THE AEROSPACE CORPORATION

P.O. Box 92957, Los Angeles, California 90009, Telephone: (213) 648-5000

11 December 1978

Mr. Michael Goldsmith
Senior Staff Counsel
Select Committee on Assassinations
U.S. House of Representatives
House Office Building, Annex 2
Washington, D. C. 20515

Dear Mickey:

On 2 December 1978, a meeting was held at The Aerospace Corporation to view and evaluate a movie film which was taken by Mr. Charles L. Bronson at Dealey Plaza approximately five minutes prior to the assassination of President Kennedy. The meeting was arranged by Ms. Jane Downey of the Select Committee on Assassinations and was attended by Al Hall, Harold Levine, and John Sigalos of the law firm Sigalos and Levine representing Charles Bronson and by the following photographic and Digital Image Processing technical experts: Harry Andrews and David Garber of USC; B. R. Hunt of the University of Arizona; Robert Selzer of Jet Propulsion Laboratory; N. K. Baker, E. A. Larson, C. J. Leontis, J. R. Parsons, D. M. Rosenthal of The Aerospace Corporation; Al Mandl, consultant to Aerospace Corporation; and R. P. Chiralo, formerly with Aerospace Corporation.

Mr. John Sigalos brought an 8 mm color movie film which he said that Mr. Bronson took with a Keystone camera at 12 frames per second, a 16 m color copy which according to Mr. Sigalos had been generated by Mr. Bob Groden, and a set of 35 mm slides showing the area around the 6th floor window of the Texas School Book Depository Building also made by Bob Groden although Mr. Sigalos did not know whether the slides were made from the 8 mm original or from the 16 mm copy.

Following some brief remarks by Mr. Sigalos regarding the circumstances surrounding the Bronson film and Mr. Groden's involvement, the participa were shown the following:

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a. Several 35 mm color slides which were enlargements from either the Bronson original 8 mm movie or the 16 mm copy showing the area around the 6th floor window of the Texas School Book Depository Building. In addition to viewing these slides slowly and in rapid succession, several pairs of slides were superimposed on the same screen using two projectors, and they were switched back and forth from one slide to the other in order to enhance any differences between frames and assess whether or not such differences might be attributed to motion behind the window.

b. A 16 mm copy of the Bronson movie film and 16 mm enlargements of area around the 6th floor window of the Texas School Book Depository Buildi This 16 mm film which Mr. Sigalos identified as the Groden film was project at a variety of frame rates ranging from stop frame to 24 frames per second.

c. Several frames of the original 8 mm Bronson film were viewed under microscope. One frame was selected in which the area around the 6th floor window of the Texas School Book Depository Building was scanned in color in the PDS microdensitometer with a 5 micron aperture and 2 micron line spacing and displayed on the COMTAL with varying degrees of contrast enhancement interactively applied. The enclosed color print which was generated in the Dicomed D-47 display unit shows the exact area of the frame which was scanned and displayed. All this was done in The Aerospace Corporation's Digital Image Processing Laboratory during the 2 December meeting. The experts recommended not to show the 8 mm original film in order to avoid any possibility of damage and because our 8 mm projector could not be operated at variable frame rates. Viewing the film at normal frame rates and without magnification of the area of interest was not considered useful enough to warrant even a small risk of damaging the original film.

Following is a summary of observations and conclusions by the experts present at this meeting:

1. The Bronson film, although taken from a slightly different angle than the Hughes film, shows about the same area around the 6th floor window of the Texas School Book Depository Building, but the Bronson film is of superior quality compared to the Hughes film. This observation is based on viewing the original 8 mm Bronson movie film under a microscope and the 6th floor window portion of a digitized frame on the COMTAL display.

2. If the Bronson film had been available earlier, the experts would l recommended that it be analyzed along with the Hughes film.

3. Following careful examination of the Groden 35 mm slides and 16 r movie film, the experts at this meeting could not say conclusively whether or not the frame-to-frame changes in the 6th and 5th floor windows were due to real motion behind the windows. The experts disagree unanimously with Mr. Groden that "you can actually see one figure walking back and forth hurriedly" as he was quoted by The Dallas Morning News on 26 Nove 1978. A more definitive conclusion may result through computer process of selected frames from the 8 mm Bronson original. The experts also fe that a good quality 16 mm photographic copy with the area of interest enla could be of interest.

4. In viewing Groden's 16 mm copy of the Bronson film and recalling memory the Hughes film and the computer processed frames of the Hughe film, the experts observed similar dynamics in the two films; i.e., the apparent motion in the windows seems to be random and therefore it is no likely to be due to human motion behind the window. Again, this observat is based primarily on our past experience with the Hughes film. Compute analysis of the Bronson film similar to that applied to the Hughes film ma clarify this issue especially since the Bronson film is of superior quality the Hughes film.

In accordance with our telephone conversation, I am sending a copy of t is letter to each participant in the 2 December meeting at Aerospace wit the request that they review it and submit corrections or additional commen s directly to the Select Committee.

Very truly yours,

THE AEROSPACE CORPORATION

Charles J. Leontis

C. J. Leontis, Director
Optical Systems Department

CJJ:peg

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PATENT, TRADEMARK, COPYRIGHT
& UNFAIR COMPETITION CASES

December 14, 1978

Mr. Michael Goldsmith, Esq.
Senior Staff Counsel
Select Committee on Assassinations
U.S. House of Representatives
House Office Building, Annex 2
Washington, D.C. 20515

Dear Michael:

I have read Charles J. Leontis' letter to you of December 11, 1978, and have several brief comments which I believe should be made of record.

First, I think Mr. Leontis did an excellent job of setting forth the consensus of the views of the experts present at the meeting at the Aerospace Corporation on December 2, 1978. There were some present who felt that Mr. Bronson's film did show certain images of definite interest and were of the view that the original film must be carefully studied, but I leave it to them to comment directly to you as to their views.

Second, while interpretation of Mr. Bronson's film and any enhanced version thereof is to be left to the experts, I do feel qualified to comment as to what should be done based on certain conclusions reached by the experts. Specifically, all experts present at the December 2, 1978 meeting were of the opinion that the Bronson film is of superior quality as compared to the Hughes film and that movements were observed in the 6th floor windows of the Texas School Book Depository. In my opinion these facts, in and of themselves, mandate proper further analysis of the Bronson film. It should be noted that even if, based solely on viewing the poor quality 16 mm. copy of Mr. Bronson's film, some experts may feel at this point that the motion in the Bronson film may only exhibit dynamics similar to that in the Hughes films, this does not militate against the necessary further study of the Bronson film. As Mr. Leontis stated in his letter referring to this motion in the windows, "Computer analysis of Bronson film similar to that applied to the Hughes film may clarify this issue especially since the Bronson film is of superior quality to the Hughes film."

As an attorney, I cannot conceive of a piece of evidence as relevant as Mr. Bronson's film not being fully studied to the fullest extent possible; particularly when it deals with the murder of a President of the United States of America

In keeping with the agreed procedure, I am sending a copy of this letter to each participant at the December 2, 1976 meeting at The Aerospace Corporation.

Sincerely,

SIGALOS & LEVINE

John L. Sigalos

JLS/dar

cc: Dr. H. C. Andrews
Mr. N. K. Baker
Mr. Robert Chiralo
Mr. David D. Garber
Alfred E. Hall, Esq.
Dr. B. R. Hunt
Mr. E. A. Larson
Mr. Charles J. Leontis
Harold Levine, Esq.
Mr. Al Mandl
Mr. John Parsons
Mr. David Rosenthal
Mr. Robert Selzer

JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

384/IPL-BIP/78-233

December 21, 1978

Mr. Michael Goldsmith
Senior Staff Counsel
Select Committee on Assassinations
U.S. House of Representatives
House Office Building, Annex 2
Washington, D.C. 20515

Dear Michael:

The purpose of this letter is to communicate some retrospective reactions to the Bronson 8mm film that we viewed on December 2 at Aerospace Corporation. I have discussed some of these points with Chuck Leontis and he agrees that a separate letter from me would be appropriate since his letter summarizes the group concensus on December 2. I am not incidently in disagreement with the report contained in the Leontis letter of December 11 but would perhaps more strongly recommend computer processing of this film for the following reasons:

1. To my knowledge, this is the only possible evidence of movement behind the two closed windows adjacent to the half-open window. I am referring first to the immediately adjacent window (labeled 1 on the attached diagram) and the second to the nearest section of the window under the curved brick facing (labeled 2). Every other photo or movie frame that I can remember shows these windows completely opaque, possibly due to a combination of dirt and sun glare. It is possible that slight window pane movement could create the appearance of rapidly moving objects. If so, the speed of shadow change, if clarified, could easily be distinguished from human movement. Such clarification could also indicate compatibility with human movement but in either case, the movement should be analyzed.

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2. In the past, viewing of computer processed movie frames as a movie has been difficult because the Comtol display can only store and rapidly display three frames. The alternative was to photograph each output picture from the computer (or alternately, record each frame on file) and then to re-photograph the "stills" with movie film. This was not done because of cost and because it was not clearly indicated necessary in any single case.

This situation has changed to the extent that we have acquired a video disk system at JPL that allows up to 200 color pictures to be easily transferred from the computer to the disk and then sequenced at any frame rate on a TV monitor for viewing. I cannot commit the use of JPL facilities in this letter but I believe some future arrangement might be worked out if the type of effort described above was to be made. I will be glad to supply a more specific processing recommendation if you wish.

3. The original 8mm Bronson film is not only better than Hughes and better than the Groden copy of the Bronson film, but in the latter case, vastly better. To give an example, the lower window framing (see arrow #3) is so blurred on the Groden copy that it cannot be identified as a structural part of the window. On the digitized version of one Bronson original frame on the Comtol display, this structure was clearly evident and well defined.

As an interim alternative to computer processing, I strongly recommend as stated in the Leontis report of December 11, that RIT be funded (somehow) to make a high quality 16mm copy of just the enlarged window area directly from the Bronson 8mm original. If a first-order registration can be accomplished (i.e., forcing an identifiable point such as the corner of a window to appear in the same spot on each 16mm frame) this would be very helpful from a viewing standpoint.

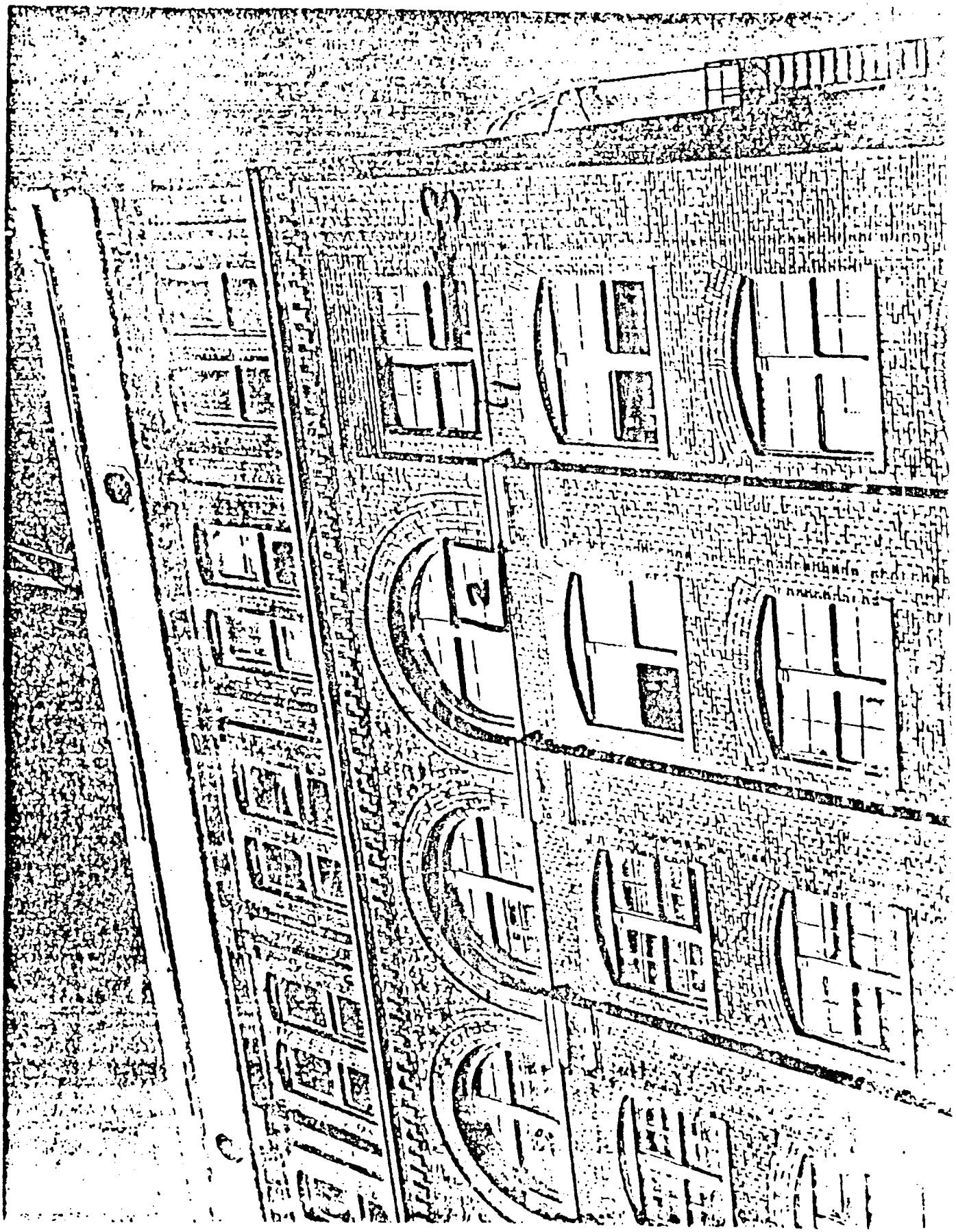
I'm rushing this a bit because Christmas is about to descend on our office. Please do not hesitate to contact me if you want any further discussion of these issues. Hope you have a nice holiday.

Best regards,

Bob Selzer

Robert H. Selzer

cc: C. J. Leontis
J. L. Sigalos



(202) 225-4624

Select Committee on Assassinations
U.S. House of Representatives
3369 HOUSE OFFICE BUILDING, ANNEX 2
WASHINGTON, D.C. 20515

January 8, 1979

The Honorable Griffin B. Bell
Attorney General of the United States
Department of Justice
Washington, D.C. 20530

Attention: Mr. Robert L. Keuch
Deputy Assistant Attorney General
Criminal Division, Room 2113

Dear Mr. Attorney General:

In connection with its investigation into the circumstances surrounding the death of President Kennedy, I am writing to recommend that the Department of Justice conduct digital image processing work in an effort to enhance the quality of a segment of a movie film that was taken by Charles L. Bronson a few minutes before the assassination of President Kennedy. The Bronson film is potentially significant because it may show movement by more than one person in the vicinity of the sixth floor southeast corner window from which Lee Harvey Oswald shot at the President. Because the film was not made available to the Committee's Photographic Evidence Panel until December 2, 1978, the Committee did not have funds available to authorize any sophisticated image enhancement analysis regarding this item.

The Committee's Photographic Evidence Panel did, however, indicate that enhancement efforts with this film are warranted (see enclosures). In particular, the Panel noted that since the quality of this film is superior to that of another film (by Robert V. Hughes) which was subjected to this type of analysis, there is now a greater likelihood of resolving the issue of how much motion, if any, can be discerned in the region of the sniper's window.

The Bronson film is presently in the possession of John Sigalos and Hal Levine, attorneys for Mr. Bronson, at 1300 Republic National Bank Building, Dallas, Texas 75201. Mr. Sigalos has expressed the willingness of his client to cooperate fully with the United States Government if digital image processing of this film is considered desirable.

Should the Department decide to act favorably upon this recommendation, I would further advise that the Committee's photographic contractors or members of its Photographic Evidence Panel be retained either on a consulting basis or to perform the actual enhancement work. Because these scientists have reviewed the existing photographic evidence pertaining to the assassination and are therefore very familiar with the issues which this evidence has raised, they are perhaps best qualified to provide you with their assistance. A list of these individuals is attached.

Thank you for your cooperation regarding this matter.

Sincerely,

LOUIS STOKES
Chairman

GRB:mgm
Attachments
cc: Ron Heller
Sigalos and Levine
Attn. John Sigalos, Esquire

PHOTOGRAPHIC EVIDENCE PANEL

MEMBERS AND CONTRACTORS

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