

Is It simply quixotic banter, or

Will the Sky Giants Return?



Goodyear's fleet of airborne billboards was once all that remained from the awesome era of lighter-than-air flight.

by WILLIAM GARVEY / AOPA 480899

■ ■ Although family autos suffer in this time of fuel conservancy, other more genteel means of travel are enjoying a popular resurgence. For example, some picnickers now venture out on Sundays in surreys pulled by hay-fueled horses; more athletic folk pedal bicycles down refreshingly uncongested roadways; and still others, extremists to be sure, are actually out walking.

This return to leisurely travel common to an age gone by has touched a nostalgic chord in many a public house patron, and tavern talk is now often rife with the hearsay return of the steam locomotive, the midtown trolley and even the handsome, square-rigged clipper ships. The more outlandish the rumor, it seems, the better will it be received.

Not surprisingly, then, one rumor which has won widespread publicity and has brought infinite delight to many dreamy quarters is that the dirigible—the airborne leviathan—is waiting in the wings for another awesome entrance. What is surprising about this particular rumor is that it may be near to fact.

The future of lighter-than-air transportation was believed to have gone up in flames with the Hindenburg almost four decades ago, but the future may actually be upon us.

There are several good reasons why the airship should be resurrected. Foremost among the pro-dirigible arguments is that the airship can haul considerable payloads while burning relatively little fuel. One expert figured an airship with a 25-ton payload (relatively small as airships go) would use half as much fuel per ton mile as a truck and 20 times less fuel per ton mile than a jet carrier.

The simple reason for this low degree of fuel consumption is the fact that no fuel is needed to lift the Brobdingnagian aircraft. By definition an airship is ever airborne and needs engines only to propel it, not lift and sustain it in flight as is the case with heavier-than-air craft.

Another plus for the airship is that its landing area needs are slight, infinitesimal, really, when compared with concrete islands like Dallas-Fort Worth's massive new jetport or Chicago's O'Hare International. A lighter-than-air ship's ground-space dimensions are dictated primarily by the craft's size. The minimal requirement is a circular space whose radius equals the ship's length, thus enabling the tethered craft

to weather-vane on its mooring mast. Ground-run area for landing and takeoff is quite small since airships are at least STOL and, theoretically, vertical takeoff vehicles like helicopters. This small land use requirement could minimize any opposition by conservationists to airship port development and might also enable planners to locate ports in urban areas where land is expensive.

One more argument supporting the revival of the flying juggernauts is the fact that despite their enormity, airships make little noise since, again, their power requirements are relatively slight. And if future airships are propeller driven, they might be designed to use large, slow-turning props, thereby decreasing the noise even more.

Combined with these enviable attributes is the airship's ability to hover, for days if necessary, while stuffed with heavy, bulky cargo. It is a remarkably stable carrier and can span oceans, jungles and continents without stopping.

All things considered, then, the airship could be a close, quiet, fuel conserving neighbor and an economical, heavy hauling link in a nation's transportation system, able to carry its load to any corner of the world.

If the airship is the panacea for the transport woes facing an oil short and

environmentally gun shy nation, as some would have us believe, then why aren't any flying? The answer is primarily twofold.

First, no nation has tried to exploit and advance lighter-than-air technology because there has never been a real need to do so. Until yesterday there was cheap fuel aplenty with which to stuff the maws of all the turbines, jets and diesels that move people and goods between points A and B. As far as air transport in particular was concerned, there seemed little reason to develop a slow-moving gas bag when you could move the same amount of men and material five times faster in a 747. But today the situation has changed; some jumbo jets have been grounded for lack of ample fuel, and the airship is being touted by some as the jumbo of the 1970s.

Second, and most important, is the matter of money. While not a forgotten art altogether, dirigible construction has been dormant for a long, long time. A renaissance would be very expensive.

Goodyear Aerospace Corp., once called Goodyear-Zeppelin Co., remains the world's foremost lighter-than-air authority, having built 300 airships, including the famed zeppelins (rigid airships) Akron and Macon. However, the company has not built any big airships in almost two decades; retooling would cost plenty. Too, labor and material are more expensive today, as is the ever more stringent testing necessary to obtain FAA certification.

Fred Nebiker, manager of Goodyear's division of aeromechanical systems, says if given four years, his firm could design and build a dirigible comparable to the Hindenburg in volume and able to carry 100 tons of useful payload. The design and certification of such a ship would cost about \$25 million, and construction of the first production version would cost an additional \$35-40 million.

"That's the joke, you know," said Nebiker. "Do you really want to spend that kind of money to level out 100

tons at 60 knots average speed?" Maybe.

Goodyear doesn't know the answer to Nebiker's multimillion dollar question, but it's trying hard to find out. As evidence of that, Nebiker can give a lot more detail about that 60-knot airship, like length, 640 feet; diameter, 150 feet; volume, 7 million cubic feet; power, twin 2,750-hp turboprops; top speed, 93 knots; specific fuel consumption, 0.5. The reason such figures are available is that Goodyear recently proposed just such an airship for use in the space program.

NASA needs a method by which to transport the reusable space shuttle from its landing site in California to its launch site in Florida. The most likely proposition is to modify a jumbo jet and have it carry the space vehicle on its back. Goodyear proposed having the above mentioned dirigible carry it.

The space agency hasn't shown much interest in the idea, but this matter of renewed public interest in lighter-than-air vehicles has the government men somewhat nonplussed.

Jerry Kayten, head of NASA's Study and Analysis Office, complains that the airship revival is long on rhetoric and short on facts. Consequently, NASA will soon let contracts to determine the viability and need of airships in this, the age of space.

"For the next year or two we will be doing simply paper studies to determine whether or not we should be doing something," said Kayten. "Depending on the outcome of that, then we will revise our research and technology programs if necessary to develop something of specific airship needs."

Kayten was personally dubious about the return of the airship and emphasized that NASA's research in the matter was a very low key, fact-finding effort. "If there's reason to up the key, at least it will be based on fact and not on rhetoric," he said.

If airships do return, most probably it will be on a small scale at first rather than as space shuttle ferries. Goodyear

recently completed a study for the city of Tempe, Ariz., to determine whether blimps could be used in police work. The study, made possible by a \$35,000 federal grant, concentrated on using two-man blimps as observation platforms for traffic control and ground force deployment. Goodyear came up with a 90,000-cubic-foot, two-man, twin-engine blimp, complete with air conditioning and bubble-type windshield. Estimated price is about \$500,000 per blimp. Nebiker thinks this police blimp will become a reality in the next few years, making it the first new development in lighter-than-air technology in 20 years.

The name Goodyear has been inalterably linked with lighter-than-air flight for generations, thanks to the considerable exposure given the company's billboard blimps, Mayflower, America, Columbia and Europa. However, the company no longer holds a monopoly on this rather unique form of outdoor advertising.

Westdeutsche Luftwettbewerb Theodor Wullenkemper KG, a firm based in Mulheim, West Germany, last year built two airships which are virtual duplicates of the 200,000-cubic-foot Columbia, America and Europa. One of the \$700,000 ships, the first ever built by the firm, is being used in Germany for advertising and flight testing. The second ship has been delivered to Japan, where it is to be used for advertising and pollution monitoring.

Wullenkemper says three more ships are to be built for operation in Colombia, France and Spain, and that there are currently options for 15 additional blimps outstanding.

The company's plans ultimately call for the development of a two-million-cubic-foot, 400-foot-long airship capable of lifting a 30-ton payload.

Word of Goodyear's interest in the shuttle ferry, of the police blimp and of the German reentry into the lighter-than-air business is music to the ears of a close-knit, dozen-man band of airship enthusiasts who have been laboring for years for the airship's resurrection.

Foremost among this stalwart group of visionaries is Gordon Vaeth, a director of the National Oceanic and Atmospheric Administration's National Environmental Satellite Service.

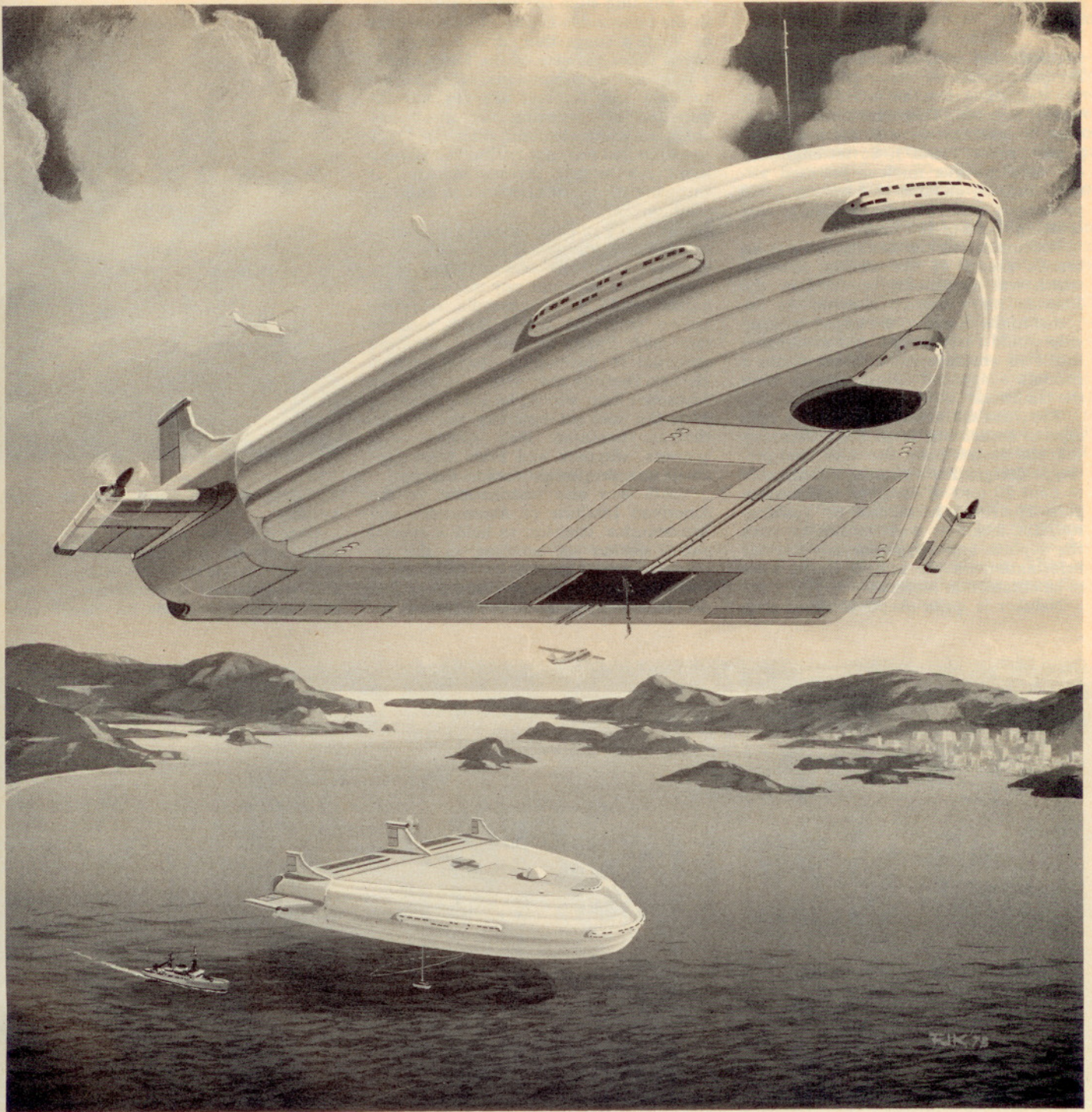
A former ground officer at the Navy's Lakehurst, N.J., airship base, Vaeth has become a ubiquitous airship advocate often accused by the less enthusiastic of promoting impossible dreams. He recently appeared on NBC's "Today" show in defense of the airship and has written numerous articles on the same subject.

One current article, which he co-authored for "NOAA" magazine with Kurt Stehling, a fellow government man and airship disciple, fires the imagination. It describes gigantic aircraft, 1,000 feet long, 300 feet wide and supported by 25 million to 50 million cubic feet of helium. Aboard these "helium horses," as Vaeth calls them, are 200 to 500 passengers "who would dine and dance in a glass covered ballroom beneath the

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Now blimps, carbon-copy copies of the famed Goodyear ships, are being constructed in West Germany. This one promotes beer.



For dreamers, the potential size and service of airships is enormous. This depiction of a "helium horse" appeared in "NOAA" magazine.

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stars,' located atop the ship. Their bedrooms and public rooms would rival those of a luxury resort. At an altitude of a thousand feet, they would glide quietly over some of the most spectacular sights and scenery the world has to offer, stopping in midair for a closer look through the ship's draft-proof open windows before moving on. Those wanting to 'go ashore' could do so, geography permitting, by helicopter or airplane carried on board and used as a shuttle

back and forth to the ground.

"A trip up the Amazon . . . an airborne sightseeing tour of the ruins of ancient civilizations in Latin America . . . a history-laden cruise along the perimeter of the Mediterranean (with particular attention to the fabled islands of Greece and the site of Carthage) . . . and, in summer, a flight above the permanent ice pack to the North Pole. . ."

Aside from functioning as an airborne Queen Mary, the dinosaurs of Vaeth's dreams would haul 500 tons of cargo, serve as disaster relief vehicles, monitor the environment, maintain buoys, carry

huge radar and even perform the same services as the hospital ship *S.S. Hope*, only inland, far from navigable rivers and roads.

Vaeth also sees his "horses" as a valuable export item whose sale to foreign nations would add hundreds of millions of dollars to our balance of payments. Unfortunately, as with satellites and the SST, the Russians may be a step ahead.

A favorite chestnut of the zeppelin club is that Mother Russia is about to give birth to an airship of stupendous proportions. This story recently bolstered

its credibility with the release of *Jane's Freight Containers*, sister publication to the definitive texts on world ships and world aircraft. The new book reveals that, according to the Bulgarian newspaper *Trud* ("Truth"), Soviet engineers are developing a nuclear powered airship airliner, capable of carrying 1,800 passengers and 180 tons of freight at a cruising speed of 190 mph.

Accompanying the description was an artist's sketch of the airship, artwork which was supposedly provided by the Russian news agency *Novosti*. As depicted in the drawing, the torpedo shaped ship would carry freight and passengers inside its envelope rather than within a gondola suspended below, as has been the tradition.

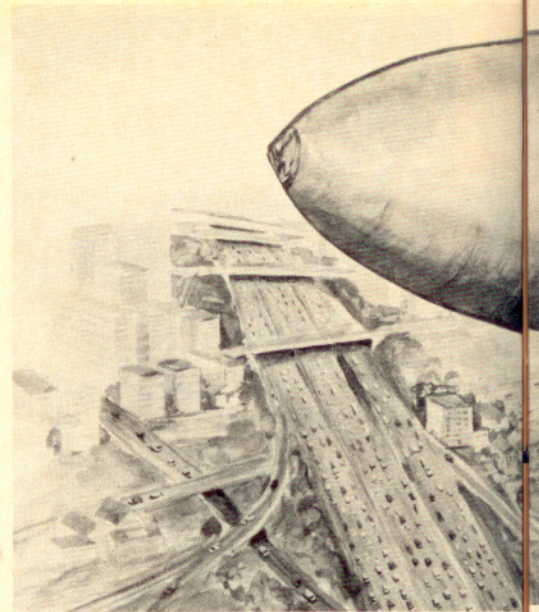
The *Jane's* account went on to note reports emanating from East Germany that the Soviets have also developed prototype designs for a smaller airship able to haul 20 tons of cargo or 200 passengers. The Russian embassy in Washington, D.C., said it was unfamiliar with the reports and suggested any further information on the matter would have to be obtained in Moscow.

Nebiker is quite skeptical about any-

one building such colossal airships within the foreseeable future. A ship the size of Vaeth's suggestion, that is, three to seven times the size of the Hindenburg, would cost approximately \$500 million to build and, Nebiker believes, has the potential of becoming the most conspicuous white elephant since the Maginot Line. No one, not within the government nor within private industry, is throwing money at Goodyear to build an airship.

But that's not to say no one is interested. Vaeth insists, "A lot of people are expressing interest and want to know more before they put any money on the barrel head." As an example, representatives from the World Bank recently met with Vaeth to study an airship's potential in developing young nations. He also recently met with men from an aerospace firm which, he said, is toying with the idea of entering the lighter-than-air business. He's spoken with growers, shippers and even hotel men about how they might exploit airships.

Vaeth was also instrumental in the American Institute of Aeronautics and Astronautics' decision to hold a special panel session on airships at the institute's annual meeting in Washington, D.C., this past January. "Something like that hasn't happened in the lighter-than-



air field in 40 years," Vaeth noted proudly.

Goodyear has not been idle either. Right now the firm has detailed 50 employees to research the potential airship market and to determine engineering and design needs for future com-

GOODYEAR'S MAYFLOWER : Queen of the Fossil Fleet

■ ■ While the age of the airship may come again—an age when city streets are shaded by blocks-long dirigibles rumbling low overhead—you need not wait until then to contract airship fever. Just head for the high hangars in Miami, Houston, Los Angeles or Rome, all cities called home by the four Goodyear blimps.

Regarded merely as pleasant, eye-filling oddities in the past, these four copious sister ships may be, we are told, harbingers of greater things to come. A visit with the *Mayflower*, queen of this fossil-like fleet, might offer a hint of what the future has in store.

The *Mayflower* appears deceptively small when viewed from afar, since there are no trees or large buildings near her Miami base that might offer some perspective. Not until you begin walking towards the ship do you appreciate just how massive a thing it really is. At 160 feet, the *Mayflower* is longer than a Boeing 707. Its 51-foot width is two and a half times that of a 747's cabin, and it's a five-story jump

(58 feet) from the top of the fin to the hard sand below. This vast gray hulk is packed tight with 147,300 cubic feet of helium.

One Goodyear man, wise in the history of dirigibles, irreverently calls this a "dinky ship," and so it might appear were it set beside the likes of the 800-foot-long, 7-million-cubic-foot Hindenburg. But then the Hindenburg isn't around anymore; the *Mayflower* is.

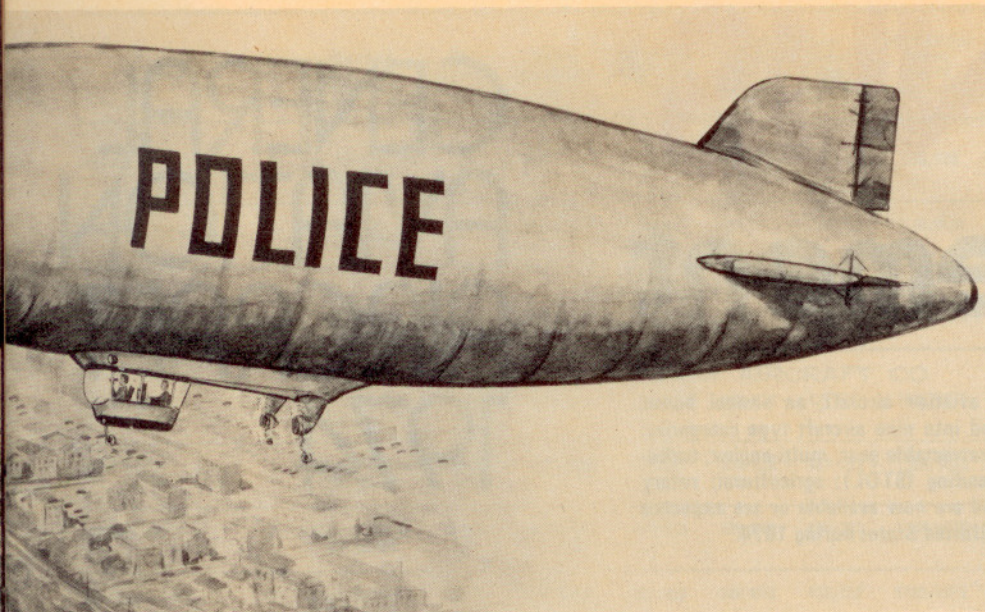
The airship is a surprisingly docile creature once it's floating free in the sky, but it can be a clumsy beast when held upon the ground. The only passenger accidents Goodyear has ever experienced—and each of the company's four ships carry some 8,000 passengers annually—have occurred during boarding or deplaning. An airship pivots into the wind, and the boarding ladder moves with it. So a passenger can get his shins smacked or have the steps swing out from under him if he's not fleet afoot.

The gondola, or car, seats seven, including the pilot, and stands on the

craft's single landing wheel about four feet off the ground. The floor is flat, the windows are very large, and school bus seats are located on both sides of the center aisle. An average-sized person can walk about easily, but stoop shouldered, since the cabin is five feet high. Goodyear provides no unnecessary frills like carpeting, air conditioning or seatbelts, but there are ashtrays. Helium doesn't burn.

Passengers may ride in the copilot's seat, since the blimp has single controls—and some unusual controls at that. The throttles and prop levers to the twin 175-hp Continentals are located on the pilot's left-hand side. There is no yoke. The elevator control is a large wheel facing fore and aft and located between the pilot and copilot seats. The pilot operates this wheel with his right hand. An airship does not roll, so there are no ailerons, and thus there's no aileron control. There is no such thing as a coordinated turn in an airship; all turns are flat turns by design.

Most instrumentation and equipment on the *Mayflower* and her sisters is relatively standard, including two transceivers, two VORs, a transponder, weather radar, gyro and remote compass, ILS (yes, the blimps are IFR), and outer, middle and inner marker receivers. The ships have no artificial horizon (they don't need one), but they each have an inclinometer, an instru-



If there is a future for airships, some believe it will unfold with (relatively) small packages like this 90,000-cubic-foot police observation blimp.

mercial dirigibles. There haven't been that many Goodyear people working in the commercial lighter-than-air field in over a decade. The problem is determin-

ing whether anyone really needs an airship, and then whether they'd be willing to pay for one. Goodyear believes the answer to both questions is yes.

ment similar to an angle-of-attack indicator, which registers a maximum plus or minus 30 degrees.

Another type of instrument peculiar to this lighter-than-air ship is the manometer, of which it has three. This instrument measures the pressure in the blimp's two air sacs, called ballonets, and the main bag itself, where the helium is stored. The gas and air pressure is closely supervised by the pilot, since the blimp's overall shape depends entirely upon the pressures within the bag. Were the pressure allowed to drop off, the rubber-coated polyester skin would become loose or flabby and be much more likely to tear under adverse wind conditions.

The ballonets serve two main functions. One is to help in climb and descent, and the other is to trim the ship longitudinally. As an airship rises, the helium expands and the pressure within the bag increases. The pilot reduces this pressure increase by releasing some of the air within the ballonets. This is done by pulling one of several lanyards, called toggles, located on a panel above the pilot's windshield. Air is heavier than helium, so when the pilot wants to descend, he simply pulls another set of toggles, and propwash air is forced into the ballonets through intake tubes located behind the two pusher blades. He can

steady the ship nose high or nose low by simply venting or filling the fore or aft ballonet.

A set of variables exists for any aircraft, and an airship is no exception. Although the *Mayflower* has a listed empty weight of 6,943 pounds and a maximum gross of 9,234, once filled with helium it can weigh anywhere from +600 pounds to -600 pounds. The weight is controlled by the pilot, who orders sandbags loaded or removed until the ship "feels" right.

At the start of a typical half-hour sightseeing flight, the *Mayflower* will weigh 50 pounds "heavy," that is, the whole thing would weigh 50 pounds if placed on a bathroom scale. The ship burns about 10 gallons of 80/87 avgas per hour, so when the half-hour ride is over, the ship will weigh a total of 20 pounds. Blimpmen like to land heavy, because to come in light they have to fly the ship under power right into the dirt, while the ground crewmen scramble for the ropes.

Total fuel capacity for the ship is 150 gallons, which means the *Mayflower's* power cruise range is 525 miles. However, the blimp can operate as a free balloon with the engines shut down, thus making its range, theoretically, infinite.

Takeoff, 50 pounds heavy, requires a ground run of 75 feet or less, depending

"There's something out there," said Nebiker. "Otherwise we wouldn't be spending all this money."

Nebiker believes that airships—small airships—will be built, but adds, "I honestly don't see airships that will be carrying people. I don't see dance halls on the top of a ship." Nor does he foresee anything exotic like nuclear powered or 50-million-cubic-foot ships on the horizon, Russian rumors notwithstanding.

Unlike Vaeth and his imaginative, well meaning followers, Goodyear has a money stake in the airship game and cannot afford impossible or unprofitable dreams. Yet even viewing airships in this harsher light, Goodyear's Nebiker predicts "there will be some new ships," like the police blimps, pollution monitoring craft and even cargo ships. He thinks the airship of the 70s might be employed in helping transportation-poor developing nations improve their flow of goods. And yes, more blimps will likely appear, advertising something other than Goodyear tires.

So while you probably won't be bugalooping atop a gas bag anytime soon, remember that airships have the right of way over airplanes. That sort of knowledge may become more than just academic. □

upon the wind. If the pilot wanted to go up "light," he could go straight up. One other way to take off in confined areas is to have the ground crew lift the gondola to eye level, bounce it on the ground, and then literally toss the whole ship about 10 feet into the sky. At that point the pilot simply guns both engines and scrambles skyward at up to 2,350 fpm. How do you write that in a spec sheet?

An airship is oddly sensationless, providing almost none of the taut feeling of flight common to all heavier-than-air craft. Once free of the ground, the blimp is completely at home and at ease, like a sailboat in calm seas. Although its top speed is 53 mph, the *Mayflower's* cruise is a leisurely 35 mph, and, depending on the wind, you might watch bicyclists pull ahead. Airships do not get tossed about by gusts or thermals; the ride is always a smooth and gentle one. It is said that no one ever got airsick in a zeppelin, and one ride in a blimp tells you that that's probably true.

Joe Hajcak (AOPA 236490), chief pilot for the *Mayflower*, regards his lethargic, great gray lady as "just a standard aircraft . . . which does everything an airplane will do, but just does it slower."

Slower, yes. Standard, never. The price: about \$1 million. □