

THE ZAPRUDER FILM

Michael T. Griffith / EVIDENCE OF ALTERATION
IN THE ZAPRUDER FILM

[Editor's note: Michael T. Griffith is a two-time graduate of the Defense Language Institute in Monterey, CA, and of the U.S. Air Force Technical Training School in San Angelo, TX. His articles on the JFK assassination have appeared in THE DEALEY PLAZA ECHO, in THE ASSASSINATION CHRONICLES, and in JFK/DEEP POLITICS QUARTERLY. He is the author of COMPELLING EVIDENCE: A NEW LOOK AT THE ASSASSINATION OF PRESIDENT KENNEDY (Grand Prairie, TX: JFK Lancer Productions, 1996). Although written in 1998, this piece remains of interest regarding alteration. More recent studies of the film may also be found in MURDER IN DEALEY PLAZA and THE GREAT ZAPRUDER FILM HOAX, reviewed below.]

What follows are some of the indications that the Zapruder film has been altered. By "altered" I mean that certain frames have been removed and that others are composites. Why was the film altered? To remove episodes and images that clearly showed there were more than three shots (at least one from the front) and therefore that there were multiple gunmen involved in the shooting. I have gathered most of these points from the historic new book, ASSASSINATION SCIENCE: EXPERTS SPEAK OUT ON THE DEATH OF JFK, about which more will be said further on in this article.

* Numerous witnesses, over 40, including the escort patrolmen to the rear of the limousine, said the limousine stopped or slowed down drastically for a second or two. The Muchmore film shows the limousine's brake lights on for nine frames (about half a second) during the time period corresponding to about frames 311-319 of the Zapruder film. This event is not seen in the Zapruder film; in fact, the limousine never comes close to performing this action in the current film.

Opponents of alteration cite the virtually invisible, extremely brief slowing identified by physicist Dr. Luis Alvarez. This slowing occurs from about Z295-304, as the car decelerates from approximately 12 to 8 mph in half a second. However, in the film this event is so subtle that it is usually not noticed by viewers. No one appears to have noticed it, in fact, until Dr. Alvarez, through careful study and analysis of the film, detected it. It seems highly unlikely that this subtle, half-second slowing is what the witnesses were describing when they said the limousine came to a full stop or slowed down drastically.

* However, the sudden slowing of the limousine from 12 to 8 mph in Z295-304 does present another problem for the film's authenticity. Though the slowdown is not very noticeable in the film, it represents a deceleration of about 0.37 g. Physicist Art Snyder notes that such a rapid slowing would be expected to toss things around, and he adds that most cars do not decelerate more than 0.4 g. When one examines the frames immediately after this deceleration, one sees no visible effect on the occupants from such a dramatic slowing. The fact that JFK is not moved by this deceleration is particularly interesting because he no longer had voluntary muscular control and should have been thrown forward. Yet for many frames before and after this event he appears to be quite immobile. So, assuming Dr. Alvarez's data are accurate, the sudden reduction in speed that he detected would seem to constitute further evidence of alteration in the Zapruder film. Could it be that this half-second slowing is a remnant of what was originally a much longer, more noticeable deceleration?

* Dr. Roderick Ryan believes he has discovered that the limousine is actually standing still in Z303 but is moving in Z302, even though the limousine appears to be moving at a nearly uniform speed in the film during this time. See Noel Twyman, BLOODY TREASON (Rancho Santa Fe, CA: Laurel Publishing, 1997, pp. 158-159, 164-165). Notes Twyman,

Experience tells us that the limousine could not have decelerated from 11 miles per hour to a complete stop in 1/18 second. (BLOODY TREASON, p. 165)

Dr. Ryan made this discovery by analyzing the blurring of background images in the two frames. Moreover, Dr. Ryan's son, who also works in motion picture film technology, studied the film and confirmed his father's discovery (BLOODY TREASON, p. 159).

In case some might be wondering about Dr. Ryan's background, he is a retired scientist from Kodak. He holds a Ph.D. from USC, majoring in cinema and communications. He worked for Kodak for 29 years. He spent his entire career in motion picture film technology. He is a recipient of the Scientific and Engineering Award from the Society of Motion Picture Arts and Sciences. He has authored numerous books on motion picture technology and several articles on motion picture science. In addition, he is a Fellow of the Academy of Motion Picture Arts and Sciences and a member of the Committee for Selection of Scientific and Technical Awards, Special Effects, Documentary Films.

* In Z353-356 we see Malcolm Summers diving to the ground. Summers is to the right of James Altgens. In Z353 Summers' left leg is extended most of the way out. But, in the very next frame, Z354, amazingly, the foreleg is bent markedly backward. Can anyone flex their foreleg to that degree so quickly? In 1/18th of a second?

In Z355 Summers' left leg is bent even farther backward. Can anyone move their foreleg that much in 1/9th of a second (from its position in Z353 to its position in Z355)?

Then, in Z356, the left foot seems to be on the ground. Can anyone whip their left foreleg backward and then put their foot on the ground in the space of three frames, 1/6th of a second?

* Another seemingly impossible action in the Zapruder film is the extremely rapid and precise movement of Charles Brehm's son in Z277-287. In Z277 Brehm junior is standing behind his father. Then, from Z277-287, or in just over half a second, he bolts out from behind his father and comes to stand beside him, clapping his hands no less. In other words, in Z277 Brehm junior is standing behind his father, but, just ten frames later, he is standing calmly and steadily beside him and clapping his hands--all in a fraction over half a second. Ten frames of the Zapruder film, calculated at the assumed speed of 18.3 frames per second, equals .56 seconds (or 560 milliseconds).

I attempted to duplicate the speed of the son's movement, but was unable to do so in the manner seen in the film. When I moved myself around a chair fast enough to appear from behind it to beside it in the required time, I was unable to come to a stop the way the son does in the film. In the film the son, after just over half a second, is standing calmly beside his father clapping his hands. I could not duplicate this feat. Again, when I did move myself around the chair fast enough, I could not stop with that kind of speed and precision and come to be clapping my hands by the time I stopped.

While working on the present edition of this article, I conducted a simulation with my eleven year-old son, Jacob. I had Jacob stand behind a chair and asked him to duplicate the actions of Brehm's son as quickly as possible. I showed him exactly what he had to do. Jacob carried out the movements twelve times. With a stop watch in hand, I timed each attempt. Jacob's times were as follows: .97, .99, .89, .92, 1.03, .92, .89, .99, .97, .85, .82, and .77, as compared to Brehm's son's amazing time of .56. Jacob was unable to perform the required actions as rapidly as Brehm's son performs them in the Zapruder film. For his last three attempts, Jacob was practically jumping out from behind the chair. And, bear in mind, Jacob was purposely trying to move as rapidly as he could. Yet, he was unable to duplicate the feat of Brehm's son.

I have pressed opponents of alteration to explain this amazing feat of Brehm's son. So far none has been able to do so. They cite the fact that Brehm's son also moves out from behind his father in the Muchmore film. However, as others have noted, the extant Muchmore film is not the original,

and some researchers believe the film might have been altered in an attempt to make it roughly conform with the edited Zapruder film.

As I've said in JFK discussion groups on the Internet, I would invite anyone to attempt to duplicate the movement of Brehm's son--to whip around an object, turning sharply in the process, stop on a dime with no need to steady himself, and clap at the same time, all in the equivalent of ten frames, or in just over half a second. To put it another way, to duplicate this movement, a person would need to be standing behind an object one moment and then come to be calmly standing and clapping beside it just 10/18th of a second later. If someone claims he or she can do this, I would invite that individual to videotape the feat and make the tape available for others to view. At this time, I am convinced this movement is impossible, and that this episode is proof of alteration in the Zapruder film.

* Several witnesses said Kennedy was knocked visibly forward by a shot to the head, and Dan Rather reported seeing this event when he viewed the film the day after the shooting. No such motion of the head is now visible in the film, only the split-second forward movement from Z312-313, which no one could have noticed.

Former FBI official and J. Edgar Hoover aide Cartha DeLoach recently provided further evidence of alteration in the Zapruder film (albeit unintentionally and unknowingly, I'm sure). DeLoach recalls in his book HOOVER'S FBI that he watched the Zapruder film at FBI HQ the day after the shooting and that he saw Kennedy "PITCHING SUDDENLY FORWARD" in the film. No such motion, of course, is seen in the current film.

Newsman James Altgens, who was standing on Elm Street, to the left front of the limousine, with an excellent view of the shooting, when asked if he saw the backward head snap, replied that he didn't see it and that he thought reports of it were based on an optical illusion.

Special Agent George Hickey, riding in the follow-up car, said the final shot made Kennedy "fall forward and to his left."

William Newman, who was standing on the Elm Street sidewalk right in front of the grassy knoll and who had one of the best views of the shooting, tried to tell New Orleans District Attorney Jim Garrison that JFK was knocked forward and to the left as if struck by a baseball bat, but Garrison wouldn't believe him because the event wasn't in the film.

I believe the above is good evidence that the original Zapruder film showed

Kennedy being knocked rapidly forward. How do defenders of the film's authenticity explain this testimony? They seem to have two approaches to this evidence: They either dismiss all of it as mistaken or they note that Kennedy does eventually fall forward and that this is what the witnesses were describing. Yes, Kennedy does eventually fall forward, but this occurs after the violent backward head snap and is a much slower motion, a motion that is clearly the natural result of Kennedy losing consciousness and simply falling over into his wife's lap. The witnesses, on the other hand, seemed to be saying that the impact of the head shot knocked or strongly pushed Kennedy forward, which is not seen in the current film.

In the current film, Kennedy's head is knocked forward from Z312-313 by the impact of a bullet. No one disputes this. With regard to these frames, Itek noted, "the President's head is subjected to a large acceleration forward." Itek calculated that Kennedy's head is knocked forward 2.3 inches and his right shoulder about 1.1 inches from Z312-313. Bear in mind that each frame represents only 1/18th of a second. But, amazingly, by Z314 the head is suddenly moving backward. I suggest that in the original film the marked forward motion that begins at Z312 did not end at Z313 but continued for at least several frames and probably more, and that this was the forward movement seen and described by witnesses.

* The violent, dramatic backward head snap in Z313-323, which for so many years was thought to be concrete proof of a shot from the front, actually constitutes further evidence of alteration. It has been established that no bullet striking the front of the skull could have caused the backward head snap. However, no bullet striking from behind could have caused this motion either. Warren Commission supporters have put forth two theories to explain how a bullet striking from behind might have caused the head snap, the jet-effect theory and the neuromuscular-reaction theory. Both theories are untenable (see, for example, ("Special Effects in the Zapruder Film: How the Film of the Century was Edited," in James Fetzer, ed., ASSASSINATION SCIENCE, Chicago: Catfeet Press, 1997, pp. 279-284; Mark North, ACT OF TREASON, New York: Carroll and Graf, 1991, pp. 383-385). So if neither a bullet from the front nor a bullet from behind could have caused the head snap, what caused it? A few researchers have speculated that Jackie was the cause of the head snap, that is, that she shoved JFK backward, but it is extremely doubtful that she was strong enough to throw her husband's torso backward with such terrific force. The head snap is a physical impossibility, at least according to everything we now know about physics and the human body. So how can we explain it? Dr. David Mantik, who holds a doctorate in physics, suggests that what we now see as the head snap was originally a much slower motion and was actually the action of Jackie lifting her husband back up to look at him.

* Seemingly impossible inconsistencies occur in the streaking of background figures in relation to the camera's movement. Mathematician Daryll Weatherly's vector analysis of image streaking constitutes powerful evidence of alteration in the Zapruder film. Dr. Mantik explains,

Weatherly, in an insightful analysis, takes [physicist Dr. Luis] Alvarez's work to its logical conclusion and raises new and curious issues related to image streaking. For example, between Z-193 and Z-194 the camera moves to the left. This is easily determined by simply looking at the right edge of the frame--the image shifts with respect to the frame edge, presumably as a result of uneven camera movement (i.e., poor tracking). As Alvarez noted, such a movement should produce streaking--of the background figures, the sign, and the closer bystanders. But none of this is seen--it is all quite paradoxical. Based on this, Weatherly proposes that this is a composite scene. This is a remarkably simple and powerful argument. It is difficult to avoid this conclusion. (ASSASSINATION SCIENCE, p. 315)

Another case of inconsistent image streaking occurs in Z212. In this frame the posts on the Stemmons Freeway sign are noticeably blurred, but the holes in the masonry wall in the background are very well defined. "Since neither of these objects is moving," observes Dr. Mantik, "their visual definition should be similar--but it is not" (ASSASSINATION SCIENCE, p. 315).

* A white spot on the grass behind the limousine is seen to behave in an unnatural manner. When the spot's width is measured in relation to the camera's tracking, the spot should be at its smallest when the image is at the left edge of the frame. But it doesn't do this. On some occasions, the spot's width is two to three times what it should be. And the frame to frame displacement of the white spot becomes especially egregious when the spot moves into the intersprocket area. Between Z334 and Z335, the displacement of the spot is 180 PERCENT OF NORMAL. Critics of alteration note that the white spot also appears in a photo taken by Richard Bothun. This, however, does not explain the unnatural way the spot behaves in the Zapruder film.

* The head turn of the driver, William Greer, from Z315-317 is too fast--it seems to be well beyond human capability. His head turns about 165 degrees in six frames, or in only 1/3rd of a second. Furthermore, attorney Mike Pincher and Roy Schaeffer argue that the Greer head turn should create blurring in the film since the human eye can't remain focused when following such a rapid movement, but no blurring is seen:

If the reader flashes his hand in front of his face in approximation of one-third of a second, it appears as a blur. The eyes are incapable of staying in full focus in following this action. If Greer's 165-degree movement in one-

third of a second truly depicted real time, it would likewise appear as
ablur. But blurring of this nature is not seen in the Zapruder film.
(ASSASSINATION SCIENCE, p. 223)

* At least four witnesses saw blood and brain from Kennedy's skull blow out
toward the rear of the limousine. Blood and brain splattered onto the left
side of the follow-up car's windshield and onto the driver's arm. A
considerable amount of blood and brain also splattered onto the two patrolmen
who were riding to the limousine's left rear. At least one of those witnesses
specified that the brain matter blew out from the back of the skull, and
dozens of witnesses, including doctors and nurses, saw a large hole in the
right rear part of President Kennedy's head. In the Zapruder film no blood or
brain is seen to spray backward. (It cannot be said that the right frontal
explosion of blood and brain, which is itself suspect, caused all the blood
splattering. In the Zapruder film the right-frontal spray blows mainly
forward, and also up and toward the camera, and quickly dissipates--in fact
it dissipates in no more than three frames. This effusion of spray could not
have caused all of the blood splattering that occurred.)

Secret Service Special Agent Sam Kinney was the driver of the follow-up car
in Kennedy's motorcade and thus had a bird's-eye view of the shooting. In
interviews with Vincent Palamara between 1992 and 1994, Kinney made some
interesting and important observations about what he saw and about his
impressions concerning the shooting. Of particular interest are Kinney's
comments about the large head wound in the President's head:

He had no brain left [in the wound created by the shot]. It was blown out.
. . . there was nothing left. . . . [The wound was in] the back of the head.
I saw it hit and I saw his hair come out I had brain matter all over
my windshield and left arm, that's how close we were to it. It was the right
rear part of his head, because that's the part I saw blow out. I saw hair
come out, the piece [of skull] blow out, then the skin went back in--an
explosion in and out. ("The Secret Service Interviews," KENNEDY ASSASSIN-
ATION CHRONICLES, Summer 1997, p. 20, emphasis added)

When Kinney was told about the description of the exit wound given by a
number of the doctors who treated Kennedy at Parkland Hospital right after
the shooting, he replied,

I would say that, too. . . . ("The Secret Service Interviews," p.
20, emphasis added)

Kinney's description of a large, blown-out right-rear exit wound matches the
reports given by numerous Parkland doctors and nurses and by several
witnesses at the autopsy. Also, his account of particulate matter exploding

out the back of the skull and landing on his windshield and left arm agrees with Patrolman Bobby Hargis's report that the head shot sent blood and brain flying toward him so fast that when it struck him he initially thought he himself had been hit and that the debris got all over his motorcycle and uniform (in an interview he gave a few years ago, Hargis described the head shot as an "explosion"). Hargis, of course, was riding to the left rear of the limousine.

* There are marked disagreements between the descriptions of those who saw the film soon after the assassination and what is now in the film. Dan Rather's reference to Kennedy's head being knocked forcefully forward is one case in point. Another example is the account of surveyor Chester Breneman, who was allowed to study enlargements of Zapruder frames to aid him in determining locations and distances. Breneman insisted that on some of the frames he saw a blob of blood and brain blow out from the back of Kennedy's head. No such event is visible on the current film. (As mentioned, some witnesses in the plaza likewise saw blood and brain blown backward.)

* The bloody spray from the right-frontal explosion that is seen in the film blows upward, forward, and also toward the camera, and is really clearly visible for only one frame, and dissipates in two to three frames--or in no more than 1/6th of a second. Yet, in films of two ballistics tests the resulting spray is visible for multiple frames. In other words, the right-frontal effusion in the Zapruder film seems to disappear too quickly, with unnatural speed.

* The 12/5/63 Secret Service survey placed the shots at approximately Z208, Z276, and Z358. A head shot at Z358 corresponds with the accounts of Emmett Hudson and James Altgens. Additionally, CE 2111, a Secret Service report, identifies the manhole cover on the side of Elm Street as being located almost opposite the limousine at the time of the last shot--the manhole cover is some 70 feet beyond the spot on the street that corresponds to Z313, which is when the head shot occurs in the current film. (There are several indications that there were TWO head shots. Dr. Mantik opines the first head shot occurred at around Z306-313 and that another one followed a short time later. He believes the current rapid backward head snap that starts at Z313 was originally a much slower motion and, as mentioned, might very well have been the action of Jackie lifting her husband back up to look at him.)

* There is a "remarkably symmetric" plus sign at the center of Elm Street in Z028 (Z28). This might have been used as a register mark for aligning the film when it was being copied by those who altered the film.

* There are magnification anomalies in the film for which there appears to be no credible natural or innocent explanation. One clear example of this is the measured width between the two posts on the back side of the Stemmons Freeway sign from Z312-318. This distance increases by over 12 percent in only six frames. Yet, from Z191-207 the interval remains constant. Some might attempt to explain this anomaly by suggesting that the lens was nonlinear for objects so far off the central axis. But, even if this were the case, it would still be unusual for such inconsistent changes to occur so abruptly within the lens, and lens aberrations do not normally occur in such an erratic fashion anyway.

* Abraham Zapruder told CBS News that he began filming as soon as the President's limousine turned onto Elm Street from Houston Street, as one would logically expect him to have done. But the present Zapruder film begins with the limousine already on Elm Street at Z133. On the day after the assassination, Dan Rather of CBS News watched what was quite possibly an earlier version of the film. Rather reported that in the film he watched that day the limousine "made a turn, a left turn, off Houston Street onto Elm Street." Again, no such event is now seen in the film. In the current film there is a long gap between the earlier motorcycles and the limousine's first appearance at Z133. Why would Zapruder have expended valuable film on the motorcycles but not have taken as much footage as he could of the limousine? Why did he report he had filmed the limousine when it turned onto Elm Street? And what of the left turn from Houston Street onto Elm Street that Rather observed in the film when he viewed it the day after the shooting?

Before I conclude, I would like to address two questions that have been raised by those who deny alteration: Why would the forgers, who were presumably trying to conceal or remove evidence of multiple gunmen and of shots from the front, produce an altered film that included the rapid backward head snap seen in the current film? And, why would the forgers have produced a film that contained indications of more than three shots? My answer to both of these objections is twofold: One, they do not explain the evidence of alteration. If there is scientific proof of alteration, then these philosophical objections must be rejected. Two, I do not believe the forgers were at all satisfied with the results of their tampering. I think they had to create the backward head snap because they had to remove images that were even more unacceptable and problematic. We must keep in mind that the Zapruder film was suppressed from public view for over a decade. In short, I believe the forgers concluded that even after all of their editing the film was still unacceptable, and that this is why the film was suppressed for so long.

I stress that this list contains only some of the indications of fakery

in the Zapruder film. I would urge the reader to read the chapters on the signs of alteration in the Zapruder film in the new book ASSASSINATION SCIENCE, edited by Professor James Fetzer of the University of Minnesota. Concerning the evidence that the Zapruder film has been altered, Dr. Mantik says the following:

A strong case can now be made for extensive editing of the Zapruder film. In fact, the conclusion seems inescapable--the film was deliberately altered. No other explanation is in the same league, in terms of explanatory power, for the myriad of anomalous characteristics that are seen everywhere in this case. Many frames were excised, some individual frames were extensively altered, others were changed only enough to fill in for missing frames, and others were left alone. . . .

What can be made of the absurd paradoxes of (supposed) camera tracking errors that are totally inconsistent with what actually appears in the relevant frame? When the frame contents shift by enormous amounts, corresponding blurs must be seen. There is no cinematic magic that can avoid such realities. And what can be said about intersprocket magnifications that are grossly different in two frames, particularly when tracking nonsense surfaces in the same frames? And now, thanks to Noel Twyman, we have the image of The Soaring Bird and of The Black Hole. These could have provided precisely the kind of reference points for pin registration that would be essential for frame to frame editing.

Why else are these images there? They do recur persistently throughout the film. And when they are absent, where do they go--unless someone has deliberately omitted them? And where exactly did the intersprocket image of the right motorcycle come from? And why is it never visible in the central image?

Why does the intersprocket image of the motorcycle skip around? Why is the intersprocket image darker after about Z235? Why do so many odd features occur within the intersprocket area? Why is the intersprocket image missing in frames Z413 and 414?

And so the questions come, one after another, like automatic rifle fire. How much more evidence is required before reason prevails? At the very least, the proposal of film alteration deserves extensive consideration and serious discussion--even among those who are still inclined to be doubters. For these individuals, there is now much to explain. It is time for them to put on their ten-league boots and begin climbing this small mountain of data. ASSASSINATION SCIENCE, p. 340, original emphasis)

If you have not read ASSASSINATION SCIENCE, I would urge you to do so.

It is quite possibly the most important book ever published on the death of President Kennedy. It truly represents a breakthrough in the case. Noel Twyman's book BLOODY TREASON also presents evidence of alteration in the Zapruder film, along with other important developments relating to the assassination.

Even if some of the apparent technical anomalies in the Zapruder film can be explained, strong indications of tampering would still remain. To put it another way, if opponents of alteration are able to explain the absence of background streaking in certain frames, the magnification anomalies, the odd behavior of the white spot, and other seeming difficulties, would this establish the film's authenticity? No. Otherwise, do we dismiss the witnesses who reported the limousine stopped or slowed drastically? Do we dismiss the witnesses who saw blood and brain blown visibly to the rear? Do we dismiss the fact that the backward head snap is physically impossible according to everything we know about physics and the human body? Do we dismiss the fact that Zapruder said he filmed the motorcade from the time it turned onto Elm Street? Do we dismiss the fact that Brehm's son is positioned behind his father one moment but half a second later is standing calmly clapping at his side? Do we dismiss the fact that the 12/5/63 Secret Service survey placed the last shot at Z358 and that this placement matches the testimony of Emmett Hudson and James Altgens regarding the explosive head shot?

The numerous indications of alteration in the Zapruder film naturally raise some disturbing questions. The answer to the question of why the film was altered is fairly apparent--to conceal obvious evidence of a frontal shot, of multiple gunmen, and of more than three hits. But, who performed the alteration? Whoever they were, they were very well connected (so as to gain access to the film) and had at their disposal considerable technical expertise. It would seem self-evident that those who altered the Zapruder film were either working with or following orders from the men who were responsible for the assassination of President Kennedy.

Though it has been 34 years since the shooting, a special prosecutor or a Congressional committee should be appointed to investigate this matter.

A declassified CIA document indicates the Zapruder film was detoured to a sophisticated CIA photographic lab relatively soon after the assassination, and quite possibly on the night of the shooting. Professor Phillip Melanson has discussed this declassified document and what it reveals about the handling of the film in his famous article "Hidden Exposure: Cover-Up and Intrigue in the CIA's Secret Possession of the Zapruder Film" in THE THIRD DECADE (November 1984). A summary of the main points of Melanson's findings is included in ASSASSINATION SCIENCE.

Though many researchers have long suspected the Zapruder film was altered at the CIA, there is some indication that at least part of the alteration might have been done at the FBI.

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