Ballooning into the Sky

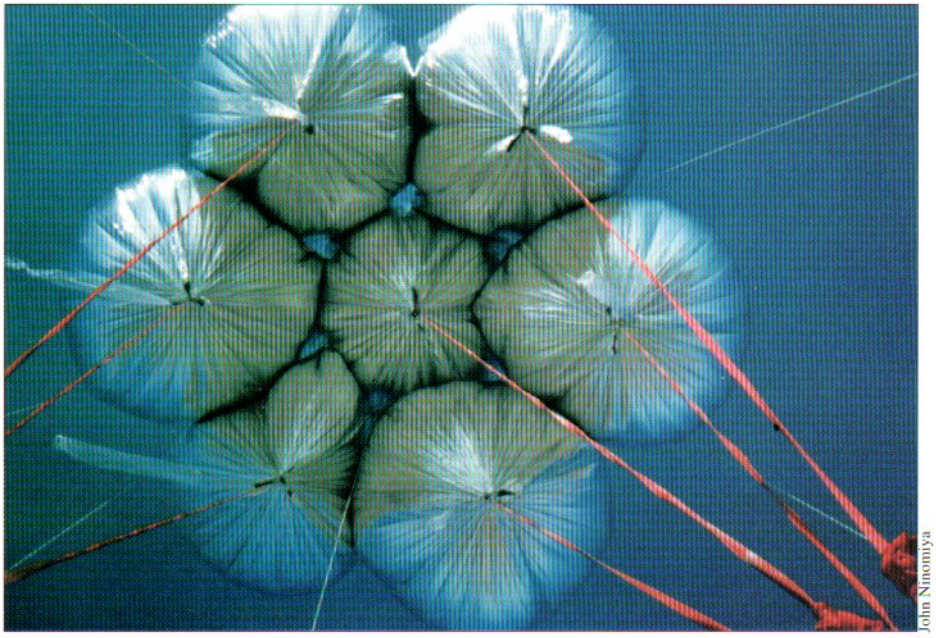
The Flight of Silver Pleiades

By John Ninomiya

When I was a boy, I had a series of science books on various topics written for children. One book was about gravity, with a section devoted to ways in which people have tried to overcome the force of gravity. In that section, there was a photo of a man ascending in free-flight in a harness attached to a cluster of twenty or so large orange helium weather balloons. The caption was: "Ballooning into the Sky — Balloons filled with helium can lift a man into the sky, but control is limited." To me, at the age of nine, flying that way seemed like the coolest possible thing in the world.

That picture stayed with me mentally through the years, and I eventually learned to fly hot air balloons. However, although I enjoyed myself tremendously, my original dream of ballooning was not quite fulfilled. Like any of us, wicker and propane both have very pleasant associations for me, being related to one of the most enjoyable and interesting activities in my life. However, somewhere inside me, I wanted to soar silently skyward tied to those huge buoyant spheres — riding around inside a basket with a giant flame-thrower blasting overhead was not quite the same.

I kept looking. About five years ago, I went to Amarillo Texas for a couple of gas balloon training flights in an old SkyPower balloon. The silence of the flight and the ability to fly long and far both impressed me. However, the expense and the large number of crew needed to inflate were serious drawbacks in my mind. Also at about that time, I began flying Cloudhopper harness balloons. These are amazingly flexible and fun aircraft, which can do most things that a conventional balloon can, plus take off and land in relatively tiny areas; take you hopping through fields and up and down hills in giant twenty-foot leaps; be walked by the pilot still inflated out of most red zones, including ones where a fence must be climbed; and respond almost instantly to pilot control input. I logged several hundred hours in T&C and Lindstrand Cloudhoppers over the next five years, and fell in love with ballooning all over again — even my annual "basket balloon" hours increased. But, although it was a lot closer, it was still not my nine-year-old boy's vision of 'Ballooning into the Sky.'



John Ninomiya

Seven clustered balloons of the Silver Pleiades.

I seriously considered directly duplicating the flight in the picture. Larry Walters, the infamous "lawn chair balloon" man, had made a flight with helium weather balloons in 1983 — in some of the world's busiest airspace, over a big city with lots of powerlines — and survived to become a kind of icon for extreme stupidity, albeit of a very whimsical and charming sort. I decided that I wasn't quite ready for that — I needed something a little bit more like a real aircraft in a reasonably survivable setting.

Finally, late last year, I saw a posting on the Internet balloon mailing list regarding "balloon jumping" — a sport which actually enjoyed some popularity in the 1920's, in which a large gas balloon is used to make a person just slightly less than buoyant, allowing them to jump twenty to thirty feet high and sail along in any wind. The author of the posting was Don Piccard, who said that he had used two Mylar balloons filled with helium to let a writer for an Internet adventure sports magazine try balloon

jumping in Central Park in New York City. I was intrigued, and my interest increased when I saw the fourteen-foot silvery balloons which Don had built in pictures in Charged magazine on the Internet, as well as here in Balloon Life. I learned that Don had originally built a number of these balloons for use as a multi-cell balloon (known as a "Pleiades") to be flown over a conventional basket. I thought that a smaller number would be great for use with some type of harness seat arrangement.

I e-mailed Don Piccard, saying I was interested purchasing some of his balloons for balloon jumping use only — reasoning that if I didn't say that I really wanted to free-fly, his potential liability exposure for providing the balloons might be limited, and he might be more willing to sell. I was unsure whether I'd get a reply from such a celebrated personage, or whether he'd think I was a nut case. However, Don wrote back promptly and urged me to think about free-flying with his balloons, too — I might really enjoy it. And he wanted to come out to see me do it.

"Gee, twist my arm," I wrote back.

Equipment and Planning

We arranged for a time for Don to come out to California with his balloons, and suddenly, I was in the midst of making my flight a reality.

I decided to use a paragliding harness for my flight. On the phone, Don urged me to consider using a basket — how about an industrial laundry cart, or maybe a plastic dumpster? I told him that crackpot aviation history already had a "lawn chair" man, and that I wasn't going to be the "dumpster" man. Having flown several hundred hours in paragliders (free-flight soaring canopies — like a hang-glider without a rigid frame, not to be confused with being dragged behind a boat) I felt very comfortable with the thought of flying in a harness rather than a basket. Furthermore, much of my recent ballooning experience was in Cloudhopper balloons with swing or harness seats — it was what I was used to. I realized that it would limit my operating window for desirable landing speeds, but for my first flight, I didn't plan to fly late into the morning.

My Wills Wing paraglider harness was therefore my choice for the job. Paraglider harnesses are built with good back protection, spinal injury being a scary possibility — I felt better about the harness than I would have about some kind of cobbled-together basket arrangement. The paraglider harness also contained a reserve parachute, which I thought might be useful in the event of multiple catastrophic failure of the balloons. Chris Knowles, who actually designed the harness before licensing the design to a large hang-glider manufacturer, helped me add two heavy webbing straps, coming up from the main suspension carabiners of the harness (just above waist-level on the pilot) up to two more carabiners to which I would tie my balloons. These two upper carabiners, slightly above the level of my head, were joined by .058 wall aluminum tubing on a vinyl-encased webbing strap. The purpose of this bar was to facilitate "balloon jumping" leaps — on landing, the balloon jumper would use the momentum of the balloons to help pull the bar down as far as possible. Then, letting the bar up, the balloons would build upward momentum before pulling up tight on the webbing straps and sending the jumper aloft — higher than would be possible by use of legs only.

Hanging down from the two upper carabiners were two additional straps, which ran to two lower carabiners. I planned to suspend my ballast from these straps, so that it would hang at my sides. I gave a great deal of thought to the relative merits of water versus sand ballast. I decided that water, while not tractable to measurement by hand, would be easier to meter in a controlled fashion than sand, which would require the opening of bags in-flight. I purchased some 2.5 gallon MSR Dromedary water bladders, which are heavy-duty water bags designed for camping use. I planned to fill them to two gallons, or sixteen pounds each; three bags on each side of me would give me ninety-six pounds of ballast. I experimented with metering out water via a handle-operated spigot and via a screw-on cap. The spigot took about eight seconds to drop a pint (roughly one pound); taking off a cap generated a strong jet of water which would drop a pint in roughly 1.5 seconds. I finally decided to use half spigots and half caps on my ballast bags — and made lanyards for the caps, of course!

Don and I had originally talked about using four balloons of roughly 1,500 cubic feet, each providing 60 - 75 pounds of lift. However, Don mentioned having some slightly smaller balloons, and I was in favor of more, smaller balloons, to create some redundancy in the system — so that a single blow-out would be survivable. We finally settled on seven 1000 cubic feet balloons.

When Don finally reached San Diego, I got to see my balloons. The balloons are made of metalized Mylar, giving them their silvery mirror-like appearance. The Mylar is amazingly light and thin — to the touch, it seems even thinner than the Mylar balloon that you'd get from a florist or party shop. The actual cut of the balloons is cylindrical, Don told me, but they would assume a "natural" balloon shape in flight. At the bottom of each balloon, the Mylar is drawn together and tied with a red webbing line, which then becomes the tether by which the balloon is attached to the basket or harness. At three places at the bottom of the balloon, part of the Mylar is not gathered in to the tied portion, leaving three small vents. In normal flight, the natural buoyancy of the helium keeps it from coming out of these vents. However, to drop gas, the pilot can pull down on a white line hangs down from the top of the balloon. This tilts the top of the balloon over, letting gas escape from the vents. When it's time to deflate, the same white line to the top of the balloon is secured to the harness, and the pilot cuts or unties the red tethering line. The balloon turns upside down, now held down by the white line, and gas exit from the vents. The balloon deflates in about thirty seconds.

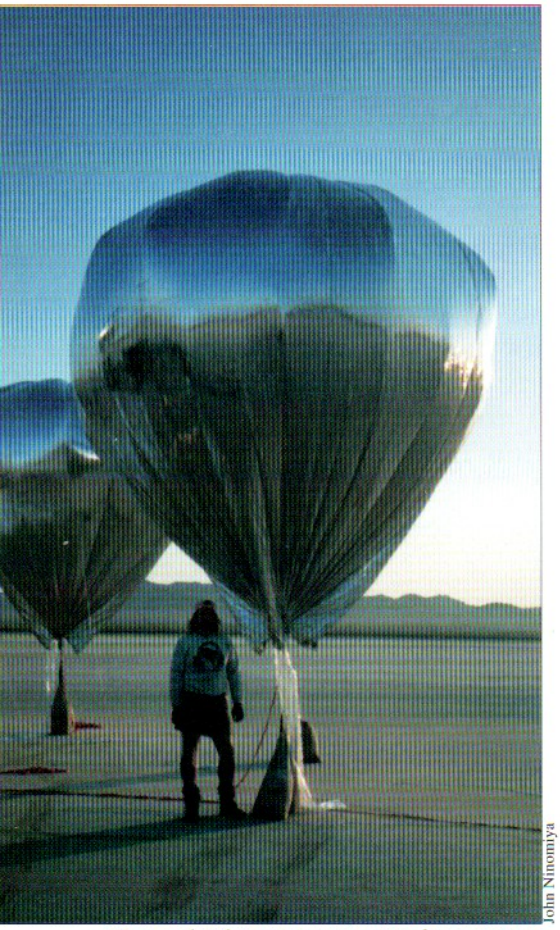
Or that was how the tests had worked, anyway. No one had actually free-flown this type of balloon before.

Don had my balloons in the back of his truck, each one in its own black plastic garbage bag.

I dubbed my aircraft 'Silver Pleiades.'

Off to the Desert

I decided on El Mirage Dry Lake on the high desert north of Los Angeles as the site for my flight. El Mirage is perfectly flat, and is a haven for ultralights, tow-launched hang-gliders, gyrocopters, sand-sailors, motorcyclists and all manner of



John Ninomiya

Crew chief Ernie Hartt standing next to one of the inflated Pleiades envelopes.

strange behavior requiring lots of open space. The Bureau of Land Management manages El Mirage, and is amazingly supportive of everything that goes on there — their main concern seems to be that no one damage the lake bed surface. El Mirage is Class G airspace to 700 feet, then becomes Class E, making Part 103 (ultralight) operations legal. As my total system would weigh under 155 pounds, I was planning to operate under Part 103. It also seemed less problematic than showing up at the FSDO with my seven plastic garbage bags, and saying something like "Gee, this nice man from Minnesota made me these seven big balloons, and I'm going to tie them to a harness and go flying 'way up in the sky — can I have an experimental airworthiness certificate?"

Then we waited for the weather. The week Don drove in was windy — he flew home for a few days to straighten out his taxes. I watched the weather, learning that NOAA considers "breezy" conditions to be conditions slightly under advisory criteria — which in the desert is 35 mph. I had a few brief moments of reflection when I wondered how my upcoming flight would go, but generally, I was happy and excited. I had good equipment and expert advice from one of the few people ever to fly a multi-cell "Pleiades" balloon. Don had made several such flights using multiple plastic balloons in the 1950's, one of which still stands as a world's record — and Don's father had flown to 10,000 feet using 98 latex weather balloons in 1937. If I wanted to do this thing, I would never have a better opportunity.

Finally, the winds died down. Don flew back into town and we headed up to El Mirage. Joining us were Ernie Hartt, a balloon pilot and master crew-person; Phil Brandt, a commercial balloon pilot for SkySurfer Balloons in Del Mar, California; and Richard Douglass, a balloonist friend of Don's who put together the balloon mail I was to carry. I rented a van to carry my twenty-eight bottles of helium. We checked into a motel in Victorville, and drove out to the dry lake to familiarize the crew with the major roads on and off the lake bed, which Phil entered into his GPS as waypoints. Then we went back to the motel, and I tried to sleep.

The Day

A bit before dawn, we rolled out onto the lake bed. I launched some pibals, and most of the upper winds seemed to be headed east. Flight Service had given a forecast of light and variable winds until 10 or 11 AM, becoming 10 gusting to 15 out of the west. Based on this, we drove to the west end of the lake to set up.

The balloons were remarkably easy to inflate. Don had a diffuser which attached to a helium tank on one end, and to a large pipe on the other. With this device, we could empty a 244 cubic feet helium tank in just a few minutes. We unrolled the delicate, crinkly Mylar of the first balloon and inserted the pipe end of the diffuser into a plastic sleeve that ran up through one of the bottom vents. A loop of cord allowed us to attach the balloons to sandbags. The first tank of helium would leave the balloon standing, with a big ball of helium filling the top and the rest hanging down limply. Each succeeding tank of helium made the balloon rounder and fuller, until by the fourth tank, the taut Mylar of the balloon was a silvery mirror in the early morning light. Each balloon took ten to fifteen minutes to fill.

Once the first four balloons were inflated, my crew chief Ernie and I began experimenting with balloon jumping while Don and Phil continued inflating the other three balloons. I donned my harness and we carefully tied four balloons to my carabiners, and let them up to the end of their red lines. Four balloons without ballast had me (at roughly 200 pounds, including harness) at slightly less than neutral buoyancy. I could make slow, lazy jumps to about ten feet; or, using the metal tube between my upper carabiners as a trapeze, I could pull the balloons down and send the up with some momentum, timing my jump to loft me to twenty feet or more. Ernie, slightly heavier, had to jump more aggressively to get the same height. The sensation was similar to jumping a Cloudhopper balloon, but slightly more agile, based on the four-thousand cubic feet of the four helium balloons versus the twenty- or thirty-thousand cubic feet of a one-man hot-air balloon.

The other three balloons were inflated, and it was time for the free flight. It was already getting towards nine o'clock; the time had passed unbelievably quickly. Ernie walked me back the hundred feet or so we had drifted while jumping. He and Phil hung my water ballast bags from their straps, along with additional sand ballast. The other three balloons were tied to my upper carabiners and let up on their lines. Together, the seven silver balloons formed a perfect cluster — one in the center, with six surrounding. They were awesome above me, straining silently at their tethers. I went through my checklist with Ernie — two knives on lanyards, webbing dropline, harness-mounted radio, vario on hip strap, compass, sectional, camera. It was all there. Silver Pleiades was ready to fly.

Crew disconnected me from the sandbags to which I'd been anchored. I could bounce on my toes, feeling how light I was — ten or fifteen pounds, perhaps. I began to let water out of my ballast bags, using the spigot fittings. The water splattered slowly on the flat, hard lake bed, turning it dark. I emptied most of one bag and began releasing water from another. I could feel myself getting lighter. My toes skipped the ground one last time, and then the ground was slowly dropping away, and I was dancing on air.

Flying Free

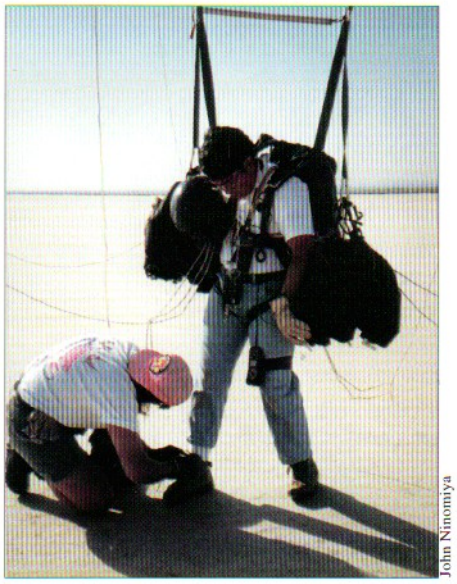
I rose slowly, at about a hundred feet per minute. Winds were a few miles per hour, westbound — different from we'd seen with the pibals when we decided to set up at the west end of the lake bed. I was headed slowly off the lake bed to an area of scrubby brush, with widely scattered houses. Tentatively, I pulled on of the white lines. One balloon tipped over, and the three small vent-mouths on that balloon widened slightly , until I released the line. My vario now showed me doing about fifty feet per minute down. It appeared that I could maneuver.

I had originally hoped to do some touch-and-goes on the lake bed , but the wind direction was not cooperating. Also, we had launched at about nine, which was much later than I had originally planned. I had about sixty pounds of ballast — perhaps a third less than I would have liked, in part due to a tear in one balloon we'd had at inflation which had lost us some helium before it was detected and patched. I decided that if I wanted to go to altitude and still have plenty of ballast for maneuvering when I came back down to shoot my landing, now was the time to go.

I began dropping more ballast, setting up an ascent of one- to two-hundred feet per minute. I began moving lazily toward the north, and then to the southwest, still over the lake bed More and more of the desert slowly dropped into view as I rose: the flat whiteness of El Mirage, giving way to dry brown scrubbrush, barren rocky hills thrust up here and there, ramshackle houses of people who like their privacy, the distant white pans of the Edwards and Rosamond Dry Lakes. Twenty miles to the south, the San Bernardino mountains were visible in a light haze, their peaks white with snow. I was off the lake bed now, heading southwest, at three thousand AGL. I talked to crew on the radio. They were just getting rolling off the lake bed. I dropped some more ballast and spent another ten minute drifting up to 4000 AGL. It was totally silent. Sunlight glistened off my huge, silvery balloons. I could see everything for miles. I kicked my legs and laughed and yelled.

I had hoped to get up a mile over the ground, but as I leveled out at 4000 AGL, I was down to forty pounds of ballast, and it was already coming up on ten o'clock. I allowed myself another five minutes at that height, then vented a balloon. That single venting set me up on a nice 150 - 200 fpm descent which the balloons maintained as I called crew and spent the next fifteen minutes figuring out my landing. I was still moving southwest. Ernie launched pibals for me and reported that there was a thin layer of eastbound just above the surface, but that above that it was westbound. He also reported that the earlier dead calm on the deck had given way to light wind gusts in the five mph range. I asked crew to drive out to a paved north-south road. It appeared that at my present rate of descent and drift , I would drop in just on the far side of the road. The near side of the road was appealing, being open scrub-land with just a single deserted house, but powerlines ran parallel to the road, and I didn't want to test my fine maneuvering ability.

I passed over the road at a few hundred feet and dropped my drop line. The end of the line was still a hundred feet off the ground. I asked crew to walk in after me to grab it — the land west of the road was more dust and creosote bushes, somewhat broken terrain, but seemingly negotiable, from the air. I was now descending at a little over one-hundred fpm. I dropped a very small amount of ballast to slow my descent, and, after a moment, was surprised to find myself ascending. I vented to correct. I was several hundred feet from the road now, and my track over the ground veered to the left. Ernie and Phil were tromping after me bravely through the brush, looking tired — I guess access always looks better from the air. For some reason I was ascending again, so I vented harder. My hundred foot drop line was now over a hundred feet off the ground, and I was headed south, not west. I was moving toward an east-west road now, faster than Ernie could slog across the terrain below. Phil had gone back to join Don in the chase truck. At this point, Don saw a bird flying rising circles over my position — either a hopeful carrion-eater, or a sign of thermals starting to kick off. I



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Top: *You can't tie your own shoes when you're tied to seven fourteen-foot balloons.*
Bottom: *Ninomiya floating above the California Desert.*

seemed to be moving a bit faster, too. It was really time to land.

I crossed over the east-west road at a hundred and fifty feet, venting . The balloons were not as full as they had been earlier, so the white lines had to be hauled down hard to get any response, but I finally managed to set up a good 150 fpm descent. Ahead was more scrub brush, with a single house about a long city block away. The chase truck roared up the road, Don at the wheel, with Phil clinging to the side of the vehicle. It roared right past me. I yelled on the radio for them to come back . They did a hasty u-turn and roared back. Phil jumped off and was running into the field toward me.

I was at fifty feet now, going down at a little under 200 fpm, doing six or seven mph over the ground. I dropped some ballast. Ahead was a bit of steep slope, giving way to a lot of creosote bushes and nothing much else. I came in right on top of a bush, taking the landing on my legs to avoid bouncing. I dragged forward onto another bush. Behind me, my drop line pulled up tight as Phil grabbed it somewhere downslope, out of view. I rose back into the air about ten feet. The balloons were streaming out downwind from me, pulled down at about at forty-five degree angle like a huge bunch of party balloons in the wind. I cut away a red line with my knife, fell a bit, then felt the tug as the balloon turned upside down on its white line. I was back on the ground, leaning to balance the pull of the balloons. I cut another balloon loose. And then I was hollering for crew to come in to grab the balloons before they could shred on the bushes.

Silver Pleiades landed safely at 10:30 AM. I had flown seven miles in an hour and a half. One of my balloons was tangled in my lines during deflation, and another was damaged on a bush. I was completely unscratched. It was a great day to be alive.

Conclusion

I think that the gas Pleiades ballooning has terrific potential. The relatively simple construction methods and materials lend themselves to home-building or fairly inexpensive commercial production. This means that people who might be able to afford helium but who couldn't cope with the notion of buying a conventional gas balloon they'd only fly once or twice a year now have another choice. Perhaps alternative lifting gases used in a Pleiades flown over an appropriately equipped hot-air balloon basket will someday provide large numbers of balloonists with the opportunity fly gas at least occasionally. Or, for those not totally basket-fixated, I would heartily recommend the harness arrangement of my own Silver Pleiades. Don says that for helium inflation, clear or colored plastic rather than Mylar could be used to make a balloon the size of one of mine for twenty or thirty dollars in material costs — making them almost a disposable item. Imagine a race at which the pilots arrive with only their "pleiadiering" harnesses and receive a huge bouquet of these balloons in their choice of color and size for the day's flight.

In my preparations for the flight, I benefited tremendously from Don Piccard's skills as a balloon designer and pilot. Having someone of his stature in the sport, with his illustrious ballooning ancestry, come out to help me realize a lifelong dream convinced me that perhaps my dreams weren't entirely crazy — or at least, as I migrated farther out on the lunatic fringe, from balloonist to Cloudhopper ultralight balloonist, to one-man gas Pleiades balloonist, it was comforting to find Don already out there, and willing to lend a hand. It was a small connection to history, and to people who knew that flying balloons was interesting and important, before the modern sport as we know it even existed.

John Ninomiya

Silver Pleiades team: (l.-r.) Don Piccard, Phil Brandt, Ernie Hartt, Richard Douglass, John Ninomiya

For his part, Don said he was glad I had flown his balloons — if he had flown them first (as he would have in Germany, had condition permitted) it would have just been another strange thing that Don Piccard had done, but my flying them represented market acceptance of his idea — a market of one, anyway.

I learned a great deal from the first flight of Sliver Pleiades. Aside from some insights regarding the equipment and its flight characteristics, I learned that I am a very persistent person, and that I am serious about what I want — even if it is somewhat out of the ordinary.

And did I, in the end, find my nine-year-old inner aeronaut's vision of what ballooning should be? Yes — or as close as you'd want it to be, to leave room for the future. It was me and the sky, and seven huge helium balloons. It was free-flight. It was silent. It was peaceful. It was kind of scary. It was thoughtfully planned and executed. It was flamboyantly weird. It was wonderful.

"Ballooning into the Sky — Balloons filled with helium can lift a man into the sky, but control is limited."

I can hardly wait to go ballooning into the sky again.