



Fright

Flight

*Putting Zoom
in the Broom*

by Ken Reed

Late October, 7:15 p.m. local--beautiful full moon climbing into the sky just off the nose. You're on the downhill into KMAN, returning from an afternoon business meeting in Portland. A dark speck appears at your eleven o'clock, then suddenly blooms large in your windscreen. During the ensuing frantic evasive maneuver you catch a glimpse of fluttering black rags and streaming gray hair, followed seconds later by a harsh cackle and the gleeful announcement, "Score one for three-niner Hotel Alpha Golf!" sounding in your headset.

Aerial encounters like this one, while unsettling, are almost routine for GA pilots braving the evening skies of late autumn. Apart from fist-shaking and a few choice words, there's not a

lot to be done following such an incident, since the perpetrators are impossible to identify and don't answer to the FAA anyway. But the fear of crossing flight paths with these broomstick borne, black-clad females has kept many worthy pilots in the hangar during what are otherwise excellent flying conditions. That's unfortunate, because a short briefing on the subject would reveal how harmless these unusual flyers actually are. What's needed here is a little background on the origins and habits of these aerial interlopers, perhaps thereby rendering them somewhat less intimidating. They are, after all, simply aviators of a different stripe.

Schooled in the physics of aeronautics, pilots are often puzzled by the apparent magical nature of broom-borne flight. Although the phenomenon may appear to be the result of pure hocus-pocus, credit needs to be given to the creativity and "can-do" spirit of early pioneers in the field. It was long thought that historical records of the earliest "flying witches" had been lost to antiquity. However, recent discoveries reveal that enchantment-assisted flight originated in the British Isles with the ancient Druids, beginning in the sixteenth century B.C.¹ A look at the cultural climate and magical influences of that era is in order.

Spell-casting being in its infancy at the time, the few dabblers in magical flight had confined themselves to simple levitation, and that of small items only. Some success had been achieved with twigs, cooking utensils, sticks of kindling, etc. Using these articles, the experimenters had been able to establish a simple hover in ground effect. Little progress had been made beyond this point, since the mental energies of the Druids were largely occupied with fending off starvation. Food was always scarce, so sorcery tended to focus on techniques for conjuring up edibles, and the need for rapid long distance transport had not become a priority. Oxcart service was slow but reasonably reliable, although subject to occasional interruptions when the power source was eaten. Most travelers made their way around the countryside by foot when

necessary, but in general, people stuck pretty close to home, since one place was about as dismal as the next. Nonetheless, all agreed that it would be nice to arrange a midnight potion party and be reasonably certain that all the participants would arrive by midnight, of the same day.

As is so often the case, accident played a large role in the introduction of a new technology. Tradition holds that one Helga Haphwhite was the first to actually achieve sustained, supernaturally powered flight. Late for an astrological conference at Stonehenge, Helga hit upon the idea of flying herself to the meeting through the use of magic. Having just that afternoon levitated a sizable chunk of firewood in her kitchen, she theorized that she could levitate *herself* into the prevailing wind and it would carry her directly to her destination.

Unable to locate her usual wand amid the household clutter, Helga instead used a small tree branch to assist in the enchantment. She redirected her usual spell, making herself the object of levitation. To her amazement, she began rising slowly into the air. As the wind freshened and altered her heading to the intended direction, Helga clapped her hands in delight, instantly falling 200 feet into a peat bog. Today's flight instructors still refer to Helga's grim fate when they remind student pilots never to remove their hand from the stick on climb-out.

Helga's ill-fated foray into the atmosphere was not without beneficial results, in spite of the undesirable outcome of the experiment. Observers noted that long after Helga's precipitous return to terra firma, the tree branch she had used in her spell continued to rise slowly and drift downwind, eventually being lost to sight. The implications were not lost on Wilma and Opal Rhyte, two spinster sisters who lived just across the bog from Helga. They too, had been dallying with spells of levitation, but with nowhere near the



¹ Before Cessna

level of success evidenced by Helga in her final moment of glory.

Wilma and Opal had gotten into the habit of experimenting with levitation during their afternoon tea. They cast spells on the saucers, the teaspoons, the sugar bowl; but never got more than a quiver from any of the objects of their incantations. Helga's brief aerial sortie lent new energy to their efforts, although without any improvement in results. Then, during an argument while preparing dinner one evening, Opal pointed at Wilma (who was stirring the soup) and shrieked out her latest incantation. To their amazement, the wooden soup spoon in Wilma's hand jerked from her grasp and set a course for the ceiling, where it began bouncing around in the rafters. The runaway utensil dislodged a number of sleeping bats, one of which fell into the soup, the last of their food for that week. This initiated a frantic and noisy scramble to evict the furry intruder, until the girls realized the soup could do with a little meat and put the lid on the pot. In the silence that ensued, they contemplated the wooden spoon bumping about overhead.



It slowly dawned on Opal that the spell she had directed at Wilma was the same one she had used that afternoon on the teaspoon, to no effect. Struck by the idea that the *composition* of the enchanted object might be the secret, she cast her spell on a saltshaker, a plate, and finally a small stick on the fireplace hearth. The first two objects were unaffected, but the stick immediately lifted into the air and joined the wooden spoon above their heads. Unfortunately, this particular stick had been, up until then, actively participat-

ing in the fire, and ignited the thatched roof. The subsequent conflagration destroyed most of the Rhyte's erstwhile laboratory and delayed further research for several weeks.

Once the excitement had died down and the Rhyte sisters had moved into less flammable lodgings in a nearby cave, they set about isolating the key elements of magical levitation. They quickly determined that wooden objects were the most easily levitated, and the cave was soon filled with floating firewood. Negotiating the poorly lighted cave became increasingly hazardous, since the larger chunks of firewood seemed to have a lower "ceiling" than the slender pieces of kindling, and tended to hover at about head height. As the experiments progressed, Opal would amuse herself by shoving the low-floating firewood at Wilma when her back was turned. Finally fed up with the mischief, Wilma turned and launched a levitation spell at the chopping block on which Opal was sitting. The block rose into the air several feet before Opal, unfamiliar with CG limitations, overbalanced and tumbled to the floor. The unscheduled flight and hard landing touched off another altercation between the two researchers.

After dodging several pieces of mutually hurled firewood, the sisters agreed to a truce and threw themselves, quite literally, into the science of flight. Taking turns as test pilot, they sat, straddled, and stood on just about every wooden article in their possession. A small chair elevated nicely with a passenger, but seemed to have no control in pitch or roll. A wooden bench was more stable, but would hardly rise off the floor and was almost completely unresponsive to directional inputs. The wooden spoon provided plenty of lift and speed, but very little in the way of passenger comfort.

The next breakthrough in aerodynamics eluded the Rhyte sisters for days simply because they were such poor house, or in this case, cave-keepers. Frustrated after a long day of levitating herself and her sister, Wilma stepped outside to smoke, having just fallen in the fire again. She tripped over an article lying outside the cave entrance, left there because the untidy duo found little use for it. It was a broom.

Holding the broom in her hand, Wilma slowly realized that it embodied the best characteristics of the firewood that levitated most eagerly to the ceiling of the cave. The handle was long, thin, and smooth. The weight of the broom was low in relation to its overall length. Even the bristles were made from a woody type of straw, which should only enhance generated lift. And from an ergonomic standpoint, the point where the bristles were tied to the handle even provided a saddle of sorts.



Struggling to contain her excitement, Wilma rushed back into the cave and showed her discovery to Opal. Opal was quickly convinced that this could indeed be the design breakthrough they had been seeking. She immediately attempted to straddle the broom for takeoff. This naturally created another argument, which was only resolved when the sisters agreed to draw straws for the honor of first flight. Not surprisingly, their eagerness to draw the preferred straw pulled the broom's bundle apart, and the girls had to rebuild the empennage before continuing.

Not wishing to repeat the dire results of Helga's first flight, the Rhyte sisters decided to launch their first attempt in the controlled environment of the cave. Wilma, having drawn the short straw, boarded the broom and ran through the prelaunch checklist, which consisted mainly of crossing her fingers.

In an uncharacteristic display of generosity, Wilma asked Opal to cast the inaugural levitation spell. In an all too characteristic display of spite, Opal selected the most powerful incantation they had thus far discovered. The broom, with Wilma seated comfortably aboard, accelerated rapidly upward, terminating climb-out abruptly at the ceiling, which created a forced bailout on the part of the pilot.

Following the usual shrieking, throwing of

objects, and mutual accusations, the girls set about trying to recover their mount from the ceiling. In a rare moment of intellectual illumination, Opal hit upon the technique of simply reciting the levitation spell backward, which brought the broom smoothly back to earth. This happy inspiration proved to simplify future takeoff and landing checklists, since the pilot need only read the one backward to cover the other.

Over the next several hours, the girls took turns as test pilot, refining their spells and becoming accustomed to the flight controls. The broom was remarkably responsive to control inputs, and simply by leaning in the desired direction the girls were soon darting and zooming about the cave like the bats they awakened from their resting places. This capability was not all to the good, however. The sisters quickly learned that rotations around either horizontal axis were ill-advised, there being no system to ensure that the pilot remained with the craft during inverted flight. To this day brooms are placarded against most aerobatic maneuvers.

One simple accommodation made by the sisters to their testing environment was to remain a part of flying witch lore long after the reasons for its creation were forgotten. Having just banged her head on the ceiling for the umpteenth time during a test flight, Opal rummaged through her wardrobe for something to cushion the cranial contact points. She donned a tall, pointy hat, and discovered that, apart from softening the blows to her head, the tall hat acted as a sort of early warning system, brushing against the ceiling like a modern day curb feeler. The sisters immediately integrated the hat into their testing process, using its altitude alert capabilities to establish an operational ceiling. The hat was originally a lovely powder blue, but didn't remain that way for long after repeated scrapes against the smoke-blackened ceiling. Later observers of the Rhyte sisters would mistakenly assume that a tall, pointy, black hat was essential to broom-borne flight.



Feeling increasingly bound by the confines of their cave, and having established a fairly decent level of competence and confidence in their piloting skills, the Rhytes decided the time had come to move their testing outdoors. Using a malodorous swamp as their "Skunkworks," the sisters worked at nights in secret to refine their flight spells and piloting skills. Lack of instrument training, or indeed of any instruments, restricted flying to nights when the moon was bright and unobscured, which proved to be the flaw in their security protocol.

The moonlit silhouette of a woman on a flying broom wearing a tall, pointy hat (Opal couldn't get over her fear of bumping her head on something) is bound to attract attention. Although the apparition inspired a great deal of fear at first, it wasn't long before an astute observer recognized the distinctive profile created by Opal's long, crooked nose and tracked her back to the swamp. Hidden in the cattails, the unseen spy quickly learned the secrets to the sisters' aerial success, and rushed home to try the technique herself.



Once the secret was out, others were soon following in the Rhyte sisters' broomwash. And now that the technique of enchanted flight was in the hands of the public, the door was opened for a great many improvements to the art. Early on, most independent researchers directed their efforts at improving the levitation spell. Surprisingly, possibly due to the pure vindictiveness expressed in their efforts to bounce each other off the ceiling, the Rhyte sisters seemed to have arrived at the most effective levitation spell attainable. Alternate incantations were not nearly as powerful, and modifying the wording or order of the Rhyte's spell produced no improvement in the flight envelope.

Perhaps the only real success in this area was never repeated, for several reasons. First of all, the alternate incantation was performed by a

witch so inebriated on her homebrewed elderberry wine as to be all but incoherent. Furthermore, the spell she mumbled was, by some fluke, so powerful that she accelerated completely through the sound barrier. This was evidenced by the fact that her prolonged scream of terror did not arrive at her destination until several seconds after her landing. Finally, her supersonic passage through the atmosphere stripped all clothes and hair from her person, generating almost as much horror for onlookers as she experienced herself. Further research into the realm of supersonic flight was consequently unmotivated.

Experimenters instead turned their attention to redesigning the aircraft itself. Early on, broomcraft designers took the obvious road of installing more "engines" on the broom, these being additional bundles of bristles. Typical designs were the forked or T-tailed broomstick. Seemingly a straightforward modification, the designs never achieved any level of success. The "engines," invariably containing different numbers and sizes of straws, appeared to respond to the levitation charm with different levels of force, resulting in marked asymmetric thrust and uncontrollable yaw forces. Broomcraft development, then, centered fairly rapidly on a single engine design.



There were also the inevitable experiments in which wings were affixed to the broom, sometimes while still attached to the fowl enlisted for

the purpose. One innovative test pilot, dogsled style, harnessed a dozen wild geese to her broom and was treated to a lengthy southbound flight terminating in an unplanned water landing. Without floats her arrival was decidedly soggy, which at least served to launder out the “exhaust products” accumulated on her person while in the slipstream of her ill-chosen power source.

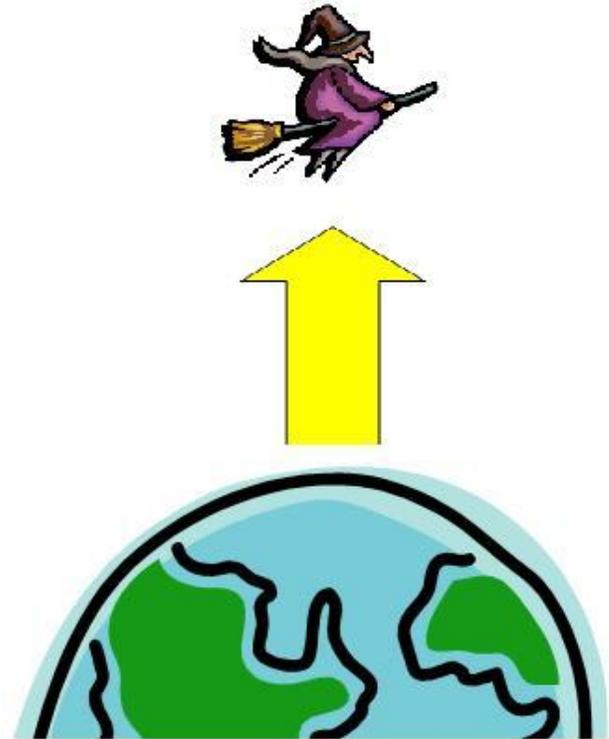
One of the only airframe modifications that endures to this day was actually added to the pilot, not the craft. During a cold snap when test pilots were bundled up against the chill, one astute witch found that she could open her cape to the airstream and substantially reduce her approach and landing speed. This had the happy benefit of allowing an arrival which was more graceful and dignified, to say nothing of being less painful, than those experienced by broomcraft not equipped with “flaps.” (Prior to this, a “three point landing” consisted of touching down on both feet followed by immediate and forceful contact of the pilot’s face with the landing surface.) Early adapters of the new braking system learned to deploy the flaps gradually, after several landing incidents in which sudden full deployment of the cape resulted in the immediate rearward departure of the pilot from the broom.

As research progressed and the number of witches pursuing magical flight increased, a strange dichotomy became apparent. Many aspiring broom pilots found themselves condemned to flight levels and speeds that would shame a dodo, even though using spells and brooms identical to those of other witches streaking by far overhead. As time went by it became apparent that there were distinct *physical* differences between the high flyers and the low floaters. Ironically, both groups were unwilling to admit to this difference; for the one group because it demeaned their abilities, and for the other because it maligned their appearance. So for several years the phenomenon went undocumented.

Finally the distinction was clearly identified and described in a seminar at the annual Fog ‘n Bog fly-in. There was no denying it: the best flyers were, to put it kindly, not beauty queens. In fact, if ugliness was altitude, and it certainly

seemed to be, then these broom jockeys needed oxygen just to look in a mirror.

There has never been an adequate scientific explanation for this principle, pithily encapsulated as, "The uglier the uplier!" However, many researchers believe that the earth itself is actually repelled by gross ugliness, and having the greater mass, tends to push the offending body away



from its surface with a force directly proportional to that person's degree of repulsiveness. In one demonstration of these forces at work, a wart on the nose was shown to improve rate of climb by 200 feet per minute.

To better hide their physical shortcomings, many of these “gifted” flyers took to flying in late evening hours or at night, as long as there was plenty of moonlight. Hiding your face in darkness was not, after all, worth the risk of flying into terrain, which happened all too often. Curiously, it was this type of mishap which contributed to the growing ranks of witches at the upper flight levels. As novices learned to control their unruly mounts, accidents, and their attendant disfiguring consequences, were bound to happen. Survivors of these accidents, once the injuries had healed enough to allow “getting back

on the horse,” often found that they were able to reach new heights and speeds.

The earliest occurrence of this unexpected improvement in the flight envelope was attributed to one Francis the Forgetful, a beautiful brunette whose broom riding had long loitered at treetop level. Mounting her broom for a hop to her mother's birthday party, Francis took off in her hallway and promptly ran into the front door, which she had neglected to open during preflight. The collision broke her nose and blackened both eyes. However, in spite of this delay, Francis made her climb to altitude in record time, and arrived at mother's in time for cake. Francis' performance improvement was long-term, too--cosmetic surgery not being what it is today.

Accidental discoveries of this sort are to be found throughout the early history of broomborne flight, and led to other innovations in the field. In one undocumented incident, a witch suffering from severe indigestion after a late night potion party found that she flew not only higher, but twice as fast. It appeared that Mother Earth could be repelled by more than just skin deep appearance, meaning that ugliness could go clear to the bone, or at least to the stomach contents. Thereafter, contributions from the culinary arm of the dark arts focused on concocting the



most repulsive brew it was possible to keep down once swallowed. These mixtures utilized as ingredients naturally repugnant creatures, or parts thereof. Eye of newt, wing of bat, tongue of eel; these constituents resulted in unmatched performance when used by a suitably repulsive pilot, and were most effective when taken straight from the bubbling pot.

Even physically attractive witches could use this technique to assist in getting aloft. But several tragic first flights proved that the performance enhancement was tied to extremely short flight endurance. For one burdened with unusual beauty, this could mean swallowing a dose of potion every few minutes. This necessitated flying an extremely tight pattern around the field. “Short final” meant, “If I don’t get down shortly this will be my final flight!”

This need for frequent dosing led some to try carrying the potion cauldron aloft, so additional doses could be taken while airborne. Historical credibility is generally not granted to the claim that this led to the modern day in-flight meal, even though most of today’s coach class passengers would confer considerable repulsive force on a small plastic tray of rubberized pasta.

Over time, the use of potions to facilitate flight faded out, at least for those not naturally gifted with ugliness. Accidents attributed to potion exhaustion were commonplace, with many novice flying careers terminating in small craters scattered across the landscape. This weeded out a great many witches who lacked the distinctive facial appearance necessary for proper lift. For those fortunate enough to survive these accidents, they often found they no longer needed to use the flight potion, since the accident and its accompanying disfigurement frequently endowed them with the repulsive force they had been seeking through artificial means.

After decades of this refining process, the best flyers naturally began to form an elitist core of devotees, their social lives restricted by their appearance. These individuals drifted into the role of flight instructor, their interaction with the rest of humanity limited to flying lessons given to aspiring younger witches. To these they parceled out miserly portions of their carefully

guarded knowledge, inculcating in their students the “Rhyte rites.”

Time marched on, and the excitement of discovery associated with those pioneering days of broomborne flight began to give way to tradition, even routine. Witches settled on a fairly standard design for the craft itself, almost unchanged from the Rhytes’ original broom. Variations of the levitation spells were limited to less than a dozen, and only a few recipes for flight potions survive to the present day. Even the “flight suit” worn aloft has changed little in more than a millennium, with modern day witches, for example, shunning fashionable Lycra speed suits in favor of black gowns, capes, and tall, pointy hats.

In fact, a witch transplanted forward to modern times from 1500 years ago would likely feel very comfortable at the controls of a modern flying broom, and would probably look just like any of the other witches clogging our airways during October. However, she would no doubt be delighted at the target-rich environment surrounding a modern airport, swooping and dive-bombing around the pattern to her heart’s content.

And this is exactly the type of behavior that uneducated pilots find so unnerving. On the other hand, students of aviation history who know the benign origins of the Rhytes’ legacy have the assurance that these “dames on brooms” are less dangerous than a flock of migrating ducks. There’s no need to hide in the hangar during these beautiful fall evenings, as long as pilots take a few simple precautions:

When checking the METARs for evening arrivals at your destination airport, look for the “HIP” notation in the report text, denoting “hags in pattern.” ATC and the ATIS may provide similar warnings during approach, but weak radar returns and the lack of transponders renders this type of target difficult to track accurately. Therefore, position warnings tend to be general, and it’s still up to the pilot to see and avoid. Enlist the aid of passengers whenever possible to watch for broomcraft; children are especially good at this, and are generally delighted with the opportunity to help in this way. Especially at

uncontrolled airports, be alert for callsigns that indicate a supernaturally powered craft. Callsigns ending in “Hotel Alpha Golf” and “Hotel Echo X-ray” are in common usage, along with the phonetic substitution of “Witch” for “Whiskey.” Using these steps with your checklists, along with adequate mental preparation before departing on evening flights in the fall, will minimize loss of control when aloft and confronted face-to-face with a face you’d rather forget.

So think not unkindly of these unusual aviation enthusiasts who share our autumn skies. When you find yourself the target of “broom-buzzing,” grin, wave, and rock your wings. The lady is up there for much the same reason as you; to enjoy the challenge and freedom of flight. And if there’s much traffic in the pattern, she’ll be thoroughly enjoying herself. She might stay aloft for hours, which would necessitate in-flight potion service. Unless, of course, she could rely solely on her facelift.

