

THE NORTH APPROACH

TECHNICAL SUPPLEMENT TO:

9/11: THE NORTH FLIGHT PATH

AERODYNAMICALLY POSSIBLE – WITNESS COMPATIBLE

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(rev 1.0)

This technical paper is a supplement to the video presentation “The North Flight Path: Aerodynamically Possible – Witness Compatible” and will serve to prove that a North Approach over the Naval Annex and north of the Citgo gas station is aerodynamically possible and consistent with witness statements. The analysis is based on USGS survey of the Arlington area using scale modeling of buildings, obstacles, elevation and overall witness statements who independently corroborate placement of an aircraft opposite the physical damage observed at the Pentagon on the 11th of September 2001.

More than one flight path will be evaluated to show best and worst case scenarios taking witness statements into consideration.

Considerations for Calculations;

- Aircraft type is unknown
- Stall Speed impossible to determine as outlined in the film.
- “Bank Angle” analysis based on level flight.
- “Pull Out” analysis based on Bank Angle and vertical acceleration required in the vertical plane to clear all obstacles and be consistent with witness statements.
- Speed: Flight Data Recorder (FDR) information not available for airborne vehicle witnessed on North Approach. Exact speed is impossible to determine based on witness statements. Several speeds are offered in this analysis including that of the Flight Data Recorder information plotted by the NTSB for this segment of flight in which many parameters conflict with a Pentagon “Impact”. When using FDR information as plotted by the NTSB it would be technically inaccurate to focus on one parameter and ignore the rest for such a segment. Therefore, the reader must also understand FDR altitude as plotted by the NTSB for this segment has to be taken into consideration which shows too high to hit the Pentagon. With that said, we will still demonstrate how even the highest and final FDR speed plotted by the NTSB at less than 1 second west of the pentagon wall, is still aerodynamically possible for the North Approach based on bank and G loading for conventional aircraft, as witnessed. All other speed data as plotted by the NTSB for this segment will lower aerodynamic requirements than those demonstrated in this paper utilizing final FDR speed.

* See “Pandora’s Black Box – Chapter Two – Flight Of American 77”

“Banking Turn”

Four reference paths/radii were used in the video presentation and are shown in the table below. We are calculating multiple paths due to the fact witnesses cannot be accurate down to the foot as demonstrated in the presentation.

Bank Angle in Degrees

Radius ¹ (ft)	12,748	19,406	59,533	11,010
Velocity (kts)	Bank Angle	Bank Angle	Bank Angle	Bank Angle
460	55.85	44.08	17.52	59.63
300	32.09	22.39	7.65	35.98
250	23.53	15.96	5.33	26.75
200	15.57	10.37	3.41	17.88

¹ All radii aerodynamically possible

Green – Aerodynamically possible, Witness Compatible

Red – Aerodynamically possible, Witness Incompatible (bank too steep/shallow).

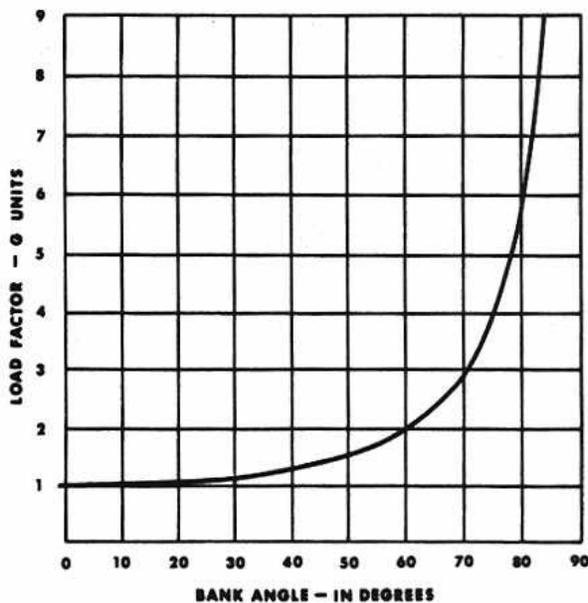
16 of 16 data points Aerodynamically possible.

10 out of 16 data points demonstrate Aerodynamically possible **and** witness compatible.

4 out of 16 data points demonstrate Witness Incompatible due to bank too shallow.

2 out of 16 data points demonstrate Witness Incompatible due to bank too steep.

Chart for Determining G Load Based on Bank Angle



Same for all aircraft type(s)

Units: 1G = 32.2 f/s²

FIGURE 26.—Load factor chart.

All corresponding G loads are less than 2 G. Less G load for given bank will cause descent, more G load will cause climb.

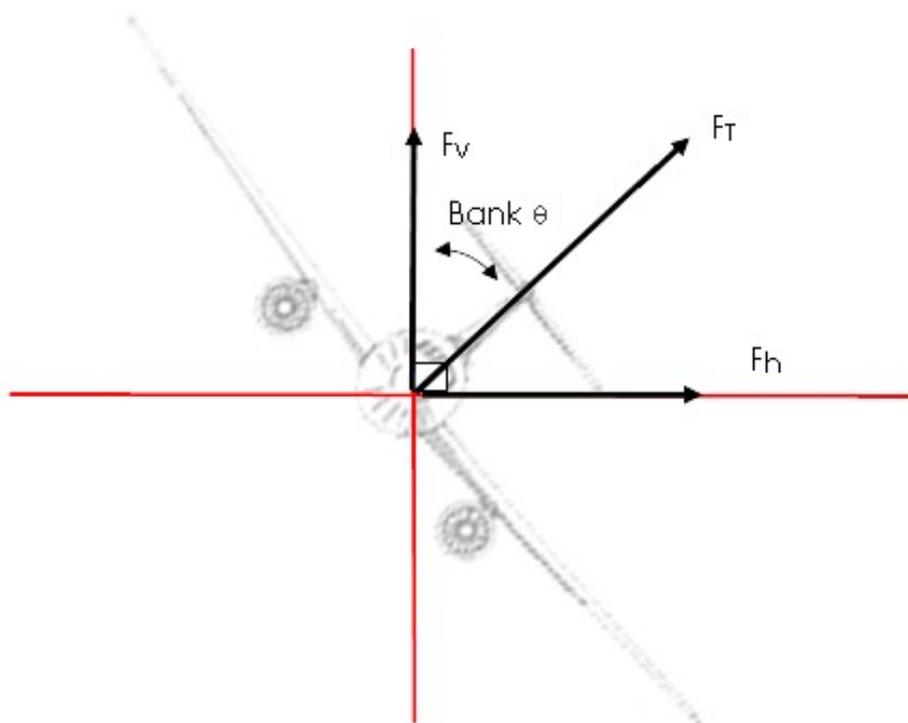
If one would like to understand how the above chart is derived, one can determine load factor based on Bank Angle using simple vector analysis.

θ = Bank Angle

F_v = Vertical Component of F_T (1G For level turn)

F_h = Horizontal Component of F_T (cause of turn)

F_T = Total G load (n) acting in direction of aircraft vertical axis



To solve for F_T :

$$\cos(\theta) = F_v / F_T$$

$$F_T = F_v / \cos(\theta)$$

$F_v = 1G$ for level turn

Example:

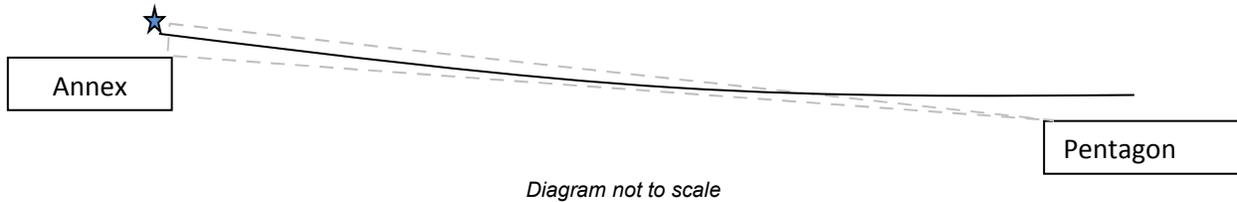
$$F_T = 1 / \cos(59.63)$$

$$F_T = 1.98G$$

To cross check all level turn radii in presentation, take a screenshot of the arc, use Google Earth overlay and measure tool to determine length of chord and sag of the arc. From there you can determine radius using a formula for Sagitta (Sag).

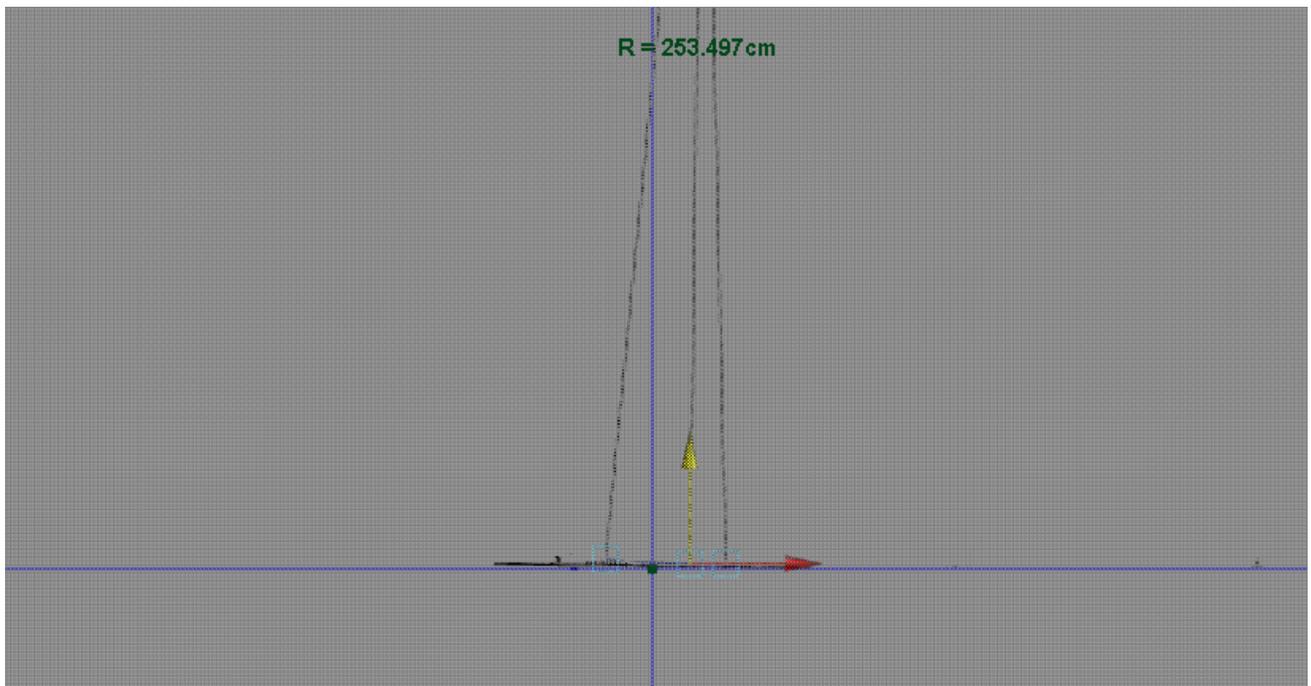
“Pull Out”

Considering witnesses are not able to determine altitude, it is impossible to determine a “pull out” without such data points. Also considering the Navy Annex is roughly 100 feet higher than the Pentagon based on topography alone, very little, if any “pull out”, is needed.



However, we will demonstrate how a “pull out” is also very much aerodynamically possible and compatible with witness statements.

First we need to determine the radius to “pull out” or arc in the vertical plane in order to calculate the required acceleration in excess of Earth’s gravity, and to cause, such a “pull out”. Note - It is impossible to determine exactly when the “pull out” was initiated since we do not have vertical speeds for the northern approach aircraft witnessed, unlike for the claimed southern approach provided and plotted by the NTSB which calculates to an impossible “pull” (See “9/11: Attack On The Pentagon”).



Zoom

Scale: 1cm = 100 feet



Scale analysis of above can be seen in “9/11: Attack On The Pentagon” and “The North Flight Path”.

Using the simple formula for determining Acceleration based on speed and radius of an arc:

$$a = \frac{v^2}{r}$$

$$a/32.2 = \text{G Load}$$

Radius (ft)	25,350
Velocity (kts)	G Load (n)
460	0.74
300	0.32
250	0.22
200	0.14

As stated, a “pull out” is not required as shown above based on topography. However, if a possible “pull out” were the case, the above G Loads at corresponding speeds are required for the demonstrated “pull out” radius in the vertical plane. 1 G needs to be added for Earth’s gravity as done for a level turn*. We can then determine G load required for a “pull out” based on Bank Angle using the simple vector analysis used above.

Radius ¹ (ft)	12,748	19,406	59,533	11,010
Velocity (kts)	Bank Angle	Bank Angle	Bank Angle	Bank Angle
460	55.85	44.08	17.52	59.63
300	32.09	22.39	7.65	35.98
250	23.53	15.96	5.33	26.75
200	15.57	10.37	3.41	17.88

G Loading based on 25,350 radius "Pull Out" for given turn Radius/Bank (shown in above table)

Turn Radius (ft)	12,748	19,406	59,533	11,010
Velocity (kts)	G LOAD	G LOAD	G LOAD	G LOAD
460	3.10	2.42	1.82	3.44
300	1.56	1.43	1.33	1.63
250	1.33	1.26	1.22	1.37
200	1.18	1.16	1.14	1.20

Green – Aerodynamically possible, Witness Compatible

Red – Aerodynamically possible, Witness Incompatible (bank too steep/shallow).

*Added G load due to Earth's gravity will be less than 1 G when aircraft longitudinal axis is not parallel to the Earth based on aircraft changes in pitch. Pitch changes are not extreme enough for the purpose of this model, so adding 1 G represents the highest G Load required along the arc for a "pull out". ie: Actual G Loading will be changing throughout the pull with all other calculations requiring less Total G Load when breaking down Earth's gravity into vectors based on pitch.

The most challenging bank angle based on a level turn (vertical acceleration component 1 G) was 1.98 G with a bank of 59.63 Degrees. Using 1.74 G as the vertical acceleration component required for the "pull out" (1 G* for Earth + 0.74 G for "pull out" radius based on highest speed), we get a total G Load on airframe of: 3.44 G.

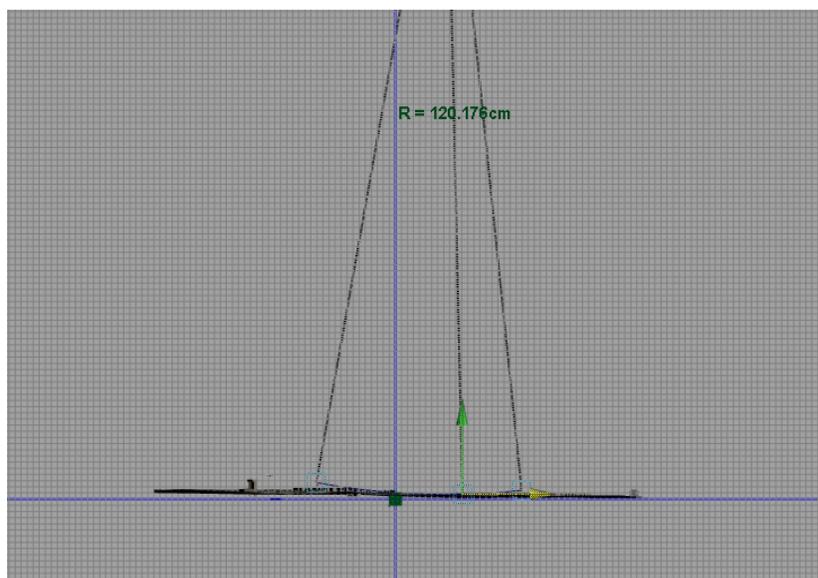
Example:

$$F_T = F_v / \cos(\theta)$$

$$F_T = (1 + 0.74) / \cos(59.63)$$

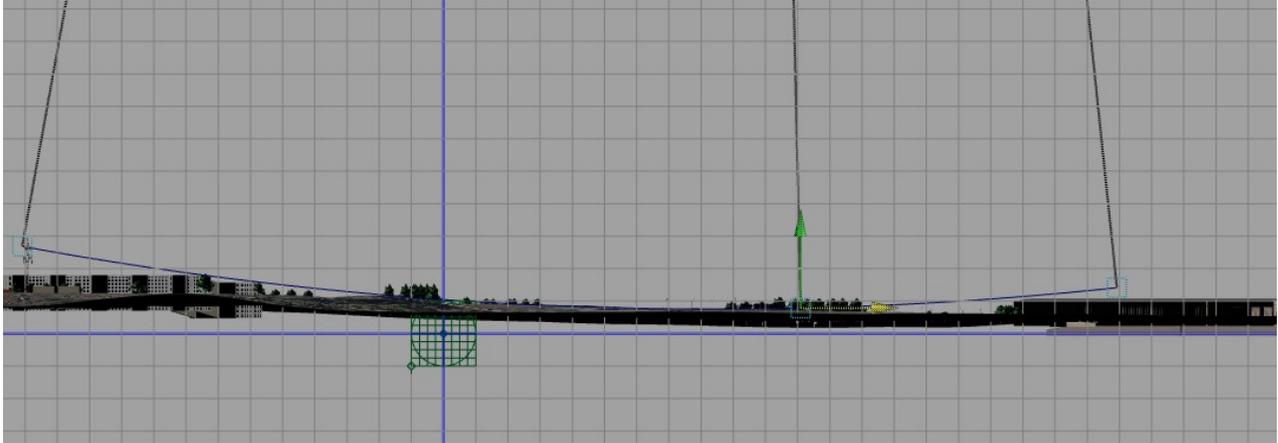
$$n = 3.44G$$

If we increase the vertical acceleration needed by hypothetically placing the lowest point of the arc on the ground, the G Loads required for a turning "pull out" are still aerodynamically possible. Although, no longer witness compatible due to the fact there isn't any witness who claims observing an aircraft skimming across the ground, and of course the ground does not show any signs of damage anywhere in Arlington.



Zoom

Scale: 1cm = 100 feet



Using the same formula's above with a modest speed of 250 knots, we determine the above vertical acceleration required to pull out of such a dive based on a vertical plane radius of 12,018' is: 0.46 G. Remember, we have to add 1 G for Earth, so we get a total of 1.46 G required in the vertical plane for such a "pull out". When calculating 1.46 G into the proper formula using a modest bank of 26.75 Degrees (which is witness compatible) we get 1.63 G required for such a "pull out" while turning. 1.63 G is not only very much aerodynamically possible even while using the extreme calculation of the aircraft skimming across the ground, but it's a non-event.

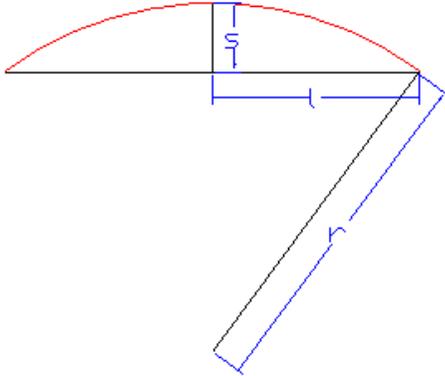
Using the most extreme hypothetical case of 460 knots would require 1.58 G + 1 G for Earth = 2.58 G for the "pull out" in the vertical plane. Using the largest Bank Angle of 59.63 Degrees, we get a total of 5.10 G required to "pull out" of such an extreme hypothetical scenario which touches the ground and then pulls up and over the Pentagon in an extreme bank of almost 60 Degrees. Again, although not witness compatible due to the extremes, it is still aerodynamically possible.

Level turning flight can also give the appearance of a "pull out" which would explain the statements of Robert Turcios witnessing the top of the fuselage (as a right bank would cause) on the North Approach. Since all bank G loading is less than 2 G, a "pull" of 1 or 2 more G to establish a climbing turn is a non-event for fixed wing aircraft.

Formulas

Sagitta of an Arc: as a function of radius and length of chord of a circle

$$S = r - \left(\sqrt{r^2 - l^2} \right)$$



Bank Angle: as a function of speed and radius

$$\Theta = \arctan\left(\frac{v^2}{11.26r}\right)$$

<http://tscm.com/maneuver.pdf>

Conclusion

Using Flight Data Speed While Ignoring Other Parameters for the North of Citgo Approach

The flight data recorder (FDR) speed was used to evaluate several flight path possibilities that are aerodynamically possible. Pilots for 9/11 Truth does not claim that the alleged aircraft was moving at such speeds due to the fact the FDR heading data does not support the North Approach, nor is the FDR speed within Vmo (Velocity Maximum Operation) limits for a 757-200.

It is intellectually dishonest and technically impossible to extract one data parameter from the FDR and ignore all others. It is therefore impossible to relate FDR speed to the North Approach path as a factual speed. However, we have hypothetically shown that even the final FDR speed is aerodynamically possible, albeit with an altitude too high to impact the pentagon.

Terry Morin “Parallel” to Annex Edge

Terry Morin was situated within the fourth and fifth wing of the Navy Annex when viewing the aircraft flying overhead (See <http://www.thepentagon.com/ona.htm> for interview with Terry Morin). His statements regarding the flight path and trajectory of the plane indicate a placement parallel to the edge of the building without any sort of measurement of approximate distance from the edge. Knowing Terry Morin’s position within the wings of the Annex building, we can safely state that the aircraft flew over the Navy Annex, however we cannot ascertain the distance from the edge base on Terry’s statement which is why several turns were calculated in our video presentation.

13 Witnesses Confirm Placement of the Aircraft

Every witness filmed on location independently corroborates the position of the aircraft north of the Citgo gas station. Although their estimations of speed and exact placement of the plane in relation to land marks cannot be exact, their drawn flight paths and statements agree with a North Approach and similar trajectory.

Recreations of witness statements have been forensically calculated and displayed with respect to a flight path required for the physical damage observed at the Pentagon versus North Approach as witnessed, opposite the physical damage. This information has been considered when plotting arcs in the video presentation.

Constant Velocity Flight Path

All of the arcs were calculated using a constant speed and Bank Angle as we do not have flight data for the North Approach. By using a final constant speed and Bank Angle, as opposed to demonstrating an acceleration to such a final speed, a G Load can be figured for a specific arc radius consistent with witness statements. Speeds demonstrated are the worst case Bank Angle and G Load at a constant speed. Any speed slower than the speed used per arc scenario would require less G Load, and Bank Angle.

Math for Pull-Up

Due to the fact that the Navy Annex is situated at a higher elevation than the Pentagon and the Annex roof height measures approximately 110 feet ASL over the Pentagon roof top, considerations for pull-up force are insignificant and are not required to clear any obstacle. However, we have hypothetically demonstrated that the most challenging scenario for such a “pull out” utilizing a finite limit such as the ground, are well within structural limits of a transport category aircraft.

A North Approach is aerodynamically possible for any conventional fixed wing aircraft **and** is consistent with witness statements. The most challenging G loading of 1.98G calculated at 59 Degrees of bank for a level turn requires only 1.46 more G for a “pull out” at highest speed of 460 knots for a total of 3.44 G. When considering witness statements, a Bank Angle of 26 Degrees is more reasonable, and requires less than 2 G for bank and “pull out” at all speeds.

We may add to or revise this document in the future as required.

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