In this article I will discuss the techniques used to land the 737-800 aircraft.

The choice of landing approach is often influenced by considerations such as the specific criteria required for the approach, the desired level of automation, and the individual pilot's preference and technique. Regardless, the procedure used to actually land the aircraft is similar in all approach types.

The first part of the article discusses techniques used in the approach, descent and landing. This is followed by a short recap regarding situational awareness, which is critical in any approach and landing. At the end there is a downloadable step guide explaining the procedure to land the 737-800.

Discussing landing technique without addressing the approach is counter intuitive. As such, a generic style approach has been 'loosely' used to provide a frame of reference. Furthermore, in an effort to ensure clarity and provide sufficient context, certain information discussed in previous articles may have been reiterated. I purposely have not included or discussed detailed checklists.

I have attempted to include as much information as possible which, can have a tendency to make the subject appear complicated; it is not complicated. Carefully read the information and note that:

- There is a considerable variability in how the 737 is flown. Certainly there are wrong ways to do things, however, there is no single right way to do it; and,
- Airline policy often dictates how an approach is flown based on whether it is a Precision Approach or a Non Precision Approach.

Generally speaking, an approach can be segregated into three segments:

- The initial approach;
- The landing approach (descent phase); and,
- The final approach (landing phase).

Discussion

Initial Approach

Technically, the approach starts when entering the traffic pattern, terminal airspace or at the Initial Approach Fix (IAF), which is published on the approach chart. However, not all approaches have an IAF, and some require that the airplane be vectored to the final approach course by Air Traffic Control. Even if there is an IAF, ATC may still decide to vector a plane to the final approach course to make more efficient use of airspace.

Prior to reaching the IAF, or receiving vectors to final, the flight crew should have prepared the aircraft for approach, briefed the crew, and begun to slow the aircraft. Workload increases considerably during the descent; therefore, it is sensible to complete whatever can be completed prior to the descent point. Descent planning and preparation is usually completed before the initial approach segment begins, which is approximately 25 miles from the runway.

<u>Important Points:</u>

- Approach planning should be completed prior to the descent point.
- In general, unless indicated otherwise, a flight crew will want the aircraft at approximately 3000 ft AGL no less than 10 NM from the runway.

Landing Approach

When reaching the IAF or descent point (*for brevity, I will refer to the descent point as the IAF for the remainder of this article*), the aircraft will in all probability be controlled by the autopilot with guidance being controlled by LNAV and VNAV (or another pitch/roll mode).

Depending on the type of approach chosen, the aircraft will be transitioning from level flight to either a step-down approach (SDA) or a continuous descent approach (CDA). Step-down approaches are rarely used today; continuous descent approaches are more the norm. A CDA, unless otherwise stated on the approach chart, uses a 3 degree glide path.

If you examine the two approach charts (click to enlarge) you will note that the VOR 06 approach shows the descent point at HERAI at 1455 ft AGL. The point is marked by a Maltese Cross and is also shown as the FAF (Final Approach Fix) in the distance legend. Also note that both a step down and a continuous approach is displayed on the chart. In the second chart (ILS 06) the descent point is shown as a LOC (localizer) at 1964 ft AGL and the FAF is noted in the distance legend. Note the chart is also annotated IF (Initial Fix). Different charts will display different annotations.

The reason for showing these two charts, is to demonstrate that the descent point and distance from the runway to begin the descent, will change depending upon the approach type selected from the FMC (assuming an approach from the FMC is used).

***'Loose'* Recommendation**

As I have already mentioned, there are multiple ways to approach and land the 737; ask several pilots and each opinion will be slightly different. Generally speaking, without alternate guidance from Air Traffic Control or an approach chart, the following recommendations should be adhered to. The aircraft should begin descent to the runway at:

- Approximately 10 NM from the runway;
- At approximately 3000 ft AFE;
- Have flaps 1 extended; and,
- Be flying at as airspeed no greater than 200 kias.

If the aircraft is following the ILS approach course, it is better to intercept the ILS glideslope slightly from below rather than above. Intercepting the glideslope from below enables greater control of airspeed.

Speed Management

Speed management is probably the most critical factor during any approach. A common saying *is 'you have to slow down to get down'*. This said, it is a bit of a conundrum. The airline wants its pilots to optimise the aircraft's airspeed for as long as possible, because this means less fuel use, less noise, and lower engine operation times.

Slowing the 737-800 aircraft is not easy when the aircraft is descending, so it is a good idea to begin to reduce the airspeed when the aircraft is in level flight prior to beginning the descent. The thrust levers should be brought to idle (idle thrust or near to) and the airspeed allowed to decay to the flaps UP manoeuvring speed. The flaps UP indication is displayed on the speed tape in the PFD. If speed reduction is initiated before reaching the IAF, the airspeed will decay naturally without use of the speedbrake.

Important Points:

- It requires approximately 25 seconds and 2 NM to decelerate the 737-800 from 280 kias to 250 kias, and it will take a little longer decelerating from 250 kias to 210 kias. More simply written, it takes approximately 1 NM to decrease airspeed by 10 kias in level flight.
- The aircraft should begin slowing at 15 NM from the airport to be at 10 NM at 3000 ft AFE at a speed of approximately 190-200 kias with flaps 1 extended.

Speedbrake and Flaps Use

The transition from level flight to descent will be much easier, with less need to use the speedbrake, if the aircraft is already at a lower airspeed prior to the descent. If the speedbrake must be used, try to *minimise* its use at and beyond flaps 5. With flaps 15 extended the speedbrake should be retracted. The speedbrake should not be used below 1000 ft AGL.

Although the speedbrake is designed to slow the aircraft, its use causes increased inside cabin buffeting and noise, decreases fuel efficiency, and can lead to unnecessary spooling of the engines; these factors are exacerbated if the aircraft is descending and travelling at a slower speed. If the speedbrake is to be used during the descent, lower the speedbrake (clean configuration) before adding thrust, otherwise thrust settings will need to be adjusted.

It must be stressed that using the flaps to slow down by creating more drag is not good technique and is frowned upon. Additionally, continual use of the flaps to slow an aircraft can cause damage to the flaps mechanism over a period of time - adhere to the flaps extension schedule (discussed shortly).

If the aircraft's speed is too high and the approach is too fast, lowering the landing gear early is an excellent way to slow the aircraft, but bear in mind that this will also increase drag, generate noise, and increase fuel consumption. This should only be done as a last resort.

Important Points:

- Whenever the speedbrake is used, the pilot flying should keep his hand on the speedbrake lever. This helps to prevent inadvertently leaving the speedbrake lever extended.
- Flaps, in principle, are not designed to slow the aircraft; the aircraft's pitch, thrust, and the use of the speedbrake do this.

Flaps Extension Schedule

All to often novice virtual flyers do not adhere to the flaps extension schedule. Extending the flaps at the incorrect airspeed can cause high aircraft attitudes, unnecessary spooling of engines, excessive noise, and increased fuel consumption which can lead to an unstable approach. If the flaps are extended at the correct airspeed, the transition will be relatively smooth with minimal engine spooling.

The correct method to extend the flaps is to extend the next flaps increment when the airspeed passes through the previous flaps increment. For example, when the airspeed passes through the flaps 1 indication, displayed on the speed tape in the PFD, select flaps 2.

The 737 has 8 flap positions excluding flaps UP. It is not necessary to use all of them. Flight crews will often miss flaps 2 going from flaps 1 to flaps 5. Similarly, flaps 10 may not be extended going from flaps 5 directly to flaps 15 and flaps 25 maybe jumped over selecting flaps 30. Flaps 30 in the norm for most landings with flaps 40 being reserved for short-field landings or when there is minimum landing distance. In the case of using flaps 40, flaps 25 is normally extended.

My preference is to *use* flaps 25 as it makes the approach a little more stable, especially if the flaps have been extended some distance from the runway. However, if you are conducting a delayed flaps approach, selecting flaps 25 may not give you enough time to extend flaps 30 or 40 and complete the landing checklist before transitioning below ~ 1500 feet AGL.

Flaps 40

The use of flaps 40 should not be underestimated, as aircraft roll out is significantly reduced and better visibility is afforded over the nose of the aircraft (because of a lower nose-up attitude). Because the landing point is more visible, some flight crews regularly use flaps 40 in low visibility approaches (CAT II & III). If the aircraft's weight is high, the runway is wet, or there is a tailwind, flaps 40 is beneficial. A drawback to using flaps 40, however, is the very slow airspeed (less manoeuvrability) and higher thrust required. For this reason, if there are gusting winds it is better to use flaps 30.

Advantages

- Less roll out;
- Better visibility over the nose of the aircraft due to lower nose-up attitude;
- Less wear and tear to brakes as the brakes are generating less heat (faster turn around times);
- Less chance of a tail strike because of slightly lower nose-up attitude during flare;
- More latent energy available for reverse thrust (see note); and,
- Helpful when there is a tailwind, runway is wet, or aircraft weight is high.

Disadvantages

- Increased fuel consumption (negligible unless flaps 40 are extended some distance from runway);
- Increased drag equating to increased noise (flaps 40 generates ~10% additional thrust); and,
- Less manoeuvring ability.

NOTE: When the aircraft has flaps 40 extended, the drag is greater requiring a higher %N1 to maintain airspeed. This higher N1 takes longer to spool down when the thrust levers are brought to idle during the flare; this enables more energy to be initially transferred to reverse thrust. Therefore, during a flaps 40 landing more energy is available to be directed to reverse thrust, as opposed to a flaps 30 landing.

Important Point:

- Correct management of the flaps is selecting the next lower speed as the additional drag of the flaps begins to take effect.

Manoeuvring Margin

The manoeuvring margin refers to the airspeed safety envelope in which the aircraft can be easily manoeuvred. This is pertinent during descent, as when the aircraft slows down its ability to manoeuvre is less than optimal. An adequate margin of safety exists when the airspeed is at, or slightly above the speed required with the flaps extended. This is displayed in the speed tape in the PFD.

Pitch and Power Settings (*Fly By The Numbers)*

Whenever the aircraft is flown by hand (manual flight), pitch and power settings become important. A common method used by experienced pilots is to *fly by the numbers*.

The term *fly by the numbers* is when the pilot positions the thrust levers commensurate to a desired %N1. The %N1 is based on aircraft weight and is displayed in the EICAS. If the figures are not available, a reasonable baseline %N1 to begin with is around 55%N1. Aircraft with heavier weights will require higher thrust settings while lower thrust settings will be needed for lighter weights. The thrust setting is arbitrary and %N1 will need be fine-tuned with small adjustments.

Once the thrust has been set, always allow the thrust to stabilise for a few seconds and ensure that both thrust levers display an identical %N1. If you fail to do this, and the thrust settings are slightly offset (despite the thrust levers being beside each other) the aircraft will turn in the direction of least thrust (asymmetric thrust).

Important Point:

- The %N1 is a baseline figure, the correct %N1 will depend on the weight of the aircraft and any wind component.

It is almost miraculous that once the correct thrust has been set, the others numbers that relate to airspeed and rate of descent fall into place, and the aircraft will only require small incremental adjustments to maintain a 3 degree glide path.

Recommendation:

- In order to gauge how the aircraft reacts during an approach, fly several automated approaches (the easiest to fly is the ILS Approach). Observe the thrust settings (%N1) as you extend the flaps and lower the landing gear. Note the numbers for the particular weight of the aircraft.

Reaching the Descent Point

If the aircraft's airspeed has been managed appropriately, initiating the descent at the IAF is relatively straightforward. During descent the aircraft should:

- Have the thrust levers set to idle thrust (or near to);
- Have an attitude of approximately 5 degrees nose-up;
- Maintain a constant rate of descent (sink rate) between ~600-800 ft/min;
- Be on a constant 3 degree glide path; and,
- Not have a descent rates greater than 1000 ft/min.

If you are uncertain to the glide path being flown, refer to the Flight Path Vector (FPV) in the PFD.

During the initial descent phase:

- Speed is controlled by pitch; and,
- Rate of descent is controlled by thrust.

As you transition to the final approach phase, this changes and:

- Speed is controlled by thrust; and,
- Rate of descent is controlled by pitch.

The above dot points confuse many virtual flyers and trainees alike. Rather than attempting to visualise this in your mind, use a small model airplane and position the model in a particular flight phase with the correct attitude. After a while it will make sense and become second nature.

Descent

Plan to be at, or just before the descent point at flaps UP or flaps 1 manoeuvring speed. If concerned that the airspeed is too fast, slow the aircraft to a speed that corresponds to the flaps 1 or flaps 2 indications displayed on the speed tape. The airspeed will usually fall between 210-190 kias.

After initiating the descent in idle thrust and with the aircraft's attitude set to approximately 5 degrees nose-up, the aircraft's airspeed will slowly decay. As the aircraft slows, match the airspeed to the flap indications on the speed tape. The maximum airspeed during the descent should not exceed Vref +20 or the landing placard speed minus 5 knots – whichever is lower *(Boeing FCTM, 2023).*

Vref +20 is indicated by the white carrot on the speed tape. The white carrot will be displayed when Vref is selected in the CDU.

Lowering the Landing Gear (General Rule)

A *rule of thumb* used by many flight crews in favourable weather conditions is to lower the landing gear and select flaps 15 at ~7 NM from the runway threshold. At this distance, the aircraft's altitude is ~2500-2000 ft AGL, and then, prior to reaching 1500 ft AGL, select landing flaps (25, 30 and/or 40). This enables ample time to ensure that the aircraft is stabilised, and to complete the landing tasks and landing checklist.

As an aid, flight crews typically will place a ring at the distance that the landing gear is to be lowered. This is displayed on the Navigation Display. The ring, created in the CDU, provides a visual reference as to when to lower the landing gear. A ring is also often added at the IAF.

Delayed Flaps Approach

Some airlines and pilots use less conservative distances, thereby minimising the time that the aircraft is flying with the landing gear lowered and flaps extended. A delayed flaps approach or minimum noise approach, will usually have the landing gear lowered and flaps 15 extended at 4 NM from the runway. Landing flaps will then be extended very soon after.

Caution - Delayed Flaps Landing

While lowering the landing gear and extending the landing flaps close to the runway threshold has positive benefits to the airline, and does limit the noise generated, it is not without its problems. Potential problems are:

- If there is a landing gear or flaps failure, the aircraft is very close to the ground;
- The landing checklist must be done quickly when concentration may be needed elsewhere (landing);
- If the aircraft's airspeed is too high, slowing down is difficult at this late time; and,
- If windshear or other weather related events occur the aircraft is very close to the ground with minimal room to escape.

When the landing gear is lowered and the landing flaps are extended, the aerodynamics of the aircraft are significantly changed. The pilot must be prepared to adjust the flight controls (pitch and thrust) to maintain control; this is especially so when hand-flying the aircraft. Being in close proximity to the ground at this stage can amplify the risk of a ground strike should the pilot have difficulty adapting to the altered aerodynamics.

Lowering the landing gear and extending the flaps, at a distance of 7-5 nautical miles from the runway, provides additional time and a crucial safety buffer for the pilot to acclimate to the new aerodynamic conditions.

Important Points:

- The 737-800 is renown for being *slippery* and difficult to slow down, which is why it is recommended to slow the aircraft prior to the IAF.
- A Rule of Thumb often used is: It takes approximately 3 NM to loose 1000 ft of altitude (assuming flaps UP manoeuvring speed).
- A delayed flaps landing should be attempted only in optimal weather conditions.

If you slow the aircraft prior to reaching the IAF, maintain the correct thrust settings to aircraft weight, and extend the flaps at their correct speeds, the approach will usually be within acceptable limits. You will also not have to use the speedbrake.

Stabilised Approach

During the final approach the aircraft must be stabilised; if the approach becomes unstable and the aircraft descends below 1000 feet AFE in IMC, or 500 feet AFE in VMC, an immediate go around must be initiated.

An approach is considered stable when the following parameters are *not* exceeded:

- The aircraft is on the correct flight path;
- Only small changes in heading and path are needed to maintain the correct flight path;
- The power settings for the engines are appropriate to the aircraft's configuration;
- The aircraft's airspeed is no more than Vref +20 kias and not less than Vref (plus wind component); and,
- The descent rate of the aircraft is no greater than 1000 ft/min (no special briefing).

Stability during an approach is made considerably easier if the aircraft:

- Is travelling at the correct airspeed;
- Is trimmed correctly for neutral stick.
- The flaps are extended at the correct flaps/speed ratio;
- The attitude (pitch) is correct; and,
- The thrust settings are commensurate with the desired airspeed and rate of descent.

Final Approach

The final approach, flare and touchdown occurs very quickly.

At 500 ft AGL, the pilot should begin to include the outside environment in their scan. This adjustment allows for better situational awareness and helps in preparing for a smooth landing.

As the aircraft descends further to 200 ft AGL, the approach becomes predominantly visual. During this phase, the pilot relies heavily on external visual references to maintain proper alignment of the aircraft (runway cues, approach lighting, and other visual references).

Select a part of the runway where you want to the land (use the runway aiming markers) and adjust the attitude of the aircraft so that it is aimed at this location. For guidance, the runway centerline should be running between your legs.

As the aircraft flies over the runway threshold (piano keys) and when you hear the *fifty* call-out, adjust your viewpoint from the aiming point to approximately 3/4s down the runway. I find looking at the end of the runway works well, as I can see the horizon which aids in determining if the wings are level and in determining the sink rate.

Flare and Touchdown

The flare is a term used to describe the raising of the aircraft's nose, by approximately 2-3 degrees nose-up, to slow the aircraft to a speed suitable for landing (Vref).

The aircraft should pass over the threshold of the runway (piano keys) at ~50 ft RA. Then at ~15 ft RA the flare is instigated by raising of the aircraft's nose to an angle of ~2-5 degrees nose-up. This attitude is maintained (held with minimal adjustments) with constant back pressure on the control column, and no trim inputs, until the main landing gear makes contact with the runway (touchdown). At the same time the thrust levers are slowly and smoothly retarded to idle, and if done correctly, the landing gear will touchdown as the thrust levers reach idle.

The reason the thrust levers are retarded slowly is to help prevent any unwanted nose-down pitch that naturally occurs when thrust is reduced. If the thrust is cut suddenly, the nose of the aircraft has a tendency to drop.

The duration of the flare ranges from 4-8 seconds and the flare distance, the distance that the aircraft has travelled beyond the runway threshold, is between of ~1000-2000 feet. The difference in the duration of the flare is dependent upon the aircraft's airspeed when it crosses the runway threshold.

A common mnemonic to remember during the flare is Check/Close/Hold. Check the attitude, close the thrust levers, and hold the attitude position.

Important Point:

- Pilots during the flare and landing are more concerned with the attitude (pitch) of the aircraft than the descent rate. If the attitude is correct, the descent rate will be within acceptable bounds.

Call-outs

Immediately prior to and during the flare it is important to carefully listen to the radio altitude call-outs; the speed at which these occur indicate the rate of descent. When the *twenty* call-out out is heard the flare should begin, as there will be a delay between hearing the call-out out and applying the required control input to initiate the flare (which will be at 15 ft RA). If the flare is delayed until after the *twenty* call-out out there is a strong possibly that the landing will have too high a descent rate.

Important Points:

- The flare can make or break a good landing. It is important to have a thorough understanding of the concept.
- Do not trim the aircraft when below 500 ft RA.
- Remember, the pilot flying controls the aircraft. The aircraft does not control the pilot.

Flare Problems

A successful flare to land involves several tasks that are done almost simultaneously. If the final approach has not gone according to plan, or the pilot is not vigilant, two problems that can occur are:

1. If the flare attitude is too steep, or the thrust not at idle, the aircraft may go into ground effect and begin to float down the runway. Floating is to be avoided at all costs; the aircraft should be flown onto the runway.
2. If the height that the flare is instigated is misjudged (too high) the flare distance will be prolonged leading to a possible tail strike. If on the other hand the flare is begun too low, the rate of descent will be high causing a very firm landing with possible damage to the landing gear.

In situations such as this, a go around should be carried out.

Interestingly, during the flare there is a natural tendency to pull back on the control column further than necessary. This can be quite common with new pilots (at least initially). Bear in mind this can easily occur and be vigilant so it does not occur.

Some pilots prolong the duration of the flare, or minimise the flare attitude in an attempt to *slide* the aircraft onto the runway with an almost zero descent rate *(often called a greaser, slider* or *kiss*). Whilst ego-inspiring, attempting to do this should be avoided.

Important Points:

- An aircraft in ground effect is difficult to land, because the air pressure keeps the aircraft airborne. Eventually, the airspeed will decay to a point where the effect ceases, resulting in a heavier than normal landing. Additionally, ground effect causes the aircraft to consume more runway length than usual.
- Do not prolong the flare in the hope of a zero descent rate touchdown (*slider*) A *slider* style touchdown is not the criteria for a safe landing.
- Do not prolong the flare, trim, or hold the nose wheel off the runway after landing (for example, trying to slow the aircraft because of a higher than normal airspeed), as this may lead to a tail strike.

Landing Descent Rate

A landing (touchdown) occurs when the main landing gear makes contact with the runway (not the nose wheel). Ideally, a descent rate between ~ 60-200 ft/min is desired for passenger comfort. This said, Boeing aircraft can tolerate reasonably high descent rates in the order of 600 ft/min.

Speaking with line pilots regarding what constitutes a hard landing will garner innumerable responses, but most agree that a hard landing is in excess of 250 ft/min.

Interestingly, a *slider* style landing can be detrimental to the landing gear by causing the wheels to shimmy, leading to increased wheel maintenance. This is because the landing gear is designed to land on the runway with a certain amount of inertia. Also, a *slider* style landing in wet conditions can lead to aircraft skidding. In wet and icy conditions, it is desirable to have a firm landing to aid in tyre adhesion to the runway.

If the aircraft is travelling at the correct airspeed, has the correct attitude, and the thrust levers are reduced to idle at the correct time, the aircraft will land at a reasonable descent rate.

Things to Consider (situational awareness)

During the approach and landing phase of flight, maintaining situational awareness is crucial. Pilots must be fully aware of the aircraft's altitude, and position in relation to the runway, terrain, and other aircraft in the vicinity. This level of awareness, often referred to as situational or positional awareness, is essential for safe and efficient landing operations.

Important Point:

- It is important to take advantage of electronic aids to assist in situational awareness.

The following (at a minimum) is recommended to increase situational awareness:

- Create distance rings from the runway threshold. For example, a ring at 10 miles and a ring a 7 miles (CDU);
- Select an appropriate approach type from the FMC (ILS, RNAV, VOR, IAN, etc);
- Set the Navigation Display (ND) to Map mode;
- Turn on the various navigation display aids for the ND (waypoints, station, airports, range rings, etc) by selecting them on the EFIS;
- Select the Vertical Situation Display (VSD);
- Display the Flight Path Vector (FPV) on the PFD by pressing FPV on the EFIS;
- Display range rings by pressing the EFIS knob;
- Turn on TCAS on the by pressing the TFC button on the EFIS; and,
- Set the EFIS to terrain.

Another aid frequently forgotten about is the Vertical Bearing Indicator (VBI). The VBI is an ideal way to determine the correct rate of descent to a known point. The VBI can be accessed from the descent page in the CDU.

Depending on the approach type selected from the FMC, the PFD will display critical information relevant to the chosen approach. The pilot can either use automation to fly the approach, or if hand flying follow the pitch and roll guidance markers. The Navigation Display (ND) in MAP mode, displays a clear overview of the aircraft's lateral and vertical position in relation to the designated navigation aids.

The information that is available is impressive, but sometimes too much information is not a good thing; a cluttered display can cause confusion and a time delay understanding the data displayed. Nearly all flight crews use the Captain and First Officer ND to display different snippets of information depending upon who is flying the aircraft and how they want to view the information.

Additional information: Approach Tools.

Control Column Movements - how much is too much

It is evident from various discussions on forums, that a number of virtual pilots do not understand how much movement of the control column is considered normal. This is exacerbated by U-Tube videos of pilots aggressively moving the yoke in real aircraft at low altitudes. Often this leads to these individuals re-calibrating their controls in flight simulator to mimic what they have seen various videos.

Understandably, many virtual pilots have not piloted a real 737; many have flown light aircraft, however, the control movements in a light aircraft such as Cessna are completely different to those in the 737.

First, many of the U-Tube videos do not provide any input to what the crosswind and gust component was during the landings in question. In windy conditions, control movements (that also include the rudder) may require a more heavy handed approach, however, without this information gauging technique is impossible.

Second, there are three types of individuals: those that at excel their chosen profession, those that get by, and those that should not be in the profession at all. Which type of individual is flying the aircraft in the U-Tube videos ? If an approach is moderately unstable, and the aircraft is piloted by a below average pilot, then they may be moving the control column erratically as they try to bring the aircraft back onto station.

Many of the U-Tube videos are uploaded to generate clicks - not to teach correct technique, and erratically moving the control column may, in their mind, instil excitement that the approach is difficult but manageable. In other words, excitement brings clicks… I have not even touched upon the *'look at what I can do'* philosophy.

Moving the control column when flying the 737 should be done smoothly, and during the approach the movements should be relatively minor with incremental adjustments to pitch and roll. The more aggressive the movement, the more the aircraft will alter its position, requiring yet further adjustment to bring the aircraft back into line (*yo-yo effect*).

If you are needing to make large movements of the control column to keep the aircraft on course (minimal crosswind), then there is a strong possibility that the calibration of the control column is not correct, or the control column has not been correctly calibrated in Windows.

