



© Darryl Heikes, Dallas Times Herald Collection / The Sixth Floor Museum at Dealey Plaza

# JFK: New light on a tragedy

by Christine L. Grah

The assassination of President John F. Kennedy on November 22, 1963, was a tragic event in American history. Many questions still linger about the young president's death, even though more than 50 years have passed. What really happened in Dealey Plaza in downtown Dallas, Texas that day? Did Lee Harvey Oswald fire the bullet from the sixth floor of the former Texas School Book Depository (TSBD) alone, or did a second gunman fire a shot from the "grassy knoll", a small sloping hill inside Dealey Plaza? For the first time ever, modern technology has been applied to investigate the Warren Com-

mission's conclusion of where the fateful shot originated. The Leica ScanStation P20 plays a valuable role in a new, state-of-the-art shooting reconstruction and helps forensic specialists resolve some of the mystery.

Most people still believe conspiracy is behind the death of the president and are convinced it wasn't the work of just one man. Can modern ballistics and technology prove this wrong? What happened that day 50 years ago in Dealey Plaza? With the help of Leica Geosystems' ScanStation P20, ballistic experts Michael and Luke Haag set out to determine if the "single bullet theory" was possible in "Cold Case JFK", part of a special Nova series presented by PBS.





© Tony Grissim

■ The former Texas School Book Depository, where the rifle was fired. In the foreground, the Leica ScanStation P20.

### The rifle and the bullet

“Creating an accurate 3D laser representation of the crime scene using the Leica ScanStation P20 made documenting the precise location of the gun as well as the primary point of bullet impact possible. Using the Leica Cyclone software for bullet path reconstruction, we recreated a line segment for the original trajectory and any secondary trajectories,” says Michael Haag. For the Nova documentary, Michael Haag and Tony Grissim of Leica Geosystems, a technical advisor for the Firearms and Tool Mark Examiners, collected laser scan data to create an entire 3D representation of Dealey Plaza and of the sixth floor of the TSBD. This representation, along with Doppler radar and high speed videography, provided accurate information that was previously unavailable to investigators.

“When I want to look at a new conspiracy theory about what happened, I don’t have to go back to the scene; I can just go to my computer and start clicking on scan data to look at distances and angles, and compare those points and angles to what I know occurred ballistically,” Michael says.

The Haags also recreated materials similar to the density and resistance of human muscle tissue to

test the bullet’s impact and exit velocity, and to test its strength and stability. Could it pass through two people, a car seat and bone material and remain intact? The 3D laser maps were analysed with the tests made to this recreated material using the same type of bullets and rifle used in the shooting. This newly acquired data plus the now public documents and evidence that was hidden for the last 50 years



© Tony Grissim

■ Collecting data from the sixth floor window where the bullets were fired.

## Single bullet theory

The "single bullet theory" advocates that one and the same bullet hit and passed through the president and also Texas Governor Connally's torso, shattering his wrist and landing in his thigh, and yet remained undamaged. Luke Haag, forensics scientist specialising in ballistics and his son, Michael Haag, senior forensic scientist with the Albuquerque Police Dept., worked for nearly two years researching and recreating the assassination to determine whether this was possible.

Critics have argued the unlikelihood of this theory, claiming that one man could not possibly have had

the time to load and remove a cartridge, aim and fire three shots within approximately six seconds with the Carcano sniper that was found on the sixth floor of the Texas School Book Depository. The first shot was fired and missed, but shots two and three, the non-fatal bullet that went through JFK and Connally and the bullet that hit Kennedy in his head, are the controversial ones. The Haag team set out to prove once and for all whether these two bullets hitting the president could have been shot from the depository within six seconds and whether just one bullet could actually do so much destruction to two people and remain relatively undamaged.

helped Michael and Luke Haag to prove that the "single bullet theory" could have been reality. It was possible to load, aim and fire two bullets within these few seconds and destroy so much. Luke Haag says, "It's a very clear picture. There was plenty of time to shoot all three shots from when the car turned the corner into Elm. We tried replicating it ourselves and could do so many times. We ruled out the conspiracy hypothesis, the shots from the grassy knoll ... two shooters."

Michael Haag has been using 3D scanning technology from Leica Geosystems for nearly a decade to reconstruct shooting incidents. His experience provides key insights on why an increasing number of law enforcement agencies and crime scene investigators have begun to rely on this valuable tool. "It's a way of documenting crimes scene more thoroughly, more completely than we have ever had the capability to do," says Michael. "We can re-examine the cases from our computers as new hypotheses appear, over and over, from new angles with new measurements, calculations - it's all right there. As a forensics scientist you try to rule out hypotheses, not go into it with the idea that you want to prove something. Physical evidence always supports the truth of the matter." ■

*For more information about this investigation and other forensics applications of laser scanning, visit the Leica Geosystems Ready Room at <http://psg.leica-geosystems.us/ready-room>.*

*About the author:  
Christine Grahl is content marketing manager for Leica Geosystems.  
[christine.grahl@leica-geosystems.com](mailto:christine.grahl@leica-geosystems.com)*



**Watch the exciting documentary  
"Cold Case JFK" produced by PBS:**  
[http://www.leica-geosystems.com/jfk\\_video](http://www.leica-geosystems.com/jfk_video)