Tukufu Zuberi: Our next story examines an instrument that may have recorded the desperate moments of a tycoon's near fatal flight. July 7th, 1946, the world's fastest military spy plane is about to launch on its maiden voyage. And the test pilot is as extraordinary as the plane itself. Howard Hughes, billionaire Hollywood playboy and aviation wizard. But 75 minutes into flight, the plane suddenly plummets at over 125 miles an hour, diving into a wealthy Beverly Hills neighborhood, smashing three homes and nearly killing Hughes. The crash scars Hughes physically and mentally, marking the beginning of his lifelong addiction to painkillers. Now some 60 years later, a man in Laramie, Wyoming, has inherited a curious item, which he believes may have recorded Hughes' near-deadly descent. I'm Tukufu Zuberi, and I'm meeting up with Jim Kirkpatrick.

Jim Kirkpatrick: Come on in.

Tukufu: So what have you got for me?

Jim: Well, I have an altimeter that my father says came out of the XF-11 airplane that Hughes crashed into Beverly Hills.

Tukufu: Okay. It's an altimeter, so it measures the altitude of a plane.

Jim: That's correct.

Tukufu: Jim tells me his dad worked for Howard Hughes for over 30 years.

Tukufu: What exactly did he do?

Jim: When he hired on, he hired on as an aircraft mechanic. And then he worked his way up to flight engineering, co-pilot that sort of thing. This is a picture of my dad. He's on the far left. This is one of Hughes' airplanes.

Tukufu: Was your dad there on the day of the crash?

Jim: He was part of the crew and he was among many people who were standing around waiting for the plane to come back and it never did. So after the crash he was on the investigation team and, of course, he had access to the entire set of wreckage.

Tukufu: Now, what is it you want me to find out?
Jim: What I want to find out if his story is really true.

Tukufu: Well, let me go see what I can find out.

Tukufu: It's a fascinating story. A billionaire playboy barely escapes death in the biggest plane crash in Hollywood history. And right here may be the instrument that charted Hughes's near fatal descent. Jim's dad certainly had access to the crash, but I have no idea if this is the real thing. It's a solid black metal case, pretty heavy and it looks old. I have no idea how old, but it does have some information on it. Here is a name. Kollsman. Now it looks like they put this little nine here. The number appears to have been painted on. And here there is a manufacturer part number 671BK03. Maybe I can find a crash report that lists this altimeter. I'm calling the National Archive in Washington D.C. I want to know if they have any files on the plane crash. For the XF-11. While the archive searches their records, it's time to do some digging of my own. Last year my colleague, Gwen Wright, investigated Howard Hughes Senior and how he earned his fortune in the oil business. Howard Junior was born into riches and went on to make Hollywood films and set world speed records in aviation. He became a national hero. But Hughes was eager to make bigger contributions. As World War II raged, a serious problem emerged in the air force. Reconnaissance planes flew too low and slow. They were often shot down. Hughes proposes the XF-11; a new kind of spy plane. Traveling at over 400 miles an hour, at 30,000 feet, the plane would be a powerful new espionage weapon. On July 7th, 1946, the plane is ready for testing, with Hughes at the controls. The scene was dramatically recreated in the hit move, *The Aviator*. It says here that the film makers on *The Aviator* used meticulous primary research to recreate the planes that Hughes flew. The XF-11 in the film is a near perfect recreation. There's even a shot of the altimeter in the film. But it doesn't look anything like ours. I'll need to talk to the folks who made the film. But first, I'm meeting a guy who might know if this is the kind of altimeter that would have been in a Hughes airplane. How you doing?

George Marrett: Hi. Doing fine.

Tukufu: George Marrett was a test pilot for Hughes Aviation for over 20 years. I'm meeting him in Beverly Hills, in the exact spot where Hughes crashed back in 1946. Tell me what happened on that day.

George: Howard took off in his XF-11 from his airport at Culver City for what was scheduled to be about a 45 minutes flight.

Tukufu: So when did he notice that he had trouble?

George: He had been airborne for now about an hour and 25 minutes. And what Howard Hughes did not know at that time was that there was a leak in the right rear propeller. And it went into reverse. He now is in an airplane that has no ejection seat, he's over populated area and he's going down.
Tukufu: Describe the crash to me.

George: He is coming in this direction. He is descending. He is trying to stretch it to a golf course which is about two blocks over here.

Tukufu: Okay.

George: Unfortunately, he doesn't have the altitude and his left landing gear goes through the roof of this house. As he continues through this two-storey house here, his right wing hits this house and the airplane now starts to come apart. The other utility pole, parts and pieces flying off.

Tukufu: None of the residents on the ground were injured, but Hughes barely survived.

George: He ended up with a crushed chest, collapsed lung. He had multiple broken bones. He had second and third degree burns over all of his body.

Tukufu: I showed George our altimeter. Do you think this came out of that plane?

George: It was a very common instrument made by a company called Kollsman Manufacturing, who made all of the altimeters for military aircraft of that vintage. I can tell you definitely, from my aviation background and experience, this is the type of altimeter that would have been on Howard Hughes's XF-11 when he crashed.

Tukufu: What about this red number on the back?

George: Typically, when people investigate accidents, what they will do is mark the equipment and then gather it all up, take it to laboratories and do the evaluation. So, I think that adds credence to the fact that this altimeter could have been in that crash.

Tukufu: But I still need proof that this exact altimeter was in Hughes' plane. It seems like the company that made it is still around. Hello. Yes. I'm calling about an altimeter you made back in 1946. It was an XF-11. Any records? Anything? 671BK-03. Your records don't go back that far? No reference to it? None at all? I'm headed off to meet with the filmmakers from The Aviator movie. I wonder where they did their research. Matthew Gratzner owns New Deal Studios in Los Angeles. His crew of model makers spent thousands of hours meticulously recreating an accurate version of the crash.

Matthew Gratzner: With most films there's a lot of artistic license. But The Aviator, it's a historical drama so many pieces of the material is realistically and accurately portrayed as possible.
Tukufu: How much research did you conduct to get the scene right?

Matthew: We went through any accounts we could find. And tried to do almost like a forensic study of how the crash happened.

Tukufu: I asked Matthew what records of the XF-11 he was able to uncover.

Matthew: For the exterior of the airplane, we ended up referencing real photographs of the XF-11, which were kind of few and far between. But for the interior of the cockpit, there really was almost no photo reference, nor blueprints or any types of drafting. So I know that because the XF-11 looked very similar to the P38 Lightning, the Lockheed Aircraft of World War II, they based a lot of the instrumentation on that aircraft.

Tukufu: No wonder our altimeter doesn't match theirs. It wasn't even from the right plane. Maybe there are no surviving photos of the XF-11 cockpit. Was our altimeter even in a plane crash?

Ray Grimsbo of Intermountain Forensic Laboratories has investigated dozens of crashes. How are you doing?

Ray Grimsbo: I'm doing good. How are you?

Tukufu: Great. I'm fine.

Ray: Come on back into the lab.

Tukufu: Great. I'm trying to find out if this altimeter was in a crash in 1946 over Beverly Hills. Is there any way you can help me out?

Ray: Yeah, I think so.

Tukufu: Ray explains there's a number of tests he can do. First he takes an alcohol swab to search from hydrocarbons, the residual smoke left behind after a fire or explosion.

Ray: And once we pick up the residue, we'll extract it into the alcohol.
Tukufu: When he's gathered a good sample, Ray brings it to the machine room.

Ray: What we're going to do now is we're going to inject one microliter of this sample...into the gas chromatograph....
Tukufu: Okay.

Ray: …and in 20 minutes we'll see if we have hydrocarbons or not.

Tukufu: Okay. Inside the gas chromatograph, a laser pulverizes our sample, turning it into ions, helping to reveal which elements are present.

Tukufu: So what have we got?

Ray: No hydrocarbons.

Tukufu: Oh.

Ray: This is all background noise. And, there's no hydrocarbons there.

Tukufu: So does that mean that our altimeter was not in the crash?

Ray: No, it doesn't necessarily mean it hasn't been through a crash.

Tukufu: Ray explains that residue may have worn off in the intervening years. But Ray's looked at photos of the crash site and he's skeptical any instrument could have survived such an impact.

Ray: It just seems to me that this altimeter should have shown more damage if it was in this type of crash. I don't see any evidence to indicate that it was in a crash of any sort.

Tukufu: The package from the National Archives gives my investigation a new twist. It seems my phone call to the archives led researchers to a crash report that hadn't been seen in decades. That report gives a thorough account of what happened on that day back in 1946. Unfortunately, there's no mention of an altimeter being recovered. But then I find a stack of photographs. Stark images taken just hours after the crash. Wow! And on one of the photos, I find what I'm looking for. What we have here is a photograph of the mangled cockpit. The steering column bocks the spot where the altimeter would be. But it's clear that every other instrument is in great shape. Our altimeter could have been in that crash. But does Jim have the real thing? The Evergreen Aviation Museum in McMinnville, Oregon, is home to Howard Hughes' famous Spruce Goose, the largest airplane in the world. Their staff helped Gwen Wright last year in her investigation. Maybe I can find original purchase orders that show the altimeter Hughes ordered for the XF-11. Registrar, Aaron Warkentin turns me loose in the archives. I don't find any purchase orders, but I do uncover something curious. What I've found here is an oral history from one of the engineers who worked on the Spruce Goose. The engineer says the Spruce Goose used engines called 4360's. In another document, an engineer notes that the XF-11 also used...
Aaron's not surprised; the two planes were built side by side and frequently used the same brand and model of parts. So it would have been very easy for them to be using some of the same instruments. I need to look at the instruments in the Goose.

Aaron: Okay. Well, I can let you in.

Tukufu: The plane is enormous. Inside are five separate altimeters. The first is made by Kollsman, but it doesn't match ours. The numbers are different. The needles are slightly different. And the dial is different. At the next three stations, it's the same story – no match. Finally, at the most important seat in the Spruce Goose, I find what I'm looking for. It's time to head back to Jim.

Jim: Have a seat.

Tukufu: Thank you. Here's your altimeter.

Jim: Okay.

Tukufu: I show Jim the long lost crash photos from the National Archives, proving that the XF-11 instruments survived the crash.

Jim: Okay! So we're on the right track.

Tukufu: But frustratingly, there was no photo of the altimeter. But then our flight took a turn. In the pilot's seat of the Spruce Goose, I make a discovery. The number's the same. The needle's the same. The colors are all the same. I think we've got a match. Jim's dad worked on the XF-11 crash team and had access to all the plane's parts. And now at the Spruce Goose, we have evidence that this exact make and model of altimeter was used in Hughes's aircraft during that period. So if you take the evidence from my investigation and your father's firsthand report, it all points to this altimeter being the one from the XF-11 flight that Howard Hughes crashed in Beverly Hills in 1946.

Jim: Well, that's very exciting. I'm very glad to hear that. My dad was a really good storyteller and, although he's gone, this is still one more story that he can keep on telling.

Tukufu: Nine months after the crash, Hughes was back in the cockpit to test another version of the XF-11. This time, the flight went without a hitch. With the end of the war, the XF-11 was never put into service. But it inspired the next generation of spy plane, the U2, which provided military intelligence for over three decades.