Twelve Seconds That Changed the World
An Assessment of a Three-act Play at the National
Air and Space Museum

March 2005

Office of Policy and Analysis

Smithsonian Institution

Washington DC, 20560-0405
Preface

From December 2003 to March 2005, visitors to the *The Wright Brothers & The Invention of the Aerial Age* gallery at the National Air and Space Museum (NASM) sometimes had the opportunity to view a play performed in the gallery. Several months ago, NASM asked the Office of Policy and Analysis (OP&A) to assess the reaction of visitors to the performances to help guide future programming at the museum. We wish to thank the staff of the National Air and Space Museum for their cooperation, in particular, Barbara Brennan, Exhibition Designer. In addition to the study team, OP&A staff members Ioana Munteanu, Andrew J. Pekarik and Whitney Watriss conducted some of the interviews. We also would like to express our appreciation to Smithsonian visitors who took time out of their hectic schedules to talk to us.

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* Twelve Seconds That Changed the World, Act 1. Photo by Eric Long, courtesy of the National Air and Space Museum. 

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Introduction

Several months ago, staff at the National Air and Space Museum (NASM) asked the Office of Policy and Analysis (OP&A) to assess a three-act play, Twelve Seconds That Changed the World, being performed at the museum. The performances were in The Wright Brothers & The Invention of the Aerial Age gallery. The goal of the assessment was to determine if changes to the play were required, and if so, what types of changes. OP&A was also asked to consider if the exhibition enriched the experience of visitors to the exhibition or, in fact, was interfering with it.

OP&A discovered, after visiting several performances, that a straightforward survey was not feasible and would not provide the information needed. Thus, our approach was to observe and interview visitors to the Wright Brothers gallery during the Wednesday performance schedule.

A team of OP&A staff members interviewed visitors who left the play while the performance was in progress, as well as those who remained until the end. We also reviewed key writing on museum theatre of the past decade and interviewed two experienced theatre managers at non-Smithsonian museums.

To provide context for readers, we begin by summarizing the current play. Next, we address key issues to be considered in future theatre performances at NASM, instead of making specific recommendations for changes to the Twelve Seconds performance. In addition to a short bibliography (Appendix A), an appendix (B) includes selected comments from the 60 visitor interviews that OP&A staff conducted.

Background and Play

December 2003 marked the 100th Anniversary of the “twelve seconds that changed the world.” On December 17, 1903, at Kitty Hawk, North Carolina, the Wright Flyer became the first powered, heavier-than-air machine to achieve controlled, sustained flight with a pilot, Orville Wright, aboard.

The Wright Flyer, formerly hung overhead in the “Milestones of Flight” gallery at NASM, is now the centerpiece of a (relatively) new exhibition, The Wright Brothers and the Invention of the Aerial Age, about that historic event. The exhibition includes technical displays on the mechanics of flight, personal materials related to the Wright brothers, computer simulation of what the Wrights' first flights must have looked like, and material related to the impact of their invention on global aviation and culture. The exhibition includes several diorama-like installations, e.g., the front porch of the Wright home in Ohio and the Wright bicycle repair shop.
Among the public programs associated with the exhibition were performances, twice a week in the gallery, by actors portraying Orville and Wilbur Wright, their sister, Katharine, and writer Franz Kafka. Katharine provides biographical information about the Wright family and the brothers’ formative years (Act 1). Orville and Wilbur, appearing in Kitty Hawk on the day of their “success,” summarize events leading up to the “twelve seconds” and the event itself (Act 2). Kafka addresses the European community's reaction to the Wrights' work and describes his reaction to attending his first air show in 1909 (Act 3). The 15-minute plays takes place in three approximately equal segments on ‘stages’ built into the exhibition that is similarly grouped by three separate themes: Why Wilbur and Orville, Visions of a Flying Machine, and The Aerial Age Begins. For example, Act 1 takes place on the Wright family porch. The play has very little action and primarily consists of the actors’ retelling of past events. Acts 1 and 3 (Katharine and Kafka) are monologues in which the actors direct the audiences attention to text panels, exhibition props (e.g., the bicycle shop) or objects (specific airplanes).

Twelve Seconds That Changed the World, Act 2. Photo by Eric Long, courtesy of the National Air and Space Museum.

The path through the 5,400 sq. foot gallery is shaped like a horse-shoe. It was designed so that the audience enters at one end and exists from the other. Act 1 takes place near the entrance, Act 2 about halfway through and Act 3 near the exit. Twelve Seconds was performed five times, from 11:30 am to 2 pm, every
Wednesday and Saturday. (Throughout July and August, performances were held on Friday and Saturday.) All performances were free. The play opened at the same time as the exhibition. By the time it closed on March 16, 2005 a total of approximately 690 performances took place.\(^1\)

The play entailed considerable resources. In addition to the initial investment in the script, sets, and costumes, a specifically hired part-time theatre manager handled the logistics, costume maintenance, and worked with the performers. The performers were professionals and subject to union regulations; thus, it was difficult, for example, to delay a performance or eliminate it if the gallery was near empty. NASM’s Development Office raised funds for the play, as they were not included in the play’s budget.\(^2\)

**The Play in the Museum’s Context**

A brief description of the play and schedule appear on NASM’s website and, recently, the museum broadcast public announcements just before each performance began. A theatre marquee is on the entrance to the exhibition. However, out of the 60 visitors that OP&A interviewed, only a few came specifically to see a performance. For example, we encountered a couple that heard an announcement, had time and came to see it. In general, the play’s performances were announced in the gallery just prior to the start of each performance. Conversations with non-SI museums professionals indicated that museum theatre typically requires ongoing and extensive promotion and marketing, especially if plays are not performed on a regular basis.\(^3\)

In the gallery, several factors appeared to have interfered with the visitors’ experience. To ensure that visitors saw the exhibition in chronological order, the gallery design incorporates a clear, open entrance and a closed door exit triggered by a motion detector inside the gallery. Visitors who wanted to leave the gallery while the performance was in progress had a difficult time doing so. The automated exit doors were noisy and blocked by the position of the actors during the performance of Act 3. Noise from new visitors continuously entering the exhibition gallery also interfered with the performance. More generally, visitors were ‘trapped’ in the space during the performance. Certainly, in the future, entry and exit patterns should be reviewed carefully.

Similarly, in part because of the closed doors, the gallery temperature was frequently uncomfortable. Again, this is an issue to keep in mind.

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\(^1\) When the gallery opened, *Twelve Seconds* was performed six plays per day, three days per week. Some performances were dropped to docents to give tours. Theatre staff reports that they encountered resistance from the docents throughout the show. These 690 performances include some family day and special event performances.

\(^2\) *Twelve Seconds* encountered budget problems for several reasons: (a) costs exceeded expectations; (b) other priorities diverted the attention of the Development Office, so that all of the required funds were not raised; and (c) one donor did not honor a commitment.

\(^3\) NASM’s Communications Office had a small budget for *Twelve Seconds* but it is not clear how it was used.
Most disruptive to the performance were the museum announcements heard in the gallery at regular intervals. Without fail, during our observations, announcements for the IMAX theatre and other museum events punctuated Act 3 of the play. For future plays, either the play’s starting times or the announcements should be adjusted.4

From visitors, sitting down during performances was difficult for two reasons. First, the number of seats at each scene location was very limited and second, even those who sat down briefly discovered that they had to move to another location before the next act. At most of the museum theatre productions reviewed by OP&A, seating was plentiful and the stage was stationary. In conversation with external experts, they applauded the multi-stage aspect of Twelve Seconds, but suggested less ambitious staging in the future and more seating.

The Script of Twelve Seconds

Two aspects of the script were inconsistent with general museum theatre practice. First, most plays are written in the present tense, adding a level of excitement for the audience. Second, the literature emphasizes the need for balance between assuming that the audience is totally naive and expert in the topic at hand. The Twelve Seconds script replicated material that was on various exhibition panels and labels and, at other times, seemed to assume that the audience had read the materials. This was especially true in Act 3.

In a recently published book about museum theatre (Bridal, 2004), the author quotes George Buss, of the Whitaker Center for Science and the Arts, as believing that “museum theatre exists to make the visitor care enough to learn” (p. 4). Buss breaks down museum theatre into three categories, which might prove useful to NASM in future planning, and script development:

a) “Demonstration museum theatre, relying on the convention of a demonstration or experiment to draw the audience’s attention and create an interest in the science or topic surrounding it.”

b) “Character-based museum theatre, introducing the audience to a person, fictional or not, so that they can evoke an emotion about the person they are portraying” and

c) “Plot-based museum theatre relying on the conventions of the plot to create intrigue and interest.” (Bridal, p.4)

The museum theatre literature and our conversations with experts emphasized the need to pre-test script ideas, portions of and whole plays with visitors, on-site. One museum enlists audiences, after the first few performances in a

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4 For the first year, Twelve Seconds did not have an announcement. The timing of other announcements discouraged theatre staff, although they tried to have it adjusted.
session of critiquing the play. Script and actions modifications then follow.

Before describing some of the suggestions visitors made for content, it might be useful to summarize the various techniques that commonly appear in museum theatre. Obviously, these techniques do not have to be used in isolations, but can be ‘mixed and matched.’ They are described in more detail in Bridal (2004, Chapter 3).

a) Storytelling. This technique, involving characters in costume who tell stories, was used in *Twelve Seconds*.

b) Monologues. This approach uses single actors, in costume, to portray real or fictional characters.

c) Historical characters. Historical characters are brought to life through costume, sets, and dialogue. They share their lives, work, and times with the audience.

d) Participatory and Interactive theatre. In participatory theatre, audience members become part of the play. In interactive theatre, the audience engages with the players without leaving their seats (e.g., to ask or answer questions during the performance.)

The suggestions made by visitors at the NASM theatre can be interpreted through any of these techniques, or a combination thereof.

Visitor Reactions to *Twelve Seconds*

A selection of visitor comments from the 60 interviews is in Appendix B. These comments show that many visitors expressed interest in the play, made both positive and negative comments, and offered suggestions for improvement. The transcripts don’t communicate, of course, the enthusiasm or lack thereof in the visitors’ voices.

In particular visitors were responsive to the idea of live actors in the museum context. Visitors named historic figures (e.g., Charles Lindbergh, Amelia Earhart), and categories of people (e.g., astronauts), as candidates for re-enactments or interacting with the audience. In the words of one enthusiastic visitor, “Yeah, the thought of having people walking around in space suits. That would be quite cool. Yeah, I mean, yeah, if you reenacted some of the space stuff, that would be quite fun as well. I’m sure kids would absolutely love that. I was pretty enthralled by just seeing those space suits. I just thought that’s really something.”
Discussion

The evidence from the museum theatre literature clearly supports the claim that actors, plays and performances are engaging programmatic additions to a visit. As Hughes writes, “Significantly, what they [evaluations] have done is establish the notion that using theatre in museums is appropriate, that visitors respond by-and-large positively, and to show evidence of visitors’ acquisition of new data” (1998, p. 139). Major studies conducted at The Science Museum (London), the Canadian Museum of Civilization, the Science Museum of Minnesota, and Zoo Atlanta provide supportive data (Hughes, 1998; Davidson et al 1993). Evidence from those studies, combined with our interviews, suggests that the public would be receptive; visitors would clearly be interested in more theatre.

Among the suggestions made by visitors was the addition of actors in character in the exhibition halls. Bicknell and Mazda (1993) conducted a study at The Science Museum (London) to see the reactions of visitors to this type of first person interpretation. The results show that 95 percent of the surveys visitors thought that this was a good idea.

Our work, conversations with experts and the literature, suggest that planning for a next effort should take place in the context of a holistic look at what visitors see and hear in the course of a visit rather than a visit to a specific exhibition. For
example, public service announcements should be coordinated not only to alert
visitors to performances but also to keep announcements from interfering with
performances. From a museum’s perspective, a successful museum theater
program requires the total support and buy-in of a wide range of museum staff
including administrators, fund raising officers, docents, public affairs staff, and
public programming developers.

At the more operational level, in general, the setting, length and content need to
be selected with care. Pre-testing should take place. Details like timing,
competing sound/announcements and publicity should all be considered. Both of
the external museum staff interviewed noted that, unlike most exhibitions, changes
can be made to performances both before opening night and afterwards based on
visitor comments. Science Museum, Boston regularly conducts audience studies
before openings and throughout a play’s duration.

Several writers, e.g. the Director of Operations in Colonial Williamsburg, point out
that part of the discussion pertaining to museum theatre involves two differing
approaches to theatre (Matthews, 1999). One approach, used primarily in historic
sites, views the theatre staff as “interpreters” rather than “performers” or “actors.”
These individuals are required to understand and know a great deal of historical
information beyond the script. The other approach, used in more traditional
museums, relies on scripts. In general, the historic sites use their museum as
both stage and set, while most traditional museums use auditoriums or spaces
and stages especially designed for performances.

Several texts (e.g. Bridal, Hughes) as well as special training programs might be
helpful should NASM decide to develop a theatre program. In addition, selected
staff might benefit from membership in the International Museum Theatre Alliance
(IMTAL) (http://www.imtal.org/) and attendance at its conferences and workshops.
Other organizations that promote the use of museum theatre include the National
Association for Interpretation (http://www.interpnet.com/home.htm), and The
American Association for State and Local History (http://www.aaslh.org/).

Needham (1999) describes a planning study for museum theatre at the Canadian
Museum of Civilization that attempted to assess whether the program was
valuable and, if it was, whether the time was right for implementation. In a long list
of questions, the following appear most relevant to future discussions of theatre at
NASM:

“1. Is the program’s mandate appropriate? Are there better alternatives to the
program? ...
1.1 Does the live interpretation program provide a museum service that cannot be
delivered any another way?
1.4 What does the program contribute, relative to the costs required to maintain it?
3. Is the program established and supported in such a way as to promote
success?”
Appendix A
Bibliography


Appendix B
Selections from Interviews: Twelve Seconds

Comments presented in this appendix are grouped by theme or subject. While typically OP&A interviewees would note demographic characteristics of the visitor, time constraints prevented this for some visitors. Intercepting visitors who exited the play in progress required swift action. Several interviewers spoke to multiple visitors who had watched the same play. In most cases, OP&A staff noted the visit group composition and in many cases identified the visitor’s hometown.

Awareness
In most cases, visitors were surprised to encounter a play in the exhibition. Information about the performances available on the website and gallery exterior did not play an apparent role in drawing visitors to the gallery. About half of the visitors who saw the play entered the gallery after the performance had started. Other visitors were meandering through the exhibition when they heard the announcement or heard the theatre manager or actors invite them to gather around.

I walked in and was like, oh there’s a play going on ... So if you do a little advertising at the entrance I think people would actually want to come.
Two adults, hometown unknown

We didn’t have any idea it was getting ready to happen. It was marvelous.
Large mixed group, from North Carolina, South Carolina, and DC metro

We just happened upon it.
Two adults, hometown unknown

We just came in and we haven’t seen very much but it’s beautiful. I had no idea [that there was going to be a play].
Two adults, from Kitty Hawk, North Carolina

Sitting and General Atmosphere
“I like the idea, but we just don’t have the time to stand.”

A woman visiting from England said, “To be fair, I only saw one guy talking and he was very enthusiastic and he seemed like the narrator. I don’t know whether it should be a bit more formal with a bit more of a stage, sort of, but I couldn’t really tell ...”

A man from Sweden, in response to a question about possible changes said, “What would I do? No disturbances. Like all the people walking around and coming in. Like it’s like a real play, it’s show time. I’d just obligate them. Make it like a show. Like from the beginning [Act 1] all the way here [pointing to location of
Act 2] was the most interesting. Like I said there were too many people moving around."

**Length of Play**  
Visitors generally had no idea how long the play might take. The uncertainty led many to leave early, for fear of their museum visit being delayed or truncated. Once the play began, OP&A observed some visitors looking for a polite way and time to exit before the end.

When the interviewer asked one woman how long the play lasts, the response clearly showed that visitors were not informed, “An hour maybe?”

Another woman said, “Because we only have one hour ... I would love to stay but ... It’s too bad that we have to leave.”

A woman visiting with children, from England also added, “It’s difficult because of the timing, because you want to do everything. It’s quite hot and it’s quite tiring.”

One woman commented that she saw the theatre manager walk around the gallery and announce the play and its length: “And then she said that they were going to have one [play], but I can’t recall what was said about the length.”

An interviewer stopped a man as he exited the play about three or four minutes in progress. The visitor explained why he was leaving, “Because I want to do a lot and see a lot today ... Because I wouldn’t see other things I want to see today if I stayed too long.”

A couple explained that, “We’re on a time schedule here. We’re going to hit like a couple of the other museums. ... It’s great if you’re here and you have time to just sit. We would have had to stand and stay and just watch the whole thing. So we couldn’t just watch a little and just walk off. I mean, it deserves your whole attention.”

One man left because he was trying to see the whole museum in limited time, “We’re on a limited time schedule, so we only have about 30 minutes, so we’re going through the whole place just as quick as we can.”

**Level of Difficulty/ Understanding**  
A young man stationed at Andrews Air Force base watched the last few minutes of the play with fellow enlists and offered this comment, “But he had really good dialogue – nice deep voice for it.” When asked if it added to experience he said, “Actually yeah. It’s a lot better than just reading everything, because you can only do that for so long ... Usually the problem in monologues like that is they’re not loud and they don’t keep their emotion very well. He did really well – the last guy we saw – we didn’t see the other three, but he did really well.”
Level of Interest in Play and/or Something New
An elderly man from Arkansas visiting NASM for the first time commented, “Well, I’ve read all there is to read about it [the Wright Brothers]. All I really wanted to do is see the actual plane and see a couple of pictures.” He continued, “For somebody who hasn’t read books about it and stuff, it was probably very good, but I don’t think it imparted much that I hadn’t read before.” His female companion explained, “We’ve watched reenactments in different places so I definitely think they’re a worthwhile project. It brings reality to it.”

A child with family from New Jersey said, “It’s sort of like showing you how they felt, like how they were excited that they did it.”

A man visiting with a mixed group of adults from the DC metro area, Chicago and California said, “Well, we were here just two days ago, and I thought this was much more -- because it was more interactive – this was much more interesting.” Another member of the group added why he liked the play, “Because they point out a lot of stuff that’s in the fine print that I didn’t really look at the first time around. I assume it’s the fine print. I just thought it wasn’t even mentioned. Sometimes it’s hard to get to every single plaque and read every single ... (friend interrupts), “Well they say it would take four years to read everything!”

A woman visiting with a large group from North Carolina, South Carolina and the local area said, “They were very good, and they gave a lot of information about Kill Devil Hill. There was a lot of information that I didn’t know about and that was really neat.” Her companion continued, “They made history come alive.”

One man from Puerto Rico was stopped by an interviewer as he left the play early, “I just like to look, you know. Read some, you know, of what’s most important to me and that’s it.”

A family from Nashville watched the play, “Well I think when the brothers were speaking that was kind of interesting. I probably wouldn’t have read or stopped to read what they said, but the fact that they said it, and spoke it, and were dressed.”

One of two women together from SC offered, “Katharine is really good. She appealed to me because she’s the sister and she went and told the story about the family. I knew nothing about the actual family. Just about the brothers. We hadn’t done any research about them. But actually learning their history and about the father and the mother and everyone dying and her going back after she’d had college.”

A visitor from England accompanied by children was enthusiastic, “You take more in I think than just reading a piece of ... I mean, yes it’s all great. You capture the atmosphere better with the live theater if you can.”

Best and Worst
In the interviews, OP&A interviewers asked visitors to comment on what they found the most interesting, and what in the play could be improved.
Two young men agreed that Act 1 impressed them the most. One said, “The beginning, the introduction, the little sister – yeah, I think that’s the part where I got into it. I was like OK, she’s explaining how the brothers worked and how they actually think about creating this flight, how they like to experience different things. I think the information really stands out because I’ve heard about the brothers, but I don’t know much about them.”

A family of four from New Jersey criticized the third act. The man said, “I think the last piece was a little – the last piece was a great little piece – but you kind of think you’re following the Wright brothers and then it’s a little disjointed.

A mixed group of adults (local, Chicago and California) commented on the whole play: “For me I liked the first one [Act 1] just because personally I like the history, but she liked the second one [Act 2].” From same group, we heard about the third act ... “It [Act 3] was completely different than the other two. At first I wasn’t sure what was going on, but I figured it out.” A woman in the group added, “That was my problem ... I don’t know.”

All the members of a local family agreed with the man who summarized, “The first scenes I really, really liked because that’s the Wrights. The last one, you know, is supposed to be an artist of some sort I guess.”

One of two women from South Carolina admitted that, “I was sucked in by Katharine ... I mean the lady just brought you into it. I mean you felt like you were really back in time.”

One woman visiting with a friend said, “She [Katharine] just had a lot of down to earth information about the family and the illness and I thought the sister and the brothers were both very good.” The last one I couldn’t really understand. I think the script wasn’t as good. I couldn’t even understand what it was. I mean when she was talking I understood perfectly and when the brothers were talking I understood exactly – the dates and the time. They gave more factual information. He was a very good actor, very dramatic, but I didn’t understand what he was talking about. Her companion agreed, “The script needs to be changed for that. It’s all emotion and no facts.”

A man from Virginia visiting with family said, “I don’t think I understood the last section of it. You didn’t know where it was coming from. They didn’t pull in the Wright brothers at all, but the rest of it was great. I love the first person narrative.”

A man from the northeast spoke about the first two acts, “I thought the first part was pretty interesting from a personal point of view with the sister. The second half I think focused a little too much on the environment that was around them – the Wright brothers – it could be a little more focused on the technology and what they were trying to do. ... Yeah, a little bit more and about their problems and their victories.”
Another man, in response to what parts should be kept in a rewrite, said: “I would say the brothers over there explaining how they took flight and the different events – like the wind – all that kind of stuff is kind of pertinent. She [Katharine] didn’t really add a whole lot to the whole thing, I didn’t think. I mean, I thought the brothers were really inspirational and this last guy – the painter – I didn’t really see where he would – I mean he was well rehearsed, but I don’t see what he added to the part.”

One woman elaborated, “Yeah, I would just would either make the connection clearer [between Act 2 and Act 3] or take that last bit out, because I still don’t understand why it was there. I wanted it to be more about – I would like that last five minutes to be a bit more from the Wright brothers about – you know – I thought they would chip in again and say that they were at that air show, but then there was no mention. And I thought – well people are flying for 59 minutes. That’s a lot more than 12 seconds. When did we suddenly get that leap between?”

**Overall Comments**
The performance was particularly appealing for visitors who prefer to look and listen and have time to spare. These visitors preferred listening to the Wright brothers’ story rather than reading the text panels.

*I’m not a reading person, so I like a lot of pictures. So, like, the play was good. I don’t have to read, I listen to them. It’s a lot easier. That’s how I learn.*

Two adults, hometown unknown

A woman from Canada, who left after Act 1, because her companion needed a restroom, said, “I think it’s good. It helps bring things to life instead of walking around and reading it. Some people learn by seeing, right? And not just reading. So I think it brings it to life, and I think it was interesting. … I thought it was pretty good. Katharine was pretty clear, it was pretty good writing, and it was a good overview of [the story.]”

A teacher from North Carolina: “I think it’s good. It’s really interesting. If I had more time, I’d stay and hear everything they said. Because, obviously, they know a lot more than we normally hear about.” However, she didn’t think that the play caught the students’ attention. “Oh probably not, because they’re more interested in all the hands-on things. But I love it. I think it’s great.”

A local grandmother commented, “I thought the length of each little vignette was very good. It’s just the right amount of time. I thought the actors did a great job. It was very informative for the children.” As for the specific vignettes, “I think we’re more interested in the Wright brothers, because they were the first to actually do this. So, I thought it was great. It was very good. And then the last one was interesting, because it told about other flyers. So the whole thing was real good.”

**Reasons for Leaving**
Interviewer, “I noticed you left during the third scene?”
Man: “Oh, I got too hot.”

A group of three chaperones with two students, part of a group of 150 from Charlotte, NC left after Act 1: “It’s because we have to get back to our class.” To see the entire museum, “We had about an hour.”

Suggestions and Possible Candidates for Portrayal
Several visitors argued for a more interactive experience and several others offered their suggestions for the stories they’d like to see brought to life. Suggestions included: Charles Lindbergh, Amelia Earhart and the Space Shuttle – astronaut actors. One visitor explained, “I think any of the astronauts would be neat but it would have to be so you could contain the sound a little.”

A child visiting with his uncle and cousins, from North Carolina articulated his desire to see the real thing, “If they have, like, reenactments like exactly like it happened or really close.”