Edwards Dep.

UNITED STATES DISTRICT COURT
FOR THE
DISTRICT OF COLUMBIA

IN RE AIR CRASH DISASTER NEAR SAIGON, SOUTH VIETNAM, ON APRIL 4, 1975	Misc. No. 75-0205 All Cases
FRIENDS FOR ALL CHILDREN, INC., as legal guardian and next friend of the named 150 infant individuals, et al, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544

JAMES DUNCAN WYNN, et cetera,

Plaintiff,

-vs-

LOCKHEED AIRCRAFT CORPORATION,

Defendant and
Third-Party Plaintiff,

-vs-

THE UNITED STATES OF AMERICA,

Third-Party Defendant.

Civil Action
No.
76-0544-37

JAY EDWARD TEFFT, et cetera,

Plaintiff,

-vs-

LOCKHEED AIRCRAFT CORPORATION,

Defendant and
Third-Party Plaintiff,

-vs-

THE UNITED STATES OF AMERICA,

Third-Party Defendant.

Civil Action
No.
76-0544-34

DAMIEN LY KHOA McCARTNEY, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544-48
ADAM HUNG WRIGHT, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544-53

KATHRYN TIEN WRIGHT, et cetera,

Plaintiff,

-vs-

LOCKHEED AIRCRAFT CORPORATION,

Defendant and
Third-Party Plaintiff,

-vs-

THE UNITED STATES OF AMERICA,

Third-Party Defendant.

Civil Action
No.
76-0544-54

JAMES EVERETT REYNOLDS, et cetera,

Plaintiff,

-vs-

LOCKHEED AIRCRAFT CORPORATION,

Defendant and
Third-Party Plaintiff,

-vs-

THE UNITED STATES OF AMERICA,

Third-Party Defendant.

Civil Action
No.
76-0544-62

DANIEL DOUGLAS BROOKS, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	:	Civil Action No. 76-0544-9
MICHAEL KHA AI BOSI, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	:	Civil Action No. 76-0544-8

NICOLE PAMELA LOGAN, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544-22
LANDON CARNIE, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544-42

KARI AN HOA BARNETT, et cetera, Plaintiff, -vs- LOCKHEED AIRCRAFT CORPORATION, Defendant and Third-Party Plaintiff, -vs- THE UNITED STATES OF AMERICA, Third-Party Defendant.	Civil Action No. 76-0544-55

Arlington, Virginia

Monday, April 28,1980

Deposition of JOHN W. EDWARDS, called for examination by counsel for the Plaintiffs in the above-entitled action, pursuant to notice, the witness being duly sworn by DEBORAH S. CUBBAGE, a Notary Public in and for the Commonwealth of Virginia at Large, at the offices of Lewis, Wilson, Lewis & Jones, Ltd., 2054 North 14th Street, Arlington, Virginia, commencing at 2:05 o'clock p.m., the proceedings being taken down by stenotype by DEBORAH S. CUBBAGE and transcribed under her direction.

APPEARANCES:

On behalf of the Plaintiffs:

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On behalf of the Defendants:

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C O N T E N T S

E X H I B I T S

PROCEEDINGS

Whereupon,

JOHN W. EDWARDS,

was called for examination by counsel for the plaintiffs, and having been first duly sworn by the Notary Public, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR PLAINTIFFS

BY MR. MARCUS:

Q Sir, would you please state your full name for the record?

A John W. Edwards.

Q And are you presently an employee of Lockheed Aircraft Corporation?

A I am.

Q And in what capacity are you so employed?

A My title now is Deputy Chief, Project Engineer.

Q And you have been employed by Lockheed for a considerable period in the past, is that correct?

A Yes.

Q In fact, your deposition has been previously taken in this case, is that right?

A That is correct.

Q And in that deposition you gave at considerable

length your background history, is that correct?

A. Right.

Q. And have you had a chance to review that deposition from time to time?

A. I reviewed the deposition I gave in last January or something like that, I went over that and edited it, yes.

Q. Well the point I am trying to get at, Mr. Edwards, is your background as stated in there, is that basically correct?

A. Yes, it is.

Q. Now, therefore, we don't have to go over that again, which is my point?

A. Up until that point in time, of course I have changed jobs since then, but we have talked about that.

Q. Fine. But in the change of job as Deputy Chief, Project Engineer, is that correct?

A. That is correct.

Q. And could you describe for me, since we don't have that in the deposition record, what the nature of that particular position is?

A. A year ago we took the deposition. There were three project engineering groups, each project engineering group was responsible for either one airplane or maybe, in

some cases, two different airplanes under manufacture or model at Lockheed.

In January of this year, those were all combined into one project and now there is one engineering project group that has design responsibility for all airplanes at Lockheed. That includes the C-130 aircraft, the L-100, which is a commercial version of that aircraft, the C-141, the C-5, and now a brand new airplane that we have started on which is the L-400, which is a twin-engine airplane that is somewhat similar to the C-130.

Q Now I gather there is a Chief Project Engineer?

A Yes, sir, my boss is the Chief Project Engineer, but immediately when they formed the project, even before the project got put together, he was assigned off on a proposal of it. He's never really been there.

Q What individual are you referring to?

A The individual is Mr. Bob Gilson.

Q Now, sir, you're appearing here today pursuant to a notice to take depositions, which describes certain areas, where you or someone designated by Lockheed is supposed to give testimony. Have you seen that notice to take deposition?

A Yes, sir, I have.

Q And do you see there are two, basically two categories of information asked therein?

A Yes, I do.

Q The first one being G forces which were generated with regard to the C-5A 68-218 and the accident involved therewith?

A Right.

Q And the second one being MADAR tapes, interpretation thereof, and other recordings or documents evidencing such G forces during such circumstances?

A I do.

Q All right. Now, are you qualified to testify, to give testimony relevant to both of those areas, in your opinion?

A Yes, I believe that I am to the extent that there is information available to interpret.

Q Now let's go with regard to the G forces. What experience and/or background do you have which permits you to give expert testimony with regard to the category one in the notice to take deposition?

A Well, G forces are nothing other than accelerations, accelerations with respect to gravity and this is a very common term that you study in Freshman Physics in

college and most any engineer student has been through this and accelerations and G forces is something we're always concerned with on aircraft and is something that we chose some 15 years ago to instrument and record on the C-5 in this maintenance recording system, the MADAR system. And I am familiar with those terms as Deputy Chief Project Engineer.

I do not necessarily occupy myself eight hours a day with calculating such forces. I have many, many other things to do, but I am basically familiar with them, yes.

Q Do I understand correctly that your degree is Electrical Engineering, do I recall correctly?

A That is correct.

Q Now basically posing the same question with regard to category two, and is that with regard to the MADAR tapes, what do you think qualifies you to give expert testimony in that particular area?

A The MADAR system is merely a recording system and the data that is recorded in this system, once this data is reduced and printed out, then it's a matter of interpretation as to what that data means, and in most cases it really doesn't need much interpretation. As a matter of

fact, it's just reading the English terms off the produced units.

Q All right, sir. I didn't mean to interrupt you, I want as full an answer as you want to give me with regard to that question. Did you finish?

A I am finished.

Q As I said, I didn't want to interrupt.

Now, in the counter-case, I believe you gave testimony concerning the calculation of certain G forces relevant to the impact of C-5A 68-218, is that correct?

A I gave testimony relative to the deceleration of the aircraft as it was coming to stop in the rice paddy. I have a little difficulty with the word impact. So what I have testified to was relative to the deceleration of aircraft going throughout rice paddys.

Q Did you give testimony relative to the G forces that would have been encountered upon the airplane hitting the ground the first time?

MR. JONES: I would object, I think the record will speak for itself on that.

THE WITNESS: All I can say about that, as I recall exactly what I said before, is that the MADAR system, which is recording all of this multitude of data, had a

power interruption at the first impact and this power interruption resulted in the erasing of the data that was in the buffer at that time, so there is no recorded information regarding the G loads or anything else really, right at that first impact.

That is listed in the accident report, Tab A of the accident report, that same remark is made in the engineering analysis of the accident report and I don't believe there is anybody in this world who can add anything to that simple statement.

BY MR. MARCUS:

Q. In other words, your calculations are prior to that first impact, is that correct?

A. No, sir.

MR. JONES: Objection.

BY MR. MARCUS:

Q. What period of time do they relate to then?

A. Just so we're talking about the same thing, the calculations that I discussed on the witness stand were in relation to the deceleration of the airplane after the second impact.

Q. Well, please go back. Have you in fact calculated the various G forces that would have been

encountered on and/or in the C-5A -- when I refer to the C-5A, I am referring to the C-5A 68-218 -- from the point of the explosive decompression until, but not including the first impact?

A From the point of the rapid deceleration, it really isn't necessary to calculate those vertical and lateral accelerations. Those numbers were recorded and were on the MADAR tape and those numbers were plotted and are on traces that are given to the Air Force and subsequently given to you.

So no, I did not calculate them because they were a recording. It wasn't necessary.

Q Sir, I have to establish this for the record. I just want to know what in fact you calculated and what in fact you recorded.

A Just so we understand what the record says.

Q All right. Now with the question to the first impact, you have already explained that.

A That is correct.

Q Fine. Now, did you make any calculations of G forces that would have been going on in the C-5A after their first impact and prior to the second impact?

A After the first impact and prior to the second

impact, no, I did not because the aircraft was essentially airborne in between these two periods of time and here again there is some recorded data and that data has been printed out, it's been given to the Air Force and subsequent to you in traces and et cetera.

Q I'm just again trying to find out what you have calculated and what your sources of information are.

A Fair enough.

Q All right. Now what about the G forces with regard to the second impact, literally with regard to the second impact?

A I did calculate those, those G forces regarding the various sections of the aircraft from the point of second impact until they came to rest.

Q All right. So that would be literally the second impact and also the decelerations subsequent to the second impact, is that correct, if I understand what you are saying?

A The deceleration starting at the point of second impact until it came to a rest.

Q And the G forces, including the second impact also in its actual point, that is the point of the second impact?

A That is right.

Q And these are in fact the sole calculations -- the only calculations as against reading from the MADAR that you made against G forces, is that correct?

MR. JONES: Well, objection, that is a pretty vague question,with respect to what.

BY MR. MARCUS:

Q With respect to G forces that occurred subsequent to the explosive decompression on the C-5A 68-218, if I am understanding his testimony correct, is that correct?

A At that time that is all that I had calculated, that is true, at the time that I gave that testimony.

Q At what time?

A At the time that I gave that testimony.

Q Have you made certain calculations subsequent to that time?

A Just for a mental exercise, I attempted to calculate what the X axis decel forces would have been at the first impact, as a result of breaking off of the aft two main gear.

Q The aft two?

A Aft two, there are two aft main gears.

Q Let me show you a sketch and ask you whether or

not that represents the axis that you were referring to, X, Y and Z, or if not, I would gladly have you -- when you say the X axis, I just want the record to indicate what you mean by the X axis.

If you would like to make your own, be my guest.

A Let me make my own because I have a little difficulty with your statement.

Q Fine.

A The X axis is in the direction of the airplane, okay. The direction of the travel of the airplane. The Y axis --

MR. JONES: Are you going to withdraw that?

MR. MARCUS: No, I never offered it.

If you would give that back to me, please.

MR. JONES: Let the record reflect he gave his paper back to him.

BY MR. MARCUS:

Q What I am asking is if you can draw a diagram showing the X axis and I believe also there is a Y axis and a Z axis.

MR. JONES: Objection. Wouldn't it be easier really to describe the direction of the X axis?

MR. MARCUS: We are going to do that.

BY MR. MARCUS:

Q There is an X, Y and Z axis?

A Yes.

Q And you generally consider G forces with regard to those three axes?

A That is correct.

Q Would you just make a diagram for me, please, showing those three axes?

A I gather you don't want me to just put it in words?

Q Yes, if you could draw the diagram first. We will do it both ways.

MR. MARCUS: If we could have this marked as Plaintiffs' Exhibit 1, please.

(The document referred to was marked Plaintiffs' Exhibit No. 1, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q Now you were going to volunteer to do it in words?

A The X axis would be in the direction of the aircraft fore and aft, direction of the aircraft. The Y axis, commonly referred to as lateral axis, would be in a direction as across the wings, laterally across the wings.

The Z axis would be the vertical axis.

Q Now with regard to readings that are incorporated into the MADAR printout, does the MADAR printout show the G forces relevant to all three axes or how -- to put it differently, how were the G forces indicated on the MADAR tape?

A The MADAR tape only records, I believe, the Y axis and the Z axis. It does not record the fore and aft.

Q So it doesn't record the X axis?

A No.

Q Now going back a minute, we were talking about calculations that you made from the second point of impact and subsequent thereto until the parts came to rest and you said that you made such a set of calculations with regard to various parts of the aircraft, is that correct?

A Various sections of the aircraft.

Q Various sections of the aircraft, excuse me.

And what sections are those various sections?

A I made the calculations for the major sections and I involved myself primarily with three major sections and the major sections being the flight deck or crew compartment, the aft troop compartment, and then a major section of the cargo floor.

Q Did you also make a calculation with regard to the actual point of second impact relevant to the plane as a whole as distinguished from these three separate sections?

A Not the plane as a whole, and I would like to add that those calculations that I made were for X axis only.

Q That was my next question. So you did not calculate Y or Z, is that correct?

A No.

Q And Y and Z do not show up in the MADAR printout, do they, for that point in time?

A At second impact, the MADAR system and all electrical power on the airplane was disabled, and therefore the MADAR was disabled and there are no records.

Q I just wanted to make sure I was correct that was my understanding and I am correct, I assume?

A That is correct, you are correct.

Q All right, sir. Now the calculations that you did make which we have said to be only X axis calculations, are they written down anywhere?

A Yeah, I wrote them down.

Q Do you have them with you?

A Well I had them on the witness stand and I think I may still have that thing in my pocket. I don't know.

MR. MARCUS: Counsel, they have not been produced to us, have they?

MR. JONES: No.

MR. MARCUS: Is there a reason?

MR. JONES: For what?

MR. MARCUS: For those not being produced. I thought we have asked for all G force calculations and MADAR information.

MR. JONES: Well, these are his notes made on a trial exhibit. These are things he has already testified to.

THE WITNESS: I just wrote them on the diagram.

MR. MARCUS: May I see it?

MR. JONES: Sure.

Off the record.

(Discussion off the record.)

MR. MARCUS: On the record.

BY MR. MARCUS:

Q Mr. Edwards, your response to my question concerns whether or not calculations exist and you have handed me a paper, is that correct?

A That is correct.

Q And basically, this paper is an exhibit which had been used at trial and on which you have made several

of your own calculations, is that correct?

A That is correct.

Q In fact, it's Defendant's Exhibit D-9 and it's called wreckage diagram, is that correct?

A That is correct.

MR. MARCUS: I would like to have that marked as Plaintiffs' Exhibit 2.

(The document referred to was marked Plaintiffs' Exhibit No. 2, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q And so you have had this exhibit in your possession ever since you have given testimony in the Snyder case, is that correct?

A I don't know which case it was, but since I gave testimony in Federal Court.

Q The first case?

A Whatever it was.

Q Now have you made any other calculations with regard to deceleration of the aircraft or G forces? Well, you have mentioned that you made one calculation relevant to the landing gear, aft landing gears.

A I made a calculation to attempt to define the

deceleration or the G loads on the aircraft as a result of the breaking off of the aft main gear at first impact, yes.

Q Now are those calculations written down anywhere?

A I don't believe they are. I wrote them down when I did the calculations, but it was just a mental exercise and I don't believe that I have them now.

Q Would you be so kind to look for them to make sure that you don't and produce them to us if you still have them in a written form?

MR. JONES: Well, we don't have any objection to him looking for them. He has already stated, I don't think he has them.

MR. MARCUS: Well, I am not saying he does. I am just asking him if he would be kind enough to look and if he does, he could give them to us.

BY MR. MARCUS:

Q Do you recall what the results of those calculations were?

A The results were a very minimum reduction in the kineticenergy of the aircraft and converting this reduction in a change of velocity, the reduction in velocity was very small, you know, on the order of less than one foot per second reduction velocity. I don't recall exactly what

it was, but it was less than one foot per second.

Q Can you describe for me what method you used to calculate these forces and again, if you want to use -- you know, feel free to use pencil and paper for any question if you think that would be of assistance.

A I don't need any paper and pencil. I can just tell you what I did.

Q All right, fine.

A First of all, you start with the kineticenergy of the aircraft and the kineticenergy is the form of, kineticenergy is one-half MV squared, where M is the mass of the aircraft and V is the velocity of the aircraft and feet per second.

So I calculate the kineticenergy of that aircraft at E, landing weight and velocity that is recorded on MADAR.

Q So you do have the velocity that you used on the MADAR recording?

A From the MADAR dictating recording and accident report, et cetera, I had to use both because we've stated many times, there is a 3.6 seconds of data that was erased right after first impact, of impact and therefore, there is some flight crew information that is in the MADAR, so

it takes both.

Q What velocity did you in fact use?

A I used 270 knots which is I think the accident record says 269, but anyway I rounded it off, okay, and then that gives me the kineticenergy of the basic aircraft. And then, in my opinion, when the aircraft went down, the two aft gear broke due to drag loads and I asked my landing gear engineer what was the limit load, drag load capability of the landing gear and I got that number. And then using that number and just from my experience at the accident site, estimating the distances that the landing gear made a track in the dirt, and at the end of the track of course the gear broke, and I used the ultimate strength of the gear at that point and came up with a force applied against that landing gear for a certain distance, and therefore, a certain length of time and converted this to an absorption of the original kineticenergy of the aircraft.

Q You said that you went to your landing gear people and got the drag load, is that right?

A The strength of the gear and a drag direction.

Q And what was that?

A I am going on memory on a lot of these things and trying to be responsive. As I remember, the limit

drag load was 160,000 pounds.

Q Now, you will have to forgive me, but I am trying to follow you.

All right. Then you went and measured the distance, is that correct?

A And I had to recall this from memory, the length of the track in the dirt before the gear broke.

Q Correct. And do you recall --

A I recall it as being a total of ten feet.

Q Then what was your next step again, sir? If you go step by step, I think it will be a lot easier for me.

A So at the zero point on this ten feet, the force was zero. At the end of the ten feet when it broke, the force would have been limit load times 150 percent or rounding it off to 250,000 pounds.

Q And what is the limit load, for the record?

A A 160,000 is the limit, ultimate is 250.

Q Now what is the term limit load mean, excuse me.

A That is the 100 percent strength of the unit and generally anything on an aircraft has to be designed for at least 50 percent more -- to break at least 50 percent more than the highest load it is ever expected to see. The limit load is the highest it's ever expected to

see and you design it to be 50 percent better than that.

Q Then what was the next thing you did? You had 250,000 pounds.

A All right. I have 250,000 pounds and it's supplied and the distance is ten feet and if you start at zero and end up at 250,000 pounds of ten feet, that's an average of 250,000 pounds for five feet.

Q At an average of 250,000 pounds for five feet?

A Since you start with zero and you are going up.

Here again, we know what the velocity was and you know, knowing the ten feet and knowing the velocity of 270 knots, then you calculate the length of time that this force was applied and thereby you can get kineticenergy.

Q And what was the formula that you used for that?

A I think it was forces times distance.

Q Equals?

A Equals energy, equals work which is energy.

Q Now I thought you said that you could calculate the time involved previously?

A Well, I am not sure I used time only, you know. If the airplane is traveling at 270 knots and you can look at how long it takes to travel ten feet and yes, you would have to have the time in there in order to figure the

deceleration rate, you would, right.

Q What I am trying to do is to get you to take me through without me testifying as to what I think you did, all right. So do you want to back up with that 250,000 pounds average per five foot, right?

A Yeah, I would say at this point I am getting involved here in the mental exercise which I only did this for a mental exercise and I don't recall all the things that I went through to do exactly this. I am trying to give you the broad brush as best I can.

I am afraid you're getting into so much detail that I would almost get to the point that I would have to sit down and take time and go through it again. If you want me to do that, I would be happy to try. I might not be able to do it without any engineering handbooks.

Q I recognize and the record recognizes that you do not have the calculations in front of you. You did go through it rather quickly for me the first time. I am really just trying to break down what you said before slower so that I can understand it.

Now let me go back to where we were and I recognize that you do not have, you know, you're not spending a couple of hours or three hours writing this thing

out. You said we were back at 250,000 pounds for five feet, we had 270 knot velocity, is that correct?

A. Uh-huh.

Q. And what is the best as you recall now, because you said force times distance equals distance and I don't believe that was your next step?

A. That gives me the energy absorbed by the gear breaking off.

Q. I understand that.

A. And I subtract that from the initial kinetic-energy.

Q. And wasn't there a step in between that with regard to time?

A. No, sir. The time thing comes next, I believe.

Q. All right. So your force times distance equals energy and the force number being?

A. 250,000 pounds, and the distance in this case is going to be five feet because I am looking for the average.

Q. And that equals the energy. Fine. Then what was your next step?

A. Then I subtract this from the amount of work from the initial kineticenergy of the aircraft to give me

the final kineticenergy of the aircraft after the first impact.

Q And the initial, I don't remember the number exactly, but it was 1.45, something like that?

A I believe I testified about that number at the trial, but I don't recall what it is now.

Q But at any rate, that number that you testified at trial is the number that you in fact used, is that correct, when you said 1.5, that would one point times ten to what, the ninth power. In any event, whatever you testified to at the trial. That is the number you used?

MR. JONES: Objection, what number are you talking about? Your question, I think, is too vague to have an answer.

BY MR. MARCUS:

Q You gave a number with regard to the kinetic-energy, the first impact in your testimony in the Snyder trial, is that correct?

A I believe I did.

Q All right. That is the number that you in fact used, is that correct, in your calculations with regard to the landing gears we have just been discussing?

A I would have used a number very close to that

because maybe I didn't remember exactly what the gross weight of the aircraft was when I did this mental exercise, but it would have been close.

Q Now let's look, if we can, to what's been now marked as Plaintiff's Exhibit No. 2 of this deposition which is this paper, and you have your original back, is that correct?

A That is correct, I have my original back.

Q Now on the top, which I presume that all of the handwriting on the document is your handwriting, is that correct?

A I believe that is correct.

Q Well, no, excluding Malone-3, 2/12/80 and D-9?

A There is a 593 there and I don't know what that is.

Q All right. That's a page number, but excluding that also?

A Excluding that and I don't see anything else right now, but I would like to reserve it.

Q All right. Well, if you see something, let me know because you will probably see it.

A All right.

Q Now these were calculations with regard to the

X axis, is that correct?

A That is correct.

Q All right. And do those calculations relate to a specific segment of the aircraft, section of the aircraft, or do they relate to all three that you previously referenced, flight deck, troop compartment and cargo floor?

A They relate to all three.

Q Now is there a formula at the top of the page, A equals V^2 over 2D, is that correct?

A That is correct.

Q Could you describe the formula for me, A being what?

A Acceleration.

Q V being what?

A Velocity.

Q D equals distance?

A Right.

Q All right. Now you have a certain number or numbers or numbers plugged into -- well, you have a number plugged into V, the V part of the equation, is that correct?

A That is correct.

Q And what number is that?

A 455.

Q And what does that represent?

A That is the velocity of the aircraft in feet per second.

Q And where did you get that number from?

A That is a number that you convert from 270 knots.

Q And then the next part of the equation is merely squaring that number out, is that correct?

A It should be.

Q And then the next number of the equation is merely dividing by two, is that correct?

A Two, that is correct.

Q Which is the denominator of that, right? Is that correct, divided by two.

A You divide by two, right.

Q And then the next thing that you did -- we are then to where it says g's. I guess or presume that means the G force?

A Yes. You define acceleration by 32.2 to get the g's.

Q All right. And why do you divide it by 32.2?

A Well, 32.2 is the acceleration of gravity at some level and that is 32.2 feet per second and that equates to one g, so if you want to equate acceleration

into g's, you divide it by 32.2 and that gives you a standard figure.

Q Fine. And then you ended up, could you read that last number for me, I am having problems with it?

A I can't.

Q It's 3,214.7 over D, would you agree it's 3,200 something. I am trying to read it.

A It may be a little difficult because it's 32.4, or whatever.

Q Well you started with a 10,000 number, is that correct?

A 10,351.

Q I am just trying to --

MR. JONES: Okay.

BY MR. MARCUS:

Q The number is 103512.5?

A I believe that is what is written.

Q Well look at the top, I think that is pretty clear, 103512.5.

A Yes.

Q Would you want to divide 32.2 into that and see if it comes out to 3,214.7 or close thereto?

MR. JONES: Well, so long as we're doing this,

why doesn't he start back at the 455^2, that's the figure on the formula.

MR. MARCUS: Why do you want him to do that? The only reason I am doing this is because he said he couldn't read it.

MR. JONES: You don't mind if he does it, do you?

MR. MARCUS: I certainly do. I don't want him to sit here and have him waste his time.

MR. JONES: Well, he has a calculator.

THE WITNESS: Well, I am going to start from the very beginning.

BY MR. MARCUS:

Q No, you are not, sir.

I am going to ask the questions.

MR. JONES: Well, if you don't want to know the answers, that is fine. If you want to find out how he did it, I think you ought to start back at the beginning.

MR. MARCUS: I don't need to know how somebody squares a number.

MR. JONES: Well, don't you need to know whether 455^2 equals the next number shown there? That is the next number that he has written down.

MR. MARCUS: I am going to ask the questions

and we'll proceed on that basis.

BY MR. MARCUS:

Q Did you in fact divide 32.2 into this 103512.5?

A Yes.

Q And does it come out to 3,214.7?

A That's correct, and I would like to say that there was a decimal point dropped in one of those numbers up there, but it was picked up subsequently so it didn't make any difference in the final number.

Q Where was the decimal point dropped?

A The number squaring 455, the number should be 207025. That really didn't make any difference because the next number over there picked it up and that number is 103512.5 is correct.

Q Now we have that number over D, 3214.7 over D, which again is distance?

A Right.

Q Now what particular distance does D represent, or does it represent distance?

A It represents any distance you want to put into it.

Q So now, where certain distances were in fact put into the equation at some point?

A Yes, they were.

Q And were the distances the distances of those three sections of the aircraft that you previously referred to?

A That is correct.

Q All right. Now with regard to the aft troop compartment, what distance was put into the equation?

A It should have been 2012.

Q And that is indicated on the diagram by that number, is that correct? It's to the right hand side of the diagram?

A On the right hand side.

Q I am assuming your equation to be on the top of the page, is that correct?

A The equation is on the top of the page and the 2012 is on the right hand side.

Q In fact it says dike to aft troop compartment, is that correct?

A That is correct.

Q There is an arrow kind of pointing to the number, is that correct?

A That is correct.

Q So that -- does that represent feet?

A That represents feet.

Q Now then above that it says g's equal 1.60?

A That is correct.

Q And what point in time does that G force, this is again X axis G force, is that correct?

A It's a X axis G force.

Q Now at what point in time?

A What point in time?

Q Yes, this G force --

A I guess I don't understand.

Q Does that represent the G force -- strike that.

Does that represent the G forces on the aft troop compartment at the actual point of second impact, X axis?

A At the actual point of second impact?

Q Yes, I wouldn't think it would.

A No, no.

Q All right. So at what point in time does that G force, that is 1.60 relate to?

A As I testified in Federal Court as to the uniformity of the terrain, the rice paddy, the mud, the grass type vegetation, the lack of trees, lack of obstacles, et cetera, the terrain and with this known velocity of

455 feet per second because of the uniformity of terrain and other factors such as the uniformity of the tracks in the mud, the rice paddys, et cetera. That if you, assuming an average deceleration, then that -- this section of the aircraft traveling 2012 feet would have an average acceleration during that entire 2000 feet of 1.6 g's.

Q Average deceleration?

A Average X axis g deceleration.

Q I thought you said average, that is why I said that.

A Some textbooks like to call it minus X acceleration, other people call it deceleration, as far as I am concerned the terms mean one and the same.

Q Fine. Now that assumes again a surface that would permit a -- you said it assumes that smooth surface, is that correct?

A I did not say that.

Q All right. Again could you repeat the assumptions that you made?

A I referred to the uniformity.

Q The uniformity?

A The uniformity.

Q Now if in fact the troop compartment bounced up

and down and assuming the bounces were not all equal, then we have got your calculation and that assumption then would not be correct, is that correct?

MR. JONES: Objection.

THE WITNESS: Counsel, I believe I started off this discussion by saying that due to the uniformity of the terrain and many other factors, including the uniformity of the tracks in the rice paddy, and that is an important item in this consideration of discussing average uniform deceleration.

BY MR. MARCUS:

Q Fine.

A The tracks in the rice paddy were uniform throughout.

Q I understand that. I hear you and I understand what you are saying, but I am making, I think, at least a different assumption based upon testimony that was in fact given this very day.

MR. JONES: Objection.

BY MR. MARCUS:

Q And my assumption now, I am asking you, assuming with me that the troop compartment did not slide evenly but in fact bounced up and down at various rates, then your

assumption of average uniform deceleration would not be correct, is that correct?

MR. JONES: Objection.

BY MR. MARCUS:

Q Am I wrong? If I am, tell me why. Assuming my assumption.

A Your assumption cites a hypothetical case. As far as I know, it didn't exist.

Q Assume it though.

A I guess you could set up a hypothetical situation.

Q Well, Mr. Edwards, really I wish you would answer the question. When you testify you can assume anything you want.

A If it bounced, I would have to know how much bounce. You see, you're getting into an area of once you -- it may have very little effect on the X axis, the bouncing may involve the Z axis, if you're talking about bounces vertically. It may have no effect on the X axis.

Q And it may, on the other hand, depending on what bounces, if I understand what you are saying?

A If it were to bounce completely clear of the ground so that there is no more drag and it's kind of flying through the air so there is zero drag, at least on

that point, the only drag that you have got is the air. Then the drag would be less than the air and when it plopped down in the water and mud again, then it would pick up more drag load than there would be a variation in the X axis.

Q Now, sir, why did you only calculate the X and not the Y and Z?

A I stated before, as quickly as the plane came across the dike, the tracks in the rice paddys started almost immediately and those tracks continued almost to the final resting point, as is indicated on this wreckage diagram.

Q But does that answer the question why you did not calculate Y or Z, that a vertical or lateral G forces?

A I guess I saw nothing on the accident site to indicate to me that there was any radical up and down movement because the tracks stayed more or less glued to the rice paddy.

Q Again I will pursue it. Again assuming my assumption, I won't say however because that is not fair. However, assuming my assumptions that there was in fact a bounce, then there would be certain G forces relevant to the X and Y axis, I mean the X and Y axis, is that correct?

MR. JONES: Objection, you're assuming facts

that are not in the record.

THE WITNESS: If you want to set up some circumstances that were not in evidence at the accident site, then you can get close to any answer you want to get.

BY MR. MARCUS:

Q I really don't want to argue with you, I think I am asking a relatively simple question and that is, if in fact there was a bouncing of the troop compartment, then there would be certain Y and Z axis G forces generated, is that correct, if that assumption is correct?

A If there was bouncing, there would be some Y axis bouncing in the vertical direction. If there were some sideways motions, there would be Y axis.

Q I think you misstated yourself. The first time you meant to say Z forces?

A Vertical is Z, I am sorry.

Q Now, does that complete your calculations on this paper relevant to the aft troop compartment?

A In regards to G forces, yes.

Q I am sorry.

A G forces, yes, it does.

Q Now are there other calculations, other than G forces, on this piece of paper and again, other than the

distance that you used, 2012 feet?

A There is a calculation on there in reference to the aft troop compartment, but only in regards to the distance it was from the wing and tire area.

Q Let's put that aside. So that including those two items, the distance and the G force that we just discussed, those are the only two calculations relative to the aft troop compartment?

A That is correct.

Q Now there are calculations relative to the flight deck for the G is equal to 1.5, is that correct?

A That is correct.

Q And again, the basic formula being the same, the numbers being the same, the only difference being here is the distance?

A That is correct.

Q And the distance here being 1356 feet, is that correct?

A No, that is not correct.

Q All right, what is the distance?

A Because of the more circular trajectory of the flight deck, I broke this measurement into two pieces.

Q I see.

A I took the essentially straight portion and that was the 853 feet and then for the portion where it veered a little more to the left than the aft troop, I measured that separately and then added the two numbers, giving a total of 2209 feet.

Q Now, in your opinion, would the G forces number that you arrived at with regard to going back to the aft troop compartment, that is the 1.60, would that be a representation of the G forces, X axis, which were generated literally at the point of second impact or would that be after the point of second impact?

MR. JONES: Objection, asked and answered.

THE WITNESS: As I stated before, these are the G forces that would have been -- that the aft troop compartment would have been subjected to during this entire distance that is 2012 feet, and it would have started at the impact and would have persisted until it came to a final rest.

BY MR. MARCUS:

Q So the 1.60 would apply to the X axis, to the point of the second impact, is that what you are saying?

A No, sir.

Q No, sir. All right. Then tell me why, is it

at the point of second impact or after the point of second impact?

A. It starts at the first impact and continues through until it comes to a rest.

Q. So it starts at the second impact?

A. Second impact.

Q. Yes, and does it include the second impact, the distance there is zero?

A. The distance is zero and then you pick up right at that point and then it carries through and stays there until it comes to a rest.

Q. And does that G force number, is that a relevant number with distance zero, for distance zero?

A. No, I wouldn't think so.

Q. Would G forces be greater at that particular point?

A. I am sure it would take a finite length of time from the time that the gear dragged through that dike and broke off the two forward gear and you would start a decel at that point, and again this would be a gradual thing like the first one we talked about, the first impact point we talked about. And then the airplane settled into the rice paddy quickly after crossing this dike and then you

pick up the drag load.

Q But wouldn't you agree with me that the G forces at distance zero second impact would be greater than the 1.6?

MR. JONES: Objection.

THE WITNESS: No, I can't say that.

BY MR. MARCUS:

Q Can you say what they are at all?

A There is no recorded data, but as I say in my opinion the gear is what dragged through the dike, the fuselage itself, the gear dragged through the dike, broke the gear off.

Q Now we're talking about the second impact?

A The second impact.

Q All right. Now did -- I am sorry.

A And then the aircraft fuselage contacted the rice paddy and started dragging through the rice paddy.

Q And what distance did the contact, the fuselage contact the rice paddy?

A It was right at the dike from the pictures, and just a few feet across the dike.

Q Okay. Would the 1.60 G forces, in your opinion--

A It picks up --

Q Let me finish my question. I will try to give you that courtesy.

Would the 1.60 G forces figure be relevant to the point, to the distance, whatever it is near zero where the fuselage hit the rice paddy, X axis again?

A It starts to build up when the gear dragged through the dike and this calculation assumes that it would build up rather quickly just as you cross the dike and get into the rice paddy.

Q Mr. Edwards, I don't think you are answering my question, maybe you would like to look at it a different way. You have said that you have assumed, excuse me, an average uniform deceleration and the basis of that you said that during the period of time that you have a G force of 1.60, is that correct?

A As an average.

Q As an average?

A Correct.

Q Now, well, let me ask you this, what would the range of the G forces be, you said that is an average which would indicate a range, is that correct, that there in fact would be a range of G forces during that particular distance?

A I am sure it would be impossible to calculate just how much that G force went below the 1.6 and then --

Q I am not asking that. I think you're making it a more difficult question than I am asking you. All I am asking you is if there would be a range, is that correct?

A There would be some variation below the 1.6 and above 1.6, and it takes some very precise instrumentation to even record that.

Q And you have not calculated those, the range, is that correct, for the G forces?

A No, I did not calculate the range. I only knew two factors and those two factors being the initial velocity and the total distance of travel, and that is all you can use in a calculation.

Q So you can't say that 1.60 G force in fact relates to the particular point where the fuselage impacted the rice paddy with regard to the aft compartment?

MR. JONES: Objection.

BY MR. MARCUS:

Q You can't calculate that?

A I calculated the average through the whole distance.

Q But you didn't calculate it for that specific

point in time, is that correct?

MR. JONES: Objection.

THE WITNESS: No, I calculate it, as I said, the average for the whole distance.

BY MR. MARCUS:

Q But you didn't calculate it for that specific point in time, that is where the troop compartment hit the rice paddy, where the fuselage, excuse me, hit the rice paddy?

MR. JONES: Objection, the evidence is not in the record.

THE WITNESS: I calculated it with an assumption that the deceleration started to build up right at the dike and that it built up to a finite value in that that continued until the whole thing came to rest and that is where I got the average decel of 1.6.

BY MR. MARCUS:

Q I understand that, sir.

A But I did not calculate it as a specific distance of one foot, two foot, ten foot, and so forth. I just took it as an average.

Q Fine, that is what I thought was the case. I am not trying to argue, I am just trying to confirm what I

think is correct.

So, you didn't calculate it for the actual point of zero distance, nor did you calculate it for the specific point where the fuselage hit the rice paddy, but you in fact did calculate it over an average for the entire distance, is that correct?

MR. JONES: Objection.

BY MR. MARCUS:

Q Is that correct?

A I stated many times this is the average decel from distance zero to distance 2012.

Q But you didn't specifically calculate it for distance zero, did you, sir?

MR. JONES: Objection, he testified about that.

BY MR. MARCUS:

Q Did you, it's either yes or no?

MR. JONES: You have been asking this question about three or four times and he said he included that point and it's concluded up to the point of stopping.

BY MR. MARCUS:

Q You didn't calculate it specifically for distance zero, did you?

A I would rather tell you what I did.

Q Well, I would rather you answer my question.

A I have done that about four times, Marcus.

Q No, what you haven't done, and don't call me Marcus, it's either Mr. Marcus or counselor, but it's not Marcus.

MR. JONES: This is ridiculous.

MR. MARCUS: No, it's not ridiculous, people call me Mr. Marcus.

BY MR. MARCUS:

Q Now with regard to point zero, and it's only point zero, you did not calculate specifically for that point of G forces, did you? Is that correct?

MR. JONES: Objection, he answered this.

MR. MARCUS: No.

MR. JONES: He has. He concluded that point and you keep trying to attempt to turn around what he is saying.

BY MR. MARCUS:

Q You did not calculate it for that specific point, did you, Mr. Edwards?

MR. JONES: Objection.

THE WITNESS: I calculated it for the entire distance of 2012 feet, starting at the zero and going all

the way through the 2012 feet on an average basis.

BY MR. MARCUS:

Q But not specifically for any given point, is that correct?

MR. JONES: Objection.

THE WITNESS: I would, in my understanding, in my previous statement, includes the zero to 2012.

BY MR. MARCUS:

Q As an average?

A As an average.

Q So that the zero point may in fact be different than that average, isn't that correct? The G axis, the X axis, G forces.

A It may be slightly below or it may be slightly above. The actual real world reads there is no way --

Q Then you didn't calculate it, did you?

MR. JONES: Objection, he's answered that.

MR. MARCUS: No, he hasn't. I find it incredible, it's obvious that he didn't calculate that.

MR. JONES: Well let's stop badgering the witness. You know what you want to say and he is not willing to say what you want him to say and you're persisting in asking.

MR. MARCUS: I am just asking him to answer the

question.

MR. JONES: Well, there is going to come a point where you're not going to ask any other questions at all.

MR. MARCUS: Well, do you want to go see the Judge?

MR. JONES: We may have to do this.

MR. MARCUS: This is ridiculous.

MR. JONES: Why don't you pick another line of questioning.

MR. MARCUS: I want an answer to this specific question.

MR. JONES: You want your answer to that specific question.

BY MR. MARCUS:

Q Well, the very fact that you say nobody could know what G forces would be at the distance zero would indicate you didn't calculate it, isn't that correct?

A I've told you what I calculated and then I said and almost my last answer was that the actual G load as it just touched that dike may have been lower than the 1.6 and it may have been higher than the 1.6, and there is no recorded data and nobody knows, so the only calculation you could do is assume that average, and that is what I did.

I assumed that average was from the point zero to 2012 feet.

Q Now, would there in fact have been Z, not X, Z G forces generated at the point distance zero, which is the second impact?

A There probably were some.

Q Would there have been Y and Z forces generated?

MR. JONES: At what, again at the point of distance zero or at the point of the second impact?

THE WITNESS: There may have been some Y axis accelerations from the trajectory of the aircraft and the straight path in which it traversed through the rice paddy and if it goes in a straight line, then there is very little disturbance in the lateral axis.

BY MR. MARCUS:

Q In any event, you didn't calculate that?

A I didn't calculate that because the evidence indicates they really were inconsequential because the tracks were straight and if the tracks are straight, then you have very little disturbance.

Q And we're talking about lateral G forces, is that correct?

A No, the Y axis is the lateral.

Q Right, just to state it differently.

Do you have any idea of what the forces, what force is necessary to sever one of the aft landing gears, have you calculated that?

A I didn't calculate it. As I previously indicated, I went to my -- one of my guys in the landing and I said what is the drag load it takes to break the gear and he gave me an answer.

Q And that is 160,000 pounds?

A That is the limit load.

Q Right. Now let me -- I don't mean to -- off the record.

(Discussion off the record.)

MR. MARCUS: Back on the record.

BY MR. MARCUS:

Q All right. Now these calculations I believe you indicated in your prior testimony that you had them checked by someone else, is that correct?

A I asked some other individual to doublecheck these things, which is common practice in engineering, especially aircraft engineering. You don't trust one person.

Q I am not criticizing.

A I am just saying why I did it, okay.

Q I beg your pardon?

A That is why I did it.

Q I didn't ask that. Who was the individual?

A I think it was a fellow in our structures load group named Taylor Wittle.

Q Could you spell that for me, please?

A W-i-t-t-l-e.

Q You said he was in the structures load group?

A Yes.

Q Does he have a specific designation, a design engineer or structural engineer?

A I don't recall what his classification is.

Q And does he presently work for Lockheed?

A Yes, he does.

Q And what exactly did you show him, did you show him this piece of paper or did you just give him the results or did you basically review orally what you did or something else?

A I gave him the wreckage diagram without anything.

Q So you gave him a clean diagram?

A A clean wreckage diagram. I told him the velocity of the aircraft and I asked him to use his own methods of

determining the distance traveled, and whatever distance he arrived at, to then calculate the G forces on these compartments.

Q All right. Did he in fact use the same assumptions that you used in calculating the decelerations in that, concerning the uniformity of the terrain, et cetera, and the other ones you have indicated?

A He, of course, was not familiar with the terrain as I was and he told me that all he could do is recalculate the average deceleration and he did that.

Q So whether explicitly or implicitly, he did use your same assumptions?

A He had no other choice other than those assumptions.

Q Right. And he also calculated the average uniform?

A That's true, he did.

Q Now so given those particular assumptions and given the factor that you calculate the average uniform deceleration, it would be very -- there would be little likelihood that he would come up with a different answer, isn't that correct? It's a fairly simple formula.

A Since I asked him to scale the distance and if

any of his assumptions he came up with, if he came up with a different distance, he would have a different answer but that would be the only difference.

Q All right. So the only possible difference would be in scaling the distance off the wreckage diagram, is that correct?

MR. JONES: Objection.

THE WITNESS: I guess I asked him to check this because I wanted him to check my methodology, you know, the formula, et cetera, using whatever method he had.

BY MR. MARCUS:

Q But going back to the distance, which is really what we're discussing, all he had was the wreckage diagram, is that correct?

A That is correct.

Q From which to scale the distance, is that correct?

A Correct.

Q And basically you asked him to take a look at this diagram and from the diagram, tell me what you think the distance to be, making sure that his distances were somewhat similar to yours, is that correct?

A Right.

Q And that is what he did and then you plugged it

into the formula?

A. He did not plug it into this formula.

Q. What formula did he use?

A. He used whatever method he, whatever formula he remembered or he could look out of the handbook.

Q. And do you know which formula in fact he used?

A. I do not know that formula, I know that he saw it in two steps, he first of all calculated the lines of time that each compartment was traveling before it came to rest.

Q. Now was his calculations written down?

A. I believe he wrote me a letter.

Q. Do you have that letter?

A. I have it, but not here.

MR. MARCUS: Counsel, may I ask why that was not produced?

MR. JONES: Because it's attorney work product and has been previously referred to in the interrogatories of April 18, 1980. Again it's been referred to in other places also.

MR. MARCUS: Are you at this time refusing to turn that over to us?

MR. JONES: As we stated in both our answers to

interrogatories and I believe in our response to your last production, these calculations were derived from the accident report information and they constituted attorney work products that were done explicitly at the request of counsel and are clearly calculations that plaintiffs could do themselves because they have the same basic knowledge.

MR. MARCUS: My question to you, counsel, is very simple, are you willing to turn them over or are you not willing to turn them over at this point in time, regardless of what you may have said in the past?

MR. JONES: Well, we're adhering to our previous position.

MR. MARCUS: Which is not turning it over?

MR. JONES: The witness is not turning it over.

MR. MARCUS: I understand. I just want to make sure that you're not going to change your position.

BY MR. MARCUS:

Q And do you know what G forces he came up with with regard to the aft troop compartment, that is an average uniform deceleration, do you recall?

A I don't recall those G forces from memory. As I recall, they were slightly different because when he scaled this distance, he got a slightly different distance.

Q Do you know what Mr. Wittle's background is in terms of his educational background?

A No, I do not.

Q And how did you happen to go to Mr. Taylor Wittle as opposed to somebody else?

A I guess I knew his name and I knew where his desk was and I knew he was in the loads department. This is a dynamics type problem as opposed to a statistic type problem and I went to the loads department.

Q You didn't tell me anything about his background?

A I am not interested or familiar with his background.

Q Do you know what he is presently working on in general terms?

A He is in the loads department that furnishes services on all of the airplanes that I mentioned that I was responsible for in the design area.

Q I understand that.

A He is in a totally different engineering division than I am.

Q So do I defer from that correctly that you can't tell me what he is working on, for example, at the present?

A He works on all four airplanes, or all five

airplanes.

Q Can you give me a sample or an example of the problems that he would be working on?

A No, I cannot.

Q For the last six months, one?

A All I can say is in general the group that he's associated with provides auto-aircraft load analysis on all airplanes that we deal with that are in that project, and I can't give you a specific example.

Q You cannot, you say?

A The group, I cannot give you a specific example, I am saying in general the group he is associated with furnishes loads data on all aircraft that we're involved with.

Q And now we have discussed, is that correct, all the calculations that you have made relevant to G forces? I am not talking about what you may have read, but the physical calculations you made relevant to the G forces decelerations on the C-5A 68-218?

MR. JONES: Objection, I don't think it's a clear question. It's ambiguous.

MR. MARCUS: I will be glad to restate it again.

BY MR. MARCUS:

Q I said excluding readings of MADAR, simple

readings, I don't mean those to be calculations, have we discussed all calculations that you have made with regard to G forces that were experienced on or in the C-5A 68-218 on April 4, 1975?

A. In looking over this diagram, I really don't recall that we even discussed this --

Q. Relevant to the aft two compartments, excuse me.

A. The aft troop compartment, I agree with it.

Q. I am not trying to play games with you. I realize that what you were saying is that yes, there are calculations and flight deck calculations with regard to the cargo.

A. Right.

Q. Which we have not discussed, and I think the reasons are probably apparent.

A. You help me a lot there when you limit it to the aft troop compartment, up until then I was having trouble.

Q. Now are there any others that you can think of?

MR. JONES: Objection, relevancy.

BY MR. MARCUS:

Q. Is the answer no?

MR. JONES: That is still an ambiguous question.

MR. MARCUS: No, I think the record should reflect that the question but you say any others, I think you should

ask him by category.

BY MR. MARCUS:

Q The same prior question, the answer I think I got was no, is that correct, when I limited it to the aft troop compartment?

A When you limit it to the aft troop compartment, I believe there were others we haven't discussed.

Q There are?

A Yes.

Q What are the others?

A We touched briefly on the flight deck.

Q No, I am limiting it to the aft troop compartment, and excluding readings off of the MADAR. Are there any other calculations that you have made with regard to G forces experienced in or on the aft troop compartment of the C-5A 68-218 on April 4, 1975?

A I believe we have discussed all of them.

Q Now we have mentioned the G forces relevant to the flight deck being 1.45 that you have calculated as indicated on Plaintiffs' 2 of this deposition, is that correct?

A That is correct.

Q And we didn't discuss, but in fact there is

indicated a calculation with regard to, its entitled major sections separation which I presume to be the cargo, is that correct?

A Yes, that is the pointing to the section of the cargo.

Q And that is 3.77, is that correct?

A That is correct.

Q Now are there any other calculations that you have made relevant to G forces with regard to the C-5A 68-218 and is this other than all the calculations indicated on Plaintiffs' Exhibit 2 and the calculations that you described with regard to the lending gear, are there any others?

A G forces only?

Q Correct.

A I believe that is all.

Q Or deceleration?

A I believe that is all of them.

Q Now we do know that Mr. Wittle has made a certain calculation with regard to deceleration or G forces from the point of second impact subsequent thereto at your request, is that correct?

A That is correct.

Q And did he in fact make such calculations with regard to the aft troop compartment and the flight deck and the section of the cargo compartment?

A Yes, he did.

Q Fine. Now again, using the same parameters, are there any other G force calculations or deceleration calculations that have been made by anyone in the employ of Lockheed that you know of relevant to C-5A 68-218, that you are aware of, obviously?

A Not that I am aware of, not that I am aware of.

Q Would you likely be aware of such if they were made?

A I probably would, but I am not there all the time and I don't know everything that goes on while I am gone. Of course, I probably would have been aware of them, but I am not aware of any.

Q Did you inquire as to whether any other calculations had been made?

A I don't believe I ever went around asking that question. I had no reason to.

Q Did you ever discuss these calculations with anyone in the employ of the Air Force, these calculations?

MR. JONES: Objection. These being what?

BY MR. MARCUS:

Q These being the calculations which are indicated on Plaintiffs' Exhibit No. 2, you personally?

A I don't recall that I ever did, but I may have.

Q Did you ever discuss the calculations of G forces from the second point, the second impact subsequent thereto with anyone in the Air Force employed in the United States Air Force?

A I don't believe I ever have.

Q Did Mr. Wittle, to the best of your knowledge?

A I can't speak for Mr. Wittle.

Q To your knowledge?

A To my knowledge, no.

Q He didn't tell you?

A He had no reason to, no.

Q And to the best of your knowledge, has anyone in the employ of Lockheed discussed such calculations with any employee or any person within the United States Air Force?

A To the best of my knowledge, nobody has discussed these with any military forces.

Q And would the answer be the same to those questions if I said anyone employed in the United States?

In other words, not just the Air Force but any part of the United States Government.

MR. JONES: Excluding counsel?

BY MR. MARCUS:

Q I am asking what Mr. Edwards discussed.

A That is an awfully broad question.

Q Let me try it again. Maybe it's better if I did reask it.

Did you discuss the calculations of G forces that were experienced on or in the C-5A 68-218 with anyone in the employ of the United States?

A If I ever discussed it with anyone, either military or anyone in the employ, I don't recall it because if I discussed it, it was nothing that would stand out in my memory. I don't remember it.

Q That is all I am asking.

A I am not saying I didn't do it, because it's just too broad. I am going to say to the best of my knowledge, I do not remember.

Q Fine. And to the best of your knowledge, using your words, did anyone, any employee of Lockheed discuss that subject with anyone in the employ of the United States?

A To the best of my knowledge, no.

Q You did not discuss it with them. And did you consult with anyone other than Mr. Wittle with regard to the calculations that you made with regard to the G forces as indicated on Plaintiffs' Exhibit No. 2?

MR. JONES: Other than counsel?

BY MR. MARCUS:

Q Other than counsel?

A Do you mean if in any time sitting down around lunch or whatever that I have ever mentioned it to anybody at Lockheed that hey, I calculated the G forces on so and so and they were so and so, that probably happened.

Q That is not really what I meant. Let me try again. I am talking about a substantive discussion whereby you say I have this problem of calculation, what methodology would you use and/or showing them what you have done and asking them whether or not this is correct, or in any other way substantively discussing the calculations that you have made? Have you done that with anyone other than Mr. Wittle in Lockheed or outside of Lockheed?

A I wanted Mr. Wittle to check this.

Q Other than?

A Other than Mr. Wittle, I am sure that I probably discussed what I did, but I have never asked anyone else

was what I did correct. I don't believe that happened.

Q Can you recall anybody that you in fact discussed what you did with, whether they were within Lockheed or outside of Lockheed?

A They would have been within Lockheed.

Q Do you recall who they were?

A No, I don't. My previous answer was that, you know, I may have mentioned this in passing to people who have worked for me.

Q Well I tried to use the word substantive discussions to help as against oh, by the way, I calculated the G forces, but that didn't seem to help so I am asking again whether or not you can recall anyone that you so discussed the subject with?

A I don't recall anyone in particular, but I guess I am not going to sit here and say I didn't mention this or discuss this with some other people at Lockheed. I am not going to say it.

Q You cannot give a name?

A Nothing stands out.

Q That is all I am asking.

Are there any other documents, we have this one and we have the letter from Mr. Wittle, are there any other

documents that you have in your possession or that you know of that relate to any calculations of G forces relevant to the airplane crash of the C-5A 68-218 on April 4, 1975?

MR. JONES: Are you excluding MADAR?

BY MR. MARCUS:

Q Yes, I am excluding MADAR.

A I believe some scrap papers laying around, which I derived the formula that is on the top of this wreckage diagram which you have marked as Exhibit 2, but all it does is lead up to that diagram, it leads up to that formula.

Q Now you say you derived this formula, is that A equals V^2 over 2D?

A Using some other basic materials, physics formulas, yes. I combined a couple of formulas and arrived at that basic formula.

Q Would it be too much to ask for you to derive that formula for me now since it's such a basic physics formula? If you could, you have a piece of paper in front of you.

A Do you want to go off the record because it's going to take a while?

MR. MARCUS: Certainly.

(Discussion off the record.)

MR. MARCUS: On the record.

Off the record, I asked Mr. Edwards whether he would be kind enough to let me know how long this exercise would take and I believe you said 30 minutes to an hour, is that correct?

THE WITNESS: It may take five minutes, it may take 30, it may take an hour.

MR. MARCUS: Why don't we take five minutes and see where you are.

(A short recess was taken.)

BY MR. MARCUS:

Q Mr. Edwards, have you arrived at a derivation for me?

A Yes, I have.

Q May I please see it?

A All right.

MR. MARCUS: I would like to have this document marked as Plaintiff's Exhibit No. 3.

(The document referred to was marked Plaintiffs' Exhibit No. 3, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q Sir, why don't you get a copy of Plaintiffs'

Exhibit No. 3 in front of you, if you would. Let the record show I have given copies of both, two copies of both 1 and 3 to counsel and for the use of the witness also.

Now we are going to look at Plaintiffs' Exhibit No. 3, which is your derivation of the formula that you used to calculate acceleration and G forces, is that correct, for deceleration and G forces?

A That's correct.

Q Now are the first formulas, which is D equals VT, D equals distance and VT equals velocity and time. The second point, I assume, would be a changing velocity, is that correct?

A That is correct.

Q Is it T times the sum of V_1 plus V_2?

A Yes, that is what my formula indicates.

Q So should there be a paren around V_1, V_2, it's the sum of those two in any event, V_1 plus V_2?

A The sum of those two divided by the two to get the average velocity.

Q And then times T?

A And multiply the average velocity times T.

Q Number 3, is D equals V_1 over T or V_2 is zero as was this case, is that correct? This case being what

case?

A. Talking about the Saigon incident, I guess, in this deposition.

Q. Now why do you say that V_2 is zero?

A. When the various sections of the airplane came to rest, then the final velocity was zero.

Q. So you're talking about from point of second impact to the point where the parts came to rest, that is the period we're talking about, is that correct?

A. That is what all these previous calculations have been reviewing, yes.

Q. I am just making it clear for the record, sir. What I think is not going to do the record very much good.

Now, is there an X in the calculation, is that correct, it looks to be an X? In any event, number three, D times something?

A. That was not intentional, that just is supposed to be a T.

Q. I see. Then number four is merely transposition, is that correct, so that you get T instead of getting D?

A. That is correct.

Q. Now you have also another D formula, is that correct, one-half A which is acceleration, is that correct?

A That is correct.

Q D^2 which is again time, is that correct?

A That is correct, another basic physics formula.

Q And that does not come from the above, that is an assumption, that is a formula, a new formula?

A Sir Isaac Newton's formula.

Q Yes, and five is a transposition of the second formula, is that correct?

A That is correct.

Q For purposes of acceleration?

A Right.

Q Now you say substituting formula 4 into formula 5, which I presume to be T equals 2D over V, is that correct, that is the 4 that you are referring to?

A That is correct.

Q All right, into 5 which is A equals 2D over T^2, and basically what you're substituting is the 2D over V for T, is that correct?

A That is correct.

Q Then you come -- following certain crossouts and mathematical work, you then come out with the equation V^2 over 2D, is that correct?

A Acceleration equals.

Q Acceleration equals, A equals V^2 over 2D, I left out the A, is that correct?

A That is correct.

Q So that follows from your first statement which is A equals 2D over 2D over V^2, the rest of it just follows, is that correct?

A I got a little lost in your statement there. Could you ask it again or read it back?

Q Yes, you took the equation 2D over V^2 and you squared the denominator, is that correct, you squared the bottom part below the line, squared 2 is 4, D is squared and D is D^2?

A You lost me when you said 2^2, I don't see that anywhere.

Q Number 6, A equals 2D?

A Right, 2D.

Q The bottom part is 2D over V?

A Total quantity squared, right. I am with you.

Q And then you squared the bottom part, is that correct?

A Squared the bottom part.

Q The 4D V^2, square of 2 is 4?

A That is correct.

Q And then you transposed the V^2, since it's the denominator and the denominator is not there, then it's the enumerator?

A Correct.

Q And you divided -- you got rid of the 2 on the top and put it down below and the 2D's, correct?

A The D and the D^2, right.

Q And you came out with what you said here?

A Right.

Q And then you add the 32.2 for the reasons you have already indicated?

A Right.

Q In order to get the G forces?

A Right.

Q Which is the number utilized at sea level, is that correct?

A That is correct.

MR. MARCUS: Off the record.

(Discussion off the record.)

MR. MARCUS: Back on the record.

BY MR. MARCUS:

Q All right, Mr. Edwards, I would like now to sort of change courses a little bit and go into the second part

of the areas we were discussing this afternoon, and that is the MADAR tapes, the interpretation thereof, more specifically the category two in the notice of taking deposition which you have already seen. I just want you to know what we are doing.

Now, we had delivered to us last week a document which is -- which I will show you, I am just going to ask you to generally, you have seen this before, haven't you, sir?

A Yes, I think so.

Q And you're generally familiar with that?

MR. JONES: Why don't you describe what you're showing him for the record. It was produced on April 18, 1980.

BY MR. MARCUS:

Q I don't deny that, fine.

It's a document entitled Lockheed MADAR. Is this referred to as an octal form dumpout or a dumpout in octal form to be more accurate?

A I believe that is an accepted term, right.

Q And what does a dumpout, is that a reading or printout?

A It's a computer printout in response to some

program request, printing out data that is recorded.

Q The documents that we're discussing is a many folded such dumpout or printout, computer printout, is that correct, many pages, many folds?

A Right.

Q And what is the octal part mean, the octal form, what does that mean?

A That means that the data there is printed out in a computer language rather than in arithmetic units.

Q Now, when was this octal form run, do you know?

A I am not sure.

Q And this was run by Lockheed?

A Yes, it was run by Lockheed.

Q And did you get the basic information from, was that supplied by the Air Force or was it taken from other MADAR information?

A That printout, that printout was made from the MADAR tape that was a copy of the master tape. The master tape is a tape that is on the airplane and you never use the master because you might destroy it, so you make a copy and all you do is work from the copy. That was made from a copy of the tape that was on this aircraft, 218, at the time of the accident.

Q And what use does this have, that is the octal form that the original MADAR tape does not have?

A What use does that octal tape dump that the original MADAR? Well, it's merely a piece of plastic tape on a reel and you can't use it at all. You really don't know what's there, you have to put it in a computer and then you have to ask that computer certain questions to printout the data that was on that tape. This is the data that was on that tape.

Q Does this represent all the data that was on the tape?

A The tape that was on the airplane had been on the airplane for quite a bit of length of time, as I recall. This is going way back. I don't believe that is the octal dump of each and every flight on that tape.

Q I didn't mean that. That is why I was trying to stop you because I don't think that is what I meant.

Does this octal dump evidence all of the evidence on the tape relative to the C-5A 68-218, April 4, 1975, at the time of and subsequent to the explosive decompression?

A I believe it does, but I have not examined that in every minute detail.

Q Did the Air Force also run a dumpout?

A That is going back too far for me to remember who did what. Right after the accident?

Q Let me show you something that may assist you. I don't know, maybe it won't.

MR. JONES: I am afraid I have to object to that question, I think it goes beyond his knowledge.

MR. MARCUS: Mr. Jones, we don't have a question. I am about to show him the document.

MR. JONES: Well, I mean the previous question. For the record, I want to state it. You asked him about what the Air Force would do and he is not the Air Force.

MR. MARCUS: Well, obviously it was to the best of his knowledge and he answered it in that vein, I am sure.

BY MR. MARCUS:

Q In any event, I would like to show you a document, there is a cover letter. As far as I am concerned, you can look at the cover letter or not look at the cover letter, it's up to you, but I am basically calling your attention to the third page and beyond and ask whether or not you can identify the document for me?

MR. JONES: Is this a copy of what had been marked Defendants' Exhibit 43 at the trial?

MR. MARCUS: Affirmative.

MR. JONES: Are you going to mark this?

MR. MARCUS: Yes.

(The document referred to was marked Plaintiffs' Exhibit No. 4, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q Mr. Edwards, just so you're clear, I am not asking you specifically with regard to any specific page, but if you get past the first couple of pages you can see there is at least, what would seem to be some kind of printout or dumpout?

A I see that, yes, I do.

Q Have you ever seen this document before?

A Yes.

Q Can you tell me what it is?

A That is some data that evidently the Air Force produced from the data bank where they store all the MADAR tapes. They produced it from the data bank and that data bank, in this particular case had data in there on this aircraft 218, and this printout is a piece of that data on that airplane, not all of it.

Q Does this relate to 68-218 on April 4, 1975, this being the printout?

A Yes, I believe that it does.

Q And how does this differ from the printout, the dumpout, Lockheed's dumpout that we just previously discussed? Well, let me retract the question because I have not asked for it to be marked. I would like for it to be marked as Plaintiffs' Exhibit P-4.

Now going back to the question I was about to ask and that is how does this document differ, but in general terms, I am not asking line by line, but in general terms from the octal printout that we were discussing a minute ago as it relates to C-5A 68-218 on April 4, 1975, at the time or subsequent to the explosive decompression?

A This data?

Q This, you're referring to?

A Item 4, this is what, is that what you're talking about?

Q Yes.

A This is a piece of the data, a part of the data that was in that file. It was evidence extracted for a specific purpose and it only asked the computer printout certain specific information, not all of the information.

This printout I would call a VGH Audit as opposed to the other documents that you're looking at over

there with the many pages being an octal dump.

Q All right, what does a VGH Audit mean or what is it?

A All the data is in the computer and there are certain prescribed programs that you can go ask the computer to printout certain pieces of information that you're interested in. This is, a VGH Audit is one of those many programs where you can ask it to only printout what I am interested in and what you're interested in here is the VGH and the altitude and that is what you had.

Q V is what, velocity?

A Vertical, it's G's in the H direction, H being the "Z axis up and down".

Q So that would be the one item, what we were previously discussing is the G forces in the Z axis, is that correct?

A Yes, that is basically what you're getting, but in order to have this information be useful, you have to have things like time and altitude, et cetera, and you see a little bit of that on there.

Q Are you looking on any page?

A No, just in general, that is what you see. You would see more than VGH as you look at the printout.

Q You would see time. What else?

A You would see time and altitude and there are certain other events messages which are printed.

Q Now are there any other dumpouts that Lockheed has made other than the one that I just showed you with regard to C-5A 68-218?

A The one you just showed me being this?

Q No, the one I just showed you being this document that I have in my hand as being Lockheed MADAR octal form dumpout?

MR. JONES: That was produced to you on April 18, 1980.

THE WITNESS: Are there any additional?

BY MR. MARCUS:

Q I am sorry, that was produced on April 18th, yes. Are there any others?

A I would have to say that it is possible.

Q That you know of?

A It is possible to go ask this computer almost any kind of a question and get almost any kind of a dumpout. You might go ask it to printout Ti on engine number one and if you wanted to play with the program, you could get only the Tit on the engine number one.

For example, you can printout almost anything so I would say it's almost impossible to get -- excuse me, I am not saying we printed it, we printed an octal dump.

Q What is an octal, I may have asked this, but I think I need to ask it again. We discussed what a VGH Audit is, what is an octal, does that -- what is that, let me guess.

MR. JONES: Which is which?

MR. MARCUS: An octal dumpout.

MR. JONES: Well I think you asked that before.

MR. MARCUS: I may have, but in order to save us time, I need to have the answer again. I am not talking about number 4 now, I am talking about the document which we have described to be an octal form dumpout and I am asking you basically what is meant by octal dumpout?

THE WITNESS: You ask for an octal dumpout, it's what is on the tape, it's a printout of what is on the tape, in computer-type language.

BY MR. MARCUS:

Q Everything that is on the tape?

A Everything.

Q As against a selected printing which is a VGH, for example?

A VGH, for example.

Q It's the only selected one, but that is a selected printout.

MR. JONES: So there is no misunderstanding, I think you previously elicited from Mr. Edwards that this is an octal dumpout from a period that included the rapid decompression up until the end dump.

MR. MARCUS: Correct.

MR. JONES: Not the big gigantic tape.

MR. MARCUS: That is correct.

BY MR. MARCUS:

Q So there would be no confusion, my question as they relate to the MADAR from here on out will refer to the period close to the decompression or subsequent thereto so we don't --

A Is it fair for me to see that document I am being asked questions about?

Q Certainly. Unfortunately we tried to copy it.

MR. JONES: We have a copy of this same document that was produced.

BY MR. MARCUS:

Q I wasn't trying to hide it from you, I was just unsuccessful in my method of copy.

A That's okay.

Q You do have one in front of you now?

A Yes.

Q And you can go ahead and look at it to the extent that you think is necessary.

Sir, so that we may have a comment, I am looking at one that is, I guess the altitude is the best way to pick it out. Altitude 5092.30, could you also get to that page?

A I think I have that page.

Q Now there is a line that says record 11933 from 52510 to 52515, do you see that?

MR. JONES: What is the record number again?

BY MR. MARCUS:

Q 11933, it's the second line of the typing. It says record 11933 from 52510 to 52515 and it says status equals 2509.30, mach equals .38 and then there is a long number. Do you see that?

MR. JONES: 11933, the record number 11933?

BY MR. MARCUS:

Q 11933.

MR. JONES: You're almost at the end?

MR. MARCUS: That's right, it's on 5092.30.

THE WITNESS: Right at the top of that page.

BY MR. MARCUS:

Q I just happened to be looking for my purposes, it says record 11933, do you see that?

A Right.

Q What does that mean? Is that just a reference number?

A That is just a reference number on the raw MADAR tape, the tape that came off here.

Q And then it indicates a point in time, is that correct?

A That is correct.

Q Well that really isn't correct, it indicates range of time?

A It indicates an elapsed time from whatever time the engineer pushed into the MADAR system at the start of the flight.

Q And that would be 52510 subsequent to that point?

A Uh-huh.

Q And this is subsequent to the explosive decompression, is that correct, this particular point in time that we're looking at which is 52510 to 52515?

A This point in time is subsequent to decompression,

I am not saying that it's five minutes or five hours and 25 minutes after, that is just a relative time.

Q No, I didn't say that. I just said it was subsequent.

A I believe that it is.

I really should go back and trace back to the altitude and verify that statement.

Q Go ahead.

A That is subsequent to decompression.

Q Did you find out by looking where the decompression was? I am not asking if you happened to see it, fine; if you didn't, fine.

A No, I did not. I just merely traced the altitude back up to the maximum altitude and started the circling back down again.

Q Did you see what the maximum altitude was at the point in time?

A I went past that, yes. Do you want me to tell you?

Q Yes, if you don't mind.

A Of course, I am in the approximate region as to when the rapid decompression occurred, which is somewhere between 23200 feet and 23403 feet.

Q What time in period?

A That time period of somewhere around 51328.

Q 51328. Excuse me a minute.

Now, sir, let's go back to where we were, record 11933 and it says status equals 200, do you see that?

MR. JONES: Record number what?

BY MR. MARCUS:

Q The same place we were, 11933 times 52510 to 52515, that is where we were, Mr. Edwards, before I asked you to move.

A I lost it.

Q I will give you time. It says status equals 200. Do you see that?

A Yes.

Q What does that mean, 200?

A I don't recall.

Q And then it says altitude equals 5092.30, is that correct?

A Yes, that is an engineering, that is the altitude at that particular time.

Q At what particular time, there is a range of time that is referenced there and what particular time is

that altitude?

A. It's the last altitude printed in that record, 11933, and it's the last altitude that is printed, it may be very close to that end time which is 52515, it may be sometime prior to that. That is the last altitude recorded in that record.

Q. Is there any way of looking at the printout to determine exactly when that altitude was reached because you said it may be at the end and it may be prior to that. So I am gathering you don't really know when that altitude--

A. To find out exactly when that altitude was printed, you have to go back and go through the octal computer language here and decode that and find out where that interspersed.

Q. Then let's leave that for a moment and the next is mach which equals .380, and what was mach?

A. Well that is the function of the air speed of the aircraft and to convert that into air speed, you will have to use a standard conversion chart which has as a function the altitude.

Q. But it's a measure of speed?

A. It's a measure of speed.

Q. Then there is a long number next to it,

33167046105221, does that have any meaning to you?

A Well that is the board of this computer language and when you decode it, it will tell you something in engineering units, but I can't look at any of those numbers and tell you what they really are.

Q Do you see there are various columns of numbers underneath the line which we just discussed?

A Right.

Q Ten columns, is that correct?

A That is all, that is correct.

Q Now my question is, sir, do each of those columns have a specific subject or meaning?

A No.

Q In other words, there is no sanctity to the columns, one doesn't refer to the vertical forces and one doesn't refer to lateral forces, et cetera?

A No.

Q Now do those numbers have any meaning to you, for instance, the first number 140504425650, which is the first number in the column to the extreme left?

A Those numbers are merely what's printed on the MADAR tape and what is in the computer and these numbers would require computer print decoder.

Q So there is no way that I or you, for that matter, can look at these numbers and get any meaning out of them, is that correct?

A You could look at that number and then you could use the decoding formula and make and decode it manually, mentally, just like a computer.

Q What would those numbers relate to, I am not asking you specifically what the number is? Am I correct that those numbers relate to a certain kind of information or am I incorrect?

A Each series of numbers, each set of numbers when decoded would relate specifically to some particular parameter of data recorded.

Q Right. When you say series of numbers, are you talking about all ten columns, are you talking about one column?

A I am talking about all numbers and all columns.

Q All ten columns?

A Right.

Q I am presuming that the next -- there is another line for a different time period and that time period would be independent of the -- I mean those numbers, those columns with numbers would be independent of the columns of

numbers we're now discussing, is that correct?

MR. JONES: Objection, I don't think that is clear.

BY MR. MARCUS:

Q We have ten columns of numbers for the time period 52510 to 52515, is that correct?

MR. JONES: You have ten sets of columns of numbers, I believe. Excuse me, you have ten columns with sets of numbers.

BY MR. MARCUS:

Q Fine. I just said ten columns with numbers.

MR. JONES: You have got a problem, it looks like you might have -- there are ten columns. It looks like you might have 120 columns of numbers across the printout.

MR. MARCUS: I am talking about with regard to the time period 52510 to 52515. I would prefer that he answer the question.

BY MR. MARCUS:

Q Aren't there ten columns of numbers?

MR. JONES: I was just correcting the record, there are across that printout there appear to be 120 columns of numbers.

BY MR. MARCUS:

Q Fine. Are there ten columns of numbers, Mr. Edwards?

A There are ten columns of numbers and each number in each column consists of twelve numbers.

Q Fine.

A And as to how many lines there are of those numbers, I haven't counted them.

Q I am not asking you. I am just trying to say that there are ten columns of numbers under 52510 to 52515, correct? You agree with me, right?

A Yes.

MR. JONES: And you mean to say ten columns of groups of numbers?

BY MR. MARCUS:

Q Fine, if that helps. Then there are also ten columns of groups of numbers under the next time period, 52515 to 52523, is that correct?

A That is correct.

Q Do I understand correctly that the ten columns of numbers that relate to 52510, et cetera, are different from the ten columns of numbers that relate to 52516, than they give different information, maybe the same parameter

but it's different information?

A It may be different, it may be --

Q But it relates to that particular time period as distinguished from the previous time period?

A In that record.

Q Now can you tell me what parameter or parameters are dealt with in the ten columns of numbers, ten columns of groups of numbers under 52510 to 52515?

A I could if I were to take the thing and mentally, manually decode those numbers.

Q All right. But you would need some other document, is that correct?

A Or I need to go back and ask the computer to do it.

Q All right. Mr. Jones, have you furnished us with a decoder?

MR. JONES: We produced a manual to you in the Court.

MR. MARCUS: Have you furnished us with a decoder so that we can use it other than in the Court at that one particular time?

MR. JONES: Well, we made it available to you. Are you asking for it again or what?

MR. MARCUS: Well, was it ever given to us?

MR. JONES: It was made available.

MR. MARCUS: For what purpose?

MR. JONES: To examine and look at it.

MR. MARCUS: But not to copy?

MR. JONES: Not to copy, no. It was given back to us. It was made available and it was given back to us.

MR. MARCUS: It was given back to you. Well, it was my understanding, and correct me if I am wrong, it was made available for that specific point in time but not for copying or reproduction, am I incorrect?

MR. JONES: Well, I don't know that it was denied to you for that purpose, it was given back to us when it was presented to you. I don't know whether you wanted to have it copied or not.

MR. MARCUS: Well, I do now.

MR. JONES: Well, I have a copy with me if you would like to copy it. In fact, I will let you have this copy here. However, I would like to state for the record that this is subject to the protective order, the protective order of 1979 with respect to its proprietary information and I want to emphasize that point, that it is not to be produced or used outside of this litigation and

to be returned to us at the end of the litigation.

MR. MARCUS: Fine. Could you be so kind to give that to us and then give it to Mr. Edwards.

BY MR. MARCUS:

Q Now could you tell me first whether there is going to be a lengthy process or not a lengthy process, tell me what information, what the parameters are that relate to the information under column -- in the first column under time period 52510 to 52515?

A My first answer is that yes, it is lengthy, it's very lengthy. The information is here and it can be done, but it would require familiarization, et cetera.

MR. MARCUS: Mr. Jones, do you have another copy of that book for Mr. Edwards?

MR. JONES: I just have the one copy.

MR. MARCUS: Then if you don't mind, I will come over and look at it with you, if that is all right.

BY MR. MARCUS:

Q Mr. Edwards, could you give me some idea how one would go about decoding that? Let's just take an example. I am not asking you to do it, just show me the process, decoding the numbers in the first column under 52515.

MR. JONES: You mean under record number 11933?

MR. MARCUS: Yes.

THE WITNESS: Well, first of all, you are going to have to be familiar with this textbook if you're going to manually decode this.

BY MR. MARCUS:

Q Let me retract the question. The document that we are referring to is T01C-5A-103S-1, operational supplement description and support manual C-5A malfunction detection analysis and reporting system (MADARS) digital computer programs, is that correct? That is the document that we're now discussing, is that correct?

A That's correct except you issued or identified only a supplement and the basic textbook number is --

Q And that is a supplement in front of the basic tech order which is T01C-5A-103, which is the great majority of the document that we now are both looking at, is that correct?

A Right.

MR. MARCUS: I would like to have this document marked as Plaintiffs' Exhibit No. 5 to this deposition.

(The document referred to was marked Plaintiffs' Exhibit No. 5, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q And I presume we have an understanding that we don't have to give you a copy back.

Now, you were telling me that what I had to do when you said I had to become familiar with the text in order to decode the information, is that correct?

A That is correct. This tech order defines the complete digital computer program and you would have to become familiar with a great deal of this tech order in order to be able to manually decode this octal dump and it is an involved process. I personally have never spent the time to decode those. I know of people who have, but it's a very precise mental exercise.

Q It's not something that we're going to do sitting here across the table?

A Absolutely not. There is just no way.

MR. JONES: Well, in order to do the whole thing, you mean.

BY MR. MARCUS:

Q Any one number, or at least tell me what the

information is under column 525 time period or record number, excuse me 11933, that would be something we are not going to be able to do sitting here today.

A First, a person who's experienced and who knows the computer program, who knows the tech work and has taken the time to become familiar, once you become familiar and if you want to decode one number, you are talking about minutes.

Q You could do it right now?

A I would have to take time to familiarize myself with that, I personally don't want to spend that time.

Q If I said you have 30 minutes to do it, you couldn't do it in 30 minutes, could you?

MR. JONES: Do what in 30 minutes?

MR. MARCUS: Translate the information or decode the information under record number 11933.

MR. JONES: Well the record should reflect that there are 11 times, 12 times, 10 different numbers.

MR. MARCUS: The information in the first column or group of numbers under record number 11933.

MR. JONES: Which appears to be 121 numbers.

BY MR. MARCUS:

Q You couldn't do that in half an hour, could you?

A One of the first things you would find is you don't decode them by columns, you go laterally across the page and it's a certain series of numbers that go together and make up a set of numbers and that number may go from the first column into the lines on the second column.

Q Could you decode the first line in the first column of numbers for me in the next half hour?

A No, it's been 15 years since I saw that document and I would never trust my 15 year old memory. I would have to go back and familiarize myself with it and once I am familiarized with it, myself I could do it in a matter of minutes. But it might take me an hour, it might take me eight hours, whatever, to do that.

Q Looking at the document, as you're presently looking at it, we can't tell what point in time exactly that altitude 5092.30 was reached, if I understood before correctly what you said?

MR. JONES: Objection. What do you mean by exactly because it's talking about a record period of five seconds?

BY MR. MARCUS:

Q Whether it was 10, 11, 12, 13, 14 or 15?

MR. JONES: You mean precisely within those

five seconds you can't tell.

MR. MARCUS: That is right. Isn't that correct, at least without decoding the information?

THE WITNESS: As I stated before, that altitude is the last altitude printed in that time period, 10 seconds to 15 seconds. There may have been other altitudes printed, but this is the last one.

BY MR. MARCUS:

Q It may not necessarily however have been the altitude printed in the decoded information?

A In the coded information.

Q Below the time period in the ten columns that we're referring to?

A Now for someone experienced in this computer that could just glance at all these numbers and they could look for a certain sequence of numbers and they could pick that thing out in a matter of seconds. I can't because I don't deal with this every day.

Q I am just asking what you can give me, sir. Now, below those columns there is a B -- do you see a B and it says 527, do you see that?

A Record B527?

Q B like in boy, do you know what that means,

what that is?

A That is an event number, but I don't recall what it is.

Q And you have another status number, do you see that?

A Right.

Q Do you know what that means, that status equals 31232, do you know what that is?

A Not without going back into that.

Q Fine. I am asking you now. Is there a number equalling eight, do you know what that is?

A No.

Q There is a time equals 52523, do you know what that is?

A Well, that is a fine time, 52523, but these -- that is all according to that line of numbers across there, that's always starting with the event of 527 so and so, but again a person who is familiar with this, all these things would mean something to them almost in every instance.

Q And you're not so familiar, is that correct?

A I've got too many other things on my mind.

Q Go down to record 11935, which is on the same page and it says from 52524 to 3050441, do you see that?

A That's right.

Q Could you explain to me what 3050441 is, or is that a typographical error?

A No, that is not a typographical error. I am sure it's typed correctly. However as you notice immediately above that, it says even power off which meant that there was -- you know, we previously stated that this particular recorder had a little kit that was not -- we were getting a little stickiness in the drive mechanism sometimes and when the tape doesn't dry, you get overprint, you get one number printed over the other and sometimes that turns up a peculiar number. And that particular time there 3050441 is obviously one of those overprints and the number is just out of place and wrong.

Q Now should the numbers be consecutive in that, that the last -- if you look above there, that is record number 11934, the last time period is 52523, do you see that?

A Right.

Q And the next one is 52524, so I would presume, and correct me if I am wrong, that the first number in the record, in the next record number should be a number, the next number after the last number in the prior record, is

that correct? Again 52523 being the last number, 52524 being the first record of the subsequent record.

A. Okay.

Q. And that is the way it should flow, continuously throughout, is that correct?

A. I believe so.

Q. Now have you looked through here and noticed that in fact it doesn't always work out that way?

A. I haven't looked through there, but recognizing this tape drive did have that stickiness in there, I wouldn't be surprised to see some of these numbers jump around.

Q. Sir, if you would, and just sort of flip the page over to the next two pages. I am sorry, one more page, would you flip it over one more time to record 11946.

A. 46, okay.

Q. And it says time from 302763 to 52635, is that another one of those unexplained difficulties?

MR. JONES: Objection, he explained it.

THE WITNESS: It's another one of those erratic data things that in interpreting this data, you just have to recognize that as an erratic point and disregard it.

(A short recess was taken.)

BY MR. MARCUS:

Q I believe we were looking at 11946, is that correct, we were looking at that, is that correct?

A Right.

Q And the last item was 52635 and then record 11947. Is 52635 to 52635, is that correct?

A Right.

Q Can you explain to me why there is no passage of time with regard to that record, that is an instant in time, isn't it?

A Not necessarily. Now there is -- there could be .99 of a second in between you see and, for example, some of these other documents you see here the VGH Audit does printout seconds in hundredths of a second.

Q The five referred to there is minutes, is that correct?

A That is hours.

Q That is hours, 26?

A Minutes.

Q 35?

A Seconds.

Q All right. Then the last one, 52635 and then you go down to 11948, correct, and it starts 52642, is that

correct?

A That is correct.

Q So there are seven seconds missing, is that correct, or at least not recorded?

A If you go through the routine to decode this thing, you will probably find some event that happened in that 12 seconds. It could be either in the previous record or this record and right now I don't recall why that is.

Q But the reason I went through this, I mentioned at least to an uneducated observer, there appear to be periods missing and I just wanted to point one out that I had found.

A Well, that is the general thing, but as you decode this thing, you will find a general statement so not necessarily true in all cases.

Q Let me refer you to record 11955, which is another page, 52714, do you see that, 52717?

A Right.

Q And the next record which is 11956 is 52719 to 52723, do you see that?

A Right.

Q Again there is a second missing, is there not, or at least not indicated in the document in terms of time,

in other words, 52718?

A. There is a second that is not indicated between those two times that you just mentioned, but that doesn't really mean that there is a second missing or once you decode all this, it could tell you that in between here was one of those cases where we had the sticking tape drive and maybe the clock was working but the tape didn't record it, I don't know.

Q. Now, could you look at record 11976 for me, please. It's the second to the last page of it, if you want to look at it from the standpoint of folds.

A. 11976, all right.

Q. And you see record number 11976, which is 52849 to 52850, do you see that?

A. Right.

Q. And this altitude is 53720, do you see that?

A. Right.

Q. And the next record 11977, which is 52851 to 52852, that is also altitude 53720.

A. Right.

Q. Why is that the case?

A. It just happened to be the same altitude. In fact, I recall having seen this record, I believe. This is

the record where the aircraft was between these two records, the aircraft was right at first impact and second impact and the altitude was essentially the same on those two records. I see nothing to be concerned about in those altitudes.

Q Now, I am asking you to explain it. Then at the bottom of that page, there are no longer -- it says total mess twice and then there are no longer full columns of numbers, is that correct?

A Right.

Q And then that continues onto the top of the next page and then does that indicate that's where the system started to fail or conk out?

A No.

Q What does that indicate?

A You know, we have talked about the ten columns and the 12 digits per column, the last recorded information in the record was 11977. What you see below that is just merely totaling up the number of messages from various LRU's, et cetera.

Q So that is the last point that there was -- after 52852, the MADAR system no longer functioned, is that correct, for the reasons that you have previously indicated?

A I think that is -- that is the last record and after that is when you had the second impact and power went off the airplane. I believe that is it if you decoded this, I think you will find that was the case.

Q Fine. Now, sir, let me show you another document which has a cover letter on it which is signed by Mr. Dubuc to us, and certainly you are free to look at that, but I would refer you to an attachment to that letter which is a chart and I ask you to look at that chart and see if you can identify it for me.

MR. JONES: Why don't you identify it for the record what it is attached to.

MR. MARCUS: I will, I am trying to look for a copy.

MR. JONES: I have a copy. Well, if you have a copy for me, I will take it.

BY MR. MARCUS:

Q Well the letter is an April 18, 1980 letter from Mr. Dubuc to Oren Lewis, Jr. which is discussing certain information, one of which was the octal form that we have previously discussed and which has an attachment which we're now discussing dated 4/20/80.

Could you identify the attachment for me?

MR. JONES: I think you said 4/20/80, Mr. Marcus?

MR. MARCUS: 4/2/80, excuse me. I misspoke if I said 20.

BY MR. MARCUS:

Q What is that? That really isn't the important part of the question. There are four pages, okay, of information, one being a diagram, three being tables of various kinds. Have you seen that information before?

A I believe that I have, yes, without of course the letter that is attached to it.

Q Yes. I would assume that to be the case. And is this work that was done by Lockheed?

A Yes, it was.

Q At your direction?

A At my direction, yes, as requested by counsel.

MR. MARCUS: All right. I would like to have this marked as Plaintiffs' next exhibit.

MR. JONES: The whole thing or just the four pages?

MR. MARCUS: The whole thing.

MR. JONES: I object to marking the cover letter, I don't see any need to mark that.

(The document referred to was marked Plaintiffs' Exhibit No. 6, Edwards Deposition, for identification.)

BY MR. MARCUS:

Q Now, sir, if you would look at the last page of that document which is a diagram.

MR. JONES: Off the record a moment.

(Discussion off the record.)

MR. MARCUS: On the record.

BY MR. MARCUS:

Q And does this diagram indicate that the recording system power loss, which is what you were discussing, is that correct, there is an indication of when that took place, is that correct, on this diagram?

Do you see the words recording system power loss?

A Yes.

Q And there is an arrow there, is there not, right above it?

A Right.

Q And isn't that indicating when it basically took place?

A Yes.

Q Does that document indicate that it took place

somewhere between the first and second impact?

A This document has notes H-1, H-2, H-3, H-4 and in addition to that, words "power loss", that power loss is the second power loss prior to second impact, right at second impact.

Q That is the final power loss?

A Yes.

Q And didn't that take place somewhere between the first and second impact?

A That is true.

Q And wasn't the plane airborne at that particular point in time?

A The airplane was airborne, of course, between the first and the second impact. The power loss, as best anybody can tell, took place at second impact, not prior to it.

Q But this doesn't indicate that?

A It doesn't indicate when it took place.

Q Well, it is in the middle of the first -- between the first and second impact, is it not, the arrow?

A The arrow is, but it doesn't mean all that. You can't read H-1, H-2, H-3, and H-4, which were on documents previously supplied.

Q Which documents?

A I believe that's on the accident report, it was called Appendix A, item 43.

Q Well, let's --

A This is a sheet of paper out of that item 43, and a complete item 43 contains the explanation of notes of H-1, 2, 3, and 4.

Q You did not draw this then?

A No, sir, I did not draw this.

Q Do you know who did?

A No, I don't know.

Q Somebody in the Air Force or somebody in Lockheed?

A I assume it was somebody at Lockheed.

Q Now what is H-1, H-2, H-3, or excuse me note H-1, note H-2, and note H-3 refer to?

A As I say, this is a piece of paper, this is a sheet of paper out of Appendix A out of 43 and the complete documents, item 43 contains a page which explains these notes.

Q Can you tell me, do you know what they mean now in this form as tendered to us?

A From my knowledge of a long time ago of what item 43 included, I could -- I would almost have to guess at it to be a general concept of what at least H-1 means.

Q Could you give me that then?

A H-1 I believe is, if my memory is correct, deals with the situation that there was a power interruption at first impact and that this power interruption resulted in erasing or loss, if you will call it, of the data stored in the buffer before it could get recorded.

Q Do these notes, H-1, H-2 and H-3 relate to power losses in general, because you mentioned one specific power loss just now?

MR. JONES: Well, you're asking him about a document that the Air Force produced. I mean, he doesn't have it in front of him. I mean, it's based on his recollection.

MR. MARCUS: Obviously, unless you have the document. This is what was tendered to us and I presumed it had some meaning to somebody who tendered it to us and I am trying to find out what the meaning is. I am looking in the letter to see if it was so referenced and I don't see it. If you will help me, Mr. Jones, and correct me if I am wrong.

MR. JONES: Well, as Mr. Edwards said, this page here is derived from Appendix, item 43 of Appendix A, Tab T.

MR. MARCUS: Where does it say that in the letter?

MR. JONES: I don't know that it says it one way or the other in the letter. It doesn't specifically describe these documents in the letter, other than to say that here are some documents pertaining to MADAR that may have previously been produced to you.

MR. MARCUS: What are you referring to, Mr. Jones, page two?

MR. JONES: Page two, paragraph (5) of our April 18 letter.

MR. MARCUS: That is the eight pages of calculations?

MR. JONES: I think what happened, you got four--two copies of four pages of the two things, if I am not mistaken, because I think this is the total production that we gave you, but I may be wrong about that.

MR. MARCUS: I would like to know what I have got. It says eight pages, I have got four?

MR. JONES: Well, why don't you go through these eight pages.

MR. MARCUS: Mr. Jones, let me put my question to you. Am I missing four pages, to the best of your knowledge?

MR. JONES: No.

MR. MARCUS: That is all I am asking.

MR. JONES: I believe when I drafted the letter, when I did it, I think I gave you two copies of four pages each.

MR. MARCUS: In other words, eight should have been four?

MR. JONES: Yes.

MR. MARCUS: I am just trying to find out for my own knowledge, if the letter would have been written four pages instead of eight, then it would have been correct, is that what you are saying?

MR. JONES: Yes.

BY MR. MARCUS:

Q Mr. Edwards, since I didn't know up to this point in time that the last page came from item 43, I am afraid that we're just going to have to do the best that we can.

Now, can you tell me what note H-2 means, refers to?

MR. JONES: Just for the record, I want to make clear that item 43 pertains to the portion of Appendix A, Tab T that was held by the Air Force initially and then subsequently produced.

MR. MARCUS: I didn't reference it, the witness did, but that is what we're referring to.

MR. JONES: Yes.

BY MR. MARCUS:

Q Are we looking at the last page of Plaintiffs' Exhibit 6? Feel free to read it here. I don't think it's going to help, unfortunately. At least it didn't help me. I mean if you don't recall at all, you don't recall it at all, if you do, if you could share that with me, I would appreciate it.

A I think what the engineer is doing here with this last page, this page which shows the aircraft path of the first impact and the second impact has reference to notes H-1, 2, 3, and 4. The previous pages is his manual decoding of the octal data of the last record, and what he is doing with this page, he's showing you that this last record was after the first impact, so that really is the data that he is decoding, which happens to be that record number that he indicates on that first of those four pages or excuse me, the second of those four pages as record 11977. So he's merely showing you in a point of time reference when that actually happened on the airplane, which is this group of data after first impact.

Q In other words, page two, page three and page four kind of go together of this attachment, excluding the letter again?

A The first page is unnumbered and that of course goes with the next number of pages which is 1, 2, 3 and 4.

Q So they all go together?

A Right. I was misreading it.

Q I misunderstood. Let's go back, what was page one of the attachment?

A Page one lists the specific points in time in vertical and lateral acceleration of the CG of the aircraft.

Q How are these numbers obtained?

A Well, they would be obtained, I asked that this record, this be decoded and then I believe I didn't see it until now. I saw this, it got started but I didn't see it completed.

Q Would these numbers, can you answer the question or should I --

A I really need to study a little bit, if I have to answer a lot of detailed questions about it.

Q Well let me try to help. Were these numbers obtained from decoding the octal form dumpout?

A Yes.

Q Or were they obtained from another source?

A I assume that they are from this data and I am trying to place them in a point of time and I am having a little difficulty because I didn't get to see the document before testifying.

Q When you say this data, I don't know what you're talking about.

A I am talking about the vertical and lateral acceleration data.

Q Now, but that was obtained from decoding the octal form. Let me ask it differently. You see time 52849552

MR. JONES: Page what?

BY MR. MARCUS:

Q Page one, which is where we have been all along, and then you see VA which is vertical CG, is that right?

A Right.

Q What does CG stand for?

A Center of gravity of the aircraft.

Q And what does the other number, there is a number 0.52, is that vertical G?

A That is the vertical -- that is the arithmetical number of the vertical G, G load.

Q Now is that a calculated number or is that a number read off a printout or dumpout?

A That number, I believe, is a number that is produced from this octal dump.

Q I am sorry?

A From their octal dump.

Q Reduced?

A Reduced from this octal dump, manually reduced from there.

Q When you say manually reduced, I don't know what you mean by that term. Do you mean decoded or decalculation?

A Decoded.

Q So it's here, but you have to know how to read it as against a new calculation, is that correct?

A That is right, it's not a calculation, it is decoded data from the record.

Q And the LAT being lateral, next column?

A That is right.

Q There is a number there?

A Right.

Q It's negative 0.37?

A Again that is the lateral G force at that point

in time.

Q And again, that is a reduced number using your term as against the calculated number?

A Decoded, it is not a calculation, it is a decoded number.

Q Now going back to the octal form, if I may, which is -- you know, you have it in front of you, sir, decoded information that contains the G forces lateral and vertical?

A Yes, among other data.

Q Among other data. But again, is this relatively useless unless you have decoded the information, is that correct?

A Correct.

Q There is no way you can tell what the lateral or vertical G forces are unless you decoded it?

A You can't use it unless you decode it, as was done here, for certain periods of time.

Q This was done, decoded here for 52849, 55 and 52850?

A This is the decoding of this last record which is the record 11977.

Q There is also 52851 and 52852, I didn't see it

on the other side. What does the star minimum and the star maximum mean?

A I can't comment on it.

Q In other words, you don't know, is that what you are saying? You're not unwilling to comment, you just don't know?

A I just don't know.

Q What does NR mean?

A Not recorded, I would assume.

Q Is that 5284955, do you see that column, go down to .90, is that 5284955, is that NR?

A I assume it's NR, yes.

Q It's not NL, all right. Now let me ask you this, go to 52850, 52851, excuse me, .10, do you see that column, I mean that number, that series of numbers?

A Right.

Q And there is numbers changed, you see that?

A Yes.

Q Do you have any idea why those numbers were changed?

A Yes, and that is really the only reason I got to see this document is because the engineer who did this worked into the wee hours of the morning and he got tired

in finishing this task and the next day, after he was rested, he went back and did a quick check and he found that due to the working in the wee hours, that he made just a minor oversight where his eyes got tired or what and he came back and corrected it. That is a manual error.

Q When was this done, does it indicate a date on the top, April 2nd, 1980?

A I don't recall.

Q Reasonably contemporaneous therewith?

A I think that has been in the very recent past, I am sure.

Q Around April 2nd, you don't know?

A I don't know. I didn't try to remember. The date is 4/2.

Q Would it be at least around that period?

A Yes.

Q Who did this work?

A A gentleman by the name of Ken Peck, P-e-c-k.

Q Ken Peck, is that correct?

A Yes.

Q And was he the one responsible for getting that work out?

A Yes.

Q And did he in fact do it himself?

A He did it himself, yes.

Q And why was these particular time periods selected, that is 52849, 55 through 528520, if you know?

A Again I am trying to look at the whole thing.

Q Do you want to take a minute to look at it, sir?

A In looking at the fourth page, the page with a little aircraft path trace on it, you notice in the MADAR time of that airplane 5284955, that is the beginning of that record, it says MADAR data, okay, and that record shows --

Q Of that data, you mean the data on the first page?

A Right.

Q Excuse me?

A And then the record goes on for 2.45 seconds.

Q So this is the part after first impact until the system stopped?

A That is one record that was recorded in between the two impacts.

Q Does the MADAR tape indicate X axis, G forces?

A I don't believe it records the X axis.

Q Those are Y and Z, is that correct?

A The vertical is Z and the lateral is Y.

Q So these are Z and Y?

A Right.

Q I didn't mean to indicate the order, but it's not X?

A No, it is not X.

Q There is no way of knowing what X forces are, G forces are, I gather, from the MADAR tape anywhere?

A My memory is that the MADAR does not record the X axis.

Q What I am really asking, I thought I got that from you, maybe I am not making it clear, was that there is no way of calculating to know that from the Y or the Z?

A No.

Q So in other words, it is not an obtainable recording?

MR. JONES: Objection.

THE WITNESS: Not from the recording.

BY MR. MARCUS:

Q Not from the recording or the data in the recording?

A You cannot deduce X axis knowing Y and Z alone.

Q What about knowing whatever other information is

included in the MADAR tape up top?

A. There is other information in the MADAR like the aircraft velocity which is an important key function in calculating X axis deceleration. If you know the velocity over two different points in time, then you could calculate them. It was not put there for that purpose, it was put there just to record the velocity of the aircraft.

Q. Well, you brought the subject up and I was going to get into it and I might as well get into it now.

What other information is indicated in the MADAR, what other parameters? We have the vertical and the lateral or G forces and we also have the velocity, is that correct?

A. Right.

Q. What other information?

A. What other?

Q. Yes.

A. I don't recall exactly how many parameters are referred to on the MADAR for the whole aircraft system, but it's in the hundreds.

Q. I presume these parameters are for the plane in general, is that correct?

A. These parameters were printed down here because they probably had some relationship or some interest. Now,

there are many, many other parameters which nobody never really cared about.

Q Let me ask the question differently. We have a parameter vertical G forces, correct?

A Correct.

Q All right. We have a number underneath that column for given time, is that correct?

A Correct.

Q I am looking on page one.

A Okay.

Q Now, does that number refer to the vertical G forces that were experienced by the plane as a whole, or is that for a particular portion of the aircraft?

A That instrument is located at the CG of the aircraft.

Q All right. So it's for the center?

A It's for the specific points.

Q It's for the center of gravity of the aircraft, it's not necessarily for other points of the aircraft?

A No, you would have to have a transducer at that other point in order to know what it was.

Q And where is the center of gravity of the aircraft?

A It's roughly behind the point of the -- well it varies back and forwards as you have the cargo on the aircraft, particularly from 19 percent to 35 percent, but I don't recall where it was in this case, but it was somewhere around the center of the lift which is about the treading edge of the wing or something like that.

Q Is it in the fuselage up with the wing?

A The center line of the aircraft, at the center lift which may not necessarily be lined up with the wing because this is a swept-wing aircraft.

Q Is it placed in the cargo area? I assume we're all talking about instruments which takes a readout, it being the instrument that would be placed in the cargo or troop compartment?

A It's in the cargo compartment.

Q Always?

A This instrument is in the cargo compartment and it's in the same place on every airplane.

Q And there was no accelerating -- that was the only instrumentation, vertical and lateral G forces, is that correct, just one?

A That is the main instrument.

Q I am talking about only for vertical or lateral

A I believe that is true.

Q Not for other parameters.

A We have some aircraft that our structural people have installed and they may duplicate some of this data, I can't recall right now.

Q But that wasn't on the C-5A 68-218, was it?

A I don't remember.

Q There was a chart prepared like this for times prior to 58284955, this being page one that you are aware of?

A This type of information that is vertical and lateral accelerations was included on that thing I mentioned a while ago which is Appendix A, item 43, and that included for the entire flight from the point of takeoff to the point of first impact and prior to second impact.

Q Was it in a tabular form like this?

A No, sir, it's in trace form.

Q Graph form?

A Graph form, easy to read.

Q Is 5284955 the exact point of first impact?

A No. I say no, we have discussed many, many times, there was a power transit or interruption at first impact and we lost the last 3.6 seconds of data. Now the people,

the experts in the computer program made an analysis and with all available information in trying to predict the exact point in time as to when the first impact occurred, and this is a result of that and it shows that 52849 is either being the point of -- I believe that was the time of first impact.

Q You have got me confused and I will tell you why, maybe you can help me.

A I believe it was the point of first impact.

Q I thought we said before there was no information relative to the G forces generated upon first impact because of the fact of the failure?

A Because of the erasing the tape, that's correct.

Q Then how could you come up with the vertical and lateral G forces at the exact point of first impact?

A If you look closely at this page four, you will see that there is a finite length of time after first impact and before that data, that message starts and in fact it's listed right on there as .020250 seconds.

Q So in other words, the vertical and lateral G forces that were indicated at 5284955 are not literally the exact points of first impact?

A At some specific time after first impact and

I believe that is what I have been saying, unless I misunderstood the question.

Q No, I believe that is what you were saying, I maybe misunderstood an answer and that is why I went back.

A I am trying to be very careful because I don't want to mislead anybody.

Q That is exactly what I understood up until about a minute ago, so I am back on track. And of course, you don't have the -- such information for the point of second impact because the MADAR did not go that far?

A Well again you probably had another power interruption which erased the data which is the buffer zone.

Q At any rate, 52852 is the point between the first and second impact while the plane was presumably in flight, is that correct?

A That is correct.

Q Let's go to the second and third page. They are the same item, the same type of items?

A The same type of items.

Q Page one and page two of the document, is that correct?

A Right.

Q It says decoding of SLRP(05) messages on record

11977, is that correct?

A That is correct.

Q And does the remainder of the data on the two pages come from 11977, record 11977?

A I believe that is true, I am sure that is true but I want to make sure. Let me just check 11977.

Yes, that is in that last record.

Q 11977.

A Yes.

Q Now again, we're talking about the MADAR, is that correct, SLRP?

A Yes.

Q And what I want to do with you, if I may, Mr. Edwards, is go across the page, there are various columns. You can see octal, X-3, X-4, the second number 20, X-5, X-6, et cetera?

MR. JONES: Which document?

BY MR. MARCUS:

Q Page two of the attachment to the letter that we have previously referred to and which has been marked Plaintiffs' Exhibit 6.

Mr. Edwards, are you with me?

A Yes.

Q And it says -- see where it says octal X-1, X-2, X-3, X-4, X-5, X-6, X-7, and I presume, I don't know what that is. Is that all the way to 10?

A 8, 9.

Q Is that 10?

A I believe it is, yes.

Q And there are two X's to a column?

A Two numbers to a column.

Q What does X refer to, X-1, X-2?

A Well that is just -- it's just the coordinates of these two numbers, of these two numbers means something in a series, a certain series and it's in the decoding process.

Q Do you know what they mean?

A Going through this coding system, you can determine what they mean, yes, as it's decoded here, and I didn't decode this.

Q But you can't tell me sitting here right now what X-1 and X-2 mean?

A No.

Q Or X-3, X-4 or X-5, or X-6?

A No, it's all in that big text order which I am--

Q I am not quarreling with you, I am just asking.

A That is where it came from.

Q But you can't tell me what they are?

A I can't decode that just by looking at it, no.

Q Can you tell me in general terms what the X's refer to? Is that a specific number, is that a coordinate which gets you to a specific number on a chart or what?

A It merely tells you that the first two numbers in that series are listed as and recorded as X-1 and X-2 and you treat those as a pair and then you separate that into the second pair and the second pair, three and four, that's coordinates 3 and 4, in a decoding process, that does tell you something.

Q All right. What does 05 refer to? Do you see 05 under X-1 and 2?

A That is the beginning of each one of these messages.

Q But you can't tell me what that means without decoding?

A Without decoding?

Q Yes, can you sit here and tell me what 05 means?

A The 05 has a specific meaning, but it escapes me right now because, as I said, it's been some 15 years.

Q Do you know what 34 means?

A. No, there you have to get into decoding. 05 has a specific meaning each and every time. 34 would have a specific meaning, but you would have to decode it to find out.

Q. You can't tell me that?

A. No, not without going through the decoding, on none of those.

Q. I am just asking, sir. All right, then you see the next column X-3, X-4, do you see that?

A. Right.

Q. Can you tell me what that is underneath?

A. These numbers result from --

Q. No, can you read it?

A. 1-C.

Q. I beg your pardon? There are a number of markings, I can't read them, would you read them for me.

A. The first three letters I believe is an HEX.

Q. HEX?

A. An X coordinate system.

Q. And what is that?

A. Again you record this in octal form and then your first step in decoding is to convert it to an hexanal coordinate system and then that is what this engineer did

manually.

Q What does 1-C mean, do you know?

A That is the process that he went through to decode, looking back at X-3 and X-4, the numbers 3 and 4, and when he decoded that, he got a 1-C on the HEX coordinate system.

Q Why does one want to go from the octal to the HEX coordinate system?

A Now you're getting kind of deep into computer programming techniques and it gets heavily involved with the method which they put this on tape in consideration of saving space on the tape and time and things like that.

Q Is it a retrieval mechanism or retrieval system, a means of retrieving the information from the computer? I am trying to understand what you're saying, Mr. Edwards.

A This is part of the decoding system.

Q Then there is a SEC, is that second or is that for something else, SEC, do you see that in the third column, /20?

A I would like to tell you, Mr. Marcus, that I have stated that I can't decode this without refamiliarizing myself with the book. Now, if you are trying to establish that I can't do it, I've already told you that I can't and

and I don't really know what the point --

Q Mr. Edwards, I find it a little unbelievable that you don't understand, but this is what I am trying to do, I am trying to find out what the document is, that is the document that the Lockheed people sent to me and I would like to know, I am not asking about the numbers underneath the column, I am just asking if you can tell me what those columns mean. If you can't tell me, you can't tell me. You told me to at least a certain extent what column one and two generally do, can you tell me generally what column three does or I am asking you what SEC means, do you know?

A I started out by saying that X-3 and X-4 on the HEX coordinate system, from there on across the page, you're in the process of decoding and I believe I previously stated that I am no longer familiar with this decoding process and everything you ask me across that page there is involved with the decoding process.

Q Well you certainly can tell me what the parameter means, can't you?

A Not with any degree of certainty because I have explained several times, if you like I will go through it one more time.

Q I want to know what parameter --

MR. JONES: Are you talking about the last column to the right?

MR. MARCUS: Right.

BY MR. MARCUS:

Q I picked one which I thought we could discuss.

A Well, the parameter in starting with the engineering interpretation and in the parameter, the engineering interpretation of that number 22, going through the decoding process means in-flight refueling was disengaged. And on the second line, the 27th count, that number 27 together with all of the other information in the decoding process means that the basic acceleration was minus .027 ratings per second.

Q Let me stop here. Let me just go a little slower, if I might. What does the word counts mean in this context?

A Well here again, that is part of the decoding system and I don't even want to get into that because I can't tell you exactly and I don't want to guess.

Q I had no way of knowing whether that was the case or not. Okay, engineering interpretation, is that literally what the word -- is that the engineering

interpretation of the data to the left in the columns to the left?

A That is the sum total of all of the decoded information to the left. Between there and under the column marked octal data.

Q Correct, on a straight line, horizontally across going either way?

A Right.

Q From octal to counts?

A Right.

Q Now, I am sorry, you may have said this, I was trying to figure this out and you were going just a little too fast for me. What does the word disengaged mean?

A That in-flight refueling was not taking place, instead of engaged like you're hooked up to a tanker, the aircraft was not hooked up to a tanker.

Q What significance does that have to the G forces, if any?

A That doesn't have any, that just happens to be the first piece of data that was recorded there and it's meaningless.

Q Is this the decoding of all of the data in the record 11977, whether or not it has relevance to the first

page of the attachment?

A I can only assume that it's a decoding of all the data that is there that is good data. There may be a bad piece of data in there that can't be decoded and I wouldn't know that unless I spent some time.

Q Well, I wasn't really thinking in those terms. Putting aside that data that could not be decoded, is this the decoding of all data, whether or not it's relevant to the question that we're addressing in page one of the attachment?

A Yes, sir, because as you look down that parameter column, you find a lot of things that you're not really concerned about like unkneel, level kneel down below the middle of the page.

Q Would you be concerned with air drop?

A No, you wouldn't be concerned with air drop.

Q Ground spoilers, you wouldn't be concerned with that either, would you?

A No, that is merely the status of the ground as far as they're retracted and the status of the kneel system is unkneadable.

Q So those pages really don't do me very much good, do they, unless I understand the decoding system or

have somebody here that is familiar with the decoding, is that correct?

MR. JONES: Objection.

BY MR. MARCUS:

Q That is pages two and three of the attachment.

A Two and three is the backup data for what is on the previous unnumbered page, which gives you the -- which decoded this last record for you.

Q But you can't interpret these numbers, the data given on pages two and three of the attachment, is that correct, that you just stated a number of times?

A I can't interpret them.

Q Yes.

A I didn't say that, I said I couldn't decode it. Now once you get over here to the other end here, you know that the C, starting out on the third line, you have got 1.03 g's, if you want to know what the g's were during this last record and .2 g's, et cetera.

Q Let me restate the question. You can't interpret the information to the left of engineering interpretation, is that correct?

A That is not an interpretation, that is decoding and I said I can't, I am unfamiliar with the decoding.

Q You can't tell me what the numbers or letters mean, is that correct?

MR. JONES: Objection.

BY MR. MARCUS:

Q I thought that is what you said.

A All the numbers to the left of that wording is engineering interpretation, and that is involved with either the decoding process or with what is on the tape in octal form. But from the column under engineering interpretation to the right, that is the decoding and all you have to do is look at that and then it doesn't need an interpretation.

I mean it doesn't need decoding, it's already decoded for you.

Q I understand that, sir. You see you have to understand it from my standpoint, certain information was given to us so we can ask reasonable questions and I am beginning to get the feeling that the information given to us was not -- does not permit us to ask these reasonable questions.

MR. JONES: The information was given to you because you requested it.

THE WITNESS: And this information really is duplicated by these traces on Appendix A, item 43 that you

have had for some period of time from the Air Force.

BY MR. MARCUS:

Q All right, sir. I notice there are various vertical and lateral G force numbers indicated here, in fact almost -- my question is how come there are so many for a given record? Let's get the time lapse, the time lapse, if you could check me, Mr. Edwards, if I am wrong, if you want to correct me, it was 52851 to 52852 which is the total of one second.

My question to you is how come there are so many vertical and lateral G force recording under engineering interpretation and parameter?

A Well the MADAR system is designed such that it looks for a change in a parameter before it would record it. It records the change. If it looks at it and the parameter is the same before that, it ignores it. So it tends to record the data that is changing.

Now in between the first impact and the second impact, there was some activity on the vertical and lateral channels, acceleration channels. My opinion is that the aircraft, after this initial touchdown and in the climbing attitude that it had, the right wing chopped off about three or four trees as is indicated on this wreckage

diagram that was seen previously. And that would have created some disturbances in the structure of the aircraft and would have made these transducers record a change and that is what the thing is trying to record.

Now, that is my opinion.

Q Would you agree with me that the record 11977 was one second?

A One second, correct.

Q A period of one second?

A No.

Q It does not?

A I think that that record, if you look at all the details here and especially the first page, it says that it goes beyond one second. It covers a period of time 5284955 to 5285200.

Q All right, sir. Would you please go back to the octal form. Do you see that, do you see the record 11977?

A Yes.

Q Does it not say 52851 to 52852?

A It does.

Q And that is not one second?

A If you subtract 51 from 52, you get one second, but as I previously pointed out, sometimes there is a start

with a 5100 and you get to 5299 so --

Q That is one second, am I not correct? Didn't the information that we have been discussing in Plaintiffs' Exhibit 6 come from the octal dumpout?

A It came from the decoding of all these numbers under here and obviously this line that you see right across here, this 5285152 and proceeding across, you see the altitude 537.20. What this line means is that altitude was recording within that period of time, 51 to 52. It doesn't really mean that that record is limited between those two times.

Q I see.

A As I stated before, this altitude is the last altitude recorded. It may be the only one within that period of time and in this particular case, I believe it was.

Q So in other words, you don't even know the time with which these columns, those ten groups of numbers --

A The time is inherent in the decoding process.

Q But you can't tell without decoding?

A We have been over that, I can't decode this.

Q Well, sir, we have been over it but you have to understand I have not worked with this like you have. I see a time period.

A That is a part of the decoding process.

Q All right, fine.

(A short recess was taken.)

BY MR. MARCUS:

Q Now, sir, in analyzing the MADAR tapes for G force information, did you, meaning you and/or anybody else under your direction or anybody else in the employ of Lockheed use any document that we have not referred to in this deposition?

MR. JONES: To do what?

BY MR. MARCUS:

Q I said for purposes of taking or analyzing G forces information from the MADAR tapes, did you, you meaning Mr. Edwards or anybody under Mr. Edwards' direction or anybody to his knowledge in Lockheed use any documents that we have not referred to yet in the deposition, and the documents we referred to are one, the octal form dumpout; two, the VGH Audit; three, the attachment to the letter, the four page attachment to the letter; and four would have been item 43?

A I would imagine when that Appendix A 43 was made up at Lockheed and the Air Force and I think it was made up in part when they were down in San Antonio, I would

imagine that they merely asked the MADAR systems, excuse me, not the MADAR system but asked the computer to printout all the data that it had on this last flight in engineering units because there is a mass of data that is plotted on the A-43 like --

Q We're talking about relevant to G forces, that is the question.

A Relative to G forces, I am sure that they just printed the stuff out in engineering units. They may have asked, and I don't know, they may have asked for a VGH Audit and a VGH printout every time there is a VGH change.

Q My question, sir, is were there any other documents that were used? Are you telling me that there may have been another printout?

A They may have asked for a specific printout like all this Al Heath document, but they may have asked it for the whole flight.

Q Do you have that?

A No, I don't have it, I am just supposing, that is a way they could have done it.

Q Have you made a search, caused to be made a search to see what documents Lockheed in fact possessed with regard to the MADAR tapes and interpretation thereof,

again related to G forces or more specifically, relating to item number two in the notice of taking depositions, have you caused such a search to be made?

A. We don't have such a printout now and haven't had anything in the recent past on VGH Audit on the entire flight. All I am saying is that when Appendix A was made up, item 43, when that was printed, they probably asked for the total.

Q. I understand, I am going to something else. Do you remember item two in the notice, you can look at it, I am not playing games with you, take a look at it. It says MADAR tapes and interpretation thereof of the flight, of 68 -- C-5A 68-218 and all other recordings and/or documents evidencing G forces?

A. Yes, I talked to the MADAR people about what do we have in the way of computer printouts.

Q. And did they tell you anything other than what we have referenced today?

A. That's right, nothing other than what we have talked about here today.

Q. And that is including, I made one mistake and that was the interpretation manual, that also should be included in what we have talked about today.

A. We recognized that that had been previously sent up when we talked about this thing last week.

Q. You missed my point, Mr. Edwards. I referenced certain documents that we talked about today. I left that one out and I want to include it so that we are accurate.

Now, I am asking you, are there any other documents and you are telling me no, is that right?

A. As far as I know in our possession at this time, that is all.

Q. Now are there any other documents that relate to number one that we have not discussed today?

A. No, sir.

Q. We have discussed a letter which counsel is not going to give us, preserving his legal objections, and also it has been tendered, a calculation sheet that you have, correct, and those are the documents relative to G force calculations that we have discussed today and you have no others that you know of?

A. I have no others but the letter, what letter are you talking about?

Q. The letter from Mr. Wittle to you, counsel has preserved his objection but we have discussed that today. So there are no other documents relating to calculations of

G forces as indicated in number one that we have not discussed today, is that correct?

MR. JONES: Well, there is a reference in our letter of April 18th to a -- April 18, 1980, where we produced these documents to paragraph paren, this is on page two of that letter, this is in paragraph (4) on page two of our April 18, 1980 letter. Do you have a piece of paper as to formula, Mr. Edwards, that you had in front of you during the testimony that resembles, I think, layouts -- that lays out the formula, that part of the exhibit, Deposition Exhibit No., Plaintiffs' Exhibit No. 3 here today?

THE WITNESS: I honestly derived that formula and I can probably go back and find that paper, but it's going to be identical to that.

MR. JONES: If there is such a piece of paper, we will produce it.

MR. MARCUS: That is all I was asking.

MR. JONES: I think that there may be such a paper and I think that is this --

MR. MARCUS: Fine, I would ask that you produce it, and my question is, are there any others, any other documents in the possession of Lockheed that you are

aware of that relate to number one that we have not discussed?

THE WITNESS: I don't recall any at the time but if I recall any in the future, I'll produce them.

BY MR. MARCUS:

Q Will you give them to counsel?

A I will give them to counsel.

Q At least inform counsel of their existence.

Now we have referred to octal form dumpout and we have not marked it and I think we probably should. I would like to have this marked as Plaintiffs' Exhibit No. 7.

(The document referred to was marked Plaintiffs' Exhibit No. 7, Edwards Deposition, for identification.)

MR. MARCUS: Mr. Jones, I believe there was something you wanted to tell me about another document?

MR. JONES: Here is a Xerox copy of a communication sheet that's used in deriving the G force calculations that are on what you have marked as Plaintiff's Exhibit No. 2 and it also has the formulas that are contained on Plaintiff's Exhibit No. 3.

MR. MARCUS: Let's mark this as Plaintiffs' Exhibit No. 8.

(The document referred to was marked Plaintiffs' Exhibit No. 8, Edwards Deposition, for identification.)

MR. MARCUS: On the top of that, I notice you're multiplying 270 times 1.15 times 88 over 60, and that is merely a conversion of knots to feet per second?

THE WITNESS: That's correct.

BY MR. MARCUS:

Q And the distances are distances that we've previously discussed?

A That is correct, yes.

Q Now the heading of this is G loads on passengers. Do I understand correctly you're basically calculating the G loads felt on various sections of the aircraft just like we previously discussed, is that correct?

A That is correct. Further down the page you will see there are really three segments, and this says for aft troop flight compartment and the second is cargo and this is just as we discussed previously.

Q This is not an attempt to calculate G forces that were felt at any particular seat on any particular passenger, is that correct?

A No, it is not.

Q And the rest of the information is basically the same as we have discussed previously, is that correct?

A That is correct, except it does contain the detailed compilations using these distances and those velocities.

Q I don't understand what you mean, sir?

A It contains a detailed calculation; previously all we have done is talk about the G loads and such and such. Here it shows the detailed number as to how you arrive --

Q Are you talking about the one, two, three and four?

A Right.

Q Well, we also have something else, we have it for a car going 70 miles an hour and this is 100 feet, is that it?

A Correct.

Q 100 feet.

A We have not discussed that before, that was just another mental exercise to compare what an automobile would do.

Q And that would be 1.63 g's, is that correct?

A That's correct.

Q And that is basically the same, at least that number is basically the same as the number you came out with regard to the aft troop compartment, is that correct?

A Fairly close.

Q And would you agree with me that stopping a car between 70 miles an hour and 100 feet is a fairly short distance?

MR. JONES: Objection.

THE WITNESS: At the time I made this detailed calculation here, I really didn't have any information available as to how quickly you could stop a car with a good braking system and I don't know whether that 100 feet at 70 miles an hour is a good number. I really don't.

BY MR. MARCUS:

Q I didn't mean it as a good number, I mean it's a short span upon which to stop a car going 70 miles an hour?

A It may be too short a span, it may not, I really don't know, that is what I was trying to say.

MR. MARCUS: All right. I just want to make a statement on the record relevant to 30-B-6, it's obvious that Mr. Edwards is not able to decode or familiar with, by his own testimony, the decoding mechanism without reviewing the manual which he has not done prior to this deposition

and therefore, in my opinion, this was not the appropriate party to tender with regard to the paragraph two of the notice of the 30-B-6 notice of taking depositions.

Secondly, I would contend to renotice the taking of this deposition at a later time because of the fact we were not tendered the decoding manual which is the only way by which, according again to Mr. Edwards' testimony, you can understand the information contained in the octal dumpout. It's my understanding that the manual made available in Court, we were not permitted to take it out of the Courtroom and therefore, there is no way in which we could have gotten it copied nor was it ever tendered to us for copying or generally.

Therefore, we intend to pursue the retaking of the deposition as it pertains to MADAR. As it pertains to paragraph two as contained in the notice of taking of deposition, and that we intend to do so at a different date other than today so we can study the operational supplement and become reasonably familiar with the subject.

I don't know that we need to argue it at this point, I am just putting you on notice that that is our intent.

MR. JONES: Well, for the record, we think the

whole decoding process is completely irrelevant because the Air Force has produced in graph form in item 43 of Appendix A, Tab T to plaintiffs long since a graph that lays out in graph form information that the decoding would show, and not only that, we have testified, we provided people to testify at some length about this and in fact, the calculations that Mr. Edwards used to calculate the G forces on the X axis were derived from information contained in the accident report which is available to the plaintiffs and Mr. Edwards did not use this decoding manual himself to derive that.

And anything that get s into the decoding of this manual is beyond the scope of discovery with respect to this case. And not only that, but we do tender witness, we have a witness available right now and we have offered this witness who has used this manual to decode this data, and I am referring to the decoding that's contained as an attachment to our letter of April 18, 1980.

We have this witness here today and if we had made him available, counsel for plaintiffs indicated that they wanted a half day's time to cover this 30-B-6 deposition and we have provided somebody. And if plaintiffs right this minute want to proceed with examining someone

on decoding MADAR data or at least ask about it based on this manual, that witness is available and we object to making anybody else available for this deposition.

Secondly, this manual was provided to plaintiffs down in Court and was returned to us without a request that it be copied and we have never denied plaintiffs an opportunity to copy this manual. We understood they weren't interested in copying it until today. In fact, no statement was at all made by plaintiffs' counsel when they had this manual available for a full day in Court and they simply returned it to us at the end of the day. So I think that the record should be clear that this manual was available and we would object to any further depositions in this area.

We have made Mr. Edwards available and we will make a second witness available who has decoded portions, a small portion of the octal dumpout. It's an extremely complicated process and in one record number, there are approximately 11 times 10 times 12 sets of numbers and this process has been gone through as a result of the accident investigation report before and the Air Force has plotted the results of this information in its Tab T, Appendix A, item 43 and we see no reason to go through this process once again.

MR. MARCUS: With regard to the statements made by counsel relevant to the tendering of the document, I categorically disagree with his representation. The document was not made available, it was my understanding, although I admit it is my understanding that we asked to take the document outside of the Courtroom and that was denied for the purposes of copying.

With regard to the other statement, the tendering of the witness, I specifically asked counsel when we began with this deposition, are you tendering one or two witnesses and he said one. He did indicate there was somebody else available in case we ran into some difficulties. That was indicated about 4:00 o'clock, Mr. Edwards was tendered as someone who's knowledgeable and there is no way I could tell whether he was knowledgeable or not until I started pursuing the matter in detail.

But with regard to continuing the deposition to tonight, that is preposterous, there is no way that I could read that manual between now and starting a deposition and become knowledgeable. I have just received the document, I am going to study the document, and then we are going to send out a notice of deposition.

I have no reason to pursue the matter, it's now

6:00 o'clock, after spending four hours on the subject, just getting a document three or four inches thick tonight. And as I said, we'll argue about it later. I understand your position and you understand mine.

I think that is the only purpose for this particular colloquy.

I would like to make one other statement on the record which I don't think is going to be one disputed, and that is that Mr. Piper is absent as is any representative of the United States and I was informed that they did not intend to attend this deposition and therefore, his absence should be noted and his waiver of appearance should also be noted.

MR. JONES: I want to make it clear that we feel we have fully complied with the 30-B-6 notice of deposition.

MR. MARCUS: Mr. Jones, you have already stated that. Do you want to do it again?

MR. JONES: Please don't interrupt me.

MR. MARCUS: I don't want to have to pay for this.

MR. JONES: You will have to pay for it.

MR. MARCUS: No, I don't, I don't have to sit here for three hours while you go on a harangue. Youhave

made your statement.

MR. JONES: Would you be quiet so I can finish my statement. You have interrupted my statement.

Let the record reflect that Lockheed believes that it has fully complied with the 30-B-6 notice of deposition with respect to G forces and MADAR tapes and we have made available and/or are tendering a second witness today. We have tendered him and I made it clear to Mr. Marcus that we had a second witness available to the extent that he wanted to go beyond what Mr. Edwards' knowledge is of the record and he has indicated that he may want to go beyond that, but we have agreed upon a set discovery schedule for these depositions and we're not agreeing to bring up people a second time to go through this process again when the information is contained in this octal dumpout. It's already been transcribed as part of the Appendix A, item 43.

MR. MARCUS: I would just like the record to show that Mr. Jones didn't say one thing that he hadn't said the first time and I really object to this harangue, this verbage. Your position is well stated. I don't see why we have to argue this point.

My position I hope is very clear, I don't

accept anything you're saying, and in fact you're tendering a witness in the middle of the deposition. If you want to tender him, you should have brought him here. That was your choice, you made the selection and you made the tender.

MR. JONES: I told you at the beginning of this deposition that we could cover this area with another witness and I made it clear he was available in town and I will bring him over here right now, if you want. He's here in town and we're not going to bring him up again without the Court deciding that we have to.

MR. MARCUS: That is the way I intend to go.

MR. JONES: All right.

(Whereupon, at 6:15 o'clock p.m., the taking of the instant deposition ceased.)

_____
Signature of the Witness

SUBSCRIBED AND SWORN TO before me this ____ day of _____, 1980.

_____
Notary Public

My commission expires:

CERTIFICATE OF NOTARY PUBLIC

COMMONWEALTH OF VIRGINIA)
) ss.:
COUNTY OF FAIRFAX)

I, DEBORAH S. CUBBAGE, the officer before whom the foregoing deposition was taken, do hereby certify that JOHN W. EDWARDS, whose testimony appears in the foregoing deposition, was duly sworn by me, a Notary Public in and for the Commonwealth of Virginia at Large; that the testimony of said witness was recorded by me by stenotype and thereafter reduced to typewritten form under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative of or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.

Deborah S. Cubbage
Notary Public in and for the
Commonwealth of Virginia

My commission expires:
March 12, 1983