WILLIAM F. PEPPER
D.C. Bar No. 464502
1003K St., Suite 640
Washington, D.C., 20001
575 Madison Ave, Suite 1006
New York, NY 10022
Telephone: (212) 605-0515
Facsimile: (718) 956-8553
wpintlawus@aol.com

LAURIE D. DUSEK
NY State bar No. 2588481
63-52 Saunders St.
Rego Park, NY 11374
Telephone: (718) 897-2700
Facsimile: (718) 897-2703
ldd1126@gmail.com
Attorneys for the Petitioner
Admitted Pro Hoc Vice

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

SIRHAN BISHARA SIRHAN	
Petitioner,	**NO. CV-00-5686-CAS (AJW)**
vs.	**REPLY BRIEF ON THE THE ISSUE OF ACTUAL INNOCENCE**
GEORGE GALAZA, WARDEN, et. al	**(28 U.S.C. section 2254)**
Respondents	**Hon. Andrew J. Wistrich United States Magistrate Judge**

Exhibit C

Declaration of Philip van Praag

DECLARATION OF PHILIP VAN PRAAG

I, Philip Van Praag of 37396 S. Desert Star Drive, Tucson, AZ 85739, declare under penalty of perjury that the following is true and correct.

1. My life-long training and resulting qualifications are predominantly in audio engineering and computer technology.

2. I studied at California Western University (MS & BS Engineering), DeVry University (AAS) and benefitted from various other college and university courses through the auspices of my employment through the years: (Aurora College, Aurora IL while at Bell Laboratories, University of New Mexico while at Sandia National Laboratories, Stanford University while at Ampex Corporation). I gained decades of work- related training and experience working for Ampex Corporation (Senior Instructor in the commercial Audio / Video Products Division), Audio Consultants (Technical Services Manager), computer related experience at Hughes Aircraft Company (Technical Head, Automated Data Management), American Heart Association (Vice President, Information Technology), Applied Power (Vice President & Chief Information Officer), and R.R. Donnelley (Director, Information Technology). I also gained considerable experience from utilizing my personal audio / video equipment test facility, equipped with hundreds of audio related items representative of analog magnetic and digital recording methods, formats,

technologies, test equipment and characterization capabilities from the inception of magnetic tape recording in the 1940's.

3. I first became aware of an audio tape recording made on the night of June 4-5, 1968 by Stanislaw Pruszynski, a free-lance reporter for Canadian newspapers, when told about this Pruszynski recording in the spring of 2005 by Brad Johnson, a senior international news writer with CNN. Johnson had contacted me after becoming aware of my work with tape recording through my book published in 1997, "*Evolution of the Audio Recorder*". He initially asked that I examine an audio cassette copy from (and created by) the California State Archives (CSA) that contained the content of Pruszynski's recording made at the Ambassador Hotel in Los Angeles, California during the June 5, 1968 shooting that resulted in the death of Senator Robert F. Kennedy.

4. On or around August 6, 2005, I began to examine the sounds contained within the Pruszynski recording.

5. Realizing the content-quality limitations imposed by the consumer-grade cassette-based copy produced by the CSA, I requested, and was granted, permission by the CSA (that permission made possible in part through the efforts of CNN's Brad Johnson) to make my own recordings from the CSA's open-reel Pruszynski recording copy using laboratory grade playback and recording equipment. The CSA's open-reel copy had been

transferred there in 1987 by the Los Angeles Police Department, which had been provided this copy by the FBI in 1969.

6. My examination of the Pruszynski recording involved the following process steps: (1) general examination of the entire recording; (2) initial more-detailed examination of the time period covering several seconds prior to the commencement of gunshot sounds through several seconds after the termination of perceivable gunshot sounds; (3) validation of the overall recording through comparison with several other audio and video recordings made prior to, and after the gunshot interval; (4) re-timing of the gunshot interval to real-time; (5) determination of Pruszynski's movement immediately prior to the commencement of the shooting, based upon analysis of television network video feeds; (6) determination of Pruszynski's likely recording equipment, distances from, and room dimensions surrounding, the shooting site, followed by simulation recordings with like equipment; (7) a first-level detailed analysis to characterize the gunshot sounds in both number and timing; (8) a second-level detailed analysis of the gunshot sounds to characterize the gunshot impulse trailing edge envelope data for frequency content; (9) field testing as a result of frequency content data findings from the Pruszynski recording for envelope characterization; and (10) a data pattern match comparison between field test results and Pruszynski recording test results.

6a. The first two process steps acquainted me with overall recording content. I initially recognized that the FBI-copied recording, which was made from a Royal Canadian Mounted Police (RCMP) dub of Pruszynski's original cassette recording, consisted of several segments evidently dubbed from the original cassette in a non-contiguous manner. Thus the next step was to ensure that the recording's critical time period encompassing the shooting was in fact contiguous. This was accomplished in part through an analysis of the prominent background nominal-60 Hz frequency content found throughout the recording; a cycle by cycle examination revealed that while expected breaks occurred at the obvious abrupt audio content changes consistent with the non-contiguous segments, the sinusoidal 60 Hz pattern was consistent from the pre-shooting through the post-shooting period segment. Then, preliminary testing of the shooting period was accomplished, utilizing analog laboratory audio active-filtering equipment (e.g., Krohn-Hite 3323 and 3750), along with other examination tools such as time interval elongating computer software (e.g., Audacity) and frequency domain spectrum analyzer equipment (e.g., Tektronix 5441 with 5L4N).

6b. In the third process step, several commercial broadcast and private audio/video recordings from that night at the Embassy Room of the Ambassador Hotel were compared with the Pruszynski recording to validate the various sounds throughout the Pruszynski recording and to gain a general understanding of the positioning of Pruszynski, Senator Kennedy, and others heard

on the recording during and immediately after Senator Kennedy's victory statement at the podium on the makeshift stage. As seen on the video recordings, Pruszynski's recorder was stored under the podium during the victory statement, with his microphone on top of the podium.

6c. The fourth process step consisted of re-establishing correct timing for the entire gunshot interval of the Pruszynski recording. From examination of the recording, together with FBI declassified documentation indicating the FBI's attempt to correct an obvious speed issue with the RCMP dub (that attempt was imprecise), it was necessary to re-time that interval in order to synchronize that Pruszynski recording interval with broadcast recordings from just before the shooting. This provided the basis for comparing Pruszynski's movements to the sounds of his recording, and then to ascertain the correct timing of the shot sounds recorded as Pruszynski walked down the stairs from the stage area and entered the corridor leading to the kitchen pantry where the shooting occurred. As will be described in conjunction with the third discovery, another benefit of the re-timing would prove to be the re-establishment of correct frequency content of the gunshot trailing edge waveforms.

6d. With re-timing completed, Pruszynski's movements (Process Step 5) could be accurately tracked as he left the stage area, descended the steps, and proceeded into the corridor toward the kitchen pantry.

6e. Process Step 6 involved detailed study of Embassy Room video footage, from which several frames were located which provided excellent clues as to the recording equipment used by Pruszynski: specifically, footage of him retrieving his equipment from the podium after Senator Kennedy completed his victory statement, and footage of Pruszynski as he left the kitchen pantry approximately 24 minutes after the shooting, and walked past a television interview being conducted at the time. Scale drawings and models of the kitchen-pantry, corridor, and Embassy Room, along with precise measurements obtained of relevant areas in and around the kitchen pantry were located.

6f. With Pruszynski's movements known, together with dimensional data, information concerning the locations of Sirhan and Senator Kennedy at the time of the shooting, and an accurate approximation of Pruszynski's equipment, I was then able to begin examining the shot sounds (Process Step 7). First, using a cassette recorder and microphone closely approximating Pruszynski's equipment (a Concord F100, simulating Pruszynski's likely Telefunken 4001 model), and using cassette tape generally available in that year (a Scotch 271 "magnetic cartridge"), gunshot sounds were recorded and played back to gain a general sense of the resulting gunshot sound characteristics, given the limitations imposed by that consumer grade equipment. The resulting data was useful, as was a succeeding generation dub of that recording through a Uher Report 4000L open reel recorder similar to that used by the RCMP to make a copy of the original cassette (as ascertained from FBI declassified files). The

Pruszynski recording was analyzed, at this stage, using analog test equipment and computer-based software to attempt to determine the number of shots captured by that recording. Given the recording equipment limitations, together with the general noisy crowd environment, and Pruszynski's distance from the area from which the shots emerged, it was not possible to definitively determine the exact total number of shots fired. However, 13 shot sounds were identified (my first discovery). It is possible that the total number exceeds 13, in view of the fact that loud screams emerged within seconds from the people closest to the shooting scene as they became aware of what had just occurred. These emerging screams and loud shouting may have obscured the capture of discernible additional shot sounds. As the number of captured shot sounds I identified significantly exceeded the capacity of Sirhan's gun (eight shots),and with no opportunity for him to reload, it became evident that more than one gun must have been fired. With multiple guns fired over a short period of time (slightly more than five seconds), and by more than one individual, it occurred to me that this would result in a random timing distribution among the occurrence of those shots during that brief interval. And, that the spacing of some of those shots could, by chance, be quite narrow. Two "double shot" groups (my second discovery) were indeed located within the 13 shot sounds. That is, there were two instances identified wherein the two shots within each of those double shots were fired extremely close together, specifically about 149 ms apart for shots 3-4, and 122 ms apart for shots 7-8.

Given that Sirhan's gun was an inexpensive revolver (an Iver Johnson Cadet 55SA), it seemed highly unlikely that that gun could have been fired that rapidly.

6g. Given the findings at that point of the analysis (my first two discoveries), I continued with a more detailed analysis (Process Step 8). As the occurrence of two guns fired suggested at least the possibility that those two guns might have been of different makes and models, I began examining the shot waveform envelopes more closely. One distinguishing characteristic of gunshots is the presence of a trailing edge waveform "envelope". The presence of this envelope, quite long relative to the very short initial "impulse" sound created at the instant of firing allows law enforcement-utilized commercial products such as "ShotSpotter" to immediately send notification of 'shots fired' to police headquarters, reliably ignoring other impulse sounds (firecrackers, balloons, etc.) that humans might easily mistake for gunshots. As I examined the frequency content of these trailing waveform envelopes, I discovered an anomaly occurring in five of those gunshot waveforms. This anomaly presented as a single frequency component, at 1,600 Hz, at a level not found in the other shot sound waveforms. It was further noted that this anomaly was present in one, and only one, of each double shot pair. Later, as my understanding of the significance of the 1,600 Hz level evolved, this became my third discovery. The presence of this anomaly being possibly caused by 'coloration' due to the kitchen pantry area furnishings or construction materials was discounted since it

only appears in five of the shot sounds; and, during the brief five-second interval during which all 13 shots were fired, Sirhan's gun arm had been pinned down onto a steam table (and thus he was then shooting from exactly the same position after his second shot). Also, echoes are ruled out for the same reason (why would echoes appear only in those shots?), and by reason of the dimensions of the kitchen pantry area (given the speed of sound).

6h. As a result of this finding, with no immediately demonstrated apparent exact cause, I conducted field testing (Process Step 9) of two differing 22-caliber revolvers of that era: an Iver Johnson Cadet 55SA (as was confiscated from Sirhan at the crime scene) and a Harrington & Richardson 922. The H&R 922 has identical class characteristics to the Iver Johnson Cadet 55SA, with six riflings, a right hand twist, and a 0.054 inch land width mark. It is also a make/model gun owned at that time by a security guard who confirmed to police that he had been armed and had been standing immediately behind and toward the right of Senator Kennedy at the moment the shooting occurred. The outdoor field test was set up with microphones located 40 feet from the guns, to mimic the average distance between Pruszynski's microphone and the guns. One microphone was positioned in front and slightly to the side of the guns, the other positioned behind and slightly to the side. The tests were repeated a second time, about two weeks after the first set of tests, to help ensure confidence in the resulting data.

6i. Analysis of the test data (Process Step 10) was conducted using the Steinberg Wavelab computer software, the same software used to initially identify the frequency anomaly on the Pruszynski recording. The results revealed that no frequency anomaly was found within the Iver Johnson test fire data within the tested frequencies, whether recorded from the front or from the rear of that gun as it was fired. With the H&R 922, however, a frequency anomaly was found when analyzing recordings from the rear of that gun, but not from in front of that gun. Further, the test results revealed the frequency of that anomaly to be the same frequency (1,600 Hz) as that discovered within five of the Pruszynski recording captured shot sounds.

From a preponderance of witness accounts, Sirhan was firing in a westward direction. Pruszynski, and the microphone he was holding, was moving in an eastward direction, toward the kitchen pantry, and therefore toward the source of the shots. That put Pruszynski's microphone in front of Sirhan's gun, essentially facing the barrel of Sirhan's gun. As my field test results placed the second gun firing in a direction facing away from the microphone, therefore that second gun was firing in an eastward direction, opposite that of Sirhan's direction of fire.

7. It is important to understand that the capability to perform a number of the technological related processes described above, together with the capability to perform other of the described processes in the depth and to the degree of

accuracy necessary to result in definitive findings, such as described above, were not available in 1968; and particularly, to the best of my knowledge no other analyst, including those referenced by the State in their Supplemental Brief Regarding Actual Innocence (RSB 7.), utilized a sophisticated computer-based analytical program with the capability to discern unique frequency characteristics from the trailing edge contained within the brief audio wave envelope created by gunshots, such as the one I employed to uniquely define individual frequency based acoustic characteristics.

Until recent years, qualitative judgments concerning gunshots relied predominantly upon human hearing. Such methods - relied upon by the State - are extremely deficient given that the human ear is most often unable to discern gunshots from other impulse sounds; unable to individually identify and count the exact number of rapidly occurring gunshots (such as from multiple guns being fired), much less to characterize the unique frequency content of gunshots so as to accurately determine the existence of, and differentiate between, gun makes and models.

8. Within recent years, the advance of computer and other electronic technology has enabled the commercial development of computer based analytical tools capable of differentiating gunshots from other "impulse" type sounds (firecrackers, balloons, etc.). Thus, products such as "ShotSpotter" have emerged, and have gained acceptance in many law enforcement communities throughout the United States. Such products have

the capability to identify the overall presence of the unique trailing-edge acoustic audio pattern that is characteristic of a gunshot; this uniquely defines that impulse sound as a gunshot as opposed to other impulse sound sources. The methodology I used, as described above, and which led to my third discovery, goes a significant step further by analyzing that unique trailing edge pattern to identify the level of individual constituent frequencies that comprise that envelope pattern. In cases such as the shooting death of Senator Robert F. Kennedy, where the firing of more than one gun was identified by virtue of my first two discoveries, it was indeed possible to confirm multiple firearm use. In addition, it has become possible, as I was able to demonstrate in this case, to determine the sequencing of shots respectively from each identified firearm by virtue of the unique gun make/model resonance characteristic.

9. Contrasted with the opinions cited by the State, (*id.* at p.7) there is no indication that their analysis methods contained a level of sophistication sufficient to adequately characterize the nature of the gunshots present in the Pruszynski recording. It would seem that without use of that level of sophistication, particularly given the relatively poor quality of the Pruszynski recording, one cannot definitively state that only one gun was fired. Just as one cannot accurately state that the proverbial haystack does not contain a needle simply because one was not found during a cursory search,

so too in this case one cannot accurately state, categorically, that only one gun and one gun model was fired as a result of using cursory testing methods; cursory methods incapable, for example, of resonant frequency determination from gunshot trailing edge envelope waveforms. Using adequate methodologies in this case, two differing audio frequency signatures were detected and later verified through the test firing of two different gun makes/models (with one being that which was taken from Sirhan and the other bearing the same class characteristics but differing in composition - and hence, resonance characteristics), leading to the basis of my opinion, namely: that two guns, of differing make/model, with one of those makes / models differing from that which was confiscated from Sirhan Sirhan immediately after the gunshots ceased, were fired during the shooting that resulted in Senator Kennedy's death. Further, that with regard to the two "double shot" occurrences, each double shot pair consisted of one shot each from the two differing gun makes/models.

9.a The use of the highest quality version of the Pruszynski recording that can be obtained for analysis today (i.e., the open reel audio recording that has been housed at the CSA since 1987) is essential for the complex analysis necessary to support these findings.

9.b Also essential is use of the highest quality dubs of the CSA's open reel recording that can be created today and which I created, in September, 2005, through the simultaneous recording of five new copies directly from the open reel

recording, which was played back with a laboratory quality Studer A807 model, ideally suited for that purpose. It should also be noted that, subsequent to my analysis as described above, I obtained quality recording copies (produced as a result of a release in 2008 by the FBI through the Freedom of Information Act) of the RCMP-recorded direct copy of Pruszynski's audio cassette and the companion 1969 FBI-produced copy of that RCMP recording (the companion to the copy now residing at the CSA). Both of these additional copies presented with test results corroborating those I obtained from the CSA recording copies I had made in 2005.

9.c Also essential is the use of techniques and methodologies I developed specifically for the task, as described above. In particular, I do not believe the testing I performed on gunshot trailing edge waveform envelopes for resonant frequency content had been used before.

10. In the case of the killing of Senator Robert F. Kennedy, I was able to determine the existence of two firearms being discharged during that shooting, verified through the identification of unique resonant frequency characteristics present in several -but not all - recorded gunshots.

11. In order to understand the significance of advanced technologically computerized analysis of the sounds contained within the Pruszynski recording, it is essential to fully comprehend the difference between these processes and simply

listening to the tape with the human ear or the use of earlier, relatively primitive, electronic filtering or other sound altering devices. I note that the State in its Supplementary Brief refers only to the unsworn opinions of claimed audio experts who "heard" the tape and came to their conclusions on the basis of what they heard, directly, or through some amorphously defined electronic analysis. (*id.* at 7.)

11a. For example, the examination by Philip Harrison, a United Kingdom forensic audio technician, hired by anti conspiracy author, Mel Ayton, cited by the State,(*id.*) was conducted without the examiner knowing where Mr. Pruszynski was standing and, most significantly, what was the location of his microphone, and how it was moving toward the pantry as the shots were fired. He perhaps was not aware of the layout, dimensions, or contents of the kitchen pantry in which the shootings occurred. He perhaps was not aware that Sirhan's gun arm was pinned down onto a steam table after his second shot. In addition, Harrison was working from a dubbed copy of one of my masters. These deficiencies, contrasted with the mandatory standards set out above (see paragraph 9) that I employed, bring into question the credibility of Harrison's opinion. Further, exactly what scientific process(es) did Harrison use to categorically rule out the possibility that there could have been more than eight shots fired?

11b. Another unsworn opinion, relied upon by the State, (also commissioned by writer Mel Ayton) is that of Steve Barber, whose credentials are withheld from us.(*id.*) It emerges that

Barber largely relied upon listening to a copy of one of my masters for his conclusions. When he did use a computer to examine the sounds it is revealing that he admits the possible presence of an "echo" or a double shot, which, of course, is what I concluded occurred in two instances. Also, it is doubtful perhaps that Barber was aware of the essential shooting scene details listed above with reference to Harrison. Again, the question begs to be asked as to exactly what scientific process(es) did he use to categorically rule out the possibility that there could have been more than eight shots fired?

11c. I suggest that the reliance of the State upon the also unsworn opinion of Ayton, (*id.*), who has consistently supported the official positions in such cases, and his efforts to provide evidence of their contrary conclusions by way of articles and not formal Declarations, is worrisome.

12. As a matter of scientific certainty I know of no way that such methods of examination, as those described by the State, could, in accuracy, be sufficient so as to be capable of determining that no more than one gun was fired in the shooting of Senator Kennedy; nor that such methods would be capable of discerning and defining the occurrence of two almost-simultaneous shots. There is no indication, in the writings, that any of the State-described experts calculated the known dimensions of the pantry for the possibility of echoes, or whether they used any level of sophisticated technology to isolate the gunshots from the background noises, or were in

possession of other important material facts surrounding the shooting as described above, or that they used any scientific methods to categorically rule out the presence of more than eight shots. In testimony, under oath, these and other relevant issues would be ascertained. As it stands, these detailed informational omissions render such opinions quite speculative from a scientific perspective.

13. I confirm that my analysis revealed: that 13 shots, or more, were fired in the pantry during that brief five second period of time; that five of those shots were fired from a west-to-east direction, opposite to the direction that witness accounts report as the direction in which Sirhan was firing (east-to-west); and that in two instances within those five seconds there were virtually simultaneous, or "double" shots (shot numbers 3-4 and 7-8).

14. The "double shot" conclusion alone clearly evidences the fact that two guns were fired, given that Sirhan's weapon type cannot be fired anywhere near rapidly enough to account for the shot pairs -double shots - occurring as they do in the Pruszynski recording (the latter fact was confirmed in a field test by marksman Phil Spangenberger for the 2007 Discovery Times Channel television documentary entitled "*Conspiracy Test: The RFK Assassination*").

15. In light of the discoveries comprising my findings, together with the Spangenberger-verified analysis, in my opinion the conclusion is inescapable that there was a second gun fired by a second shooter during the shooting that resulted in the death of Senator Robert F. Kennedy, and that the five shots from the second gun were fired in a direction opposite the direction in which Sirhan fired.

I declare under penalty of perjury, under the laws of the State of California that the foregoing is true and correct and that this declaration was executed on November 14, 2011 at Tucson, Arizona.

Philip Van Praag,