

# High Velocity Bursts of Debris From Point-Like Sources in the WTC Towers

Kevin Ryan, 6/13/2007

Since September 11<sup>th</sup>, 2001, there have been two competing hypotheses to explain the destruction of the World Trade Center buildings. The first hypothesis, a fire-induced collapse of all three buildings, has undergone numerous variations over the years, as government scientists have worked to keep it alive while ignoring the second hypothesis.[1] That second hypothesis is the controlled demolition of all three buildings.

There is a great deal of compelling evidence for the demolition hypothesis, including the following physical facts about the destruction of each building.

- Sudden onset of failure
- Near free-fall speed of “collapse”
- Symmetrical “collapse”
- Many eyewitness testimonies to explosions and flashes of light
- Small rubble piles (WTC 7 fell into its own footprint)
- Molten metal in the rubble piles and pouring from WTC 2
- Dust clouds resembling pyroclastic flows from volcanoes
- Sulfidation and intergranular melting of the steel

Currently, the only official explanation given for these devastating events is a provably false “collapse initiation sequence” for two of the three buildings, provided by the National Institute of Standards and Technology (NIST).[2] By failing to explain the actual collapse dynamics, NIST was able to avoid all of the evidence cited above. Additionally, they were able to avoid considerable circumstantial evidence in favor of the demolition hypothesis (e.g. evidence destroyed or withheld, extensive foreknowledge).

This paper aims to bring to light just one specific aspect of the physical evidence, namely, the phenomena known as “demolition squibs”. In actuality, this evidence is better described as high velocity bursts of debris ejected from point-like sources near the exterior facade as each building disintegrated. The demolition hypothesis suggests that these bursts of debris are the result of the detonation of explosive charges (squibs), placed at key points in the structure to facilitate the removal of resistance. But it’s important to note that it is the bursts of debris themselves that are the actual evidence, not the presumed cause of those bursts.

There are many photographs in the public domain showing these bursts of debris, and all parties agree to the existence of this evidence. Unfortunately, NIST will not release the thousands of pieces of photographic and video evidence they have collected at taxpayer expense that might help us to better understand what happened. But in the example at the link below we can see two such bursts being ejected simultaneously from different faces of the building, and apparently at different levels, some ten to twenty floors below the “collapse” front.



**Figure 1 – Bursts of debris emanating from the sides of a WTC tower**

In videos we can see these bursts being ejected from the sides of the towers nearly thirty floors below the collapse front.[3] The bursts continue throughout the duration of each tower's destruction, and all of them are similar in shape and velocity.

Each of these was a sharp emission that appeared to come from a point-like source, ejecting approximately 50 to 100 feet from the side of the building in a fraction of a second. From the extracted frames of the KTLA video (ref. 2), we can estimate that one of the first bursts was fully ejected in approximately 0.45 seconds. This gives an average burst velocity of approximately 170 feet per second (fps). Others have estimated the velocity of these ejections at over 1100 fps.[4]

These bursts were ignored by government investigators for a period of several years, as was all other evidence for the demolition hypothesis. But after being forced to field many "frequently asked questions", NIST's Shyam Sunder finally provided a semi-official explanation. In a March 2005 article by Popular Mechanics, Sunder called these bursts "puffs of dust", and explained "When you have a significant portion of a floor collapsing, it's going to shoot air and concrete dust out the window. Those clouds of dust may create the impression of a controlled demolition, but it is the floor pancaking that leads to that perception." [5]

Unfortunately for Sunder, NIST was forced to abandon that answer, in the summer of 2006, saying "NIST's findings do not support the 'pancake theory' of collapse." In an attempt to maintain their faltering fire-induced collapse hypothesis, NIST tried to retain the essence of the explanation, despite having forsaken pancaking floors. They did so by saying "the falling mass of the building compressed the air ahead of it—much like the action of a piston—forcing smoke and debris out the windows as the stories below failed sequentially." [6]

Although the piston analogy might have made some minimal sense for the discarded pancake theory, it does not work at all for NIST's current pile-driver theory. A piston is a sliding shaft that fits within an enclosed cylinder, whose action within the cylinder causes the volume and pressure to change. But the WTC buildings did not have sections acting like pistons at any time before, or during, their disintegration. Without pancaking floors, there is no internal shaft to slide down within the "enclosed cylinder" of these tall buildings.

Because the government scientists never did any physical testing to support this latest compression argument, we must try to imagine for ourselves how the disintegrating building could have created the ejections of debris.

To be the result of overpressures created from the falling mass, these bursts had to emanate from highly pressurized containers that were tightly sealed on all sides except the point of ejection. With his 2005 pancaking floors hypothesis, NIST's Shyam Sunder suggested that these pressurized containers were entire floor areas, compressed by the falling mass. The reason these containers cannot be smaller than a full floor area is because the office floors were wide-open spaces, with no floor to ceiling partitions as normally found in other office buildings. The effective partition-less area in each floor was approximately 3000 square meters.

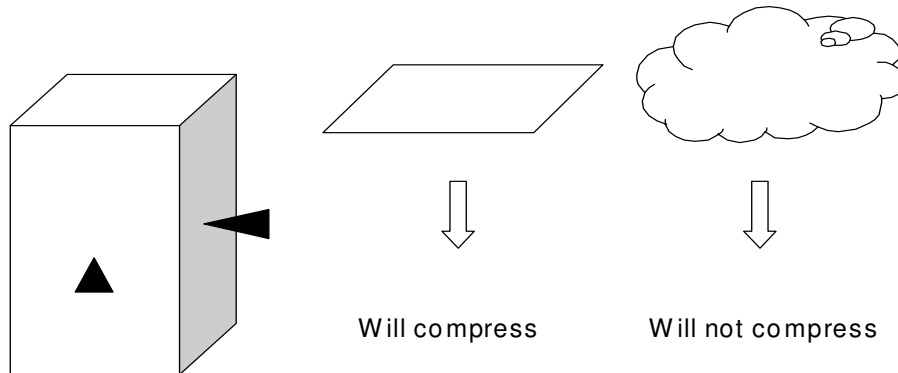


**Figure 2 - Typical office area of a WTC tower**

It's difficult to imagine how 283 steel columns in each of the Twin Towers could have been compressed so rapidly and uniformly, while collapsing at nearly free-fall speed through a vertical distance of 350 meters. But even if this feature of the fire-induced hypothesis was a given, to initiate the gas pressure below, we would need to imagine the

falling mass as a flat plate, or a continuous sheet, exerting uniform pressure at all points. If discontinuous, the falling mass would allow pressure to be released upward.

But we can infer that the falling mass was probably not a uniform flat plate or a continuous sheet because workers who cleaned up the site described how the debris at ground zero was all pulverized, except for the steel assemblies. Photographic evidence (as in Fig. 1 above) also indicates that the falling debris, which appeared to explode outward to some extent, was cloud-like. Such cloud-like debris could not form the continuous falling surface that would be needed to create the downward pressure and compress the air below.



**Figure 3 - Cloud-like debris would not create a continuous downward pressure**

The lack of a continuous compressive force in itself repudiates the compressive piston hypothesis. But it is not enough to simply discredit this latest weak answer from NIST. By showing how completely ineffective NIST's new argument is, we can better understand how desperate those supporting the government's ever-changing fire-based hypotheses have become.

Not only was there no way to compress the gas below, the floors were not air tight, enclosed containers either, which means that, even if the falling mass could exert a uniform downward pressure, it would not be contained. There were eight large air supply and return ventilation shafts located in the core areas of each floor.[7] There were also three stairwells running throughout the building, and over thirty elevator shafts at any given level. Any compressed air would have had to equilibrate with open stairwells and elevator shafts, and with any openings from these shafts to other parts of the building (i.e. vent ducts). Additionally, we know that the fire in the north tower in 1975 was spread by means of openings in the floor slabs, of more than one square foot area, used to transfer telephone cables.[8] All of these facts indicate that any pressurized air would be forced to equilibrate over large sections of the building, if not the entire lower section, and could not be contained on one floor alone.

In the hypothetical scenario that the entire lower section was one enclosed volume, we can estimate the change in pressure as the building fell by using the Ideal Gas Law. Note that there is no need to obfuscate the point with differential equations or an elaborate

mathematical model, as the evidence is quite simple and the proof requires, at most, a few simple ideas.

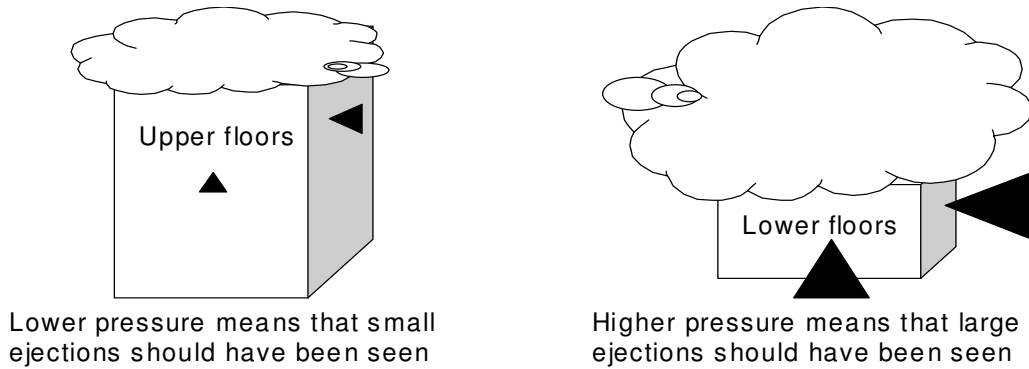
$$PV = nRT$$

where P = pressure, V = volume

Considering that R is a constant, if we assume that no gas escaped (n constant) and temperature (T) changes were negligible, we see from the equation above that P and V are close to being inversely proportional. That is, the pressure within the lower section of the building would increase in proportion to the decrease in remaining volume. So if the upper section dropped ten stories, from floor 90 to floor 80 as was the case for the north tower (WTC 1), the volume of the lower section would have decreased from V to 8/9 V, and the pressure would have increased from P to 9/8 P. This small increase in pressure would not likely have caused windows to burst in a building designed for hurricane winds. But if no gas escaped as the building continued to fall another 70 stories (again, highly unlikely), the pressure would have increased to 9 times the original pressure. This would be 9 times normal atmospheric pressure, or about 132 psi, which might very well break a few windows. But again, the evidence shows bursts of debris coming from very high floors of the building, not just at the lowest levels.

In fact, the videos show that bursts of debris began shooting out from below the disintegration front almost immediately after the “collapse” began. Within 2 seconds of initiation, these bursts began appearing, after the upper section of WTC 1 had fallen less than five floors of vertical distance. The increase in pressure at that early moment would have been only about 6% greater than normal atmospheric pressure. Such an increase in pressure would be comparable to that which could have occurred simply through variations in temperature caused by problems with the air handling system in the building, that is if the volume of air was somehow contained. In such a hypothetical scenario, if the room temperature was 60 °F, and then suddenly rose to 90 °F, causing a similar increase in pressure, would we expect the windows in the WTC towers to break and cause “smoke and debris” to burst forth at velocities of 170 fps? No, we would not.

From videos and photographs we can see that the bursts of debris ejected from the higher floors seem to be very similar in size, shape and velocity to those ejected lower in the building, and the frequency of bursts does not increase. If these bursts were the result of the pressurization of the lower section, how did the pressure remain so constant as the buildings fell? The pressure should have been much smaller at the top, creating a smaller force for ejection of debris than was seen near the end of the fall, and therefore smaller bursts near the top. But, if anything, the opposite is evident in the photographic evidence of those bursts emanating from the WTC towers – those ejecting at lower levels were smaller, or at best the same size.



**Figure 4 – Bursts from the sides of the WTC towers were not proportional to expected pressures**

The compressed air feature of the piston hypothesis must also explain the geometry of the burst points. If the area of an entire floor, or many floors together, were to be pressurized, why would the bursts be ejected from point-like sources? If the compressed region was just one floor and the windows would fail first, why would the bursts not be seen ejecting from more windows, perhaps even in a row across all four faces of the building? This is not what we see with the bursts from the towers. We see very specific point-like bursts, not floor-wide rows of bursting windows.

As noted above, there were numerous routes of escape for gas on each floor, so it could not have been just one floor that was pressurized. Additionally, bursts can be seen to be ejecting from multiple floors simultaneously, so we must assume that the entire lower section of the building was pressurized. But if this were so, why were there not many more bursts seen, ejecting more randomly throughout all levels of the building?

Finally, can this compressed air scenario explain how crushed concrete, or other debris, could have been created at levels twenty to thirty floors below a “collapse” front that was already moving at nearly free-fall speed? Either the compressed air actually crushed this material itself, or some of the debris from the falling mass fell very quickly and was either ejected itself or crushed material from the lower section that was then ejected laterally due to pressure. It is not likely that the pressures created could have crushed the floor slabs and then ejected them horizontally. But on the other hand, it is simply impossible for some of the falling debris to have moved faster than gravity will allow.

In summary, it is clear that the high velocity bursts of debris known to exist during the disintegration of the WTC towers cannot be explained by NIST’s latest “compressed air” explanation for the following reasons.

- There was no piston mechanism possible in the falling towers because there was no internal shaft and the upper section was disintegrating as it fell.
- The disintegration front was characterized by the explosive ejection of material outward, and the resulting cloud-like debris could not have formed a continuous surface to apply pressure to the air below.

- Any pressure created would not be contained within a single floor, but would have been distributed over many floors in the lower section and probably would have vented into the external atmosphere as well.
- The high speed bursts seen early in the “collapse” could not have been produced by air pressure alone as the pressure could not have risen substantially at the time when they occurred.
- The similar size, shape and velocity of the bursts is not consistent with the fact that any pressure created would have been rising as the debris fell.
- The point-like sources of these bursts cannot be explained.
- The debris that was ejected at the lower levels could not have been created as a result of the air pressure alone, and could also not have been created by the falling mass above, which would have required more time to arrive and was already traveling at nearly free-fall speed.

The demolition hypothesis, in contrast, seems to explain these high velocity bursts of debris perfectly. Research has shown that, for an experimental structure made of concrete and steel, debris launch velocities created by explosive charges are on the order of 50 m/s , or 164 fps.[9] This corresponds well with the earlier estimate made from video evidence of the disintegrating towers (170 fps on average).

With the demolition hypothesis there is no need for vague and untested “compressed air” scenarios, or a re-evaluation of the laws of gravity. If demolition charges had been set-off, to remove the resistant mass of the building below, then the inexplicable features of the destruction of these buildings would be made clear. In fact, nearly all of the physical evidence listed above, none of which has ever been addressed by the government’s fire-induced collapse hypothesis, could be explained very well by the simple controlled demolition hypothesis.

#### References:

[1] Ryan, *Looking for Truth in Credentials: The Peculiar WTC Experts*, GlobalResearch.ca , 2007

<http://www.globalresearch.ca/index.php?context=va&aid=5071>

[2] Ryan, *What is 9/11 Truth? - The First Steps*, Journal of 9/11 Studies, August 2006

[http://www.journalof911studies.com/articles/Article\\_1\\_Ryan5.pdf](http://www.journalof911studies.com/articles/Article_1_Ryan5.pdf)

[3] Examples of these bursts can be seen in the following clip from the film Loose Change, <http://www.youtube.com/watch?v=La0LOG2NBM4> . Other video clips and photographs, including the KTLA5 video of the North Tower collapse, are available at 911Research.com, <http://911research.wtc7.net/wtc/analysis/collapses/squibs.html>

[4] Bazant, Le, Greening and Benson estimated the velocity of escaping air to be as high as 340 m/s, or 1100 fps. Of course they were trying to establish an argument for the bursts having reached the speed of sound, in order to explain away the witness testimony to explosions. Their argument is not convincing, but see their paper *Collapse of the World Trade Center Towers: What Did and Did Not Cause It?*, submitted to Journal of Engineering Mechanics, May 2007

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[5] Popular Mechanics, *Debunking The 9/11 Myths*, March 2005 Cover Story

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[6] NIST's Answers to Frequently Asked Questions, August 2006

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[7] NIST, *NCSTAR 1-1, Design, Construction and Maintenance of Structural and Life Safety Systems*, page 20

<http://wtc.nist.gov/NISTNCSTAR1-1.pdf>

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[9] Kai Xu and Yong Lu, *Debris Velocity of Concrete Structures Subjected to Explosive Loading*, International Journal for Numerical and Analytical Methods in Geomechanics, 2006, 30:917-926.