



WORDS CAPT DAVID JACOBSON

2008 is a significant year for the 'Jacobson Flare'. November marks the 21st anniversary of its first presentation in Canberra at the 1987 Australian Aviation Symposium, co-sponsored by the then Institution of Engineers, Australia (now Engineers Australia) and the Royal Aeronautical Society, along with an article published in the Aviation Safety Digest (ASD 134 Spring 1987).

Disclaimer: Information contained within this article is based on the research and personal views of Capt David Jacobson. Aircraft management and operation must be in accordance with Boeing and Airbus operating manuals. The Jacobson Flare is not Qantas Policy.

A long-overdue website www.jacobsonflare.com is now on-line. Files containing the original (enhanced) research paper, the CASA-produced 1997 Flight Safety Seminar presentation, a B737-specific presentation and ILS / VASI / PAPI / Visual aim point comparisons are available for free downloading.

The 'Flare' has received an early birthday present: I am both humbled and very proud to announce that Captains Chris Manning and Ken Ireland have approved a link from the Qantas Flight Operations intranet to mine, for reference by Company pilots. This represents a major step forward in terms of the acceptance of the 'Jacobson Flare' by the Company as a valid and valuable training tool, and I thank these gentlemen sincerely for their support.

While the first publication occurred in 1987, the story of the 'Flare' goes back much further, to early 1965. I trained at Moorabbin with Civil Flying School and soloed at seventeen years of age at the typically average total of about 10 hours. Even then I was dismayed with the standard of landing training, which still persists to this day with 'trial and error' techniques tracing back to the techniques of the Royal Flying Corps in 1915.

We've all been told over the years, by instructors and training manuals, WHAT to do to successfully land an aeroplane; but the HOW has been a bit more elusive. Initially, I was taught to pitch the aircraft to control airspeed and then use power to control the rate of descent. It made no sense to me, to use the secondary effects of controls to fly the approach (???)

Have you ever watched the movie "The Dam Busters"? I first saw it with my father upon its release in 1956, and the use of simple triangulation to solve the problems of low-flying at

60ft over water at night, together with a Y-shaped bombsight, captured the imagination of this then nine-year-old.

In 1965, at 18, this film became my inspiration. By then, thankfully, I had been taught to aim my eyes at an aim point by pitching the aircraft with the elevators, and controlling airspeed with power (as taught by the airlines, the RAAF and some enlightened flying schools). Then it clicked; my eye path to the aim point was a position line. A second position line, such as one over the nose of the aircraft to a point on the runway centre-line, short of the aim point, would surely provide a visual fix for the flare point. I didn't have much flight experience back then, certainly not enough to dream that my idea might actually work, let alone be universally adaptable to almost any aeroplane. My career followed the typical course through General Aviation as a flying instructor. In 1970, I was accepted by TAA to train as a F27 First Officer, and then flew DC9 and B727 aircraft before achieving command on the F27 in 1982.

1983 found me instructing again, on weekends, with the RAAF Point Cook Flying Club. It was an opportunity to put something back, and to re-discover my love of flying training in a special and historic environment. By 1986 I was a DC9 Training Captain, finding that my landing technique on the DC9 was much the same as on a variety of light aircraft at Point Cook, although obviously commencing at different flare heights. One day, while waiting for the rain to lift, a couple of RAAF instructors, a private pilot, student pilot and I were gathered around a white-board with steaming mugs of coffee, discussing landings. The 1965 flare-fix inspiration from "The Dam Busters" was re-kindled that day.

For the next two years I gave myself a harder time than anyone has done since. I couldn't believe that no one else had thought

of it. However, many industry experts were very encouraging, and insisted I should publish my findings. Apart from the "The Dam Busters", I had also been a young fan of "The story of Davy Crockett", and I recalled Walt Disney suggesting that Crockett's motto had been "Be sure you're right and then go ahead." So I did.

Triangles have had three sides for a very long time and we'd only ever used two of them. Moreover, apart from trying to judge the height of an invisible 'opposite' side of the triangle which, of course, varies for every type of aircraft, every error occurring on this vertical side compounds about 20 times down the runway. Landing accuracy and runway occupancy times suffer as a direct result.

In comparison, the 'adjacent' side (on the runway) is visible, and any errors occurring here are reduced to 1/20th in vertical terms. Flare point predictability, consistency, transportability (to other aircraft) and safety are only some of the benefits. It is tolerant of errors and actually self-compensates for runway slope, path angle and flap settings. Runway width is no longer a consideration, because the flare fix occurs longitudinally and the height illusions may therefore be discounted. It also diminishes 'lack of recency' issues. It is a visible VNAV path to touchdown.

The name came about because one cannot patent a training technique, or a formula. (Margaret Fulton may copyright a cookbook, but she cannot patent a cake recipe.) So I called it the 'Jacobson Flare', and this name and a logo are registered trademarks.

Over the years the most common statement made to me by others is "it has quantified what we've all probably been trying to do." I agree.

Some people believe that I developed a mathematically based theory which I have attempted to prove in practice. The truth is actually the converse: I observed landings and then attempted to explain. The maths were necessary to validate the technique, and to produce a couple of simple formulas to make the 'Jacobson Flare' predictable and useable on our 'next' aircraft. I haven't invented anything; just made a couple of connections. The old type of Nose-in Guidance Systems with a centre-line indicator plus a separate stop indicator to

the left, use the same kind of triangulation, only in a different plane.

I've used it for my own conversions from DC-9 to B733, to B734, to B738 and lately onto sailplanes at Mt Beauty Gliding Club, for my B737 trainees' conversions, and for every landing I've made on every type since 1986. Is every landing perfect? No, because we're not all human. IT works consistently well, but if we're not alert to the guidance cues, then we shouldn't expect a perfect result, any more than would be the case if we didn't follow the guidance cues of the Head-up Guidance System fitted to the B738. However, landing consistency is greatly improved and troubleshooting is very much simplified. As a matter of interest, the HGS is totally compatible with the 'Jacobson Flare'.

For too long, the landing has been regarded as an 'art'; I prefer to think of it as a skill. Ask your mates how they land. I suggest that you will get responses like the following clichés: "darned if I know", or "I just close my eyes and hope for the best" or "you just get the hang of it". It is attitudes like these that will eventually see the landing manoeuvre taken away from the pilot as a normal procedure, because the results are too inconsistent.

Industry acceptance has been steady. Since 1988, many Qantas cadets at Parafield and more recently at Moorabbin have learned to land using the 'Jacobson Flare' and they can easily apply the same principles to their 'big' aircraft. The Aviation Safety Foundation Australia awarded a Certificate of Air Safety in 1998, and it has been featured in various magazines including Flight International, Australian Flying, Flight Safety Australia and The Longreach Flyer. A number of flying schools use it as one of their most effective training tools.

I offer the website as a resource, for pilots at all levels. My contact details are included and I am always available to clarify any point of interest. Feedback is always appreciated.

In conclusion, I wish to acknowledge the tremendous support and encouragement offered to me by past and present Flight Operations Department Managers and from you, the pilots of Qantas.

