

11 Seconds in Dallas Redux: Filmed Evidence



Figure 1. Still photo taken during a restaging of the assassination by the Secret Service in 1963. Six months later, the Warren Commission would independently label the limousine's location at this approximate point on Elm Street "Position A." The ghost image, which is inserted, approximates the position of the presidential limousine on November 22 at the moment Abraham Zapruder restarted his camera (see figure 2).

By Max Holland and Kenneth R. Scarce

In March 2007, the inaugural issue of *Washington Decoded* posited a radical new description of the shooting sequence in Dealey Plaza.

"[11 Seconds in Dallas, Not Six](#)" argued that the [Zapruder film](#) did not capture in full the 1963 assassination of President Kennedy. Rather, the iconic movie recorded an assassination that had already commenced. Lee Harvey Oswald's errant first shot was fired about 1.4 seconds before Abe Zapruder started his camera, or just after the president's limousine reached a point on Elm Street identified by the Warren Commission in 1964 as "Position A," which was "not on the Zapruder film" (figure 1).[\[1\]](#)

Washington Decoded

This new explanation changed nothing, and everything, at the same time. In the first sense, it only underscored that Lee Harvey Oswald, acting alone, killed President Kennedy. But it also lay to rest the notion, which had long haunted the official story, that Oswald's feat of marksmanship was anything exceptional. Firing three shots in 11 seconds took no great skill.



Figure 2. Frame 133 from the Zapruder film, the first frame in which the presidential limousine is visible. The car had reached the second set of lane dividers, and was approximately 70 feet down into Dealey Plaza.

Seeing is believing, the cliché goes. And it is a testament to the power of visual media that for 44 years, the Zapruder film was considered equivalent to the assassination. During that time, it was no secret that Abraham Zapruder had turned off his camera about seven seconds after he initially started filming, after seeing nothing but police motorcycles through the viewfinder. And it was also fairly easy to calculate that by the time Zapruder restarted his “Zoomatic,” the presidential limousine had already traveled about 70 feet down Elm Street.

Yet the presumption made at the outset—that Zapruder had captured the assassination in full—was never seriously questioned. As the critic Richard B. Woodward [insightfully](#)

[observed](#) in 2003, the assassination quickly became “fused with one representation, so much so that Kennedy’s death [was] virtually unimaginable without Zapruder’s film.”^[2]

The March 2007 essay in *Washington Decoded*, and a [subsequent Op-Ed](#) in *The New York Times*, made the case for an 11 second-long shooting sequence on the basis of numerous earwitness and eyewitness testimonies, and because Oswald’s first shot missed—most likely because it ricocheted off a traffic-light mast overhanging Elm Street (see figure 1).^[3] An independent November 2007 [essay](#) by Kenneth Scarce, a co-author of this article, examined how the Zapruder film itself provided additional corroboration.^[4]

This new essay takes another fresh look at some old evidence, including several films from Dealey Plaza, to see if there were any additional clues that might have been overlooked during all those years the Zapruder film exerted its grip on the collective imagination. Several pieces of old evidence turn out to corroborate the observation that a shot was fired before Zapruder restarted his “Zoomatic.”

The new paradigm of 11 seconds cannot, in all likelihood, be proven beyond a reasonable doubt today, as might have been in the case in 1963 or 1964 had the traffic mast been examined promptly for metallic residue. But three shots in 11 seconds should now be regarded as the depiction with the greatest fidelity to all the known facts.

The Films: Zapruder, Dorman, Towner

As Vincent Bugliosi pointed out in his 2007 book, [Reclaiming History](#), most murders are not recorded on film and still manage to get solved. Bugliosi was making a point about the Zapruder film, which he argued had “been given more attention than it deserved,” but his general observation is applicable to all the films taken of the assassination.^[5] They are prone to revealing only “partial truths, biases, and distortions of reality,” as Richard Trask has written.^[6]

Still, and despite these shortcomings, there is an undeniable power inherent in film that gives it an outsized role. Indeed, nothing illustrates this power more than the stranglehold the Zapruder film exerted for 44 years on conceptions of how the assassination occurred, making the most famous motion picture sequence ever shot as much a hindrance as a help.

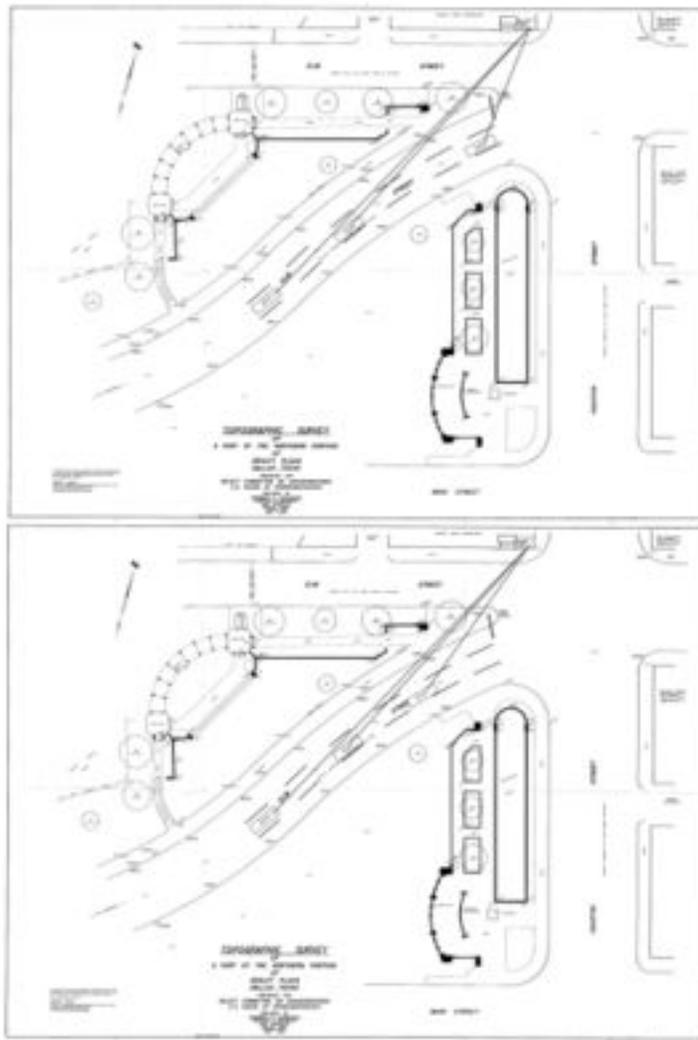


Figure 3. The topographic map at the top illustrates the bullet paths if Oswald commenced firing just after the presidential limousine reached Position A, while the bottom depicts the conventional view of a first shot circa Zapruder frames 155-161. Click on the image to enlarge.

Since both the limitations and power of film have to be reckoned with, the authors of this essay have taken a fresh look at all the amateur movies that were taken while the president's limousine was in Dealey Plaza, testing them against the new explanation. The exercise has unearthed some compelling corroboration of the premise that the first shot was fired just as Position A was realized. And it is no surprise that the Zapruder film provides the strongest support, befitting its central role from the outset in deconstructing what happened.

Zapruder Film



Figure 4. Zapruder frame 153. From left to right, the red arrows point to Secret Service agents John D. Ready, Glen A. Bennett, and George W. Hickey, Jr. in the Cadillac follow-up car. President John F. Kennedy and Governor John B. Connally are identified in the presidential limousine.

When the theory of a first shot circa Position A was advanced in March 2007, the essay purposely refrained from using the Zapruder film to buttress its argument. The thinking was that the Zapruder film's early frames had become a Rorschach test: researchers took from the film what they wanted to see. Since the Position A assertion argued for a shooting sequence that fell outside the confines of the Zapruder film, to use the film to prove the contention smacked of falling into the same trap.

Eight months later, however, a Seattle lawyer and student of the assassination named Kenneth Scarce dove in where the earlier authors had not tread. Scarce published an essay, [Hidden in Plain View](#) that paid particular attention to the movements of Texas Governor John Connally in the early frames of the Zapruder film. These movements, Scarce argued, actually buttressed the notion of a pre-Zapruder first shot.^[7]

For reasons that are not particularly clear, efforts to discern from the Zapruder film when Oswald fired the first shot have been largely, if not exclusively, focused on the movements of Connally, and how those reactions comported with his testimony over the years.

Yet Connally is far from the only person visible in the first 30 relevant frames of the Zapruder film. More important is that he was not the only person to exhibit sudden or unusual movements. Nor was he the only such person to give a detailed account of his reactions.

This essay will concentrate on the movements of three Secret Service agents who were in the follow-up Cadillac, the so-called "Queen Mary," which functioned as the presidential limousine until the modified 1961 Lincoln Continental went into service.

As figure 4 shows, three agents in the Queen Mary were already reacting in an unusual manner by frame Z153, which, in and of itself, undermines the conventional wisdom

about when the first shot was fired. There can be no question that these agents were reacting in response to a worrisome stimulus; the protocol agents are supposed to observe during motorcades was and is quite clear. Agents positioned on the running boards are supposed to keep their eyes fixed on the quadrant immediately in front of them and to their right (if they are stationed on the passenger's side of the car), or to their left (if standing on the driver's side).

The purpose of this protocol is manifest, e.g., it is supposed to impose some discipline and order on the agents' constant scans of the space surrounding the president. Agents are even trained to be conscious of falling for a diversion calculated to take their eyes away from where they are supposed to be looking. If distracted by a stimulus, they are trained to be flexible and give it a glance, but then resume their assigned pose as soon as possible.^[8]

Thus, when John Ready, the agent on the right running board, was looking to his left as in Z153, it was because he was responding to some kind of stimulus that momentarily caught his attention. His reaction is especially telling because he was the president's "body man" for the duration of the motorcade through downtown Dallas—the critical agent responsible for literally interposing his body between the president and any perceptible danger.

While Ready was clearly looking left by Z153, in fact, his turn in that direction began at ±Z139. He held this leftward glance for about 1.5 seconds or until ±Z 167, at which time he began turning his head back to its proper position. By Z182, after taking a moment to look at the president, Ready was following the proper security protocol again. (All the Zapruder frames can be viewed individually or sequentially by clicking [here](#)).

Ready's distraction lasted approximately 2.3 seconds altogether. And for the balance of the time he remained visible in the Zapruder film—until frame Z208—Ready's gaze was fixed to his front right, just as it was supposed to be.^[9]

In Ready's [initial and brief account](#) of what happened, written after he returned to Washington that Friday night, he did not specifically recall turning to his left—only that he "heard what sounded like firecrackers going off from [his] post on the right front running board."^[10] Several days later he wrote a [more detailed version](#). This time Ready recalled that after hearing what appeared to be firecrackers, he "immediately turned to [his] right rear trying to locate the source."^[11] But by then, of course, Ready knew that all three shots had come from the Texas School Book Depository, and that turning to the rear was the only response that made sense.

While Ready certainly did turn to his right rear, as proven in the picture taken by AP photographer James Altgens (figure 5), Ready did so only after the *second* shot.



COMMISSIONER EXHIBIT 369

Figure 5. CE 369, a cropped version of James Altgens's still photo corresponding to $\pm Z255$, clearly depicts Secret Service agents John Ready and Paul Landis turning to their right rear within 1.8 seconds after the second shot. President Kennedy's left arm, supported by his wife's gloved hand, is raised to his throat.

The reactions of two of Ready's fellow agents, Glen Bennett and George Hickey, provide confirmation that Ready's turn to the left at $\pm Z139$ occurred in response to the first shot. Although Bennett is much harder to see in the early Zapruder frames than Ready or Hickey, his movement is critical because of the correspondence between what Bennett said he did, and what he can be seen doing in the early frames of the Zapruder film.

Bennett was the only agent who recognized the importance of writing down his recollection of what happened at the earliest possible opportunity, before his thoughts faded or became colored by other recollections. Most important, though, he put his thoughts down before any details of what had actually happened became common knowledge—facts that might have caused him, consciously or unconsciously, to skew his recollection so that it would appear (even if only to himself) that he had instantly reacted “the right way.”^[12]

Bennett, who had been seated on the passenger's side of the rear bench in the follow-up Cadillac, wrote down his thoughts on a note pad during the funeral plane ride back to Washington. Like all the other Secret Service agents in the motorcade, he would later write an [official version](#) for the record. But the key passage between the two accounts was unchanged.

The president's limousine had just begun to move down Elm Street, wrote Bennett, when he heard a noise that instantly reminded him of a firecracker, and diverted his attention from the physical area to his right that was his assigned responsibility.

I immediately, upon hearing the supposed firecracker, looked at the boss's car. At this exact time I saw a shot that hit the boss about four inches down from the right shoulder; a second shoot [sic] followed immediately and hit the right rear high of the boss's head.[\[13\]](#)

In retrospect, it's obvious that Bennett's recollection was a remarkably accurate and succinct statement of what actually happened. Bennett's note was recognized as such at the time, too. The *Warren Report* singled out Bennett's recollection as support for the contention that the first of the three shots fired by Oswald was the one that missed.[\[14\]](#) But until now, another notable aspect of Bennett's statement has never been recognized.

Bennett, by frame Z153 (figure 4), had turned his eyes toward the front and tilted his head markedly to the right so that he could keep his eye on "the boss." He had to do this to see around the two passengers seated in front of him. And Bennett's initial head turn from his assigned space (looking to the right) can be discerned as happening virtually simultaneously with John Ready's abrupt head turn to the left at \pm Z139.

Clearly, Ready and Bennett were both reacting to the same stimulus, the only difference being that Bennett recalled his initial reaction for the record, whereas Ready, for whatever reason, did not.

Any residual doubt that Ready and Bennett were, in fact, reacting to the first shot ought to be put to rest by the movements and corresponding testimony of agent George Hickey, who was riding on the rear bench seat alongside Bennett. Whereas Ready and Bennett's reactions were relatively subtle—separate turns and a head tilt—Hickey's movement cannot be characterized as anything but extraordinary.

Beginning (again) at \pm Z139, Hickey can be seen in the Zapruder film standing partially up, and by Z153 (figure 4), he was beginning to lean way over the driver's side of the Cadillac follow-up car, almost as if he were looking for something on the ground. And he was. According to his [later statement](#), Hickey said he thought the initial loud report was a firecracker, and that it had exploded at ground level.[\[15\]](#)

It is true that there is a divergence between what Hickey can be seen doing on the Zapruder film and his written recollection, as is the case with Ready. Hickey wrote not that he bent over to his left and looked at the ground, but that he "stood up and looked to [his] right and rear in an attempt to identify" the source of the loud report.[\[16\]](#) But this alteration in his recollection, clearly, is an artifact of what he learned after leaving Dealey Plaza behind. As did Ready, when it came time for Hickey to record what he saw and heard, he elided his first movement and conflated his reaction to the first shot with his actual reaction to the second—which was when he actually did turn around and look to his rear, as vividly illustrated in the Altgens photo below.[\[17\]](#)

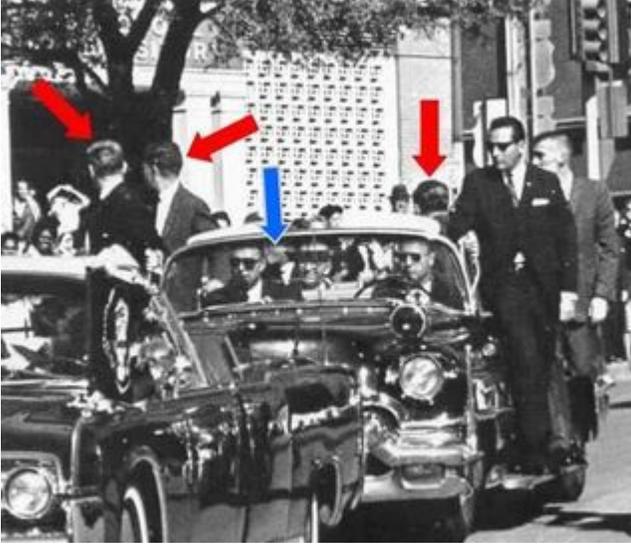


Figure 6. In this rendering of the Altgens photo, red arrows point to three Secret Service agents (from left to right, John Ready, Paul Landis, and George Hickey) whose heads turned abruptly back toward the Book Depository after Oswald fired the second shot. The blue arrow points to Glen Bennett, whose head was turned 90 degrees to his right.

On Cherry-Picking

It's easy to foresee the objections that will be made against the foregoing analysis. The charge of "cherry-picking" eyewitness testimony is bound to be raised, either in the sense that conflicting accounts were ignored, or that the recollections of Ready, Bennett and Hickey were used selectively and even distorted.

But if the Zapruder film teaches us anything, it is that the cherry-picking of witness statements is unavoidable. Compared to the infinitely malleable human mind, reactions captured on film are generally truer than any person's memory. Juxtaposing the written accounts of Ready, Bennett, and Hickey against what they actually can be seen doing vividly illustrates the usefulness and perils of relying on eyewitness testimony. The exercise reproves the old axiom familiar to trial lawyers: nothing carries more weight with a jury—and is less reliable—than eyewitness testimony.

Human beings are not recording machines. An eyewitness to a crime is being asked "to be something and do something that a normal human being was not created to be or do."^[18] Recollections are frequently imperfect to begin with, no matter how vivid. Subsequently, they are prone to being subtly influenced by what others think and say, as well as information learned after the fact. If a person is in a responsible position, such as Ready and Hickey were, recollections can be edited unconsciously.

The only approach that makes sense is to examine each recollection carefully and weigh it against the totality of the ballistic, forensic, visual, and aural evidence gathered. A witness can offer one critical detail that is accurate and get almost everything else wrong. Another person's recollection, like that of Glen Bennett, may prove accurate in

every important respect, although even Bennett failed to note that he was briefly distracted, after the second shot, away from his concentration on the president.

Most recollections will fall somewhere along a spectrum from accurate to false. Judicious cherry-picking of witnesses' testimony is precisely what must be done.

• • • • •

Mediated Reactions

Taken together, the unusual movements of agents Ready, Bennett, and Hickey, all starting around $\pm Z139$, combined with their written statements, should be sufficient to indicate that something happened far earlier on the Zapruder film than the conventional wisdom would have anyone believe. None of the standard explanations ever posited a first shot in the Z130s.

Yet, there is still more to be learned from these agents' unusual movements. By applying the science of human reaction time, a more precise understanding of when the first shot must have been fired can be achieved.

There are basically two kinds of human reaction to external stimuli: reflex reactions, and mediated reactions. In both instances the body requires time to manifest the mind's reaction to a stimulus, but the time varies considerably depending on whether the response is reflexive or mediated.

An example of a very fast reaction time is the startle response to hearing a gun fired close to one's ear. As long ago as 1939, two scientists established that humans reflexively flinch, on average, within 0.06-0.20 seconds after hearing a gun fired in that manner.^[19] Obviously, this kind of reaction is unmediated by the conscious thinking process; it is a reflexive or "automatic" response, and is not necessarily very noticeable. The startle response may consist of nothing more than sudden eye-blinking or a slight hunching of the shoulders—movements that might be imperceptible to others, especially at a distance.

The quality of the Zapruder film is such that it rules out measuring startle responses, unless one is considering Zapruder's *own* reactions to the loud sound of shots being fired. The film's resolution simply isn't sufficient to discern any reflexive responses that probably occurred in reaction to the first, missed shot.

But the early frames are suitable for measuring mediated reactions, which, like the term implies, involve gross, obvious, and willed bodily movements in response to a stimulus. The difference between a reflexive and mediated response is easily understood as the difference between flinching in reaction to hearing a sudden loud noise, and

looking around in response to hearing a sudden loud noise to determine the sound's cause, origin, and its potential significance in a given context.

Washington Decoded consulted [Dr. Marc Green](#), one of the foremost experts on the physiology of human reaction time, to help sort out what the movements of the three Secret Service agents signified. Green agreed that their responses could not be categorized as startle reactions, if for no other reason than onlookers in the crowd would also have reacted if it had been an automatic reaction. “. . . [S]omething loud enough to have startled a couple of Secret Service guys,” Green explained, “would have startled people in the crowd, too.”^[20]

That several Secret Service agents simultaneously exhibited signs of alarm reflected their training, Green suggested, and in a specific sense, their high level of sensual arousal. They were on the lookout and straining to detect any sudden movements or sounds that might signal a threat. But while being “tuned in,” their attention was also, in a sense, diverted, because of the competing demands on their senses. While steadily moving, they had to focus and then refocus their attention on points in the crowd continually amid a din of four belching motorcycles, and shouts and cheers from spectators.

Dr. Green confirmed that the reactions of the three agents were volitional and deliberate, and would have to be categorized as reactions mediated through the brain and nervous system. The question then becomes, how much time would have to elapse between the stimulus and the agents' gross movements?

First, Dr. Green observed, one has to allow some time for the sound to get to the agents. About 0.10 seconds has to be allotted simply for the sound waves to travel from the sixth floor window to the ground below, given the distance at ±Z139. To that must be added the amount of time it takes for the brain to process the sensation, decide what to do, and transmit the order through the nervous system. A fast mediated response would be in the range of 0.50 to 0.75 seconds.

Simple arithmetic thus proves that agents Ready, Bennett, and Hickey were responding to a stimulus which occurred before Zapruder restarted his camera. Even if they reacted at the fastest possible mediated speed—which is highly doubtful, given that the agents had to pick out the rifle's report while concentrating elsewhere and being bombarded by other sensory information—at least 0.60 seconds or 11 Zapruder frames would have to be subtracted from frame ±Z139.

That fact does not determine when the first shot was fired precisely—but it indisputably places it before the Zapruder film restarted at Z133.

Dorman Film



Figure 7. A frame from the Dorman film, which shows the mast attached to the traffic light at Elm and Houston. About 2.7 seconds after this frame Dorman stopped her camera, at approximately the same moment that Abe Zapruder restarted his camera.

The 24-second film by Elsie Dorman was taken from the fourth floor of the Texas School Book Depository. As such, it is the only film of the assassination to be taken from inside the building, and therein lies its distinct contribution.

The [Dorman film](#) is usually considered a disappointment in terms of its ability to shed any light on what happened, which is partly why it didn't gain immediate attention. Stills from the film were not published until 1967, when *Life* magazine learned about the movie Mrs. Dorman was keeping in a closet and had never shown anyone.^[21] Three stills from the Dorman film were published by *Life*, but the movie itself proved to be "choppy, [and] the panning erratic." After the president's limousine turned onto Elm, the inexperienced Mrs. Dorman had pointed her camera too high and missed the presidential entourage altogether as it entered Dealey Plaza. Rather than peering through the viewfinder, she had pressed the camera against her face while keeping eyes free so that she could see the presidential procession.^[22]

Although the Dorman film largely disappoints, in one respect it conveys important information regarding the timing of the first shot. Mrs. Dorman recalled that she had a willed reaction to the sound of the first shot.

In her very first statement given two days after the assassination, Mrs. Dorman, who worked on the School Book Depository's fourth floor for the Scott, Foresman & Company, one of the nation's largest educational publishers, gave either a short statement or the FBI chose to take down a very brief account. Mrs. Dorman was "looking out the window on the fourth floor. The window was raised and she was taking pictures. It was at this time she heard sounds which sounded like shots."^[23]

In a subsequent [FBI affidavit](#) dated March 1964, prepared after a request from the Warren Commission, Mrs. Dorman gave more details. "I went to a window near my desk

. . . . I was using my husband's camera and was not too familiar with its operation [A]s the motorcade turned from Houston Street onto Elm Street I became excited and did not get any more photographs.”[\[24\]](#)

After Mrs. Dorman died in 1983, the film came into the possession of her son, John, an oil company executive, and he donated it to the Dallas's Sixth Floor Museum (SFM) in 1995. But in the early 1980s, before her death, Mrs. Dorman retold her story to Gary Mack, then an assassination researcher, who later became the archivist at the SFM, and eventually, its curator. According to Mack, Mrs. Dorman explained,

Her husband, John, owned the camera and planned to film the motorcade on Main Street near his place of employment. But John was sick that day, so he told [her] to use the camera. . . . [S]he had never used the camera before and couldn't see much through the viewfinder. So she held the camera next to her face when Kennedy appeared. That's why the film is so shaky and she los[t] sight of the motorcade.

She remembered that the first shot was very loud and sounded like it came from behind her. She said she stopped filming just *after* the first shot [emphasis added], but it's hard to tell exactly when that moment occurs in the film.[\[25\]](#)

Mack wrote the above, however, before Dale Myers's yeoman work in synchronizing all the films taken in Dealey Plaza. It is no longer difficult to discern when Dorman stopped her camera.

After the president's limousine has turned onto Elm, Dorman's film runs continuously until it stops abruptly at frame D335—which was exposed, according to Myers, about 0.12 seconds before Zapruder restarted his camera at Z133 (or about 1.3 seconds after the estimated time of the first shot).[\[26\]](#) Dorman did not restart her camera for almost 3 seconds, until the equivalent of Z185, and then abruptly stopped filming again at the equivalent of Z228, an instant after the second shot had been fired by Oswald. After this second interruption, Dorman waited about 2.7 seconds before she restarted her husband's camera yet again; this time she kept on filming without interruption until a little more than 5 seconds after the third shot.[\[27\]](#)

It would not be surprising that Elsie Dorman remembered this important detail many years later, even though it was not recorded in her earlier statements. A first shot just after Position A was reached would have meant that more of the rifle's muzzle was inside the TSBD, making the sound that much louder inside the building—loud enough to cause some debris to fall from the ceiling on a spectator, Bonnie Ray Williams, who was looking out from the floor directly below Oswald.[\[28\]](#)

If Elsie Dorman's recollection from the early 1980s is judged to be correct, Myers's synchronization alone corroborates that Dorman heard and reacted, as she claimed, to a first shot that occurred before Zapruder restarted his camera.[\[29\]](#)

Towner Film



Figure 8. An amateur photographer, Hugh Betzner, Jr. captured Tina Towner's position in Dealey Plaza as she filmed the motorcade.

The Towner film has never received anything close to the attention lavished on the Zapruder film, chiefly because it did not seem to reveal anything. But if the assertion that posits a shot right after Position A was realized is correct, then the Towner film is second only in importance to the Zapruder film. Of the motorcade films, only Towner's shows an unobstructed view of the presidential limousine at the moment the first shot was fired.

The Towner film, like the Dorman film, received almost no attention until November 1967, when it was featured in a *Life* magazine article about amateur photographs of the assassination in addition to the Zapruder film. The article published three frames from the Towner film. But that hardly did justice to the true magnitude of what Towner had captured because of the firmly embedded notion (first propagated, of course, by *Life* itself) that the Zapruder film was equivalent to a time clock of the assassination.[\[30\]](#)

Tina Towner was 13 years old when she accompanied her parents to Dealey Plaza to see the president. James Towner, a civil engineer, decided to use his 35 mm camera to take still photos, and left the family's 8 mm movie camera in the hands of his daughter. Tina Towner, standing on the southwest corner of Elm and Houston, began filming just as the president's limousine was beginning its turn, and continued to pan left as the car traveled down Elm Street. She stopped filming when all she could see was the rear of the presidential limousine.^[31] This meant, according to the synchronization established in 2007 by Dale Myers, that Tina Towner captured the crucial interval, prior to Z133, when Abraham Zapruder had not yet restarted his camera. The Towner film lasts approximately 11.25 seconds, or some 200 frames, and ends 0.70 seconds before the Zapruder film picks up the presidential limousine at frame 133.^[32]

The Towners left Dealey Plaza without being asked to give a statement to the Dallas Sheriff's Department, and apparently were never approached by the FBI either, once the Bureau took complete control of the investigation. It wasn't until the 1967 *Life* article spurred interest in Towner's account that she went on the record and described her experience that day.

Towner agreed with the consensus account that three shots had been fired, but recalled that the shooting began just after she finished filming.^[33] By now, though, it should be clear that statements by filmmakers about when the shots were fired must be weighed and evaluated like all other testimony, and are not to be taken at face value.

If Abe [Zapruder's recollection](#) were gospel, then one would have to conclude there were only two shots, although the current consensus is that three shots were fired *while* he was filming. The Zapruder, Dorman, and Towner accounts cannot all be true, in other words, even though it would seem to the neutral observer that loud sounds before, during, or after they filmed would make a definite impression on these filmmakers, allowing them to be precise in their observations. It is fair to conclude that having a camera in one's hand did not necessarily make one a better eyewitness. There is no reason to privilege Towner's recollection over that of Elsie Dorman, whose recollection is in direct contradiction.^[34]

What their cameras recorded, however, is another matter.

In Towner's case, because she was filming during the first shot it would seem likely that she must have recorded some action that can be correlated with relevant testimony, or some circumstance that corroborates the explanation of a first shot near Position A. And in fact, Towner did capture such an action, though it has gone largely unnoticed until now.

Patricia Ann Lawrence was a stenographer with the Macmillan Company and worked in the School Book Depository. Shortly before the motorcade arrived, she and a friend, Lucy Whitaker, who also worked as a Macmillan stenographer, found a spot in the front row of people on the north side of Elm Street; Lawrence later estimated they stood about seven feet west of the corner.

As the president's limousine approached, Lawrence first looked at Jackie Kennedy, but noticed that the First Lady's gaze was fixed on spectators on the south side of Elm. But the president was looking in her direction, so Lawrence spontaneously and enthusiastically waved. The first shot occurred as the president raised his hand in seeming acknowledgment. After a pause, she heard two more shots. Indeed, her friend Lucy Whitaker would recall there was sufficient time between the first and second shots that the two young women had time to exchange puzzled glances.[\[35\]](#)



Figure 9. This still photo taken by Phillip Willis, equivalent to frame $\pm Z137$, corresponds to the president's arm motion at the time of the first shot, as noticed by eyewitnesses Patricia Ann Lawrence, Bonnie Ray Williams, and Harold Norman.

One of the aspects of the president's behavior captured by the Towner film was the way he would periodically wave during the motorcade. He would raise his right arm less than half-way to acknowledge the crowd to his right, put it down after a few seconds, and then repeat the gesture after a pause. A review of the Towner film shows the president was waving just after Position A was realized, and this same gesture was still evident when the Willis photo (see figure 9) was taken approximately 1.5 seconds later. Both corroborate Patricia Lawrence's recollection that the first shot coincided with this type of movement by the president, a juxtaposition that Lawrence specifically mentioned during her [interview by the FBI](#) on November 24.[\[36\]](#)

The same correspondence between the president's arm motion and the first shot was also noticed by one of the best-positioned witnesses to the assassination, Bonnie Ray Williams. Along with his co-workers James Jarman and Harold Norman, Williams was looking out from the 5th floor of the School Book Depository—Williams was almost directly below Oswald's window—as the motorcade passed by. When [Williams testified](#) before the Warren Commission he specifically linked the first shot to the president raising his arm:

After the president's car had passed my window, the last thing I remember seeing him do was, you know—it seemed to me he had a habit of pushing his hair back. The last thing I saw him do was he pushed his hand up like this. I assumed he was

brushing his hair back. And then the thing that happened then was a loud shot . . .
[.37\]](#)

[Harold Norman](#), meanwhile, who was looking out the window on the fifth floor directly underneath Oswald, also made point of the president's arm motion at the instant the first rifle report sounded:

[When the president] got past the window where I was, well, it seems as though he was . . . brushing his hair. Maybe he was looking to the public. [Saluting?] Yes. [With which arm?] I believe it was his right arm, and I can't remember what the exact time was but I know I heard a shot . . . [38\]](#)

To be sure, since the president can be seen making this motion throughout the Towner and even the early frames of the Zapruder film, it could be cited to corroborate a first shot at various points. Nonetheless, there is such a movement that overlaps with a first shot fired shortly after Position A was realized. Meanwhile, the next (and last) time the president raised his right arm to acknowledge the crowd—circa Z174—it is not likely that either Williams or Norman could have clearly seen that motion. By then, the oak tree would have been obstructing their lines of sight.

• • • • •

Shell Pattern in Sniper's Nest

One aspect of the ballistic evidence, the expended cartridges found on the sixth floor, has long been relied upon to corroborate that only three shots were fired by Oswald. Yet there may be more information that can be extracted from Commission Exhibit 510 rather than confirmation of this simple fact.

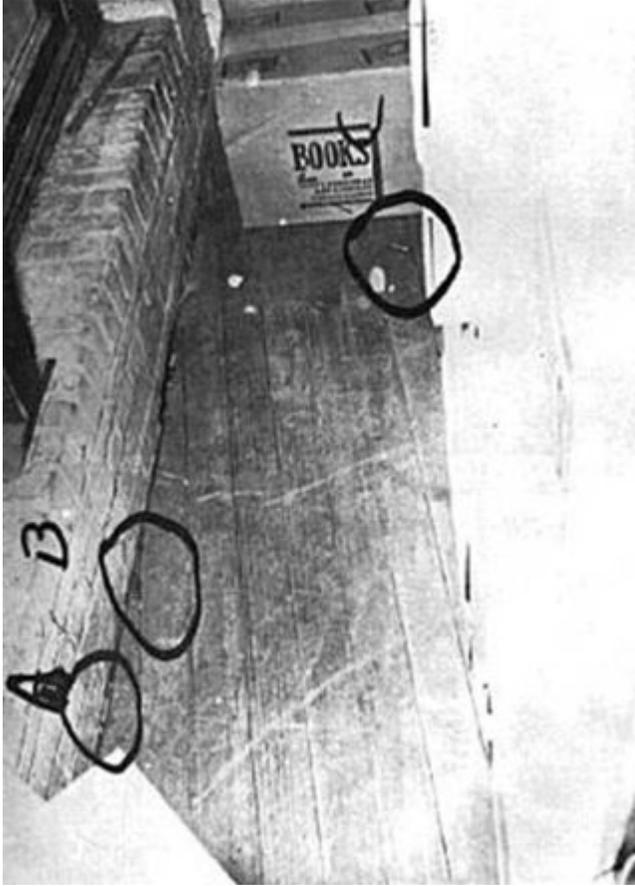


Figure 10. CE 510, a still photo of the cartridge casings ejected from Oswald's bolt-action rifle. The boxes on the right side of the picture were stacked about five feet high.

As figure 10 illustrates, the cartridges were found in a distinctive pattern. Two of them (labeled "A" and "B") were close together against the south wall facing Dealey Plaza, whereas the cartridge labeled "C" was several feet away in a westerly direction.

When the Warren Commission came to the realization about Position A during its restaging of the assassination in May 1964, surveyors calculated that the angle to the rifle in the window would have been about 40 degrees if Oswald had fired in the vicinity of Position A. Meanwhile, the angles for the shots fired at Z222 (the missile that passed through Kennedy and Connally) and Z313 (the fatal wound to JFK's head) would be far less steep: 20 degrees and 15 degrees, respectively.[\[39\]](#)

Although it was not measured, the angle of the rifle in relation to the building would also have differed markedly if the first shot had been fired in the vicinity of Position A. If a perpendicular line is drawn to the Texas School Book Depository's south side, the angle of rifle to this imaginary line, assuming a shot near Position A, would be separated by many degrees from the angles necessary for the shots that provably occurred circa Z222 and Z313, when the presidential limousine was farther down Elm Street (see figures 3 & 11).

More to the point, the angles of the latter two shots could easily account for the shell dispersal pattern. A casing ejected from the rifle after a first shot near Position A would not have ricocheted off the book cartons stacked on the right side of the sniper's nest, as depicted in figure 10. In all likelihood, it would have bounced and rolled unimpeded on the floor until it came to rest in the location labeled "C."[\[40\]](#)

But once the rifle was pointed in a much more westerly direction, corresponding to the shots taken circa Z222 and Z313, it's easy to see how the second and third cartridges would have both bounced off these same cartons, and come to rest against the south wall. Only a minute adjustment was necessary to fire the third and fatal shot, after Oswald had shifted his stance to fire the second shot, which wounded both Kennedy and Connally.



Figure 11. The south face of the Book Depository, as seen from Dealey Plaza. The mast of the traffic light at Elm and Houston Streets is clearly visible in the lower right quadrant.

The Warren Commission [testimony of Luke Mooney](#), the Dallas deputy sheriff who discovered the cartridges, also bears mentioning. Mooney was questioned in March 1964 about the exact circumstances of his discovery. He stated that while he did not disturb the shells once he found them, when Captain Will Fritz of the Dallas Police Department arrived, Fritz did pick them up and by doing so, may have displaced them slightly. But when asked to affirm whether CE 510 accurately depicted the cartridges' locations as originally found, Mooney affirmed that the still picture was "pretty close to right." The photograph depicted them "just about the way they were laying, to the best of my knowledge," Mooney testified.[\[41\]](#)

As Mooney was describing the scene, moreover, he tried to offer up what he thought was a relevant observation. After Warren Commission counsel Joe Ball asked him to circle each cartridge in the photograph, Mooney said, while presumably pointing to one

of the cartridges, “I assume that this possibly could have been the first shot.” The voluntary observation immediately drew a rebuke from Ball. “You cannot speculate about that,” he said. So Mooney was not asked why he thought that, or which cartridge he was even referring to.[\[42\]](#)

Mooney was recently interviewed to see if he still recalled what he had meant to suggest in his testimony before Ball cut him off. Mooney could not remember. But a reasonable inference, if not the only one possible, is that he was going to suggest that the shell identified as “C” in the photograph had not bounced off the cartons of books visible on the right side of the picture. That was why it landed much further west than the two other cartridges ejected from Oswald’s rifle.[\[43\]](#)

In sum, the pattern in which the expended cartridges were found is not at all dispositive. But it is suggestive and corroborative, akin to a visual equivalent of the aural pattern the majority of Dealey Plaza witnesses heard.

Finally, there is also some aural testimony that complements the logical inference that can be drawn from CE 510. If Oswald fired a shot in the vicinity of Position A, much more of the rifle’s muzzle would have had to remain inside the building because of the telescopic sight mounted on the Mannlicher-Carcano, and because the angle to the limousine was much steeper.

The report that would have been created by a rifle that was mostly retracted within the building was an aural phenomenon actually mentioned by one Dealey Plaza earwitness named Garland Slack. An experienced big-game hunter, Slack offered up his observation unprompted and in a timely manner. At the time he gave his statement, Slack undoubtedly knew that the police believed the shots had been fired from the School Book Depository; yet there was no reason why he would have singled out the distinctiveness of the first shot unless it was a strong perception.

According to the [statement Slack gave](#) the Sheriff’s Department on the afternoon of November 22, he was standing on Houston Street when the president’s car passed:

[J]ust after they rounded the corner from Houston onto Elm Street I heard a report and I knew at once that it was a high-powered rifle shot. I am a big game hunter and am familiar with the sound of high-powered rifles

When the sound of this shot came, it sounded to me like this shot came from away back or from within a building. I have heard this same sort of sound when a shot has come from within a cave, as I have been on many big game hunts.[\[44\]](#)

• • • • •

Other evidence exists that corroborates or dovetails with the proposition that Lee Harvey Oswald fired three shots in 11 seconds. Unfortunately, because 45 years have passed since the assassination, no single test or proof can be applied that would be dispositive one way or the other. Future issues of *Washington Decoded* will continue to explore how evidence gathered decades ago, when examined anew, lends support to this description.

Still, the 11-second explanation is already in accordance with more of the facts than any other theory of what happened.

Max Holland is the editor of *Washington Decoded*. Kenneth R. Scarce is a Seattle attorney. The authors wish to thank Tim Brennan for his research assistance.

[1] Commission Exhibit (hereafter CE) 886, [18 Warren Commission Hearing Volume](#) (hereafter WCH) [85](#).

[2] Richard B. Woodward, "[The 40th Anniversary of a 26-Second Reel](#)," *NYT*, 16 November 2003.

[3] Max Holland and Johann Rush, "[JFK's Death, Re-Framed](#)," *NYT*, 22 November 2007.

[4] Kenneth R. Scarce, "[Hidden in Plain View: The Zapruder Film and the Shot That Missed](#)," [Kennedy Assassination Home Page](#), 27 November 2007.

[5] Vincent Bugliosi, *Reclaiming History: The Assassination of President John F. Kennedy* (New York: W.W. Norton, 2007), 451.

[6] Richard B. Trask, *Pictures of the Pain: Photography and the Assassination of President Kennedy* (Danvers, MA: Yeoman Press, 1994), xvii.

[7] Scarce, "[Hidden in Plain View](#)," 27 November 2007.

[8] Holland interview with John Joe Howlett, 21 May 2008.

[9] From Z208 to ±Z255, Ready is not visible in any of the available moving or still pictures of Dealey Plaza. While it cannot be proven to a certainty that he maintained his assigned position until reacting to the second shot at ±223, it appears highly unlikely that he moved his head prior to reacting to the second shot.

[10] CE 1024, [18 WCH 750](#).

[11] CE 1024, [18 WCH 749](#).

Washington Decoded

[12] CE 2112, [24 WCH 541-542](#).

[13] CE 1024, [18 WCH 760](#).

[14] [Warren Report](#), 111.

[15] CE 1024, [18 WCH 762](#).

[16] Ibid., [762](#), [765](#).

[17] Hickey falls out of the Zapruder film at Z212, but was still looking forward at that point and does not turn around until after the second shot.

[18] Quote cited in Mark Zaid and Dennis Ford, "[Eyewitness Testimony, Memory, and Assassination Research](#)," *Proceedings of the Second Research Conference of The Third Decade*, 18-20 June 1993.

[19] Carney Landis and William A. Hunt, *The Startle Pattern* (New York: Farrar & Rinehart, 1939), 27.

[20] Holland interview with [Dr. Marc Green](#), 18 June 2008.

[21] "November 22, 1963, Dallas: Photos by Nine Bystanders," *Life*, 24 November 1967, 3.

[22] Trask, *Pictures of the Pain*, 444.

[23] Harold Weisberg, *Photographic Whitewash: Suppressed Kennedy Assassination Pictures* (Hyattstown, MD: Harold Weisberg Publisher, 1967), 177.

[24] CE 1381, [22 WCH 644](#).

[25] Gary Mack, "[Dorman Film to Appear on the History Channel](#)," [alt.conspiracy.jfk](#), 1 September 1998.

[26] Dale K. Myers, [Secrets of a Homicide: The JFK Assassination](#) (Milford, MI: Oak Cliff Press, 2007), 110-111.

[27] Myers, [Secrets of a Homicide](#), 110-115.

[28] [3 WCH 175](#); [3 WCH 192](#); [3 WCH 204](#).

[29] At first glance, it might seem that the [F. Mark Bell film](#) is another example of the same phenomenon, e.g., an amateur filmmaker who stopped his movie camera at the sound of the first shot. Bell stopped filming just after Position A was realized, and perhaps at the instant the first shot was fired. In addition, the frames at the end of this

segment are very blurred, as if Bell jiggled the camera in reaction to the first shot. In a 1989 interview with author Richard Trask, however, Bell explained that he stopped filming at that juncture because “Between me and the president’s car was a tree. I jumped down from the thing that I was on and ran around to the end of it so that I could get a better picture. That’s when the shots were fired” Consequently, the abrupt end to the Bell film and jiggle may just be a coincidence. Trask, *Pictures of the Pain*, 264.

[30] Frames from the Zapruder film first appeared in *Life* a week after the assassination, and were represented as a “remarkable and exclusive series of pictures which show, for the first time and in tragic detail, the fate which befell our president.” *Life* chose Z144 as the first frame to depict the presidential limousine, not mentioning and/or realizing that Zapruder had not restarted his camera until the limousine was approximately 70 feet down Elm Street already. “Split-Second Sequence as the Bullets Struck,” *Life*, 29 November 1963, 24.

[31] “Photos by Nine Bystanders,” *Life*, 24 November 1967.

[32] Trask, *Pictures of the Pain*, 217; Myers, [Secrets of a Homicide](#), 111.

[33] “View from the Corner,” *Teen*, June 1968, 49. Towner’s recollection, in this respect, is similar to that of John Martin, Jr., a 58-year-old superintendent at the Post Office Terminal Annex. [Martin filmed](#) the motorcade mostly as turned north onto Houston Street from Main. He then sprinted to a point nearer to Elm, and began filming again about 2.8 seconds before Zapruder restarted his camera. As with Tina Towner and several still photographers, Martin was so intent on recording the motorcade, apparently, that he paid little attention to the first shot. Several months later, in April 1964, he was interviewed by the FBI and indicated that the first loud report came after he had stopped filming at approximately Z146. [Warren Commission Document 897](#), 51-53; Trask, *Pictures of the Pain*, 570-571; Myers, [Secrets of a Homicide](#), 110-112.

[34] Zapruder testified he “never even heard a third shot.” [7 WCH 571](#). To conform the Towner and Dorman accounts would mean that Dorman turned her camera off within no more than 0.26 seconds after hearing the first shot—a physical impossibility for a mediated reaction. Myers, [Secrets of a Homicide](#), 111.

[35] CE 1430, [22 WCH 841](#); CE 1381, [22 WCH 660-661](#); CE 1381, [22 WCH 681](#). In recent interviews, Patricia Lawrence and Lucy Whitaker confirmed and expanded upon their statements.

[36] Towner film; “Photos by Nine Bystanders,” *Life*, 24 November 1967, 91.

[37] [3 WCH 175](#). Williams believed the president was raising his arm to adjust his hair rather than wave; in the Towner film, the motion seems to be consistent with the president’s habit, every few seconds, of raising his arm to wave and acknowledge spectators.

Washington Decoded

[38] [3 WCH 191](#).

[39] CE 886, [18 WCH 85](#); CE894, [18 WCH 89](#); CE 902, [18 WCH 95](#).

[40] Although it cannot be entirely ruled out, it is unlikely that Oswald brushed against any of the cartridges with his feet as he departed, as his easiest and fastest route of egress was back and to his right.

[41] [3 WCH 286](#).

[42] [Ibid.](#)

[43] In an oral history, Mooney reiterated that he found the cartridges in a distinct pattern and noted that “It appeared as though they had been ejected from the rifle and had possibly bounced off the cartons of books to the rear.” Larry A. Sneed, *No More Silence: An Oral History of the Assassination of President Kennedy* (Dallas, TX: Three Forks Press, 1998), 226.

[44] Decker Exhibit No. 5323, [19 WCH 495](#).