

Burn-and-pause vs. one long burn

By David Tanzer

A couple of months ago I gave a lesson to a student who is working toward his commercial certificate. He had trained with another instructor for his private license. One of the things I observed and commented on was his inflation technique. When it came time for the hot inflation, this pilot started burning and didn't stop until the balloon was standing upright. My instructor taught me to inflate with relatively short burns interspersed with pauses to allow the burner and area in and around the mouth to cool. I have used this technique for over 26 years, and I find that it works very well. The repair station operator I now use has told me that pilots who burn and pause during inflation damage their balloons far less than those who don't.

I suggested to my student that he might try using this technique in lieu of one continuous burn, and he replied that his original instructor had told him "...when you stand it up, do it assertively."

SUBSEQUENTLY, MY STUDENT e-mailed me to tell me that he used the "burn and pause" technique several times and that it worked beautifully. His note prompted me to make a query to the balloon listserver. I was interested in the inflation techniques that various pilots use and why they like them. I soon found that there were definitely two camps—those

who use the "Burn and Pause" technique, and those who hot inflate their balloons with one long burn. There were good arguments for both methods.

MOST "BURN AND PAUSE" proponents mentioned that burning intermittently allows time for the area in and around the mouth to cool. This is advantageous for many reasons—it allows the fabric to cool and, therefore, one is less likely to overheat the fabric at the base.

Last summer, on a warm day, I inflated my balloon normally. The wind was light and the inflation was easy and relaxed. However, once the balloon was standing upright I realized that I had melted some of the fabric in my (nylon) skirt. I was certain that my burner flame had not come close to the skirt, so I was perplexed.

Later my repair station operator asked if I inflate with the skirt bunched up or extended. My practice was to bunch it up using the two handling lines that are attached to the center of the "top" of the mouth. My repairman said that inflating with a bunched up skirt creates folds that can trap radiant heat from the burner resulting in fabric damage. His recommendation: inflate with the skirt fabric fully extended. In any event, I elected to replace my skirt with a scoop; now, I'd never go back to a skirt. The scoop does a much better job of pressurizing the balloon both during and after inflation. It

also stays tight during the beginning of the hot inflation.

Most "One Long Burn" proponents mentioned that the beginning of the hot inflation is when the balloon is most unstable, and inflating with a single long burn lessens that time period. Many of them said they ran their fans at full throttle until the mouth of the balloon was above the fan's airflow, cooling the air in and around the mouth. Regardless of their inflation technique preference, many pilots commented that it was important to allow the balloon to become fully cold-packed prior to beginning the hot inflation. That makes good sense—after all, what we are doing when we inflate a bal-



loon is pressurizing its interior, and beginning with a fully packed balloon makes that quite a bit easier. The old saying: "Well begun is half done," certainly applies here.

One pilot mentioned that it was important to run the fan at a speed sufficient to prevent the air in the balloon from flowing back out of the mouth during the hot inflation. Many balloonists reduce their fans to idle prior to hot inflation, and the weight of the fabric can cause the airflow to work against the burner flame.

SEVERAL PILOTS COMMENTED that "Burn and Pause" is easier on the crew at the mouth. One said that the pause allows the crew to adjust their position, which they are less likely to do while the burner is running. Another mentioned that she got her arm singed once by a careless pilot who inflated with one long burn without regard to the crew. I think it is important to have the crew handling the mouth wear a sweatshirt, particularly on warm days, to protect them from this sort of thing. Things get quite warm for those closest to the burner even when using the "Burn and Pause" method; some protection is important and necessary.

Another pilot commented that "Burn and Pause" allows the balloon to keep a better shape during the inflation because "...the heat does not all get rapidly forced to the top."

Two responses were from people who manufactured balloons. Both are very experienced with all facets of ballooning. One was a proponent for "One Long Burn," and the other favored "Burn and Pause." The one favoring "One Long Burn" cited reducing the unstable time period, but went on to say that this technique lessened the likelihood of damage due to burning grass and debris in the envelope. "If you do one long burn and then stop for a few seconds," he said, "the envelope stands up and the grass and debris falls out. You can then burn more to stabilize the envelope without igniting anything."

The other fellow said "If I had a packed balloon and was in a hurry to get it hot, I'd be inclined to waggle it around a bit to keep from developing a concentrated flow which would get the top skin hotter than needed. But taking your time with short bursts would do the same and be less hard on the balloon."

One "Burn and Pause" proponent said that his comments didn't apply to balloons larger than 105,000 cubic feet. Inflating a 250,000 cubic foot balloon takes a continuous burn on one burner with short blasts on a second. He quipped that the throat of such a balloon "is big enough to drive a Volkswagen through, so I don't think the fabric gets as warm as it might with the smaller systems." I don't have experience with balloons that large, but that makes perfect sense.

ONE LONG TIME PILOT commented that he has always used the "One Long Burn" technique in more than 1,800 inflations without ever burning fabric. Like many other "One Long Burn" proponents, his argument is to maintain maximum control of the balloon during its most unstable period. He said that he was always amazed observing "limp" balloons gyrating back and forth on the ground while his balloon was

standing straight up. He said that he thought many pilots were unsure or afraid of their own judgment with respect to keeping the balloon close to equilibrium prior to takeoff.

Another pilot said she varied her technique depending on the conditions of the day, using "Burn and Pause" on calm days, but on breezy days "... I don't mess around: I warn my crew that we're getting it up fast and hot and I lay on the burner." Her point: it is wise to adjust to one's environment.

Another commented, "I never, ever allow crew to be at the throat while I'm burning. Once the balloon is cold packed, the fan and the crown line keep the throat open." Another long time pilot said "...once the balloon is cold packed in calm conditions, why do you need anyone holding the throat?"

This certainly requires a balloon with a scoop. In addition to flying a 90,000 cubic foot balloon, I regularly fly a 31,000 cubic foot Cloudhopper, equipped with a scoop. I almost always inflate the Cloudhopper with a single crew person (my kind and patient wife), and she is usually holding one side of the mouth. On at least once occasion when it was a bit breezy, I had her hold the crown line and I inflated the balloon without anyone on the mouth. The envelope stayed open without difficulty, and the balloon stood right up. I've not tried that with my larger balloon, however, and I must admit that I find comfort in having a crew person on each side of the mouth during the hot inflation. I'll keep a close eye out in the future, though, because one or both of these crew people may, indeed, be unnecessary.

WHERE DOES ALL THIS LEAVE ME? I am still firmly in the "Burn and Pause" camp, but I have modified my inflation technique somewhat. I now take a bit of additional time to allow the balloon to become fully cold-packed prior to beginning the hot inflation. On some occasions, I used to begin the hot inflation before the balloon was fully packed, and often this created unnecessary difficulty. I also now leave my fan running a bit faster than I used to during the hot inflation. I always ran my fan well above idle during this time, but I now add a bit more throttle for "insurance." I don't know if it helps, but it certainly doesn't hurt.

Once again, an open and constructive discussion on a topic has proved to be interesting, educational, and beneficial to my flying technique.

About the author

David Tanzer practices his burn and pause technique in Vermont's beautiful Lake Champlain Valley. He began ballooning in 1978, and spent many years flying in northern California before moving to Vermont in 1997. He also enjoys exercising the privileges of his instrument-rated airplane rating.