

Was the J. F. Kennedy assassination a conspiracy?

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According to polls most Americans believe that Lee Harvey Oswald was not the only shooter and many doubt that he at all shot at Kennedy. This implies that the assassination was a conspiracy and not a deed of a lone gunman. The recently released Kennedy files seem to throw no new light on this issue. However, there is old evidence that has been given and still can be given a new consideration.

The strongest arguments that the assassination of John F. Kennedy in 1963 was a conspiracy involving at least two shooters have been based on the Dictabelt and Audiograph recordings of the Dallas Police Department radio. This article is no exception. The argument is an analysis of these recordings. This is not to say that there were not other suspicious features in the Kennedy assassination, only that they do not seem to give a binding proof.

So, what is on these recordings? On the day of Kennedy assassination the Dallas Police Department used two radio channels. Channel 1 was for normal police traffic and Channel 2 was reserved for the presidential motorcade. Channel 1 was recoded on the Dictabelt machine and Channel 2 on the Gray Audiograph machine. Both channels were voice activated, but one radio on Channel 1 got stuck before Kennedy assassination and recorded continuously for several minutes. Therefore the recording on the Dictabelt may contain sounds of the gunshots and echo location analysis may pinpoint if the shots came from more than one location.

The House Select Committee on Assassinations (HSCA) investigated the Kennedy assassination in 1978 and reached the verdict that the Kennedy assassination was a probable conspiracy because the echo location analysis of the Dictabelt seemed to show that there were two shooters: one shot came from the grassy knoll. A later scientific examination discarded the result.

It was not the researchers who noticed the problem that invalidated the echo location analysis. It was an outsider. The Dictabelt recording from Channel 1 and the Audiograph recording from Channel 2 were published as a record in a magazine. A drummer with the name Stephen N. Barber noticed that the same phrase appeared on both channels. Sergeant Decker says "hold everything secure". This seemed to be a simple case of crosstalk, where a police officer has two radios open at the same time and keeps them sufficiently close to each other. What is said in one channel is overheard also in the other channel. This crosstalk allowed synchronizing the two police radio channels and it showed that the noises identified as gunshots in the echo location analysis could not possibly be gunshots, they happened after the assassination.

The acoustics firm Bolt, Berenek and Newman, which had analyzed the Dictabelt for the HSCA study in 1978, mentioned in their report that this purported crosstalk signal had suspicious features, but the nevertheless, the signal was accepted as a real crosstalk.

Much later the Dictabelt and the Audiograph recordings were digitalized and made available in the Internet. Donald B. Thomas published an article in a peer-reviewed journal *Science&Justice* in 2001 where he states that the synchronization of the recordings by "hold everything secure" is probably incorrect since there were two other crosstalks, which gave a different synchronization. Thomas did not argue that any of the crosstalks were falsified or not real. Thomas also accepted the echo location analysis which was done in 1978 by the acoustics firm Bolt, Beranek and Newman and used as evidence by HSCA. Two articles, [2] and [3], have since then rebutted Thomas' claims. The main argument in [2] is that the two

signals, which Thomas noticed, are not crosstalks. The main argument in [3] is that the gunshot noise of the 1978 study is voice, not gunshots.

Let us first address this argument of [2]. Which, if any, signals are real crosstalks? The following places of crosstalks on the Dictabelt are measured from a recording the author made from a *youtube* recording of Dictabelt with the freely available *audacity* tool. In that recording the motorcycle noise stops at 4:09.5 and the recording continues a bit over 5 minutes. According to Wikipedia, the radio transmitting the motorcycle noise got stuck about 1 minute before the shooting and recorded continuously for 5.5 minutes. If so, then the *youtube* recording is apparently a half-a-minute shorter from the beginning, but starts still a half-a-minute before the shooting.

The putative crosstalk “hold everything secure” will be referred as the HOLD crosstalk. The signal on Channel 1 will be called Hold1, while the signal on Channel 2 will be called Hold2. Hold2 is a part of a longer talk on Channel 2: “*Have station 5 move all men available out of my department back into the railroad yards there in an effort to try to determine just what and where it happened down there, and hold everything secure until the homicide and other investigators can get there.*” Timing of Hold2 based on Channel 2 is not precise because Channel 2 has pauses. One can say that Hold2 occurs about one minute after the shooting. The shooting time is roughly 12:30. On Channel 1 the putative crosstalk sounds to the author more like: “Hold it up right there” and there follows some other talk that may sound like: “we are gonna do it. I, I got it, hope your arse you got it”. The continuation certainly does not sound to the author like: “until the homicide and other investigators can get there”. Nevertheless, this is the signal Hold1 on Channel 1 and it occurs at the time 48.6-49.5 on the Dictabelt.

The putative crosstalk “I’ll check it”, noticed by Thomas, will be referred to as the CHECK crosstalk and the signals on the Channel 1 and Channel 2 will be named Check1 and Check2 respectively. The signal Check1 on Channel 1 occurs at the time 37.7-38.5 on the Dictabelt. It sounds like “Aaaail get it” and there is nothing else on the tape at this point. The signal Hold2 is a part of a discussion between police officers Lawrence, Fisher and Curry. Lawrence says: “I’m at the Trademart now. I’ll head back out that way.” Fisher utters: “Nay, that’s all right. I’ll check it”, which sounds to the author as “Ail get it”. Then comes “10-4”, Curry continues: “the Triple underpass”. After Curry’s words follow five typical police announcements. “10-4 One”, “15 car 2”, “12:30 KKB364”, “125 to 250”, and “15 car 2”. The third of these has the time announcement 12:30. The Dispatcher had a digital clock, thus the time can be assumed correct. From “12:20 KKB364” to “15 car 2” there is 18 seconds. After “15 car 2” the next announcement on Channel 2 is “to the hospital...”, Kennedy was shot. Judging from Channel 2, Check2 is 11 seconds before the Dispatcher’s announcement of 12:30.

The third putative crosstalk, also noticed by Thomas, is named as the YOU crosstalk. It consists of signals You1 and You2 on Channels 1 and 2 respectively. In the Channel 1 the signal is very clear. A police officer says: “You want me to still hold this traffic on Stemmons?” The signal You1 occurs at Channel 1 on the time 3:39.65-3:42.3 sec. On Channel 2 the signal You2 occurs about one minute after Hold2, but Channel 2 has pauses and cannot give a precise time. Channel 1 must also have pauses, since on time 3:47.05-4:00.0 there is a time announcement “12:34”, but if Channel 1 has no pauses, it would mean that the Dictabelt started four minutes before this announcement. That is, the Dictabelt would have started 13 seconds after 12:30. This is impossible since Channel 2 Dispatcher makes a comment on the stuck radio on Channel 1 before the time 12:30. Consequently, Channel 1 has paused at some point before 3:47.05. Looking at the possible places where it could have paused, there are four: 1:04.0, 2:17.0, 2:22.2 and 2:28.7. All of these are before You1 at

3:39.65. Thus, You1 is after the pauses and cannot give the timing correctly. This putative crosstalk will not be analyzed further.

There are two ways in [2] of arguing which ones of HOLD, CHECK and YOU actually are crosstalks and which ones only appear to be so. The first way is by looking at the image of a correlation plot in the frequency dimension. Admittedly this way can be called subjective, but an eye is good at detecting similarities. The following figures show the signals for the HOLD and CHECK putative crosstalks in the time domain and in the power spectrum.

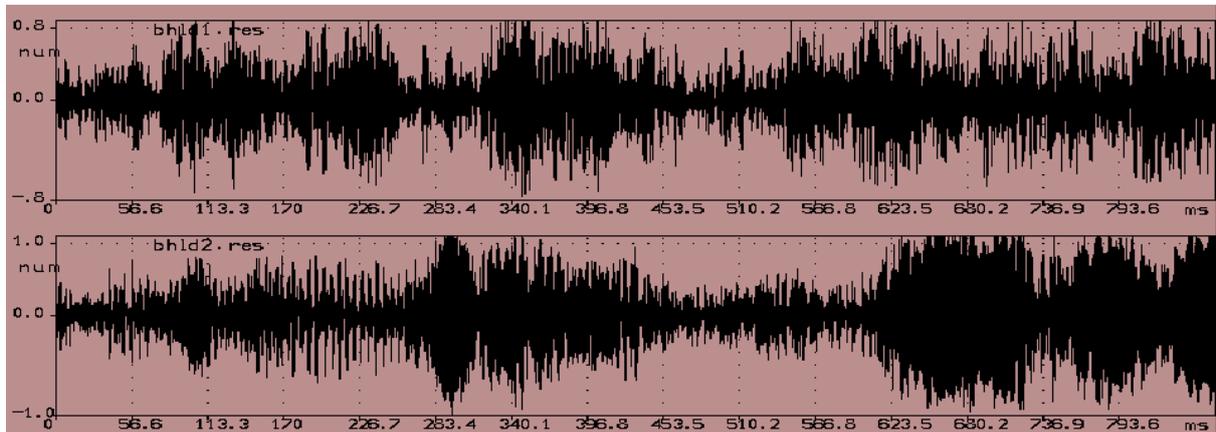


Figure 1. Hold1 is above, Hold2 below. The signals are similar from 0 to 589.6 ms, especially around 340 ms. Hold2 needs to be shifted to the right 0.035 seconds.

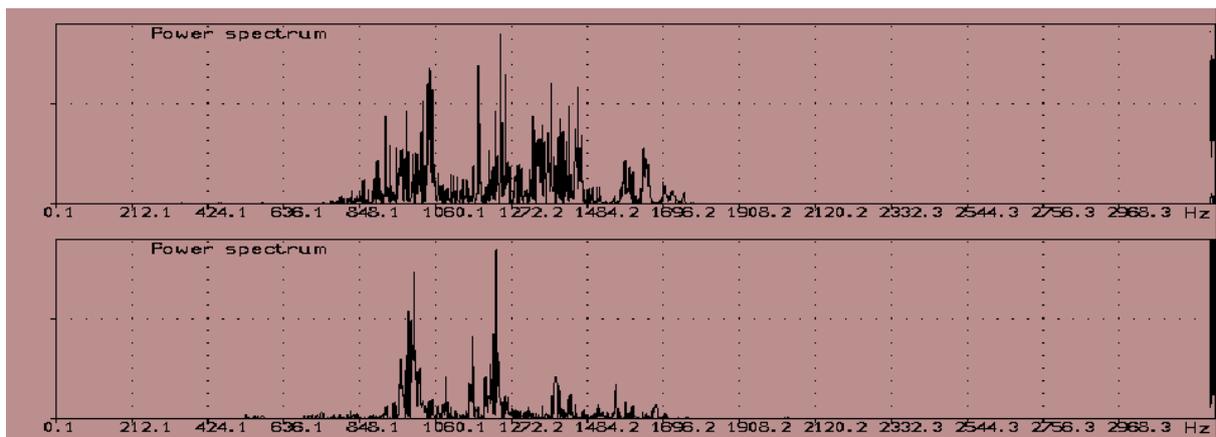


Figure 2. Power spectrum of Hold1 (above) and Hold (below) from time 0-589.6 ms from Figure 1. These are also very similar. It may appear that Hold2 should be speeded up slightly.

If we take the power spectrum over the whole time axis of Figure 1, the power spectrums of Hold1 and Hold2 are not similar. This is obvious already from the time domain plots in Figure 1, and it is detectable by listening the tapes. As mentioned before, the author cannot detect on the Dictabelt the continuation of the talk of Decker in Hold2 “until the homicide...” but hears a quite different talking “we gonna do it...”. The visual similarities in Figures 1 and 2 cannot be taken as a proof that Hold1 is a true crosstalk of Hold. But it certainly is similar. Now, let us look at CHECK.

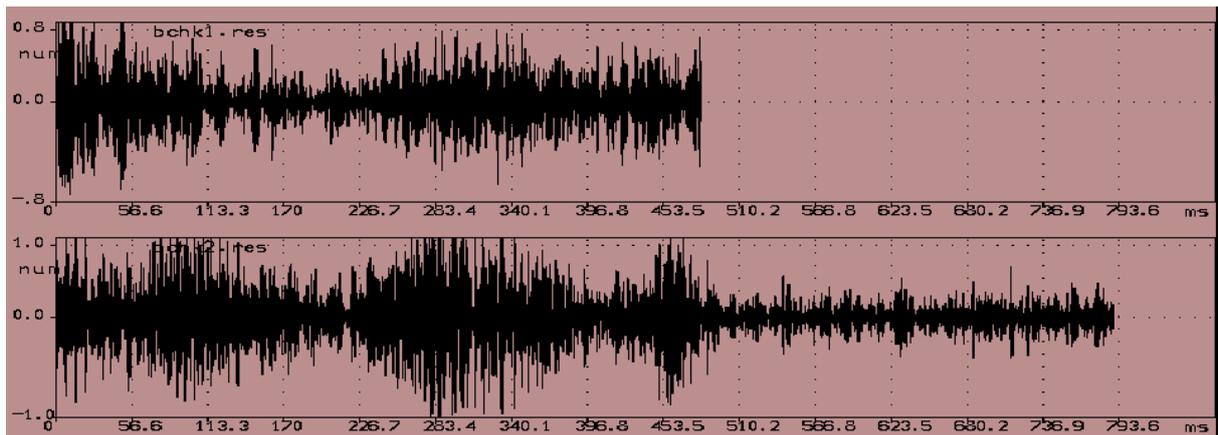


Figure 3. Signals Check1 above and Check2 below. The signals are to some extent similar.

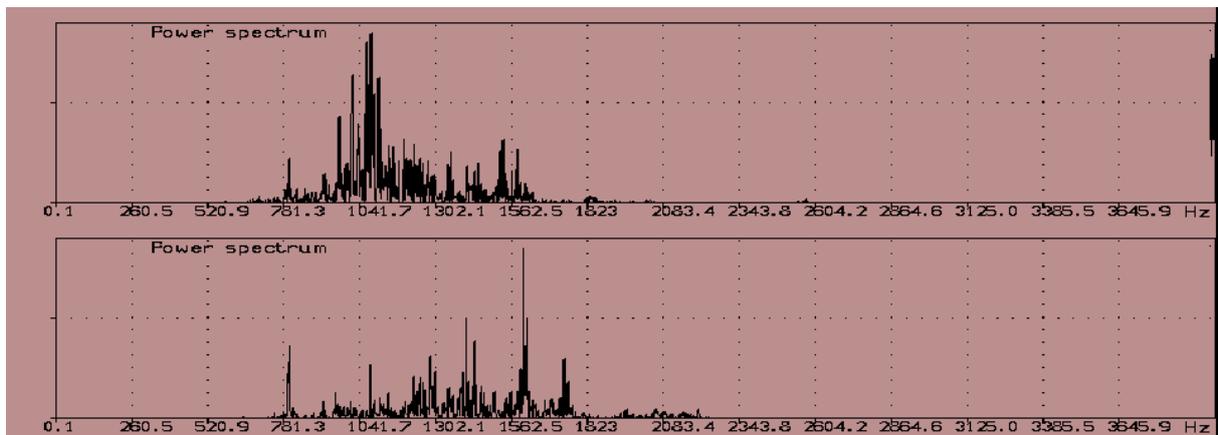


Figure 4. Power spectrums of Check1 (above) and Check2 (below) from 0 to 480 ms. Clearly, these spectrums are not as similar as those of Hold1 and Hold2.

Check1 and Check2 do not look similar in the power spectrum. Indeed, one is tempted to conclude that the signals are not the same. We can cut frequencies below 1100 Hz and above 1580 Hz, reconstruct the signals from the Fourier components and listen to the signals passed through this hard bandpass filter. The author wrote code for doing all of the operations in this article. The code is freely available from [4] with the instructions, in case audacity or other tools do not allow doing similar operations. The result of listening is that the bandpassed signals still retain the rhythm of the speech, and the rhythm in Check1 is different from the rhythm in Check2. It seems that CHECK is not a true crosstalk.

The second way in [2] of telling which putative crosstalk is a real crosstalk goes by calculating the correlation of the signals on the two channels. The authors of [2] state using a special variant of correlation, but the results are not much different from using the ordinary (unscaled) correlation. The problem with using any correlation is that it cannot prove that the signals are originally identical, it can only prove that they are similar. We already know that Hold1 and Hold2 are more similar than Check1 and Check2. We did conclude that CHECK is not a true crosstalk, but because of the rhythm, not because of similarity. We still do not know if HOLD is a true crosstalk and a correlation value cannot tell it.

The problem with correlation is easily demonstrated, and it is similar with most variants of correlation. Let the signal on Channel 2 be denoted by $s_2(t)$ and the noisy signal on Channel 1 be denoted by $s_1(t) + n(t)$ where $n(t)$ is the noise, mostly from the motorcycle. The (unscaled) correlation between the signals is the function:

$$c(\tau) = \int_A^B s_2(t) (s_1(t + \tau) + n(t + \tau)) dt.$$

The bounds A and B cannot be from minus infinity to plus infinity in our case. We must select some interval around the signal we study. Assuming that this is a case of real crosstalk, $s_1(t) = \alpha s_2(t + T)$ for some α and T . If so, then

$$c(\tau - T) = \alpha \int_A^B s_2(t) s_2(t + \tau) dt + \int_B^A s_2(t) n(t + \tau - T) dt = \alpha \int_B^A s_2(t) s_2(t + \tau) dt.$$

That is, we expect to see the autocorrelation of the signal $s_2(t)$ shifted by T . Such an autocorrelation plot has a high peak at T and elsewhere the correlation would be smaller, but the autocorrelation of a signal usually does not disappear outside the high peak. If it does disappear elsewhere, then the signal is random noise

Finding that the correlation $c(\tau)$ has a peak at T and is smaller on both sides around T does not prove that $s_1(t) = \alpha s_2(t + T)$. It is sufficient to find $s_1(t)$, which is sufficiently close to $\alpha s_2(t + T)$, and to adjust the noise $n(t)$ in order to produce this type of a correlation plot. The correlation of $s_2(t)$ with the noise $n(t + \tau)$ does not necessarily disappear, as it does in the ideal world. By selecting $s_1(t) + n(t)$ in a suitable way, we can get the highest peak at T , but such a situation can also happen unintentionally as a false positive.

Likewise, if there is a real crosstalk and we want to change the signal $s_1(t) + n(t)$ so that the crosstalk does not show nicely in the correlation plot, all we have to do is to add some suitably chosen noise, which correlates with $s_2(t)$ and reduces the peak at T to a smaller value. Such a modification, adding a peak of noise, can be made anywhere in the recording within the bounds A and B , since the correlation is calculated by integrating over the time axis. Naturally, this can happen unintentionally as a false negative.

A false negative is not an issue here, but a false positive may be. CHECK does not look like a real crosstalk in correlation, but we already concluded in another way that CHECK is not a real crosstalk. HOLD, on the other hand, does appear as a real crosstalk in correlation, but it may be a false positive. Clearly, calculating the correlation between the signals cannot tell if a putative crosstalk is real.

We may try a different way: subtracting from the Channel 1 signal $s_1(t) + n(t)$ the Channel 2 signal $s_2(t)$ multiplied by a variable β and shifted by a time variable D and to calculate the autocorrelation of this signal, which we name $s_{\beta,D}(t)$:

$$s_{\beta,D}(t) = s_1(t) + n(t) - \beta s_2(t + D) = \alpha s_2(t + T) - \beta s_2(t + D) + n(t).$$

If $\beta = \alpha$ and $D = T$, the signal components cancel and only noise is left. The autocorrelation of $s_{\alpha,T}(t)$ should have a high peak at T and be very small elsewhere. We can also try to detect noise by listening. If the human voice signal has disappeared, the remainder is noise. However, if $s_1(t) \neq \alpha s_2(t + T)$, the signal $s_{\beta,D}(t)$ will not be noise with any values β and D . Consequently it will not produce the characteristic autocorrelation of noise where there is only one correlation peak.

On the web page [4] is freely downloadable software with a program that does this calculation. The key routine is in the C-file graph/appl/audiotool/y.c and it is called my_correlation(). The program takes as inputs digitalized clips from the Dictabelt and the Audiograph, which are converted by the program to text files. The audio from *youtube* has been digitalized by the *audacity*-tool and the clips are sampled with 44100 Hz. The results of this calculation confirm that CHECK is not a real crosstalk. The results also do not support the claim that HOLD is a real crosstalk. Showing plots of trials seemed unnecessary. Any

number of such trials can be made with the program in [4]. It suffices to say that regardless of how one does it, there is no significant cancellation of the signals, as would be the case with real crosstalks.

We have to take a close look at the signals of HOLD. As the acoustics firm had remarked in their report, the signal Hold2 does look suspicious. In many places its wave form it looks too regular. The following pictures show the wave forms of Hold1 and Hold2 highly magnified at four selected places.

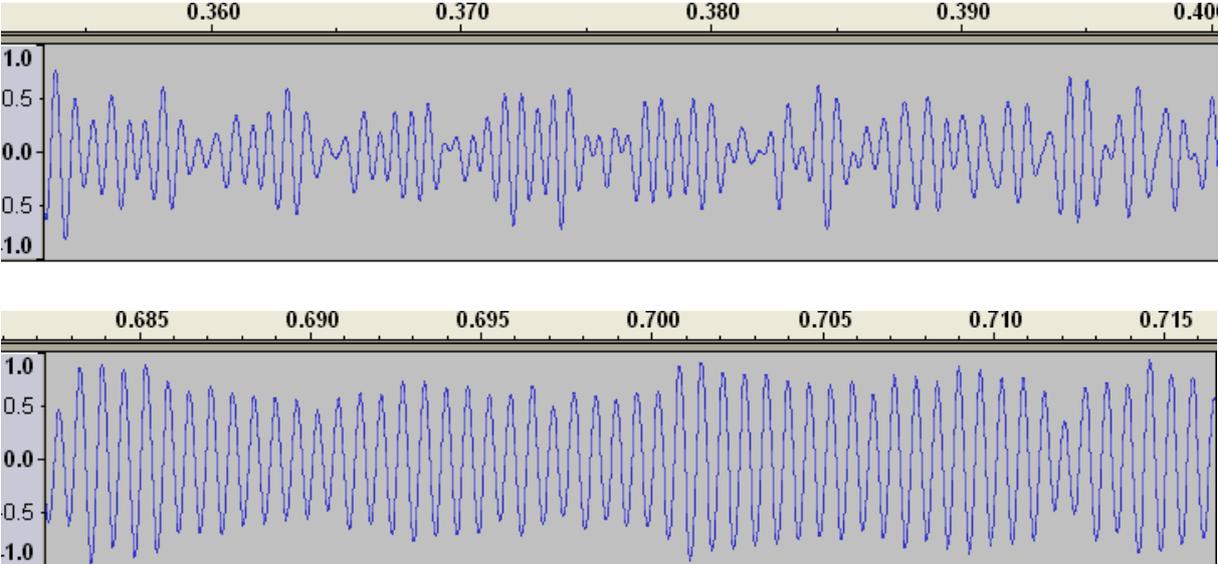


Figure 5. Hold1 above, Hold2 below, synchronized to the same place in everything. Everything on Hold2 is at 0.265-0.615 s and the corresponding place on Hold1 is 0.3-0.65 s.

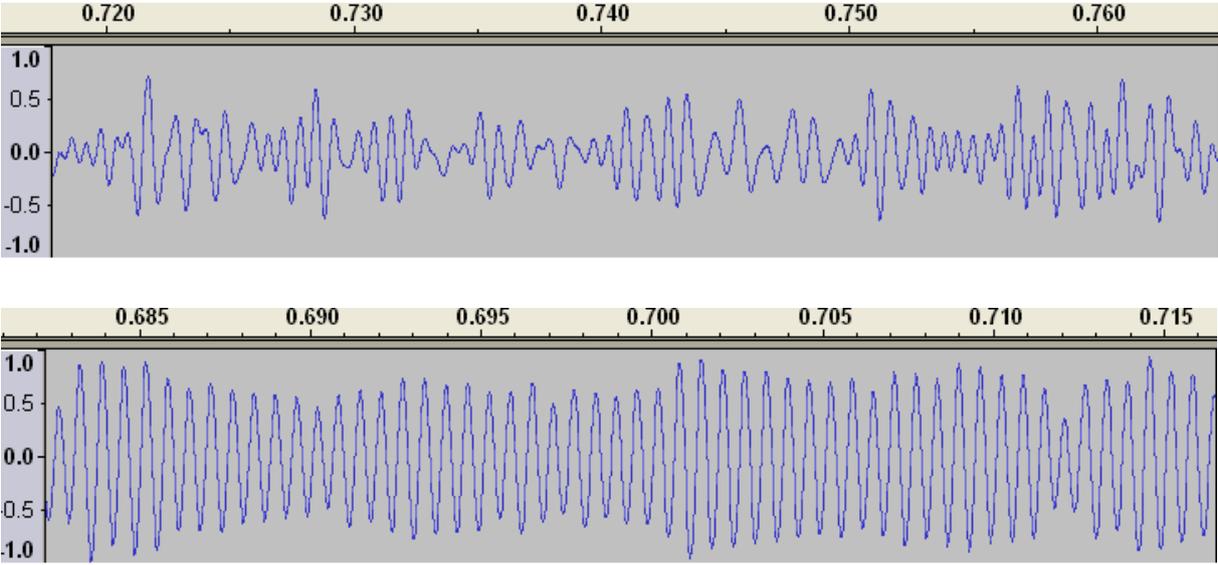


Figure 6. Hold1 above, Hold2 below, from the same place of se of the word secure. On Hold2 se is at 0.615-0.88 s and on Hold1 at 0.65-0.915 s.

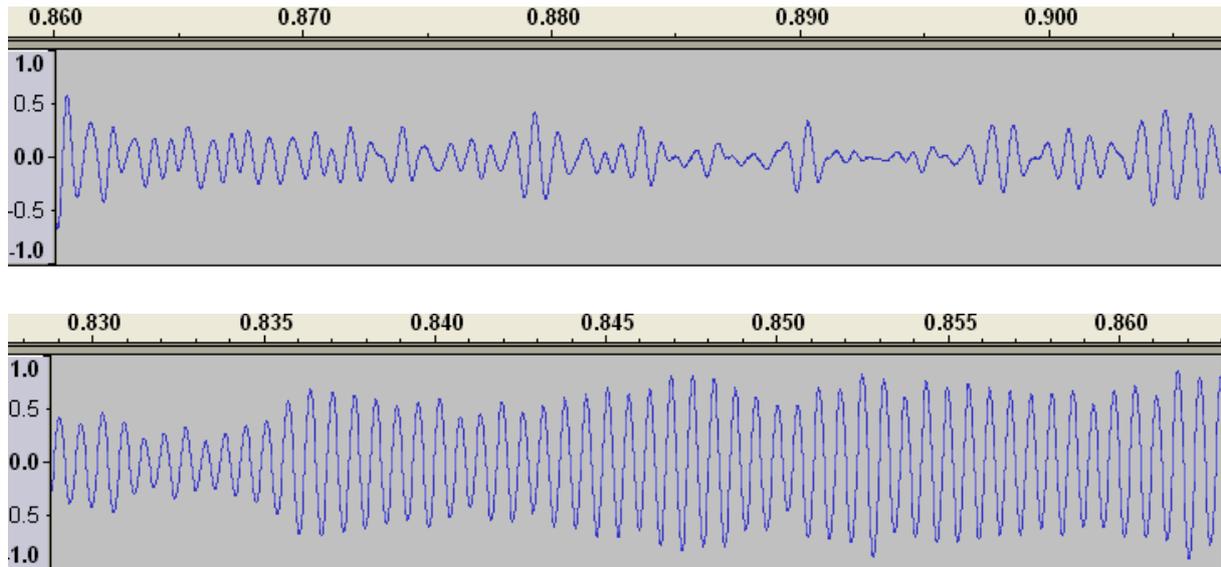


Figure 7. Hold1 above, Hold2 below, from the same place of cure of the word secure. On Hold2 cure is at 0.88-1.05 s and on Hold1 at 0.915-1.4 s.

We can analyze the signals by listening. The following table shows where the audible contents of the signals occur.

<u>Time</u>	<u>Hold1</u> <u>Content</u>	<u>Time</u>	<u>Hold2</u> <u>Content</u>
0.035-0.16	hold	0.0-0.0.125	hold
0.16-0.26	it	0.125-0.225	it
0.26-0.3	up	0.225-0.265	up

This is indeed how the recordings sound like, at least to the author. When Hold2 is played from 0 to 0.265 seconds, it sounds as hold up, the word it vanishes. If Hold2 is played all the way from 0 to 0.615 seconds, one hears hold everything, the word up vanishes. How this is done is not known to the author, but the places shown in Figures 5-7 show some modification to the signals. The regular patterns are most probably synthetic. Let us continue with the table.

<u>Time</u>	<u>Hold1</u> <u>Content</u>	<u>Time</u>	<u>Hold2</u> <u>Content</u>
0.3-0.65	right there	0.265-0.615	everything
0.65-0.885	we are	0.615-0.74	te
0.885-1.14	gonna	0.74-0.88	re
1.14-1.27	do	0.88-1.05	cure
1.27-1.35	it		

This again is rather confusing. If we play 0.615-0.88 seconds of Hold2, it sounds as te-re, but if we play from 0.265-1.05 s, then te-re sounds as se and the words become *everything se-cure*. There are suspiciously regular parts in Hold2 also in 0.64-0.675, 0.78-0.8 and 0.825-0.868 seconds in addition to the ones in Figures 5-7. Apparently the signal Hold2 has been modified to resemble Hold1.

We may also reach a contradiction by timing considerations. On the Dictabelt at the time 3:47.05-3:48.6 there is the time announcement for 12:34. Hold1 is at 48.6-49.5 seconds on the Dictabelt. Thus, if there were no pauses in the Dictabelt from 49.5 seconds to 3:47.05, Hold1

would have occurred at the time 2 minutes 58.45 seconds before 12:34. That is 12:31:01.55. If there were pauses, Hold1 happened earlier. Kennedy was shot soon after 12:30 calculating from the Dispatcher's announcement 12:30 on Channel 2 and 18 seconds from that the announcement to the order to go to the hospital. On Channel 2 there is about 1 minute from the order to go to the hospital to Hold2. That means that Hold2 occurred about 12:31.

The only way Hold1 could be a crosstalk of Hold2 would be that the Dictabelt had no pauses Dictabelt from 49.5 seconds to 3:47.05. If this would be so, then the Dictabelt started 12:30:13, because the motorcycle noise continues from the time zero to the time 48.6 seconds. There are two places where the signal almost stops, around 5.6 seconds and around 34.7 seconds, but the motorcycle sound does not fully interrupt: there is no pause. This is a contradiction because the Dispatcher remarks on Channel 2 that a police officer has a radio stuck on Channel 1, and this happens before 12:30. Consequently Channel 1 has at least one pause between 49.5 seconds and 3:47.05, and Hold1 must have happened before Hold2. Thus, Hold1 cannot be a crosstalk of Hold2.

From this timing consideration it follows that Hold1 occurred around 12:30 and the possible shot sounds should be close to Hold1. We may estimate the time of Hold1 in the following way. If the Dictabelt started 12:29, then Hold1 is at 12:29:48.6, some 12 seconds before the first shot. Most probably Check1 at 38 seconds was before Kennedy was shot, as there is no sign of any bewilderment. It means that the Dictabelt started at least 30 seconds before 12:30. The starting time of the Dictabelt is thus between 12:29:00 and 12:29:30 and Hold1 is between 12:29:49 and 12:30:41.

The Dictabelt records a bell ringing one time at 56.2-56.9 s. This may be a bell telling that the time is 12:30. Such a bell may be off even by some minutes, but it may also be rather precise. If the Dictabelt starts one minute before 12:30, then the bell at 56.2 seconds is right at the time for 12:30.

As a conclusion, there are no crosstalks between Channels 1 and 2 that are helpful in synchronizing the recordings. CHECK is not a crosstalk, neither is HOLD. YOU was not investigated, but it cannot give a precise timing since both channels have pauses before YOU. Hold1 must be placed somewhere between 12:29:48 and 12:30:41. There is no compelling reason to claim that impulse noises around Hold1 cannot be noises of the shots aimed at Kennedy.

What should shot noises look like on a Dictabelt recording? In the echo correlation analysis by Bolt, Berenek and Newman in 1978 the noises they have identified as gunshots look like any other signals, but this analysis is likely to be flawed. Their method was to calculate echo peaks for each of the four shots under two assumptions: that the shot came from the Texas School Book Depository or from the grassy knoll. The timing of the four shots was assumed known. Then they looked for a match from the Dictabelt for this kind of a pattern of echo peaks. In order to calculate the eco peaks they had to make the assumption that the radio, which picked up the gunshot sounds, was in the presidential motorcade moving with a certain speed and at a certain distance from the presidential limousine. The analysis found a match for the shots and the echo peaks. In this match three shots came from the Texas School Book Depository and one from the grassy knoll. However, the analysis was later deemed invalid.

The basic problem of this method is obvious once you look at the Dictabelt data. The recording is very noisy. There are enough noise peaks in order to have a quite good chance of finding a match for a given assignment of echo peaks. The acoustics firm used an analogue recording, but the problem can be demonstrated with the digitalized Dictabelt data created by the *audacity* tool. *Audacity* takes 44100 samples in a second and there is a half a minute uncertainty to the starting time of the Dictabelt. This means that there are $44100 \cdot 30$ possible starting time slots for matching the echo patterns. It is $1.26 \cdot 2^{20}$ trials. We may for instance

take 6 echo peaks for each gunshot. That means seven peaks for each four shots. With each peak we check if there is a peak within, say 2.9 ms, to each direction. The test for an echo peak is binary: there either is a peak within the ± 2.9 ms or there is no peak. It follows that there are $2^{7*4}=2^{28}$ possible echo patterns. Accepting peaks 2.9 ms to each direction gives additional 256 choices for the trials. Thus, there are $1.26*2^{28}$ trials for matching one of 2^{28} echo patterns. It would hardly be impressive to find a match. According to the report the acoustics firm calculated more than six echo peaks, but the size of the peaks decreases and it is unclear how many can be used for identification. It is justified to say that this method may easily give a false positive and calculations giving a very low probability for a match of echo patterns should be taken with caution. The best proof of the invalidity of the method is that the peaks the acoustics firm found do not in any way differ from other peaks on the Dictabelt. The second paper [3] rebutting the claims of Thomas concluded that the purported gunshot noises are in fact speech. This is quite possible.

Gunshot noise should not look like speech. A gunshot is a large impulse noise and it has a very wide spectrum. Digitalization with the sample rate 44100 samples per second limits the highest frequency in the digitalized Dictabelt to 22 kHz, but in any case a gunshot noise should have much higher frequencies than male speech, which is typically limited to 3400 Hz. We see that this is the case in the Dictabelt data: radio speech on the tape does not have wide bandwidth, but there are impulses with bandwidth reaching 22 kHz. These could be gunshot noises, but first we have to address the criticism that the Dictabelt cannot contain gunshot noises since the police officer with the stuck radio was nowhere near Dealey Plaza.

This is a common argument. It was proposed in 1978 that the police officer with the radio was a certain H.B. McLain, but he later testified that it was not him. Does it matter if the stuck radio was with the motorcade? It mattered to the echo calculations of the acoustics firm that the gunshots were recorded by a radio, which was in the motorcade, but does this radio need to be the same as the stuck radio?

In fact, it does not. We can notice from the Dictabelt that there are no or few Dispatcher announcements from the time zero to the time 4:09.5 when the motorcycle finally silences, i.e., the stuck radio stops sending. Apparently the Dispatcher could not transmit as long as the radio of the motorcycle officer is stuck. Still we hear talking in several occasions. Are they something that the radio of the motorcycle officer picked up, or did other police officers get to the channel? It must be the latter case. The channel to the headquarters must be shared by the radios of all police officers on Channel 1. This is so because otherwise each radio would have its own channel and the stuck radio could only block its own channel. In that case we would hear the traffic between the Dispatcher and other police officers on the Dictabelt, but there is no such traffic. As the channel to the headquarters is shared and the radios are voice activated, it means that if any radio of any police officer picks up something, even if the radio originally was inactive, it automatically turns active and transmits the sounds to the shared channel. Likewise, if the Dispatcher had managed to transmit anything, which he did not, it would have been sent to all police officers with a Channel 1 radio, and even if a radio was inactive, it would turn active and play the announcement. This is the only way the radios could have worked. Consequently, the stuck radio was not necessarily the radio, which picked up the gunshot sounds, or the sound of the bell, or the talking. There may be even several motorcycles contributing to the motorcycle noise.

In this article we will not continue to the analysis of the putative gunshots on the Dictabelt, but can the question of the headline be answered? Was there a conspiracy?

It can be answered in positive. If there was a cover-up then there probably was a conspiracy. The signal Hold2 on the Audiograph displays signs of manipulation. Closer today, is there still a cover-up? Maybe there is no cover-up, but there is certain unwillingness of

considering that the Dictabelt might have sounds of gunshots, and this unwillingness may be some times justified by incorrect arguments.

Look at the article [2] in a peer-reviewed journal. On page 225 the article purports to give a counterproof to Thomas [1] suggestion that Hold1 on Channel 1 has jumped to an earlier place and SB is the displacement of Hold1 from its correct place on Ch1. Linsker et al state that on Channel 2 the time from Check2 to Hold2 is 99.1 seconds and from Hold2 to You2 is 143.1 seconds. They also say that on Channel 1 the time from Check1 to Hold1 is 12.5 seconds and from Hold1 to You1 is 172.9 seconds. Thus, on Channel 2 the time from Check2 to You2 is 242.2 sec, while on Channel 1 the time from Check1 to You1 is 185.4 sec. They notice that Channel 1 has no pauses but Channel 2 has pauses. Therefore the time on Channel 1 cannot be shorter than the time on Channel 2. Thus, Check1 cannot be a crosstalk of Check2, which was to be proven, but this is not a valid proof.

So, what is wrong? The times [2] gives are wrong. Hold2 on Channel 2 is about one minute after the first shot on JFK. Check2 on Channel 2 is 11 sec before the first shot. You2 is about 1 min after Hold2 on Channel 2. So from Check2 to Hold2 on Channel 2 is about 71 sec and from Hold2 to You2 is about 60 seconds. In total from Check2 to You2 on Channel 2 is about 131 seconds, not 242.2 seconds. On Channel 1 the time from Check1 to You1 is 182.7-183.6 seconds, it is indeed longer than the time from Check2 to You2 on Channel 2. There is no contradiction: Channel 2 has more pauses than Channel 1 (which also has pauses before You1 as was shown before). This absurd proof in [2] and the wrongly given times are enough reason to suspect the correctness of [2].

What seems to be behind this is more absurdity. Originally a police officer made a copy of the Dictabelt by transferring the data via a small memory device. He had to copy the data in many parts and he took parts that overlap. As a result, the copy had repetitions. Originally the repetitions were removed in the analysis, as is correct. In [2] and [3] it is stated that the repetitions should not have been removed, which may be the reason for these odd times in [2]. The reason given why the repetitions should not have been removed is that the head in the Dictabelt machine moves with a fixed speed, thus if it makes repetitions, somewhere else there must be omissions. This of course is absurd. There were no repetitions originally: they were made by copying the data in small parts. There is no way a single head can write the same data twice.

References:

[1] Thomas D.B., "Echo correlation analysis and the acoustic evidence in the Kennedy assassination revisited", *Science & Justice* 2001 **41**, 21-32. 2001.

[2] Linsker R., Garwin R.L., Chernoff H., Horowitz P., Ramsey N.F., "Synchronization of the acoustic evidence in the assassination of President Kennedy", *Science & Justice*, vol. 45(4), 2005, pp. 207–226; and Linsker R., Garwin R.L., Chernoff H., Ramsey N.F., "Acoustic synchronization: Rebuttal of Thomas' reply to Linsker et al."

[3] O'Dell, Michael, "The acoustic evidence in the Kennedy assassination, *available in the Internet.*"

[4] www.pienisalaliittotutkimus.com, post on audiotool in the category Kirjoja ja Softaa.