

Room To Manoeuvre

by Bryan Quickmire

What's "aerobatics"?

The Canadian Air Regulations define aerobatics as "manoeuvres where a change in the attitude of an aircraft results in a bank angle greater than 60 degrees, an abnormal attitude, or an abnormal acceleration not incidental to normal flying".

Let's think about this for a moment. Is being upside-down abnormal? You'd certainly think so if you were on approach and were rolled inverted by wake turbulence from a 757. On the other hand, if you did loops and rolls every weekend, then being inverted wouldn't be abnormal at all. Au contraire, for you it would be quite normal!

For the general public, and a surprising number of pilots as well, the dry definition posed by Transport Canada doesn't define aerobatics at all. For them, it's defined by what they see in the movies and at airshows.

Action-packed flying sequences in modern movies usually involve a twisting low-level chase, punctuated by gunfire and terminated with an orange fireball. Airshow performances leave the crowd gasping with the derring-do of those magnificent men and women in their flying machines!

Because this is the only exposure most people have to non-straight-and-level flight, 'aerobatics' is often equated with 'stunt flying' and is assumed to take place in close proximity to the ground. This generates the perception that aerobatics is quite dangerous, which is reinforced by Transport's labeling it as abnormal!

Transport Canada views the world from a straight and level 'transportational' perspective. At the other end of the spectrum, the entertainment industry - movies, television and airshows - has a mission to thrill the viewer. Somewhere in between there exists a world of non-straight-and-level flight which is useful and enjoyable, without being unduly dangerous to the participant.

Let's take a quick tour of these realms of aerobatics!

Stunt Flying

In the movie *It's A Mad, Mad, Mad, Mad World* Frank Tallman flew a twin-engined Beech into a steel-framed billboard and through an open hangar, at 160 miles an hour. Now that's stunt flying! And since both feats were performed in straight and level flight, not even Transport Canada would consider them to be aerobatics.

Nowadays it is de rigeur for stunt scenes to include good guys, bad guys and pyrotechnics. Helicopters are flown through canyons, down city streets, even into tunnels - always to the standard explosive conclusion. At the current rate of attrition I predict that by mid-1999 helicopters will be placed on the endangered species list!

Needless to say, these scenes are not ad-libbed! Every minute detail is meticulously planned. Lots of secret tricks of the trade are employed. Then it's rehearse, rehearse, rehearse. Tallman flew through flimsy practice billboards several times a day for three weeks before he did the take shown in the movie. Craig Hosking has flown helicopters for literally dozens of movies and television programs.

Pilots who fly for the cameras are professionals who do it for a living, not hobbyists out to make some extra money this weekend. Needless to say, the reader is advised not to attempt these feats at home!

Airshows

Airshows are one of the most popular spectator events in Canada and the United States. Traffic jams miles long form as folks from far and wide arrive for the grand spectacle. The aerial performances range from the high speed passes of an F-18 and the big sweeping loops of a formation of Harvards to Sean Tucker's tumbling somersaults and Patty Wagstaff's knife edge spins.

All the flying is played to the audience. Since the audience is located on the ground, the flying of necessity takes place at very low altitude. This places the pilot in a merciless environment. To convert the great Waldo Pepper into the late Waldo Pepper doesn't require being a lot short on altitude. A little short will suffice!

Herein lies the major risk in flying aerobatics at airshows. Only a tiny percentage of airshow accidents involve mechanical failure or mid-air collisions. Most happen when a highly skilled pilot flies a perfectly serviceable airplane into the ground.

There is enormous pressure to be more exciting than the other acts - to recover closer to the grass, add an extra rotation to a spin or execute a figure not yet perfected. Simultaneously, the hot summer afternoons rob both aircraft and pilot of performance. Solo performers are particularly susceptible to these risks.

To ensure a long as well as illustrious career as an airshow performer takes much more than being a hot stick. It requires tremendous situational awareness and an intimate knowledge of the limits of the pilot/airplane duo. Most importantly of all it takes an inordinate amount of self-discipline - ego control - to stick to the script and leave some margin for error.

No, gentle reader, I suspect that you and I will watch more shows than we will perform!

Recreational Aerobatics

Does all this talk of leaving stunts and airshows to the pros imply that amateurs should avoid aerobatics? Not at all. There's immense pleasure to be had in cavorting in the sky!

The beginner starts with steep turns and wingovers to develop hand and foot coordination. Next come loops and rolls, which are themselves later integrated into combination figures such as the Immelman and Cuban Eight. Toss in a hammerhead and a spin and the novice has quickly built a rather versatile repertoire.

None of these figures generates high G forces. None requires vision-blurring rates of rotation. What about the tummy's tolerance for such gyrations? During training the flights start short and get longer only as the body becomes acclimatized.

What about the danger zone? The records show that structural failures in aerobatic airplanes are quite rare. As with airshows, the vast majority of accidents happen to airplanes operating perfectly well. A few of those involve pilots who spin in because they haven't had the proper training to recover from the inevitable botched manoeuvres.

The vast majority of aerobatic accidents occur when the ego overrides the brain and commands an impromptu display at low altitude for the dubious purpose of impressing bystanders. Such fatalities are trivially easy to avoid: simply measure altitude in thousands of feet, not hundreds of feet.

In recreational aerobatics there is no pressure to perform, no crowd to wow, no reason to be flying down low. You as the pilot in command make all the choices and need accept no more risk than you would on a cross-country flight.

Many state that doing aerobatics makes better pilots because it instills total control of the aircraft at all attitudes and speeds. True, but most partake for the simple reason that it's fun and satisfying.

The Hundred Dollar Hamburger

Only a few pilots will ever perform at an airshow, even fewer will do stunts for the movie cameras. For the great majority, recreational flying is a trip for the hundred dollar hamburger. If that burger starts to get stale, then aerobatics is an activity that costs about the same and is no more dangerous.

Yesterday I found myself smiling the smile. I was in the right seat of a Zlin, shepherding someone on an evaluation flight. Loops came after rolls, hammerheads after Cuban Eights, an Immelman after a spin. One figure followed another, chosen on the spur of the moment. All were simple manoeuvres - nothing hard-core, no big Gs.

We flew in a three-dimensional postcard. A ring of dazzling white sand separated the tropical blue hues of Georgian Bay from the fresh greens of the farms and forests of Huronia. The sky was perfectly transparent, dark blue at the zenith, light blue at the horizon, dotted with fluffy white CUs.

Sometimes the earth was below and the sky above. Sometimes the earth was above and the sky below. The globe moved from belly to canopy, from nose to tail.

I stole a glance at the pilot in the left seat. He had the smile too!