April 23, 1964

MEMORANDUM FOR THE RECORD FROM: Melvin A. Eisenberg

Over the last several months, we have held conferences in an attempt to determine the frames in the Nix, Zapruder and Muchmore films which portray the impact at which the third shot struck the President. Present at all these conferences were Inspector Leo Gauthier and Mr. Lyndal L. Shaneyfelt of the FRI, John Joe Howlett of the Secret Service and Messrs. Redlich and Eisenberg of the Commission staff. Also present at most or many of these conferences were Mesers. Specter and Belin, several unidentified assistants of Inspector Gauthier, Inspector Kelley of the Secret Service and Inspector Malley of the FBI.

The consensus which emerged from these conferences is that the impact of the third shot is portrayed in frame 313 of the Zapruder film, frame 24 of the Nix film, and frame 42: of the Muchmore film. (In each case, frames are counted from the first frame in the continuous sequence which culminates in the portrayal of the third shot, rather than from the beginning of the films.)

cc: Mr. Rankin

Mr. Willens V

Mr. Ball

Mr. Belin

Mr. Specter

Mr. Eisenberg

April 24, 1964

MEMORANDUM

TO:

Messrs. Redlich, Specter, Belin

FROM:

Melvin A. Eisenberg

SUBJECT:

Determination of the Trajectories

of the Three Shots.

1. My memos of the conferences of April 14, 1964, and April 21, 1964, designate the frames in the Zapruder film which portray or may portray the impact of the first and second bullets. My memo of earlier conferences designates the frames in the Zapruder, Nix, and Maximore films which portray the impact of the third shot. In order to translate these determinations into actual distances, it appears to me to be necessary to so to Dallas.

2. The first stop to take in Dallas is to place viewfinders on the spots at which Lapruder, Nix, and Muchmore were standing, and place a replica car, bearing six occupants, on Elm Street. The replica car should then be positioned so that, viewed through the viewfinders, the relationship between the replica car and the surrounding landmarks is the same as the relationship between the actual car and the landmarks on November 22, as shown in the designated frames.

3. Pictures should be made showing the car (positioned under paragraph 2) from the following vantage points: (a) the spots at

^{1/} Preferably, the actual car.

which the photographers were standing; (b) a point in the TSHD approximating the point at which the muzzle of the rifle was located; and (c) several points on the overpass. Still pictures, and moving pictures taken through the cameras actually used by Zapruder, Mix, and Muchmore should be taken from vantage point (a). Two sets of still pictures, one through a 4X telescopic sight, should be taken from vantage points (b) and (c).

- 4. Tapes should then be laid on Elm Street over the points or ranges at which the President and Governor were located when the three shots atruck. Each tape should be marked to show every designated frame, and the first tape should also be marked at the point where the President first became visible from vantage point (b) after emerging from behind the tree. On-the-street measurements should then be taken of the distances (1) from the marked points on each tape to the marked points on every other tape and (ii) from the marked points on each tape to the mid-point of a line connecting the southeast and southwest curbs of Elm Street.
- 5. The position of the tapes and all marked points thereon should then be mapped on a survey, and the lengths of the various possible trajectories should be measured by the surveyor on a trigonometric basis, measuring from the point at which the muzzle was probably located to the beginning, end, and marked points of each tape. The surveyor should also determine the angle each trajectory makes with the horizontal. Copies of the surveyor's work-sheets and calculations should be cent to us.
- 6. The steps outlined herein are not to be deemed as exclusive. In particular, an attempt should be made to photograph various

relative positions of the persons simulating the President and Covernor Commally with a view to determining whether the first bullet probably did or did not hit the Covernor as well as the President.

MP

BELL TELEPHONE LABORATORIES

INCORPORATED

MURRAY HILL, NEW JERSEY
TELEPHONE
AREA CODE 201
582-3000

July 17, 1964

Mr. J. Lee Rankin General Counsel 200 Maryland Ave. N.E. Washington, D.C. 20002

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Dear Mr. Rankin:

At your request we have examined the tape relating to President Kennedy's assassination. We made spectrograms for a period of 7.79 seconds and found no evidence of non voiced noise before the occurance of event #1 shown on figures 4A and 4B. If this event, which appears as a short duration spike, is a gun shot, it is followed by three other non voiced noises with different acoustic characteristics. The other noises occur .86 second, 1.035 seconds and 1.385 seconds after event #1.

Events #2, #3, and #4 are of longer duration showing three resonance bands which appear to be harmonically related. These events possibly are reverberation noises generated by event #1. Events #5 and #6 may or may not be related to the preceeding events. If not, we cannot account for them.

We continued the tape analysis for 5.04 seconds after event #6 with finding any non voiced noises.

If we can be of further help, we will be pleased to try.

Sincerely yours,

L. G. Kersta

Acoustics and Speech Research Laboratory

MH-1232- LGK/jeg

Enclosure

Tape

MPURE

AS:mln 29 June 1964

JUN 3 0 1964

Dr. L. G. Horsto Boll Laboratories Murray Hill, New Jordey

Donn Dr. Karata;

With this letter we are enclosing what purports to be a transcript of an on-the-scene relia broadcast at the time of the accession bion of President Hamody on November 22, 1963, in Ballas, Berns.

We have listened to this tape and have heard two noises which come in royal succession inactionally before the amouncer cays: "It appears as though something has happeard in the meterande rower." We would very much appreciate it if you would analyze this transcription and determine if of all possible thether there are any other noises, which may be granted counts, which preceds the two noises which we have been able to detect. It is our expectation that any such noises would occur within a few seconds preceding the noises which he detected. It may be that such noises occur of the same time that the amounter is specking so those sounds will have to be sorted out through their yer scientific means you have at your disposal.

We would appreciate a report from you on this of your carliest convenience. This tape belongs to Clasted Sound Studios, Inc., so we would appreciate it if you would conduct your amplyois with care so that it may be returned in its carried condition.

Thank you yeary much for your conditionation.

Dimercly yours,

SIGNED

J. Los Montin Comoral Councel

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Dillard, Isme

<u>1</u> DL 100-10461 RPG:vm

By letter dated July 7, 1964, the President's Commission requested additional investigation concerning an alleged mark on the curb in the vicinity of the Texas School Book Depository (TSED), Dallas, Texas, which had been photographed by JAMES UNDERWOOD, a Newsman with KRLD-TV, Dallas, Texas. In connection with this request, the President's Commission letter made available a photograph of the curb made by TOM DILLARD of "The Dallas Morning News" which had been forwarded to the President's Commission by MARTHA JOE STROUD, Assistant United States Attorney, Dallas, Texas.

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Commission No. FBI /395

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Date __7/15/64

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JAMES UNDERWOOD, residence, 9751 Farkford Drive. Dallas, Texas, a Newsman for KRID-TV, Dallas, was shown two photographs. One of these photographs is of a mark on the curb on the south side of Pain Street hear the triple underpass and shows a hand shielding the light from this mark. The second photograph was taken looking across Main Street and up Elm Street towards the Texas School Book Depository (TSBD) Building. Mr. UNDRIWCOD identified these photographs as frames taken from a 16 rm movie film, which film was taken by him on the morning of November 23, 1963. Mr. UNDERWOOD advised he had been told by a Deputy Sheriff, whose name he could not recall, that there was a mark on the curb on the south side of Main Street near the undergass, which was possibly made by a .ricmcheting bullet. The photograph of the hand shielding the mark on the curb was made by UNDERWOOD squatting down in the gutter to get a close-up view of the mark, and the picture of the TSBD Building was taken by placing the handle attached to the underneath side of UNDERWOOD's movie camera on the curb near the mark and pointing the camera back towards the TSBD Building, in order to get a low-level shot.

Mr. UNDERWOOD repeated what he had told Bureau Agents on June 11, 1964, that he could not be positive the mark was made by a richocheting bullet, but appeared to him that it could have been, based on knowledge acquired by him while in the military service. He further stated it was definitely a mark on the curb and not a nick in the curb. He repeated that the concrete was not broken and that the mark appeared to have possibly been made recently, but he could not judge how much time had passed since the mark was made when he took the photographs of it.

Mr. UNDERWOOD stated that, prior to taking the photographs, he met TOM DILIARD, a Photographer for "The Dallas Morning News," near the entrance to the Dallas County Jail, and had told DILIARD about the information he had received from the Daputy Sheriff about the mark on the curb. DILIARD indicated he would possibly also take a still photograph of this mark.

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on	7/15/64	_at.	Da:	llas	. Texas					File	# 'DL	100-10461	
Ьу	Special Agents	R.05	EFF.	M.	RARRETT ea:		IVAN	D.	LIEIS	Date	dictated	7/15/64	

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FEDERAL BUREAU OF INVESTIGATION

TOM C. DILIARD, residence, 7022 Marrilee Lane, Dallas, Texas, a Photographer for "The Dallas Morming Nuws," advised that on the morning of Novamber 23, 1963, while at the Dallas County Jail entrance, he had received information from JAMES UNDERWOOD, a Nowsman for MAID-TV, to the effect there was a mark on the curb on the south side of Main Street near the triple underpass. UNDERWOOD had told DIMMARD that the mark was possibly made by a bullet. Later during the afternoon of November 23, 1963, DILIARD, using a Mamiyaflex 120 Camera, took a picture of a mark on the curb on the south side of Main Street about twenty feet east of the triple undarpass. DILIARD stated he was of the opinion the mark very possibly could have been made by a richocheting bullet and that it had been recently made.

Mr. DILMARD was shown a photograph of a mark on the curb with a hand holding a pancil pointing towards the mark. He identified this photograph as a copy of the one he had taken on the afternoon of November 23, 1963.

Mr. DILIARD stated he definitely recalls it was a mark on the curb, rather than a nick in the curb, and the concrete was not broken or chipped.

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by S	Special AgentS_	ROF	man'n.	BAR	Enthering	<u> </u>	IVAN	D.	THE	Data	dictate	d 7/15/6	A

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Special Agents ROSERT M. BARRETT and EVAN D. LEE. of the Federal Bureau of Investigation, accompanied by TCM C. DILLARD, a Photographer for "The Dallas Morning News," and JAMES UNDERWOOD, a Newsman for KRLD-TV, went to the area approximately twenty feet east of the triple underpass and on the south side of Main Street. Through the use of the same camera used by Mr. UMDERWOOD on November 23, 1963, and by aligning three reference points in a photograph of the Texas School Book Depository (TSBD) Building taken by Mr. UNDERWOOD on November 23, 1963, from this same area, it was ascertained the mark observed and photographed by Mr. UNDERWOOD and Mr. DILLARD had been at a point on the curb twenty-one feet and eleven and one-half inches east of a point where Main Street passes under the triple underpass. This same point where the mark had been observed by Mr. UMDERWOOD and Mr. DILLARD was seventy-three feet and five inches west of the first lamp post on the south side of Main Street, which lamp post is the first one located east from the triple underpass on Main Street.

The area on the curb from this point for a distance of ten feet in either direction was carefully checked and it . was ascertained there was no nick in the curb in the checked area, nor was any mark observed.

Reference points in the photograph taken by Mr. UNDERWOOD used to locate this point were a lamp post located in the right of the photograph, which appears to be midway between two buildings, a lump post located on the north side of Elm Street, which is in line with the third row of windows from the southwest corner of the TSBD Building, and which face south, and a traffic sign located on the left side of the photograph, which is to the west of the TSBD Building.

It should be noted that no nick or break in the concrete was observed, in the area checked, nor was there any mark similar to the one in the photographs taken by UNDERWCCD and DILIARD observed in the area checked either by Special Agents

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on	Dallas, Texas		File # DL 100-10461
by Special Agents ROBERT	M. BARRETT &	IWAN D. LEE	- Date dictated <u>7/15/64</u>
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