GAS DIVISION NEWSLETTER

Official Publication of the BFA Gas Division

Volume 1, Issue 2 Summer 2000

DANVILLE
bv Barbara Fricke

The invitation went out for the National Gas Balloon Race to be held with the Oldsmobile Balloon Classic Illinois in Danville, Illinois. It would be a BFA sanctioned 3-part task race instead of a distance race. Ten balloons would compete. The pilots and co-pilots who registered, according to the rally's web site (www.balloonclassic.org), were:

Troy Bradley and Bruce Hale
Rusty Elwell and Don Weeks
Barbara Fricke, Ray Bair and Danni Suskin
Jim Hershend and Jack Holland
David Levin and George Ibach
Bert Padelt and Jack Edling
Johnny Petrehn and Sam Parks
Shane Robinson, Paul Morlock and Charles Page
Stan Wereschuk and Ron Martin
Randy Woods and Ted Stanley

The first briefing was on Thursday evening. Not much said, since weather was the main concern and the weatherman was unavailable. The flags in front of the hotel were almost straight out. Friday morning resulted in the only pictures taken relating to gas ballooning. The organizers had arranged for many helpers with the big mound of sand. Friday's noon briefing was positive about an evening flight. The 7:00 pm briefing put the flight on hold. The later briefing called the Friday flight off – too windy. It would have been a "Denver" windy inflation and a flight towards, if not over, Lake Erie with sunrise while over the lake. Saturday's noon briefing tried to be positive, while the weather channel was forecasting evening thundershowers. By mid-afternoon the filling lines had been collected and the helium trucks were gone. It was over for this year. The BFA sanction was only for flights on Friday or Saturday. The prize money was split between the balloon teams and registration fees were held for next year's flight.

The Oldsmobile Balloon Classic Illinois had put on a gallant effort to hold a gas balloon race. The amenities of the sponsor and the rally organizers were great, but Mother Nature ruled on this one.

I hope to see everyone in Danville next year.

Photos by Bill Parks ❒

EDITORS' COLUMN
by Peter Cuneo & Barbara Fricke

As we send this second issue to bed, we would like to reiterate our plea for more member submissions. Photos, articles, maps, letters, anecdotes, web sites and insights are coveted. The editors most definitely do NOT wish to make this journal a diary of their personal gas ballooning exploits, however in hopes of boring our readership into action, we shall continue on our current tack until the mailbag yields results.

That said, Mark Sullivan's article on flying hydrogen in the last issue did elicit a comment from one very respected source. Mr. Ed Yost has recounted his personal experiences using hydrogen to launch both manned and unmanned balloons. Some of his thoughts follow. 1) Hydrogen burns very quickly and with a totally invisible flame; 2) Anyone in close proximity to a hydrogen fire has virtually no time to escape; 3) Ed has personally witnessed more than one hydrogen accident and has no desire to see another; 4) Even the European ballooning community with its vast experience flying hydrogen balloons continues to have occasional accidents; 5) The immense publicity associated with the KAIBF would make any accident into a major media circus. Without entering into an ongoing debate on the merits of various lifting gases Ed does strongly feel the potential dangers of hydrogen should be considered.

While remaining neutral in this discussion, the editors refer our readers first to the statistics shown in Mark's article in this issue and second, to Anthony Smith's 1970 book *The Dangerous Sort* with its graphic description and photos of the demise of Smith's hydrogen balloon, *Jambo*. Let us know what you think.

Also in this issue, we start what may be an on going series on the physics of gas balloons. Is it too much or too little? More equations or more pictures? Let us know. ❒

GIZMOS & GADGETS

Flytek 4020 Pro Altimeter/Variometer and FAI Approved Barograph (http://www.flytec.com/4000)
This instrument has been available for several years but a recent upgrade now makes it more useful to gas balloonists. The FAI approved barograph is now able to record flights of up to 130 hours, rather than the previous 50 hours. Purchase of an optional memory module is required for this capacity. The 4020 still comes with standard features including; dual altimeter displays in feet or meters; variometer with variable averaging; a twin tone rate of descent alarm; an internal clock and thermometer; FlyChart 4.0 Windows software for downloading flight profiles; variable recording times and a protective case. The 4020 is reported to have excellent HF shielding so perhaps its variometer won't peg itself every time a UHF air-to-ground radio is keyed as does my current instrument set. List Price: $950. with extra memory. Currently available from Best Aviation for $750. (610) 845-7857 email:bestavia@aol.com

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Handheld Aircraft Radio (http://www.yaesu.com/)
The Yaesu Pro II gets a great review in Aviator magazine. Features include PC programming capability, 50 memory channels, 250 book memories, NOAA weather receive, (but no VOR capability) and automatic noise limiter (5W output, 1.5W carrier). Available: Aircraft Spruce 1 (877) 4-SPRUCE http://www.aircraft-spruce.com/spruce/ $299.00

Global Star Satellite Phone
For Discount prices for balloonists call: Down to Earth Satellites,(307) 322-2135 and ask for Maurice
Down to Earth Satellites
1154 South Street
Wheatland, Wyoming 82201

Speedtech's Thunderbolt Storm Detector
(http://speedtech.com/sm20.htm)
This handheld instrument claims to perform storm detection and tracking. The detector estimates storm speed, range, intensity and strike probability. Advertised range is 60 miles. There is a 4x16 LCD display for text messages and an audible alarm. It runs on AC or one 9 volt battery (50 hour lifetime).
List Price: Model SM-20 $399.00

Gas Balloon For Sale:
N95GB (aka "95GasBag") 220 hours TT - Experimental Aero Vail system with 1,000 cubic meter custom, equator fill, Padelt envelope (white with stars and stripes) and 2 hi-tech baskets. $20,000 OBO. For more information call Lesley Pritchard @ 970-376-4407. ❒

JD's Hangar Flying
by J.D, Huss

J. D. Huss is the Albuquerque, NM, FAA/FSDO Safety Program Manager

A hangar is a building where aircraft are maintained or stored, and pilots "hang around" (maybe this is where the term came from?). It is definitely where the term "hangar flying" originated. In the early days of airplane flying, when the weather was bad, the gang sat around the coffeepot and talked about flying. The topics of these gatherings ranged from regulations, techniques, instruction, to new ideas.

If I were to say there has been a recent resurgence in gas ballooning in the United States, I would probably be accused of "typical British understatement". When gas ballooning is mentioned, most people immediately conjure up pictures of the *HINDENBURG*. In reality, the Europeans have flown approximately 23,000 hydrogen (H) flights between 1973 and 1999 with no fatalities, traceable to the use hydrogen as a lifting gas. Although it is still quite expensive, hydrogen is a little more than 1/3 the cost of helium (He), making it feasible to remove your airborne heater limitation and let the world know that "you've got gas!" The removal of this limitation is just that – the removal of a limitation on your airman's certificate. It is not the addition of a category, class, or type rating and does not require a practical test. However, as with all things in aviation, there are certain regulatory requirements and those are what I want to discuss in this article.

Regardless of whether you are a Private or Commercial Pilot (I am going out on a limb and assume that no one is going to receive all of their flight training in a gas balloon) you must comply with the Aeronautical Knowledge [FAR 61.105 or 61.125], Flight Proficiency [FAR 61.107(b)(8) or 61.127(b)(8)] and Aeronautical Experience [FAR 61.109(h)(1) or 61.129(h)(4)(I)] requirements as they apply to the operation of a gas balloon. One of the major requirements of the training is "a person … must receive and log … training from an authorized instructor". Let's talk about these definitions a little:

- **Authorized Instructor**: A person who holds a Commercial Rating in Lighter-Than-Air, Balloon, without the airborne heater limitation.
- **Receive**: You must receive training in these areas, as required by the FAR's, from an authorized instructor.
- **Log**: Your instructors must make an entry in your Pilot's Logbook that defines what training was accomplished on each flight and they must endorse that entry.

If you compare the requirements of FAR's 61.107(b)(8) and 61.127(b)(8) you will notice the addition of items for *Fundamentals of Instructing, Technical Subjects, and Preflight Lesson on a Maneuver to be Performed in Flight.* If you are removing the "Airborne Heater" restriction from your Commercial Pilot Certificate, you must receive and log training in these additional Areas of Operation, as they apply to operating a Gas Balloon.

Now we come to the fun part – FLYING!

- Whether you are at the Private or Commercial Pilot level, you are required to receive and log two training flights, of two hours each.
- Private pilots must complete a controlled ascent to 3,000 feet AGL, and one flight performing the duties of the Pilot-in-Command.
- Commercial pilots must complete a controlled ascent to 5,000 feet AGL, and two flights performing the duties of the Pilot-in-Command.
- Since these flights are for the removal of a limitation, the flights do not need to be made within 60 days prior to the removal of the restriction.

For those of you who enjoy "splitting hairs" remember – FAR Part 1 does not define "Flight".

Continued on next page

It does, however define "Flight Time" as "time that commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing". From this definition, and the answer to a question posed in the "Flight Forum" of the September 1999 issue of *FAA AVIATION NEWS*, "…a balloon pilot would not need to deflate and break the balloon down and then re-setup and re-inflate the balloon to credit multiple 'flights.' " Based on these definitions, 1 takeoff and 1 landing equals 1 flight.

When you have completed all of the FAR required items and your instructor has endorsed your logbook, detailing each individual item of training, for knowledge, proficiency, and experience, he will need to make one final endorsement. This needs to be worded carefully, as loosely worded statements such as "meets gas balloon requirements" are not acceptable.
I would suggest something like this:

> **I certify that I have given (name of pilot), holder of (type) Pilot Certificate # (___) the ground and flight training required by FAR [61.105(b)/61.125(b); 61.107(b)(8)/ 61.127(b)(8); and 61.109(h)(1)/61.129(h)(1)] to act as a (Private/Commercial) Pilot in Command of a Gas Balloon. I have determined that (he/she) is competent to act as the Pilot in Command of a Gas Balloon.**
> Your instructor's signature, certificate #, and date of the endorsement should follow.

When all this is completed, fill out an Application for an Airman's Certificate (FAA Form 8710-1) (no instructor's recommendation is necessary) and bring it, along with your logbook (with all the training and endorsements from your "authorized instructor"), your current Pilot Certificate, and an ID card with your picture and signature to your local Designated Pilot Examiner (who holds a LTA-Balloon certificate without any limitations) or the FAA Flight Standards District Office nearest your home. Then you, too, can tell everyone ***"I've got gas!"*** ❒

"*A sea of perfect quietness is a joy known only to a handful on earth. Something close to it is encountered by glider pilots, but the free balloonist is unbridled of any sort of vehicle about him. For many, free-ballooning in the blackness of night, broken only by the silver of stars, is akin to a spiritual experience."*

The final flight of the *Goodyear-VII* was in the National Race, May 31,1928, from Bettis Field near McKeyesport, Pennsylvania. Ward Van Orman and Walter Morton flew the *Goodyear-VII* in this race. It was a cloudy, overcast day with occasional rain. The sky was clearing prior to the balloon launches. *Goodyear-VII* was the 5th balloon launched. Within two hours, the balloon was damaged in a thunder-storm, Van Orman was unconscious and Morton was dead from a lightning strike. The balloon, severely damaged, its lower three-quarters completely burned away by the lightning strike, fell 3,000 feet to land in the country-side near Greensburg, PA. Van Orman suffered a broken ankle.

Photo, quote, & info on final flight are from *The Wizard of the Winds* by Ward T. Van Orman, 1978, North Star Press. ❒

Editor's Note: Observe the WHITE DRESS SHIRTS and BLACK TIES on these pilots.

THE PHYSICS OF LIFTING GASES
by Peter Cuneo

Introduction

In this article I will try to help new gas balloonists achieve an intuitive feeling for the physics of their sport. I will then show the equations behind these intuitions. Finally, I will state some rules of thumb that can be remembered when these equations are just a vague memory.

Four main factors are instrumental in determining lift:

1) the type of lifting gas used (e.g. anhydrous ammonia, helium, or hydrogen),
2) the amount of lifting gas in the envelope (usually equal to the envelope's total capacity),
3) the outside air temperature,
4) the ambient barometric pressure (which is directly related to altitude).

Lift at Sea Level

At sea level under Standard Temperature & Pressure conditions (STP), one cubic meter of air weighs 2.702 pounds. Also at STP, one cubic meter of helium weighs 0.3729 pounds. Subtracting these two numbers gives the gross lift of a one cubic meter volume helium balloon. This is because when the helium displaces the air the balloon gets lighter by the difference in these weights.

Thus, this balloon has a gross lift of 2.329 pounds (that's 2.702 – 0.3729 pounds). By multiplying 2.329 times the volume of helium in the balloon, the gross lift, under STP, is determined. I will abbreviate this as:

Gross Lift(Helium) = Volume (cubic meters)* 2.329 [*Equation #1*]

Likewise, hydrogen weighs 0.189 pounds per cubic meter and ammonia weighs 1.583 pounds per cubic meter. Therefore to calculate gross lift for hydrogen use 2.513 to replace 2.329; for anhydrous ammonia use 1.119. As compared to helium, ammonia has about 50% less gross lift and hydrogen has 8% more gross lift.

Example 1: What is the gross lift of a 1,000 cubic meter (that's 35,310 cubic feet) envelope filled with pure helium at 59 ºF and an atmospheric pressure of 29.92 inches of mercury?
If the weight of the balloon system, passengers, and equipment is 1,500 pounds, what is the net lift?
Answer:
The gross lift is 2,329 pounds (that's 1,000 * 2.329).
The net lift is 929 pounds (2,329 – 1,400 pounds). That's equal to 31 bags of sand at 30 pounds each!

Lift at Altitude

As altitude increases, it is generally true that temperature, atmospheric pressure and gross lift all decrease. This should not surprise any balloonist, but the next statement might. Gross lift DECREASES as pressure decreases but it INCREASES as temperature decreases. Thus, as a gas balloon rises in the atmosphere, the decreasing pressure and temperature oppose each other. The decreasing temperature increases lift while the decreasing pressure decreases lift. Atmospheric pressure changes are more significant than temperature changes. Overall, lift decreases as altitude increases.

To calculate the effect of changing pressure and temperature it is only necessary to multiply the sea level lift by the ratio of pressures and temperatures. For a non-standard ambient pressure, multiply the lift at STP either by: **(pressure(in. Hg)/29.92)**. or **(pressure(mB)/1013.25)**. Use the first factor when expressing pressure in inches of Mercury and use the second for pressure in millibar.

The factor for temperature is a ratio of absolute temperatures, expressed in either degrees Kelvin or Rankine This is not as difficult as it sounds. To get temperature in degrees Rankine, simply add 459 to the normal Fahrenheit temperature. For a new temperature, multiply the lift at STP by the factor:

(59ºF+459)/(new temperature + 459). When using temperature in degrees Centigrade add 273

to convert to absolute temperature (i.e. Kelvin). This is: **(15 ºC + 273)/(new temperature + 273)**.

So the equation for lift at altitude is our original Equation #1 times these two new factors

$$\text{Lift(He)} = V * 2.329 \times \frac{59^{\circ}F + 459}{T(^{\circ}F) + 459} \times \frac{P(\text{in Hg})}{29.92} \qquad [\textit{Equation \#2}]$$

Here V is the volume (in cubic meters) of helium gas providing the lift.
P is the actual pressure (in inches of mercury) at the balloon's altitude.
and T is the actual temperature (in ºF) of both the air outside and the gas inside the balloon.
(for now we will assume that these two are equal)

Note that in this equation Temperature (T) is in the denominator while Pressure (P) is in the numerator. This causes T & P to have opposing effects on the calculated lift as discussed previously.

Example 2: What is the gross lift of a 1,000 cubic meter envelope filled with pure Helium at 32 ºF and an atmospheric pressure of 25.00 inches of mercury? These conditions might be expected to exist at 5,000ft MSL at say, 35 deg N latitude on a winter evening.

Answer: Lift = 1,000*2.329*(518/491)*(25.00/29.92) = 2,329* 1.055 * 0.8356 = 2053 pounds

This is a loss of 276 pounds of lift (versus STP) or almost 9 standard bags of ballast.

In the above example, the factor for non-standard temperature is greater than 1 while the factor for non-standard pressure is less than 1. This means that the decrease in temperature by itself would increase the available lift while the decrease in pressure by itself would decrease lift. Since the available lift does decrease, we see again that the pressure change has a bigger effect than the temperature change.

"Rules" to Remember

The following approximations generally apply to a balloon below 18,000 MSL.

1) Barometric pressure will decrease approximately 1 inch for every 1,000 feet of ascent.

2) Atmospheric temperature will decrease approximately 3.3°F for every 1,000 feet of ascent.

3) For a 1,000 cubic meter balloon at its pressure altitude, an ambient pressure decrease of 1 inch of mercury (Hg) causes a decrease in gross lift of about 80 pounds.

4) For a 1,000 cubic meter balloon at its pressure altitude, an ambient & gas temperature decrease of 3.3 °F causes a lift increase of about 16 pounds.

5) For a 1,000 cubic meter balloon at its pressure altitude, a discharge of about 64 pounds of ballast will result in approximately a 1,000 foot increase in altitude.

Note that the discharged 64 pounds equals the 80 pounds (step 3) minus the 16 pounds (step 4).

Additional factors that affect lift

1) A balloon flying below its pressure altitude (i.e. a flaccid balloon) will respond differently

2) When the lifting gas inside the balloon is warmer (i. e. super heating) than the ambient air additional lift is generated. The reverse happens when the lifting gas is colder than the ambient air.

3) Non-standard atmospheric conditions such as inversions affect a balloon's stability.

4) The atmospheric humidity has a small effect on lift with more humidity resulting in slightly less lift.

5) The purity of the lifting gas directly affects lift. Most commercially produced gas is assumed to be better than 99% pure but purity can be reduced as a result of improper filling technique.

References:

1) Technical Manual on Aerostatics TM 1-325 US War Department 1940

2) A Short Course on the Theory and Operation of the Free Balloon, C.H. Roth, Goodyear Tire & Rubber Flying School, 1917

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Hydrogen Gas Ballooning in Germany

The following information on hydrogen and hydrogen ballooning in Germany is supplied by Markus Haggeney of Stratos Ballooning GMBH & Co, KG of Ennigerloh Germany. Mr. Haggeney has been associated with gas ballooning since 1968. He has been event director at German and Gordon Bennett Gas Balloon Races. He is currently the 1st Vice President to the International Ballooning Commission.

FACTS ON HYDROGEN:

- Lightest available lifting gas.
- The extremely high speed of travel when released is 60 meters/second. This results in a very fast mixture with the ambient air, so that the time to create an explosive mixture is very limited.
- Hydrogen does not gather when leakage occurs from filling hoses or from the envelope.
- Hydrogen is invisible and can not be identified by any of the five senses, e.g. smelling.
- If ignited, pure hydrogen burns with an almost invisible flame.
- Hydrogen has a rather high flame temperature, but relatively little heat radiation (lowest heat energy per volume compared with all other flammable gases) and a low speed of the flame.
- Pure hydrogen burns, does not explode!
- When pure hydrogen burns, no shock wave occurs and there is virtually no impact to the surroundings.
- A mixture of oxygen and hydrogen explodes with destruction of the envelope.
- If an oxygen/hydrogen mixture after a flight would be ignited, an explosion would occur, but due to the rapid ascent of the gas mixture, the pressure and detonation would be released vertically to the sky with a very low risk to people on the ground.

Gas balloons are inflated in a way that no mixture of oxygen and hydrogen should be created. The filling hose is sealed off, so that 100% pure hydrogen is sent into the envelope. The moment the balloon takes off, only pure hydrogen is in the envelope. Therefore, there is no risk of a catastrophic explosion.

Mr. Haggeney stated that there have been approximately 28,000 flights with hydrogen in Germany since 1959 and that gas ballooning in Germany accounts for approximately 80+% of manned gas balloon flight worldwide during 1950-1996. He also indicated that there have been six gas balloon accidents resulting in fire due to electrostatic ignition. Only one accident resulted in fatalities. Since those accidents the following safety steps have been taken:

- Definition of minimum conductance requirements for fabric used in manufacturing envelopes. (Germany's biggest manufacturer of gas balloons developed guidelines for the manufacturing of balloon fabric. These guidelines are still in place today.)
- Strong recommendation to pilots to perform the deflation through the rip panel rather than through the valve so hydrogen is released the fastest possible way.
- Recommendation for the use of a cable attached to the basket and hanging below it to allow first contact with the surface when the balloon approaches for a landing. This cable was meant to discharge any electrostatic charge from the envelope. In 1976, German officials proved that this cable was actually no longer necessary as it would not add additional safety, mainly because the conductance of basket and wires to envelope were considered to be sufficient. ❒

Sullivan's German Gas Balloon Tour 2000

by Mark Sullivan

What better way to see Germany than to do a few gas flights and visit some good friends? Our plan was to start in the north of Germany and travel south stopping at as many of the gas balloon ports as possible along the way.

We arrived at Düsseldorf at 0700 on June 13th, intending to fly from either Marl or Oer Erkenschwik the next morning. Hans and Marita Furstner met us at the airport where we picked up our chase vehicle. We had reserved a seven-passenger car for us and crew, but the only available vehicle with a hitch only held five passengers. Well, it did have a small baggage compartment, and I guess one of us could ride back there after the flight. We drove down to the gas balloon port in Dusseldorf to pick up the balloon and then headed for Oer Erkenschwik. Albert Cramer had loaned us his 1000 m³ Warsteiner balloon that is based in Warsteine. This balloon would be used for all flights, except the flight I would be doing in Augsburg. There we would use the Wörner 500 m³ demonstrator.

We called Alföns Volker to make sure we could get gas for a flight on the 14th. He gave us the coordinates of the balloon field where we were to meet him. We called the airport to get the weather for the morning flight. The news was not good, with strong winds and possible showers predicted, but current conditions looked good. Who needs sleep on a vacation? Let's do it now! This balloon port is not much more than a field on the outskirts of a small village. Alföns lifted a man hole cover in the middle of the field and just hooked up his hydrogen filling hose.

We inflated the balloon around 1900 and off we went. On board with me was Harris Goodwin, my son Bryan, and Hans. This was to be Bryan's first flight in a gas balloon so he was pretty excited. Launch winds were about fifteen knots and we needed to climb pretty fast to clear a few obstacles. As soon as we stabilized, Bryan told me the take off was the best adrenaline rush he ever had. He has had many hot air flights, but the upward acceleration with no burner sound, was an amazing experience for him. We had a southerly track with plenty of steering to keep us out of Frankfurt airspace. It was a super night with a good moon and no need for a jacket. There was enough steerage to make it into France if we wanted. As the sun came up we were clear of Frankfurt airspace. We descended and turned south to make a few touch-and-goes before the final landing. We had a great ten-hour flight with a stand up landing just outside Bad Kreuznach.

We drove back to Oer Erkenschwik to pick up Hans' car and spend the night in a quaint country hotel that was a converted barn. The next morning we headed for Stuttgart and stayed at Hans' home. There we had a good German dinner and a few Warsteiners. Early on the 16th we followed Tomas Hora down to Bad Wörishdfen to help Walter Müller celebrate his birthday. Walter's summer home is just north of the Alps, and the flying there is incredible. We arrived at 0715. The balloon, hot air this time, was already inflated and off we went for a bird's eye view of the beautiful countryside.

After lunch we headed for Augsburg for another gas flight. We went to the Michael Wörner factory in Augsburg to pick up the 500 m³ balloon and take a quick tour of the factory. Burce Hale's new balloon was on the table having its parachute installed. After the tour, we called weather service. Winds were too fast for an evening flight so we decided to do an early morning flight out of Gablingen gas port, just on the outskirts of Augsburg. Tomas Hora and I took off about 0530 on the 17th and flew for almost five hours. We did several landing and picked up Goody for another lesson. After we packed up we found a beer garden and had lunch with the other gas balloon team that took off with us.

After lunch we took off for Stuttgart and a possible morning flight. We spent the night at Hans and Marita's place and enjoyed Marita's great cooking. Gas was available and we needed to be at the balloon port at 0300 on the 18th so we could fly out of Stuttgart at night. Tomas and I took off and again we did a hair & hound with one of the club balloons that was also flying.

The flight out of Stuttgart was a real treat and one I would really like to do again. Again we

continued on next page

flew for around five hours, doing several landings and changed out Tomas, so Goody could have another lesson. After the final landing we joined the other balloon team and found another beer garden. After lunch it was time to head for Sonthofen, the German balloon port in the lower Alps. There we stayed at a local hotel owned by a balloonist who also operates a ride business. Astrid Gerhardt, Hans and Marita drove down to fly with me for the last and most spectacular flight of our trip.

We had the balloon all prepared by the time the balloonmeister showed up to turn on the gas. We were flying the 1000 m³ meter balloon. There wasn't enough hydrogen to fill the balloon, so we filled to only about 80%. On board were Astrid, Marita, Goody, and myself. Our task was to take the drainage winds down the valley and out into the flat lands. The drainage was from the surface to about 600 feet. It was a great experience trying to keep the balloon in the drainage while the sun was coming up. Allowing the balloon to climb would turn it 180º's and head us back into the Alps. After about three hours, we were into the rolling hills, and we turned north paralleling the Alps. We took the balloon up to 12,000 MSL to take a good look at the snow-covered Alps. After about five hours we landed in a field owned by a local balloon pilot.

Thanks to our many European friends we had a wonderful trip. By looking at the schedules you may think we didn't have time to do much sight seeing on the ground. Not true! We went to the Hiddleburge Castle and King Ludwig's Chateau Schlob Newschwanstein (the Disneyland castle). In addition, we put 3000km on the rental car! If you have ever thought about getting a gas license and would like to go to Europe, you may want to think about a trip like this. The cost is about the same as one helium flight in the U.S.! ❒

UPCOMING EVENTS

September 1-3 10th Warsteiner International Montgolfiade, European Gas Champ.; www.warsteiner.com/

September 9 44th Coupe Aeronautique Gordon- Bennett in Saint-Hubert Belgium.

October 7-12 5th America's Challenge Gas Balloon Race, KAIBF, Albuquerque; www.balloonfiesta.com ❒

SHORT HOPS

NEW BOOK

To The Edge of Space - Adventures of a Balloonist by Colin Prescot, published by Boxtree, an imprint of Macmillan, Ltd, 2000. No sane young man would have considered starting a commercial hot air balloon business in the early seventies. No sane middle aged person would seriously consider flying around the world in a Rozier in the nineties . This zany autobiography proves that Mr. Prescot is indeed crazy, as is this book. Not withstanding, Flying Pictures, Ltd. and the Cable & Wireless RTW project did indeed enjoy some success. Published in Britain and available from www.amazon.co.uk. Contents are about 1/3 gas and 2/3 hot air. List price: £20.00

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BFA ELECTIONS / GAS DIVISION BOARD

The BFA elections are here. Please vote, not only for the BFA Board members, but also for your Gas Division Board members. Ballots are due back to the BFA office on August 28, 2000.

There are six elected members of the Gas Division Board. Two members are elected each year. Board members serve for three years. Board members elect their officers. Those members whose terms are ending are: Troy Bradley and Bert Padelt.

Candidates for the two Board Positions are: Bruce Hale, John Kugler, David Levin and Bert Padelt. Candidates' statements can be found in the July 2000 issue of *Skylines*.

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BFA GAS DIVISION
BOARD OFFICERS & MEMBERS

Chairman:	Troy Bradley 505 332-2829	2000
Vice Chair:	Richard Abruzzo 505 859-6419	2001
Secretary:	Shane Robinson 417-865-0800	2001
Treasurer:	Bert Padelt 610 845-7857	2000
Member:	Randy Woods 314 993-1044	2002
Member:	Mark Sullivan 505 856-6834	2002

INSIDE THIS ISSUE

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Gordon-Bennett, 2000

The 44th Coupe Aeronautique Gordon-Bennett will be held at Saint-Hubert in southeastern Belgium. The launch window opens at sunset on September 9, 2000. Launch may occur as late as September 12, weather dictating. As is traditional in Europe the race weekend coincides with the full moon. The Event Director is Mathjis de Bruijn and Mark Sullivan is a Deputy Director.

The three U.S. teams will be Richard Abruzzo and Carol Rymer Davis, John Kugler and Ralph "Red" Sheese, and James Herschend and David Levin. All three U.S. teams will be flying Wörner balloons.

Editors Note: We hope for safe flights with great distances for each US team, and an article or two for the next gas division newsletter. ❒

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