germany’s defeat.

To the victors go the spoils, and so the British seized German records pertaining to zeppelin wartime operations, and they were shocked at the vulnerability of the once-feared “aerial dreadnaught.” The British discovered, for instance, that for German officers and sailors of the Naval Airship Division, service in a zeppelin was more dangerous than service in a U-Boat. The Naval Airship Division was the unit responsible for raiding England after the German Army Airships quit, upon suffering unacceptable losses during the bombing campaign of 1915., service in a zeppelin was more dangerous than service in a U-boat. In fact, 389 German officers and sailors died violent deaths aboard a zeppelin, which by one estimate equaled 40% of all zeppelin air crews.

Although it’s long been recognized that the Naval Airship Division’s wartime exploits with the zeppelin were heroic but ultimately fruitless, there have been few if any published quantitative analyses of zeppelin losses in German navy service. This paper presents such an analysis and is based upon the data found in Appendix B of Douglas H. Robinson’s authoritative “The Zeppelin in Combat: A History of the Naval Airship Division 1912-1918,” which was first published in 1958.

The German navy flew 61 zeppelins during the war of which 13 survived to be either scuttled by their crews or captured by the Allies. An additional three zeppelins were decommissioned during hostilities. According to an interpretation of Robinson’s data, the remaining 45 zeppelins met the following fates:

Destroyed during forced landing	15
Shot down in flames	13
Destroyed in ground accident	10
Destroyed in air accident	4
Bombed on the ground	3

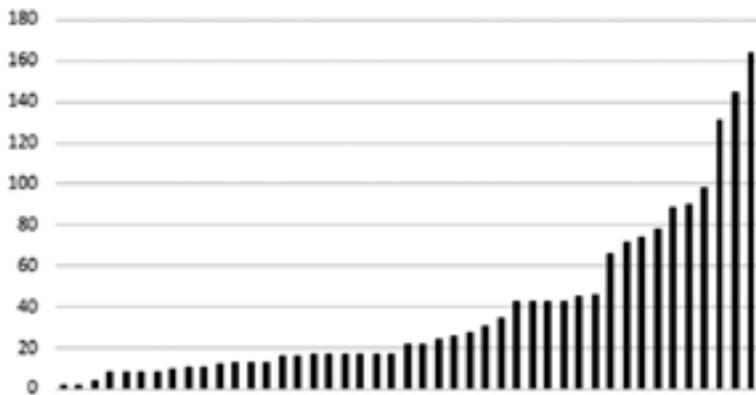
According to an interpretation of the same data, the 45 zeppelins lost to accident or action averaged just 38 flights post-commissioning, with the fewest number of flights being 2 (L 18 and L 57) and the most number of flights being 164 (L 7).

2 to 24 flights before destruction	26 zeppelins
25 to 49 flights before destruction	10 zeppelins
50 to 74 flights before destruction	2 zeppelins
75 to 99 flights before destruction	4 zeppelins
100+ flights before destruction	3 zeppelins

Perhaps more tellingly, because the average number of flights is influenced by the zeppelins that managed many flights, the median number of flights post-commissioning was just 22 (see arrow on the next figure).

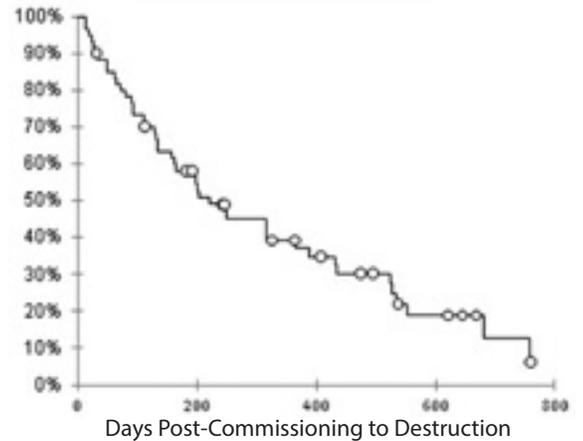
Because the average is influenced by those few zeppelins that managed to fly several hundred days, again the data might be better summarize by the median statistic, which reveals that the median number of days post-commissioning before destruction was 156 days (5.2 months).

**Number of Flights Before Destruction**



Above: each of the 45 bars represents a single zeppelin.

**Survival distribution function**



Above: Circles represent the estimated survival time of the 16 decommissioned zeppelins had they remained in service.

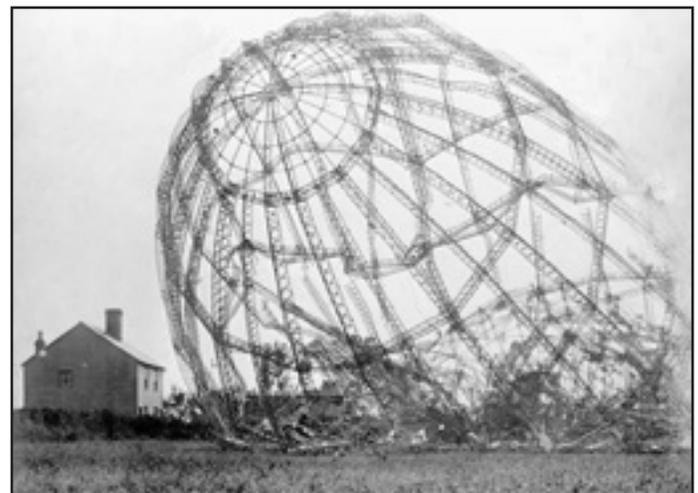
An interpretation of the data also reveals that the average number of days post-commissioning to destruction amounted to 216 (7.2 months), with the minimum number of days to destruction being just 12 days and the maximum being 757 days. (It should be noted that the two longest surviving zeppelins, L 6 at 681 days and L 16 at 757 days, were both training ships.) By 73 days (2.4 months) fully 25% of zeppelins had been destroyed and by 315 days (10.5 months) total losses had increased to 75%. Ten zeppelins failed to last even 50 days and a further 7 zeppelins didn't make it past 100 days.

Finally, the data on the 45 zeppelins were subjected to a survival (Kaplan-Meier) analysis. A survival analysis determines the probability of an occurrence, such as death or divorce, as time elapses. As can be seen by the graph above, the probability of a zeppelin becoming victim to accident or enemy fire was a deadly downward spiral practically from the day of commissioning, such that a zeppelin had only a 50/50 chance of surviving more than 222 days, or 7.4 months (see arrow in the next graphic, top right).

(Right) Wreck of L 33 after just 10 flights. Forced down in Essex following a September 23, 1916 raid on London, the Zeppelin was torched by its crew.

(Google image)

Undeterred by the German's disastrous experience with the zeppelin, almost immediately after the war ended the U.S. Navy embarked on an ambitious rigid-airship program of its own, a program based entirely on a zeppelin copy, the USS *Shenandoah* (ZR-1), an actual zeppelin made by Luftschiffbau Zeppelin in Germany, the USS *Los Angeles* (ZR-3), and two zeppelins based on technology acquired from Luftschiffbau Zeppelin, the USS *Akron* (ZRS-4) and the USS *Macon* (ZRS-5). By the time the U.S. Navy abruptly terminated its program in 1935 three of its four rigids had crashed and, more tragically, over 100 of its officers and sailors were dead. Ω

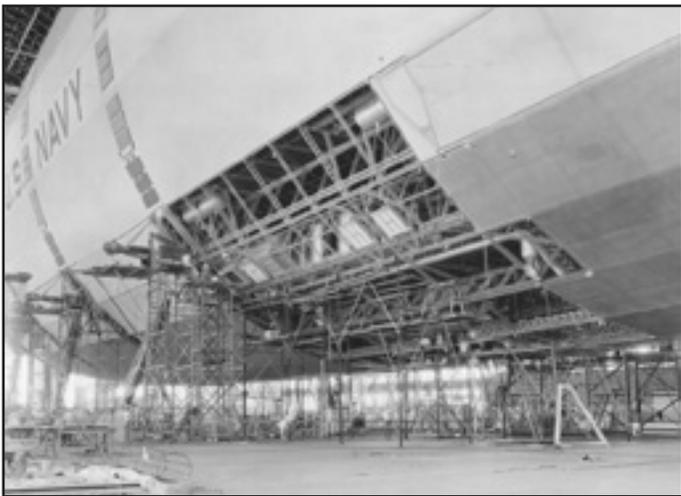


### Military Value of Airships

Excerpts from a speech delivered by David S. Ingalls, Assistant Secretary of the Navy for Aeronautics, as reprinted in "U. S. Air Services," September, 1930.



The interest of the Navy Department in these future airships is of course primarily military. It can consider the commercial aspect only secondarily. The military future of the rigid airship is assured. Most of you, of course, have heard much of the two gigantic ships that are being built for the Navy Department by the Goodyear company at Akron, but I wonder whether you have considered them from the naval warfare point of view. I wonder if you appreciate what a great aid they will be in future sea operations, particularly in the accomplishment of scouting and occasional independent missions far out at sea. Let us compare one of these ships with the modern cruiser.

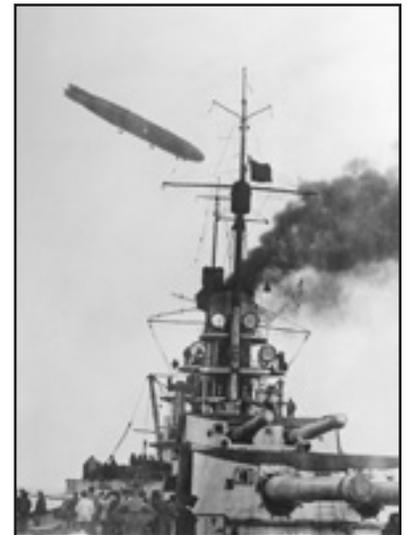


The time for construction of a cruiser is something over three years; that of the rigid airship, less than a year. The original cost of a modern cruiser is approximately \$15,000,000; of one of these rigids, approximately \$2,500,000 to \$3,000,000, or one-fifth of the cruiser cost. True, the estimated life of the cruiser is some twenty years and that of the rigid airship but ten years, or one-half. The operating cost of such cruisers is between \$800,000 and \$900,000 dollars a year; that of the rigid airship somewhere between \$500,000 to \$600,000. On board the cruiser there must be approximately 60 officers

and 550 men; the rigid airship, 12 officers and 60 men. The top speed of the cruiser is 34 knots; that of the rigid airship 72.8. The cruiser carries onboard from two to four planes; the rigid airship, five.

On the other hand, the cruiser carries a greater armament, from 8-inch guns down, while the rigid airship carries only sixteen 50-calibre machine guns. And the cruising radius of the cruiser is probably twice that of the dirigible. These figures are based upon the first rigid airships built in this country and the cost not only of their manufacture but of their operation will assuredly be reduced appreciably as we gain in experience. During the World War, for instance, Germany was turning out rigid airships not quite comparable to these, of course, but great ships just the same, at the rate of one every six weeks, and at probably only one-fourth the cost. For practical proof of their military value, we may best go to Germany, for Count Zeppelin is the man responsible for the development of this type of ship, although there is an odd circumstance in the fact that he was a member of the Union Army in our Civil War. Germany believed and does believe in these ships, and at the conclusion of the World War had constructed 115 of them. Their value from a military point of view was appreciable not only for scouting but also for transportation of certain articles, and bombing of enemy bases.

On two occasions the Germans operated a number of these ships in co-operation with the fleet, including at the Battle of Jutland, and benefited through their scouting. The British coastal defense against these great ships required vast expenditures of moneys and a tying up for a defense against anticipated



bombing raids not only of shore-based anti-aircraft but also of squadrons of defense fighting planes. At the conclusion of the War, Germany was producing one of these ships every six weeks - as fast as she could produce them. Although the great development of the rigid airship was in Germany, both the British and our own country did a good deal in the construction and use of non-rigids for convoying and patrolling. As far as can be learned, no



## **Project Michigan**

By Marc J. Frattasio, AW1 USNR (Retired)

During the early 1950s researchers at the University of Michigan working under contract to the Army Signal Corps came up with the idea of using the AN/APS-20 radar in conjunction with a moving target indicator (MTI) as a battlefield surveillance system. The proposed system, if it proved practical, was to be mounted in a large helicopter. It was intended to have enough range to allow the helicopter to remain over friendly territory while providing a real-time picture of enemy ground force movements to Army commanders in the field. Because of the University of Michigan's involvement, this effort was called "Project Michigan".



(Above) Aerial view of NAS South Weymouth as it was during the mid 1950s. North is at the top of the photo. Note LTA Hangar One and the circular blimp landing mat at right. US Navy photo via National Archives, Author's collection.

The AN/APS-20 radar, which was originally developed for the Navy late in the Second World War under "Project Cadillac" to detect Kamikaze aircraft during the anticipated invasion of Japan, was a highly successful airborne search and surveillance radar that

was used by the Navy and the Air Force for many years. The Navy was the primary user of the AN/APS-20 and deployed it on board several different types of airborne early warning, anti-submarine warfare, and maritime patrol aircraft.

In naval service the AN/APS-20 had proved effective at detecting and tracking aircraft and ships, submarines operating on the surface, and submerged submarines with periscopes, snorkel tubes, or radio/radar/electronic sensing measure masts extending above the surface. The Army wanted to determine if it would also be possible to use the AN/APS-20 along with an integrated MTI to detect and track moving vehicles and troops on the ground. The main problem in using the AN/APS-20 for this purpose was distinguishing ground contacts of interest from ground clutter such as trees, bushes, rocks, structures, etc. The purpose of the MTI was to leverage the Doppler Effect to electronically factor out moving ground targets from stationary ground clutter.

In 1953 the Navy began to test the basic concept for the Army using a Boeing PB-1W Flying Fortress and a Douglas AD-4W Skyraider provided by Airborne Early Warning Squadron Two (VW-2) based at NAS Patuxent River, Maryland. The PB-1W and AD-4W had AN/APS-20A radar systems with 8-foot-wide antennas. The radar modulators on both aircraft were modified for testing purposes to generate a pulse repetition frequency of 1,000 pulses per second and a 0.70 microsecond pulse width to provide a range resolution of 344 feet. This made the adapted radars capable of distinguishing between multiple contacts on the same bearing as long as they were spaced at least 685 feet apart. In comparison, an unmodified AN/APS-20A radar modulator generated a pulse repetition frequency of 300 pulses per second and a 2.0 microsecond pulse width to provide a range resolution of 984 feet. Both aircraft were also fitted with a prototype MTI furnished by the Philco Corporation.

The AN/APS-20A typically had a range of 80 to 100 miles. However, when modified for Project Michigan the range was reduced to 25 to 50 miles. The testing with the aircraft from VW-2 was conducted in three separate phases, one each against airborne, seaborne, and ground targets. Tests against ground targets were performed using three 2½-ton trucks operating over a four-mile stretch of road at Camp Lejeune, North Carolina and over a 50 mile stretch of road in the vicinity of NAS Kingsville, Texas.

By the end of 1954 the tests with the PB-1W and AD-4W had shown enough promise that the Army decided to try testing with a Goodyear ZPG-2 Seafarer type blimp. The ZPG-2 was not only equipped with the AN/APS-20 radar, but it could also fly slow enough to more effectively simulate the performance characteristics of a helicopter. In addition, up to this point testing had only been conducted using 2½-ton trucks as targets. Going forward, the plan was to also test against Jeeps, tanks and even troop movements. A wider radar antenna would provide a narrower beam width and therefore have better target discrimination capability. The ZPG-2s had the improved AN/APS-20E radar system with a 17-foot antenna, which was more than twice the size of the 8-foot radar antennas on the PB-1W and AD-4W.

The Army originally asked for a blimp based at NAS Lakehurst, New Jersey, or NAS Weeksville, North Carolina, to support testing on or around the Army installations at Fort Dix, New Jersey, or Fort Bragg, North Carolina. The Army considered NAS Weeksville to be more advantageous for testing purposes than NAS Lakehurst since nearby Fort Bragg had more diversified terrain, a better road network, and fewer ground radars in the area that might cause interference than was the case with Fort Dix.

Despite the Army's preference to use a blimp from NAS Lakehurst or NAS Weeksville, on April 21, 1955, the Office of Naval Research contacted the commanding officer of the Naval Air Development Unit (NADU) based at NAS South Weymouth, Massachusetts, CDR Robert H. Wood, and asked him to determine if it would be possible for the command to provide a ZPG-2 to support Project Michigan for about five weeks sometime during the summer without interfering with higher-priority Project Lincoln tasking associated with the Semi-Automatic Ground Environment (SAGE) air defense system. The intent was to conduct the Project Michigan tests on or around the nearby Army installations at Camp Edwards on Cape Cod or Fort Devens in Ayer, Massachusetts.

On April 28<sup>th</sup> and 29<sup>th</sup> CDR Robert H. Wood met with civilian researchers Jack E. Short and Harold W. Sherman at the NADU office spaces inside NAS South Weymouth's LTA Hangar One to discuss Project Michigan's requirements. Although the roads on Camp Edwards were considered to be superior for testing purposes, the area around Fort Devens offered more

varied terrain and although there were no roads inside the base that were long enough to be used for testing, there was a suitable public road network located just a few miles away. One major concern was that there might be too much S-Band (2-4 GHz) radar interference around Fort Devens. This was ruled out during an electronic interference survey mission flown in the prospective test area by NADU's AN/APS-20 equipped Lockheed P2V-3W Neptune on May 2<sup>nd</sup>.

On May 6<sup>th</sup> CDR Wood formally committed NADU to provide a blimp to Project Michigan and ZPG-2 BuNo 126719 was assigned for this purpose. This blimp served with NADU for many years. It was nicknamed the "Snow Goose" and earned some measure of fame during 1958 for being the first non-rigid airship to fly above the Arctic Circle.

The blimp's radar modulator was modified to generate a pulse repetition frequency of 900 pulses per second and a 0.67 microsecond pulse width to provide a range resolution of 328 feet. This was a 16-foot improvement in range resolution over the modified AN/APS-20A radars on the VW-2 PB-1W and AD-4W used in the earlier phases of testing. In addition to the adjustments made to its radar modulator, the blimp was also temporarily fitted with a production-model General Electric AN/APA-108 MTI, a CR1-A camera for photographing the radar scope, and some unspecified electronic data analysis and testing equipment.

The blimp flew 12 flights for a total of 82.7 hours between June 15<sup>th</sup> and August 31<sup>st</sup>, 1955, in support of Project Michigan. It appears that the first two flights on June 15<sup>th</sup> (6.7 hours) and June 23<sup>rd</sup> (4.7 hours) were flown to test and make adjustments to the blimp's modified radar system. Another 5.0 hour flight was flown on August 4<sup>th</sup> to test the CR1-A camera, the AN/DPN-19 radar beacons that would be used to mark the boundaries of the test area on the blimp's radar scope, and the AN/GRC-32B and AN/PRC-10 radios that would be used by test participants on the ground to communicate with the blimp.

It is worth noting that four radar beacons, which had rotating reflectors to present a strong return on the blimp's radar scope, were erected at the center of the airfield at NAS South Weymouth on that date and were picked up by the blimp's radar operator from as far as 36 miles away.



(Above) NADU ZPG-2 BuNo 126719 on the East Mat at NAS SouthWeymouth in 1954 or 1955.  
USN/Lincoln Labs/Author's collection

A 4.8-hour “dress rehearsal” for the actual test series was flown on August 5<sup>th</sup> using a newly completed section of U.S. Route 3 near Lowell, Massachusetts, that had not yet been opened to the public at that time as the testing area. The nine-mile stretch of road was marked at intervals with radar beacons to provide reference points on the radar scope for the blimp’s radar operator. Six 2½-ton trucks moving along the road at 25 miles-per-hour were used as ground targets.

The blimp made three separate test runs at 40 to 45 knots airspeed and 1,500 feet altitude. On the first test run the blimp circled over the town of Arlington five miles south of the southern end of the road and its radar operator detected trucks from as far away as 16 miles. On the second test run the blimp relocated 10 miles south of the southern end of the road and trucks were detected from as far away as 18 miles. For the third test run the blimp proceeded 30 miles eastward to Plum Island on a course that took it perpendicular to the road. From over Plum Island neither the radar beacons nor the trucks were detectible on the blimp’s radar scope. This was not unexpected as the previous tests with the PB-1W and AD-4W had shown that the radar and MTI combination was only effective when the aircraft was positioned so the radar could scan up or down the ground target’s track. In addition, the bearing of the ground target from the aircraft had to be within 15 degrees of the road’s heading.

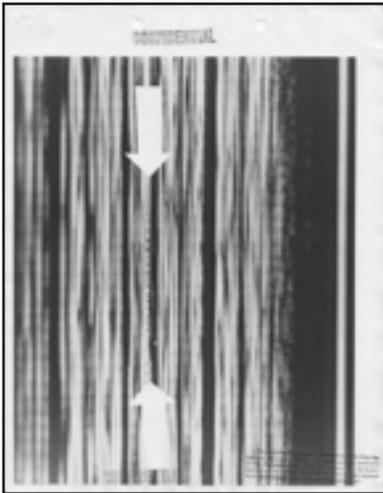
The blimp subsequently made eight more Project Michigan test flights in the Lowell or Fort Devens areas

between August 8<sup>th</sup> and September 31<sup>st</sup> 1955. These flights were all between 4.1 to 9.3 hours duration, with the shortest flight (on August 22<sup>nd</sup>) forced to abort and return to NAS South Weymouth after only three hours on station due to deteriorating weather conditions in the testing area.

During each test flight the blimp’s radar operator attempted to detect 2½-ton trucks, Jeeps, and tanks moving singly or in groups from various distances and altitudes. Detections were generally but not always successful. The returns presented on the blimp’s radar scope and on a special high-gain indicator provided for testing purposes by General Electric were photographed, with negatives being developed and prints made in-flight using a portable darkroom for immediate analysis. On some flights the GE AN/APA-108 MTI was replaced with a long delay line (an analog data storage device) provided by the Naval Air Development Center at Johnsville, Pennsylvania.

An Army de Havilland Canada L-20 Beaver utility transport aircraft operating from the Moore Army Airfield at Fort Devens overflew the target vehicles while the blimp made its test runs. A civilian photographer on board the L-20 took aerial photographs of the target vehicles. The photos taken were later analyzed and compared with the radar scope images taken onboard the blimp to determine the effects of aspect, heading, speed, ground obstructions, and other factors on detection.

In early December 1955 NADU was again asked to provide a ZPG-2 type blimp to Project Michigan, this time for a three-week period during late February and early March 1956. This time, the blimp was to be equipped with an improved MTI and its radar antenna was to remain stationary, beaming at a 90 degree angle to the ground targets' track, in an effort to determine if the AN/APS-20 could be used as a side-looking radar. For the purposes of these tests groups of Army vehicles and troop formations were to be positioned about 10 miles away from the blimp and move continuously in a small circle while the blimp's radar operator tried to detect them.



(Left) Photograph taken of the B-Scope presentation during the final NADU Project Michigan test flight on March 12, 1956. The arrows point to the return from a ground vehicle picked up by the blimp's AN/APS-20E radar operating in side-looking mode.  
USN / NARA/  
Author's Collection

NADU had two ZPG-2-type blimps on hand in February and March 1956, BuNo 126718 and BuNo 126719. It is possible that NADU assigned BuNo 126719, the blimp that was used for this purpose in 1955, to support Project Michigan again in 1956. However, the available records do not explicitly identify which blimp was actually assigned to Project Michigan in 1956.

For the 1956 tests the blimp's AN/APS-20E radar system was modified similarly to what was done during 1955, with the addition of a B-type radar scope. The B-type radar scope was substantially different than the blimp's standard plan position indicator scope, which provided the operator with a circular map-like display of whatever the radar picked up in the area surrounding the blimp, with the blimp's position being at the center of the scope. The B-type radar scope's presentation was a rectangular or tabular display in which the vertical axis represented increasing range from the blimp's position at the bottom of the display to the top.

Four Project Michigan test flights of approximately three hours duration each were flown in the Fort Devens area between February 23<sup>rd</sup> and March 12<sup>th</sup>, 1956. Problems with the data recording equipment on February 23<sup>rd</sup> caused only one out of every 15 radar pulses to be recorded for analysis rather than one in three as had been planned. Corrective action was taken after the blimp returned to NAS South Weymouth. On February 24<sup>th</sup>, the blimp went up again, the data recording equipment worked well enough, and several ground targets were detected. However, enough problems remained (mainly caused by harmonic interference from the blimp's propellers) that a flight that had been scheduled for February 29<sup>th</sup> was cancelled so that additional corrective action could be taken.

The blimp went up again on March 5<sup>th</sup>, but due to problems caused by harmonic interference from the blimp's propellers there was difficulty detecting ground targets. After this flight, certain Project Michigan related equipment was replaced and other equipment was moved from the utility compartment directly behind the radar operator's station to the navigator's table, where it was supposed to be less susceptible to harmonic interference from the propellers.

A final test flight was flown on March 12<sup>th</sup>. Although some ground targets were picked up by the radar, continued harmonic interference from the blimp's propellers influenced the researchers to decide to terminate NADU's participation in the project. NADU support for Project Michigan was officially ended on April 3, 1956.

Project Michigan does not appear to have resulted in a helicopter-borne battlefield surveillance system for the Army. However, in 1957 Sikorsky built two modified HR2S Mohave transport helicopters for the Navy, designated HR2S-1W, which were fitted with the AN/APS-20 radar for testing purposes. The author does not know to what extent, if any, Project Michigan influenced the HR2S-1W. The HR2S-1W proved unsuccessful due to radar reliability problems caused by vibration and it never went into full-scale production. In later years radar systems were fitted to several types of Army helicopters, but for tactical purposes instead of battlefield surveillance. Battlefield surveillance radar systems have been successfully fitted to winged aircraft such as the Grumman OV-1B Mohawk and the Northrup Grumman E-8 Joint Surveillance Target Attack Radar System (JSTARS). Ω

## MEDIA WATCH

### The Wreck of the Naval Airship USS *Shenandoah*

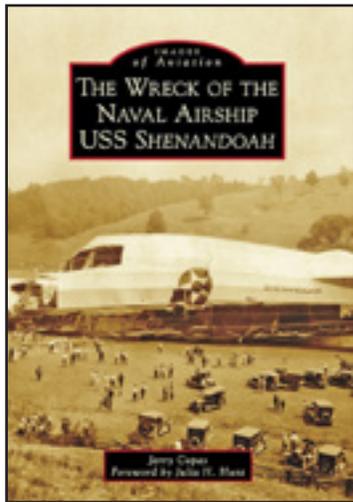
By Jerry Copas

Reviewed by C. P. Hall II

This little volume is curiously refreshing in that the title is a precise description of the text found within. Chapter 1 is titled “An Airship for America”, Chapter 2 “A Publicity Tool”, and Chapter 3 is “The Morning After”. The formal text in each chapter is a single page long. Someone hoping for an in depth analysis of the flight of *Shenandoah* after it broke away from the high mast at Lakehurst will be disappointed. The personality clashes that led to Zachery Lansdown becoming *Shenandoah's* Commanding Officer are not there, nor is there much analysis of *Shenandoah's* last flight and cause(s) of its destruction.

The good news is that what you are buying is a rather impressive *Shenandoah* photo album. The first third of the volume are photos of *Shenandoah* being assembled and then being operated for the two years that it flew. The final two thirds of the volume are multiple photos of the wreck in the vicinity of Ava, Ohio. In both of these cases, the real texts of the book are the lengthy photo captions. Now a true, blue, *Shenandoah* ‘buff’ will look at this book and say, “I have seen more than half of these photos published before.” However, if you call him on it, he might have to cite a dozen other texts to find 50%! The photo reproduction is of very high quality. Only the best magnifying glass in your home or office will allow you to find tiny dots. The Dr. Dale Topping rule is still intact. “Any book about lighter-than-air which included photos with captions will include errors.” Examples include, “These gas cells were fabricated from ‘goldbeater’s skin’” and “The huge doors (of Lakehurst hangar #1) weighed 1300 pounds each...” Such errors are part of the fun of buying and reading such a book and they are few in number!

The final two thirds of the book are a mixed lot. There are stories of unrewarded decency when local folks helped these ship-wrecked sailors. Then there are tales of locals swarming the wreckage for fun and profit. The story of Commander Lansdown’s Annapolis ring is retold with more detail than most and with a



little speculation thrown in for added spice. The before-and-after photos of *Shenandoah's* wrecked bow section, found on page 91, reveal an unfortunate truth, not to be denied.

The final chapter is “*Shenandoah's* Legacy” which covers the aftermath and what can be found on the ground today in the same format.

THE WRECK OF THE NAVAL AIRSHIP *SHENANDOAH* is one of the “Images of Aviation” series published by Arcadia Publishing of Charleston, SC. It is soft cover, 6”X 9”, 127 numbered pages.. The toll free order line is 1-888-313-2665. The option is sales@arcadiapublishing.com ; the list price is \$21.99. Ω

## THE AIRSHIP BOOK

By Hans von Schiller

Translated by Alastair Reid

Reviewed by C. P. Hall II

The year is 1938. The LZ-127 *Graf Zeppelin* is grounded after 10 years of service. The LZ-129 *Hindenburg* was destroyed by fire at Lakehurst one year ago. The LZ-130 *Graf Zeppelin* has been modified to fly inflated with helium and has just made its first trial flight inflated with hydrogen.

Commercial airship travel has to prove three basic requirements in order to demonstrate that it was worthy of investment and development. First there has to be an economic alternative to several hundred men moving an airship in and/or out of a hangar as the cost is disproportionate to value and it can be done only in favorable weather conditions. Second it has to be demonstrated that long flights can be undertaken safely. Third it has to be demonstrated that a scheduled service can be operated.

I submit that “*Kapitan von Schiller's Zeppelinbuch*” Leipzig 1938 (the original title) was written to accomplish this goal and it succeeded.

The first 57 pages are an exercise in familiarization of the *Graf Zeppelin* (LZ-127) and details of how it was operated. The next chapter is a review of airship bases in German service. Chapter 3 is a mercifully brief history of Zeppelin airships from LZ-1 through LZ-126 (USS *Los Angeles*). Chapter 4 begins a history of the flights of *Graf Zeppelin* in chronological order. The descriptions of individual flights tend to be brief. The point seems to be to demonstrate that, during



the first years of operation; the *Graf Zeppelin* initiated a series of impressive demonstration flights, and then began to establish a scheduled commercial service between Germany and Brazil. The introduction of the *Hindenburg* in 1936 created a more frequent service to Brazil along with scheduled voyages to America with a passenger capacity allowing for a profitable journey at a reasonable price. Air miles, passengers, mail and freight carried all increased making the service viable. The 1937 *Hindenburg* disaster eliminated the possibility of a commercial operation with hydrogen. The good news is that helium is a practical alternative. While the old *Graf Zeppelin* (LZ-127) could not fly transoceanic distances using helium; the new *Graf Zeppelin* (LZ-130) has been modified to operate with helium and, in 1938, is ready to resume service. The ship is ready, the bases are ready, and surely helium will be made available. "Just as commercial airship flight rose like a phoenix from the ashes after the Echterdingen disaster, we hope and trust that commercial Zeppelins will blossom and flourish anew from the wreckage at Lakehurst." The final two pages are an autobiographical sketch of Kapitan Hans von Schiller. His background is typical of a German officer of that era. Once again, the Nazi regime's non-person designation is ignored by a man unwilling to be intimidated and the *buch* is dedicated to "Dr. HUGO ECKENER".

The numerous photos are a bonus to the buyer of this book as are the drawings of the LZ-130 interior accommodations. The photo on page 178 and the cover photo are taken from the *Graf Zeppelin* (LZ-127) of "Rendezvous with the (training vessel) Schleswig Holstein in the South Atlantic." To reduce tropical heat, canvas awnings cover the ship's deck areas, smoke from the stack obscures, and the reproduction is of Lulu quality. One year after the original *buch* was published; this Battleship *Schleswig Holstein* was slamming 280 mm and 150 mm projectiles into Poland's Westerplatte base in Danzig. I recommend this book as a literate window into a turning point of aviation history. Also, if you are another author, ignorant of LTA but hell-bent to write about post WWI airships, then you should read this first chapter before you commence as the basic information plus the quotable details will doubtless improve the quality of your finished work in multiple ways. You may thank me in your preface! Ω

<http://www.lulu.com/shop/hans-von-schiller/the-zeppelin-book/paperback/product-23196885.html>  
\$13.87



MARK 1 Models  
D-LZ 127  
Graf Zeppelin  
Reviewed by  
John M. Mellberg

A company in the Czeck Republic that produces plastic molded kits of a variety of aircraft has recently produced a "long awaited" model. As the box art indicates, the kit is 1:720 scale, which is the same scale as the earlier Revell-Germany plastic kits of both the D-LZ 129 *Hindenburg* and D-LZ 130 *Graf Zeppelin II*, so for the ambitious model builder, one can have all three of the last of the great German Rigid Airships to display in a collection of models. Having not yet built this recently received plastic kit, I can only comment that opening the box containing the model was a great thrill! The kit is beautifully done, with accurate and excellent detail for a model kit of this size/scale. MARK 1 Models use a hardened resin mold/tooling, and this low volume tooling approach produces beautifully molded parts. Complimenting this are excellent pictorial instructions and model decals that provide for a variety of build configurations representing the *Graf Zeppelin* during its career. I would highly recommend this model kit to an experienced modeler familiar with assembling delicate/small molded parts. Careful assembly/construction/patience will yield a beautiful model.

I have to congratulate and thank MARK 1 Models for making these fine kits available to the model building community. In doing so, they're helping perpetuate this rich and colorful history of the Zeppelin Airship as a military aircraft and as the first airliners of the world. Ω

<https://www.aviationmegastore.com/zeppelin-lz127-graf-zeppelin-mkm720-05-mark1-mkm720-05-aircraft-scale-modelling/product/?action=prodinfo&cart=146277>



(Note horizontal fins are also painted red - historically correct, though not obvious from B & W photos)

## FATAL FLIGHT

The True Story of Britain's  
Last Great Airship

By Bill Hammack

Reviewed by C. P. Hall II

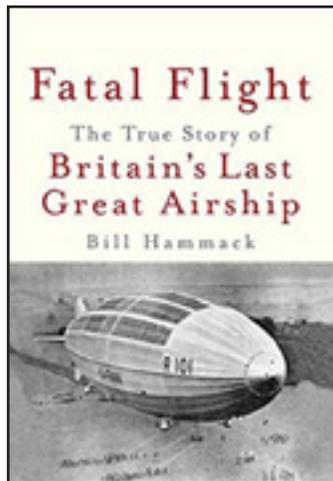
“Barnacle: (2) any of numerous marine crustaceans with feathery appendages for gathering food that are free swimming as larvae but fixed to rocks or floating objects as adults.” (Webster’s Ninth New Collegiate Dictionary) Barnacles attach themselves to the hulls of oceans going vessels and eventually impede the vessel’s progress until removed. If the vessel sinks, they may eventually cover the entire vessel rendering it almost unrecognizable.

There are ‘literary barnacles’ analogous to the marine variety. Professional writers covering technical subjects often ‘fill in a blank’ creating a barnacle-like factoid that sometimes has a life of its own. A disaster involving new technology seems to cause literary barnacles to multiply until the wreck is almost unrecognizable as well.

The R.101 was cutting edge technology when built but that technology woefully failed to deliver as promised and ended in disaster. The failure to deliver attracted multiple professional authors who could not reconcile promise vs. reality and struggled to reconcile these short comings to the disaster which followed. The result is often a wreck so covered in literary barnacles as to be unrecognizable.

Bill Hammack is an articulate writer capable of authoring a readable story. There are a few problems. The actual story takes place over 10 years and an argument could easily be made for 20 years. Hammack attempts to compress the story into 10 chapters covering one year. One result is contextual interruptions as he digresses to fill in a technical detail from an earlier year. The greatest failing is the author’s sincere desire to tell a good story and ‘literary barnacles’ often make for a livelier yarn.

The details of the final departure of R.101 were observed by Sq/Ldr. Ralph Booth, Captain R.100, from the searchlight balcony of the Cardington Mooring Tower and testified to at the subsequent inquiry. In 1957, James Leasor offered an unattributed version of final departure with R.101, having released from the Tower, subsequently dropping ballast to keep the bow



from settling to earth. In 1984 Geoffrey Chamberlain, further embellished this version of events to which Bill Hammack now adds the “thought” of Engineer Joe Binks who was in engine car #5, aft of amidships, out of sight of the bow. On disc and the internet are motion picture versions of two tower departures of ‘stretched’ R.101. Neither reveals any post release ballast dropping, nor any sign of problems with trim. Leasor’s version would seem to be a ‘literary barnacle’! Hammack’s explanation of the crash is utterly ‘generic.’ There were 33,000 square feet of unreplaced fabric, the weather was brutal, there was an outer cover fabric failure, the weather ruptured a gasbag under that failure; the ship came to earth. The fire resulted from ballast entering the control car and igniting navigational flares. Between page 163 and 165 are every cliché, literary barnacle, and fact cited out of order and without regard as to when corrected, ever offered about R.101’s outer cover.

Bill Hammack tells a readable if incomplete story. He offers no photographs and his diagrams are defective. His appendix A is woefully incomplete; however, the other five are of considerable interest to anyone in search of historical details of the larger story.

Appendix D is a copy of the report by Richmond and Rope regarding their journey from Cardington to Friedrichshafen in *Graf Zeppelin* in mid year, 1930. Richmond confirms my earlier observation regarding testimony about the odor of Blau gas in connection with *Graf Zeppelin* by Dick. I quote rather than paraphrase. “The smell of the fuel gas in the passenger cabin, which was very noticeable when the ship was at rest, was found to be not entirely dispersed when the ship was underway.” Appendix B is the complete press release proceeding R.101’s flight. F is the complete text of the proposed reductions in weight for R.101A. The rationale for deleting the heating assembly of the passenger accommodation is ‘enlightening’. There are fascinating details in his selection of included documentation!

Regrettably, if this book is picked up as a motion picture, or television program, it will require the disclaimer seen all too often, “... based upon actual events.” When I was a young man, I found an old book of my father’s about the history of aviation which ended in 1929. That book’s comments about R.100 & R.101 were so strange and inconsistent (early ‘literary barnacles’?) that it stimulated me to search out what really happened. FATAL FLIGHT could have a similar effect upon the reading public. Ω

## BLACK BLIMP

For once, no notices were received for the period. ☺ Ω

## READY ROOM

- LTA Society 65th Annual Banquet 14 OCT 17  
Greek Community Center, Akron, Ohio
- Airship Association Conference & Model Regatta  
19-21 OCT 2017 Bedford, UK
- Naval Airship Association Reunion Akron, Ohio  
September 2018

## LIGHTER SIDE

“Some cause happiness wherever they go; others,  
whenever they go.” - Oscar Wilde ☺



In the 60s, people took acid to make the world weird.  
Now the world is weird, and people take Prozac to make  
it normal. ☺

Give a person a fish and you feed them for a day. Teach  
a person to use the Internet and they won't bother you  
for weeks, months, maybe years. ☺

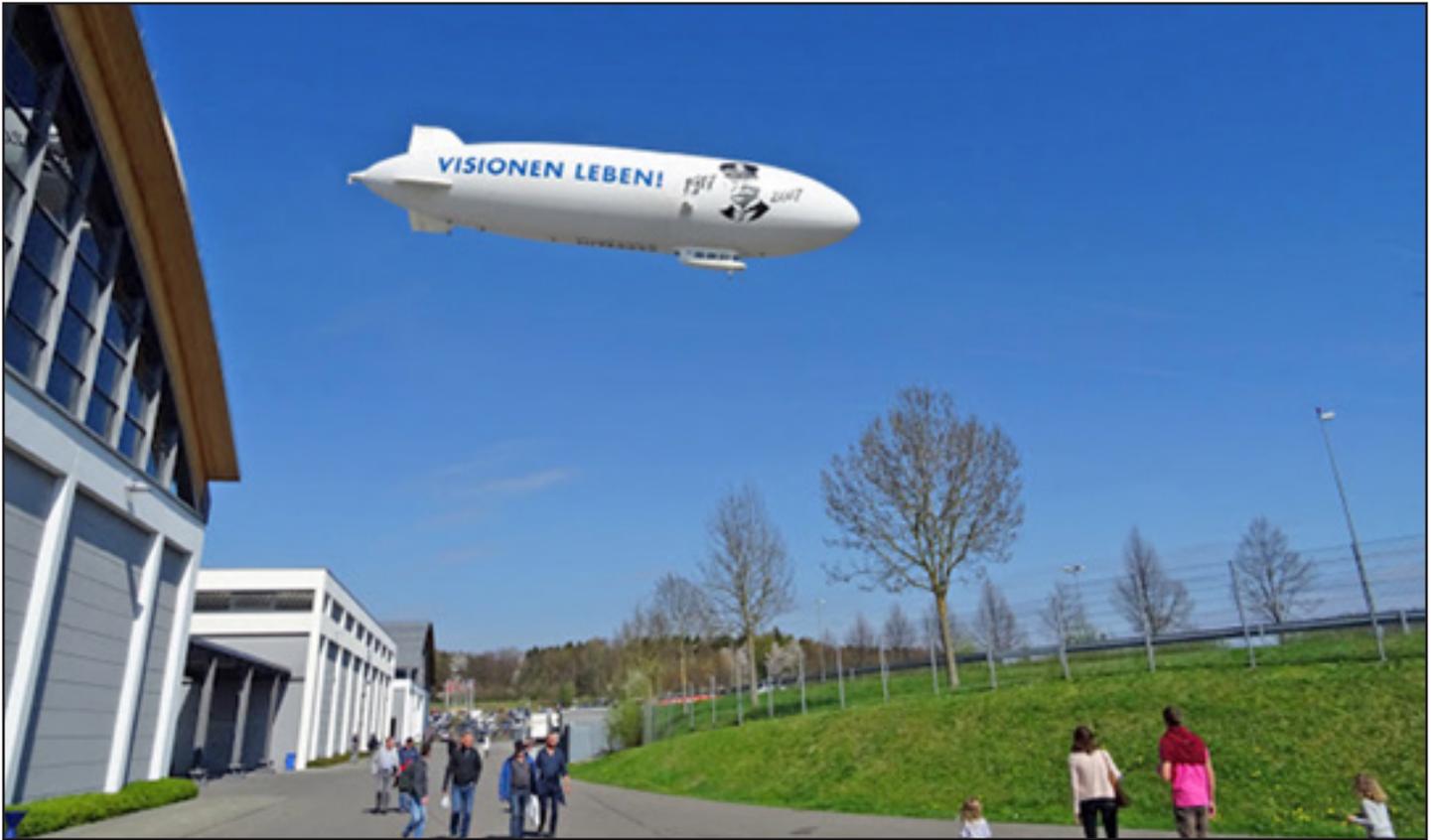


A school girl was asked, “What happens to a boy when he  
reaches puberty?” The answer came, “He says goodbye  
to his boyhood and looks forward to his adultery.” ☺

By swallowing evil words unsaid, no one has ever harmed  
his stomach. -Winston Churchill ☺



We are not making this up - the wireless speaker shown  
here for cell phones is actually called the Air Zeppelin.  
☺



USN LTA is not the only 100th anniversary being noted...  
it's also 100 years since the Count's death, as we reported last issue.





Thales Alenia Space is proposing a maritime version of its Stratobus surveillance airship.